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MAGNOLIA MICROSYSTEMS  
CP/M Plus<sup>™</sup> User's Guide Supplement  
for  
HEATH/ZENITH Z89 and Z90  
COMPUTER SYSTEMS

Revised 9/20/83

(c) 1983  
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## GETTING STARTED

This procedure **MUST** be used to bring up your CP/M Plus and make a copy of the original distribution diskette. The distribution disk should be in the '89 an absolute MINIMUM amount of time to preserve its integrity as a backup device.

Note: Throughout this text, as in many others, the symbol (cr) means to press the RETURN or ENTER key. Most CP/M programs require a (cr) after characters are entered from the keyboard to inform the program that operator input is complete. Also, in this manual, all operator inputs are underlined. Thus, in the example below, you would press the "B" key, then the "RETURN" key. The computer will respond with the characters "oot" to complete the spelling of "BOOT".

Be sure there are NO diskettes in any drive before turning on the power switch(es). When the power is applied the computer should display an "MMS:" (or "H:") prompt accompanied by two short beeps. If the prompt does not appear after a reasonable warm up time press the right shift and reset keys simultaneously. The prompt should appear accompanied by a single beep. If not, see the 'Troubleshooting' section in your computer documentation or contact your Dealer or Service Center for assistance.

### 1.0

Boot CP/M Plus by inserting Distribution Disk 1 in the FIRST double density disk drive and gently closing the disk drive door. Then enter:

```
MMS: Boot(cr)      NOTE: Some computers may require that a "drive
                    designator" be typed after the "B", such as
                    Boot 3(cr), Boot 29(cr), or Boot 50(cr). See
                    your computer and/or Monitor EPROM
                    documentation for details.
```

The drive select light should come on, and the operating system should load and sign on:

```
289/290 Loader BIOS v2.241 (c) 1983 Magnolia Microsystems
57K TPA
MMS CP/M 3.101
```

A:

The "A:" indicates that your CP/M Plus system is now up and running.

If your computer attempts to boot from the wrong drive (the red Drive Select light appears on a different drive), you have SW501 set wrong or you entered the wrong "drive designator". If the display shows:

```
Boot ?
you may not have SW501 on the CPU board set properly or you have a
hardware error. If you have tried at least twice and are unsuccessful, see
your hardware documentation.
```

## APPENDIX F

### In Case of Difficulty

If you are booting a 40-track distribution disk in an 80-track drive as used in the Z37, open the disk drive door, but leave the disk in the drive. Type the appropriate boot command and press return. When the Drive Select light comes on, close the door. You may have to try this several times to get a successful boot. As soon as you are successful, continue with the Backup and Configuration procedure, which will create an 80-track system disk.

### IF YOU STILL HAVE PROBLEMS ---

1. Most problems result from failure to follow instructions EXACTLY. Return to the manual and review the procedure. Start at the beginning and retrace each step, keeping written notes of any possible deviations from what should have happened. If the problem is still not resolved, make a written record of the FULL configuration prior to calling your dealer for assistance. As a minimum, note all hardware components, including make and model numbers (revision dates, serial numbers, etc. may be necessary to find a defective hardware element) and note all software in use by name and version number.
2. Call your dealer with the above information, preferably with the computer at hand. (Call Magnolia ONLY if you purchased direct; to assure the best quality support, we have found it vital to have the dealer involved from the beginning).
3. How things work together is the responsibility of the Systems Integrator. If you bought a system or subsystem from a single source, then that supplier is responsible for those pieces working together. If you bought components or subsystems from multiple suppliers, then YOU have assumed the role of Systems Integrator and must expect to perform that function, or pay someone to perform it for you. Magnolia products are designed, and priced, for non-experts putting together a few standard configurations, while allowing experts a great deal of flexibility in meeting special requirements. Magnolia's responsibility in the later situation is limited to providing the features we document and meeting appropriate industry standards.

## INTRODUCTION

This Supplemental User's Guide documents features of CP/M Plus which are specific to the Magnolia implementation for the Heath/Zenith Z89 and Z90 computer systems.

You should read BOTH this document and Digital Research's User's Guide before using CP/M Plus.

CP/M Plus is distributed in the following formats, be sure you ordered (and received) the correct diskettes before opening the sealed diskette package:

- 5-inch for Booting from the Z89-37 controller (as used in the Z90)
- 5-inch for Booting from Magnolia's 77316 Double Density controller
- 8-inch for Booting from Magnolia's 77316 Double Density controller

Note: 5-inch media is Single Sided, 40 Track (48 tpi), but will boot in 80 track (96 tpi) drives as used in the Z89-37. The installation procedure creates Double Sided and/or 80-track (96 tpi) diskettes.

5-inch media sets contain 5 diskettes, 8-inch sets 2 diskettes; only the first disk is 'bootable'. Many users will only need the files and utilities distributed on Disk 1 (and 2 of 5-inch sets).

The MMS release of CP/M Plus requires the following hardware configuration:

- Z89 or Z90 computer system
- Magnolia's 77318 128K RAM board
- A Double Density disk controller, either MMS 77316 or Z89-37 (as used in the Z90)
- Two IDENTICAL disk drives connected to one of the above controllers

The following optional hardware items are supported:

- Other drives on either the 77316 or Z89-37 controller
- H88-1 (Z17) Single Density (hard sectored) controller
- MMS 77314 Interface to CORVUS Winchester subsystem (REMEX/Z47 subsystems ARE NOT supported)
- MMS 77320 Interface to SASI-bus Winchester subsystems (floppy disks as in the Z67 ARE NOT supported)
- MMS 77422 Network Interface for LST; device on MMS-Net<sup>™</sup>.

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4.0

Describe your disk drives to the distribution operating system.

IF both of your drives exactly match the type of Distribution Disk, i.e., are 5-inch, Single Sided, 40 track (48 tpi) as used in the Z87, or, are 8-inch, Single Sided, enter:

A>MODE\_B1{cr} then SKIP to step 4.1

IF both of your drives are 5-inch, Double Sided, 80 track (96 tpi) as used in the Z37, enter:

A>MODE\_B1PS,DT{cr} then SKIP to step 4.1

IF both of your drives are 5-inch, Double Sided, 40 track (48 tpi), enter:

A>MODE\_B1PS{cr} then SKIP to step 4.1

IF both of your drives are 8-inch, Double Sided, enter:

A>MODE\_B1DS{cr} then SKIP to step 4.1

IF you have reached this point, you have NOT correctly followed the instructions above. GO BACK TO the beginning of Step 4.0 and try again.

4.1

The MODE utility will execute and produce a display similar to the following:

```

MODE version 3.101 (c) 1983 Magnolia Microsystems

NEW Configuration is:
  Drive - B1 (34) 5.25 inch floppy
  Controller - 77316 MMS Double Density Controller 3.100h
  Recording Density - Double
  Sides - 2
  Tracks per Inch - 48
  Step Rate - 10 milliseconds
  Format Type - MMS

```

DOUBLE CHECK the display (especially 'Sides' and 'Tracks per Inch') and verify that your 'B:' drive is accurately described. If not, execute the MODE utility again with the correct arguments.

APPENDIX D

Generating a New CP/M Plus System

The BNKBIOS3.SPR file (and hence CPM3.SYS file) on your distribution disk supports only the controller indicated on the disk label.

If you have additional disk I/O installed in your computer, you must construct a new BNKBIOS3.SPR file which supports the additional devices with DR's LINK by entering:

```

A>LINK_BNKBIOS3=MBIOS3,diskio,....
CHRIO3,END,cvsb1bxxx,LPTBL,GETDP,SCB{CR,OS}{cr}

```

Where:

- MBIOS3 is the Main BIOS
- 'diskio' is a list of Disk I/O to be supported:
  - M316'3 for the MMS 77316 Double Density controller
  - Z37'3 for the Zenith Z89-37 Double Density controller
  - Z17'3 for the Zenith Z17 Hard-Sector controller
  - CVS'3 for the MMS 77314 CORVUS interface (requires 'cvtblxxx')
  - M320'3 for the MMS 77320 or Zenith Z67 SASI interface
- CHRIO3 for Character I/O and Console interrupt keyboard
- END is the I/O module terminator
- cvtblxxx is a Corvus drive partitioning table, ONLY if required
- LPTBL is the Logical/Physical drive table
- GETDP lists all available floppy formats
- SCB is the System Control Block definition file

USE EXTREME CARE in entering the above line EXACTLY AS SHOWN. The modules MUST be linked in the order indicated. If CVS'3 is used, the partition data file (cvtblxxx) must be inserted in the command line immediately following the END entry.

After generating a new BNKBIOS3.SPR file, use the SETUP utility to properly configure it for your exact hardware configuration. Be especially careful that 'Drive A:' in the Logical Physical Table designates the device that you intend to 'boot' the system from.

Use GENCPM.COM to create the new system image, CPM3.SYS. Remember that this requires that the default disk contain BNKBDOS3.SPR and RESBDOS3.SPR in addition to BNKBIOS3.SPR.

Note: Due to limited space on some distribution media formats, you may need to generate some of the .REL files with RMAC by entering:

A>RMAC filename{cr}

APPENDIX E

Compatibility between CP/M 2.2 and CP/M Plus

CP/M Plus allocates directory entries for Passwords and Time and Date stamps, CP/M 2 does not. Thus, you may run out of Directory Space on a CP/M 3 disk, even though the same files 'fit' on a CP/M 2 disk.

Disks formatted with Magnolia's CP/M 3 format utility will automatically have directory space allocated for Passwords and Time and Date stamps (unless the NI option is used). INITDIR can be used to reallocate the directory space on disks formatted by either CP/M 2 or 3.

CP/M 2 allowed the 'user number' field in the directory to have values up through 31, CP/M 3 only allows values through 15. Because of this, certain CP/M 2 files may be corrupted if the disk is written to by CP/M 3.

Magnolia's CP/M 2 CCP (stored in User 31) will be corrupted if the disk is written to by CP/M 3 and the disk will no longer 'boot'. Unfortunately, the CCP's directory entry is not destroyed, only the file. Thus, the system will not boot but you will not receive a 'No CCP' error message.

The following patches (to Magnolia CP/M 2 disks) will move the CCP to user 15, where it is 'safe' from CP/M 3:

```

A>ddt sysgen.com          ;sysgen v2.243 or later
DDT VERS 2.2
NEXT PC
0900 0100
-s0103
0103 1F 0F      ;change user number from 31 (1F hex) to 15 (0F hex)
0104 00
~^c              ;exit DDT
A>save 8 sysgen.com      ;save the patched sysgen

```

```

A>ddt basecpm.com
DDT VERS 2.2
NEXT PC
xxxx xxxx
-120fc          ;verify that code is in the correct place
20fc LXI H,0000
20ff MVI E,1F   ;1F (hex) is User 31
2101 MVI C,20
2103 CALL 0806
-s2100
2100 1F 0F      ;change user number from 31 (1F hex) to 15 (0F hex)
2101 0E
~^c              ;exit DDT
A>save 00 basecpm.com   ;save the patched system

```

Build new MOVCPM files from the patched BASECPM file, then use the patched SYSGEN to place the resulting system image on your bootable disks.

2.0

You should get in the habit of setting the internal clock every time you 'Boot' CP/M Plus on your computer. Enter:

```
A>DATE.SET{cr}
```

Enter today's date and the current time in response to the prompts. Use NUMERIC form for the date, with '/' separators. (i.e., 8/12/83, not Aug 12, 1983). Use a '24-hour' clock for the time, with a ':' as the separator (i.e., 13:05:00; not 1:05 PM).

```

Enter today's date (MM/DD/YY)18/12/83{cr}
Enter the time (HH:MM:SS)13:15:00{cr}
Press any key to set time {cr}

```

A>

3.0

TYPE the file "READ.ME" to obtain information on any changes made since this document was last revised. Enter:

```
A>TYPE READ.ME{cr}
```

The computer will display the contents of the file (if any) on the CRT.

It is imperative that your original distribution diskettes be put in a safe place as soon as possible. Always leave them write-protected. Carefully follow the following steps in order to backup and successfully configure CP/M Plus for your computer.

6.0

CP/M Plus allows a 'LABEL' to be placed in a diskette's directory. Enter:

```
A>SET_B: (NAME=DISK\BAK.UF1)(cr)
```

Label for drive B:

Directory Label	Parwds Reqd	Stamp Create	Stamp Access	Stamp Update
B:DISK\BAK.UF1	off	on	off	on

NOTE: You may receive the message 'ERROR: Only first 11 characters of label name used' from Digital Research's SET utility. It may be safely ignored.

7.0

Use the COPYSYS utility to copy the Boot Loader to the new media. Enter:

```
A>COPYSYS_A: B: (S)(cr)
```

COPYSYS v3.101 (c) 1983 Magnolia Microsystems

```
System Successfully read from drive A!
Boot loader has been reconfigured to dd, ss, st
System Successfully written to drive B!
*AIICP.COM* Copied Successfully to drive B!
*AIICPN3.SYS* Copied Successfully to drive B!
```

DOUBLE CHECK: If your drives do not match the distribution media format the 'reconfigured' lines in the message should reflect the changes you made with 'MODE' above.

APPENDIX B

Physical Drive Numbers

Magnolia Microsystems has assigned a unique 'Physical Drive Number' to every possible Disk Controller/Physical Drive combination, as shown in the following chart:

Physical Drive Number	Controller or Interface	Drive Description	
0	H88-1	5-inch	DS3
1	.10 Sector		DS2
2	Single Density		DS1
5	Z89-47 or MMS	8-inch	DS1
6	MMS 77314		DS2
7	Interface to		DS3
8	REMEX (Z47) drives		DS4
15	MMS 77314	CORVUS	Partition 0
16	Interface		Partition 1
thru			thru
23			Partition 9
29	MMS 77316	8-inch	DS1
30	DD Controller		DS2
31			DS3
32			DS4
33		5-inch	DS1
34			DS2
35			DS3
36			DS4
46	Z89-37	5-inch	DS1
47	DD Controller		DS2
48			DS3
49			DS4
50	MMS 77320 SASI	Controller 0	Partition 0
51	Interface		Partition 1
52			Partition 2
etc.			etc.
60	MMS 77320 SASI	Controller 1	Partition 0
61	Interface		Partition 1
62			Partition 2
etc.			etc.
70	MMS 77320 SASI	Controller 2	Partition 0
71	Interface		Partition 1
72			Partition 2
etc.			etc.

APPENDIX C

Generating a New Boot Loader

The CP/M Plus operating system (the file 'CPM3.SYS') is loaded into RAM by a Boot Loader which is located on the actual 'system tracks' of the disk. It is placed there with COPYSYS:

```
A:CPYSYS d:\filespec.typ d: [s,n]
```

Where:

- d:\filespec.typ is a file containing a valid Boot Loader
- d: is the destination drive name
- [s] tells COPYSYS to configure the 'MODE' of the Boot Loader to match that of drive d:
- [n] tells COPYSYS to configure the Boot Loader for Physical Drive 'n', if 'n' is not the first drive on the controller

The actual Boot Loader file is constructed with Digital Research's LINK utility by entering:

```
A:LINK filespec=CPM3LDR,LDRxxx{cvtblxxx},LDRBxxx[OC](cr)
```

Where:

- CPM3LDR is the Loader Operating System, containing the loader program, simple BDOS, and main BIOS.
- LDRxxx is a simple disk I/O module which can only select and read a single drive.
- cvtblxxx is the Partitioning table, if booting from a CORVUS drive.
- LDRBxxx is the 256-byte Cold Boot Loader which the EPROM places in RAM at 22800h.

Drive and Controller	Cold Boot Loader	Disk Module	Complete Loader (1)
8-inch on MMS 77316	LDRB8316	LDR316	LDR8316.COM
5-inch on MMS 77316	LDRB5316	LDR316	LDR5316.COM
5-inch on 289-37	LDRBZ37	LDRZ37	LDRZ37.COM
5-inch on H88-1 (Z17)	LDRBZ17	LDRZ17	LDRZ17.COM
SASI (2) on MMS 77320	LDRB320	LDR320	LDR320.COM
CORVUS (3) on MMS 77314	LDRBCV5	LDRCV5	LDRCV5.COM

- (1) Complete loader, ready for installation with COPYSYS. May not be on distribution disks with limited capacity.
- (2) SASI-bus Winchester MUST have been previously initialized with DEFSASI2 or DEFSASI3.
- (3) CORVUS Winchester MUST have been previously initialized with CORVGEN and CP/M 2.2 module with SAME partitioning as cvtblxxx.

Note: Due to limited space on some distribution media formats, you may need to generate some of the .REL files with RMAC by entering:

```
A:RMAC filename(cr)
```

5.0

Format at least enough disks to backup your entire distribution set. It is usually a good idea to format the entire box of disks when it is first opened, then you will not inadvertently attempt to use an unformatted diskette.

```
A>FORMAT B:(cr)
```

The FORMAT utility will clear the screen and sign on with a display similar to that shown by MODE in step 4 above. Again verify that the 'Sides' and 'Tracks per Inch' match your drives, then press (cr) to accept the default answer of 'Yes'. The following prompt will appear:

```
Insert BLANK disk in drive B:.  
Push RETURN to begin formatting, ^C to quit.
```

After inserting a new diskette in B:, press (cr). A bar chart similar to the following will appear, representing the media in your B: drive. (This example is for an 5.25 inch Double Sided drive with 40 tracks).

```
SIDE 0  
0-----1-----2-----3-----  
  
SIDE 1
```

An 'P' will be placed by each track as it is formatted. The media will then be verified, with a 'V' replacing the 'P' by each track:

```
SIDE 0  
P  
0-----1-----2-----3-----  
V  
SIDE 1
```

Upon successful verification of the entire diskette, the following message will be displayed:

```
Attempted to format 1 Disk, 1 Disk Verified OK  
  
Do you have more media to FORMAT? Y
```

Press (cr) to accept the default answer of 'Yes', and format a supply of new media. When through, enter a 'N' to return to CP/M.



## 9.0

If your drives EXACTLY match the distribution media, i.e., are 5-inch 40 track, Single Sided, or 8-inch Single Sided, SKIP TO STEP 10.0.

If your drives do not exactly match the distribution media format, you MUST reconfigure the operating system now on the media in drive B: by entering:

```
A>B:SETUP_B1(cr)
```

```
SETUP v3.101 Z89/Z90 (c) 1983 Magnolia Microsystems
```

- . Logical/physical drive assignments
- . I/O redirection vectors
- . Set file type search order
- . Z89 Standard and interrupt I/O v 3.101
- . 77316 MMS Double Density Controller 3.101
- . Generate new CP/M system and exit
- . Exit to CP/M

```
ENTER = Execute Functions          Modifying B:\BNKBIOS3.GPR  
(UP)  = Move up a line  
(DOWN) = Move down a line  
(HOME) = Jump to top line
```

Use the 'arrow' keys on the numeric pad to position the cursor over the entry which lists the controller you 'boot'ed from (either 77316 MMS or Z89-37 Zenith), then press (cr) or 'enter'. A display similar to the following will appear:

## SETUP.COM (continued)

### Disk I/O Characteristics

This generalized option may appear with one or more specific titles on the main SETUP menu, depending upon what Disk I/O modules are present in the BNKBIOS3 file. All Distribution systems will include a Double Density Disk Controller, such as Zenith's Z89-37, or Magnolia's 77316:

#### 77316 MMS Double Density Controller

Selection of this option displays the Physical Number (and Logical Name if assigned in the Logical Physical Table) of the drives supported by the specific controller. Default default values for the following controller and drive specific characteristics are displayed and can be changed, within the constraints imposed by the physical controller and system software:

##### • Physical Drive Characteristics

- Number of Heads (1 for Single Sided drives, 2 for Double Sided)
- Tracks per Inch (48 tpi on 40-track drives, 96 tpi on 80-track)
- Recording Density (Single indicates the drive can't do DD)
- Step Rate (the drive's mechanical limit)

##### • Default Media Characteristics, i.e., what 'MODE'

- Number of Sides (either 1 or 2 sided media can be used in a 2 headed drive)
- Tracks per Inch (either 48- or 96-tpi media can be read in a 96 tpi drive)
- Recording Density (can't do DD if drive or controller is just SD)
- Media Format, describes sector size and directory structure
- Sector Size (display only, follows Media Format entry)

### Generate New CP/M System and Exit

Selection of this option causes the system to (temporarily) log onto the drive containing the BNKBIOS3 file being configured, and execute the GENCPM utility using the GENCPM.DAT file for input. See the description of GENCPM in the CP/M Plus User's Guide for additional details.

### Exit to CP/M

Selection of this option simply causes a return to CP/M's A> prompt. GENCPM must be manually executed to construct a new CPM3.SYS file containing the changes made.

## APPENDIX A

### Creating Backup Copies of Distribution Disks

Distribution disks may not be of the same format type as you must boot from and hence normally use.

For example, Zenith OEM software is distributed on Z37 format disks, while you must 'boot' from MMS format disks. Also, the distribution media may be 40 track (48 tpi), while you have 80 track (96 tpi) drives.

Or, you may purchase software on IBM standard Single Sided Single Density 8-inch media, and need to convert it to MMS Double Density 8-inch format.

Use the following outline to convert your distribution software to MMS format media:

1. Boot a copy of your Configured User Master CP/M Plus disk
2. Use the MODE utility to set drive B: to the format of the Distribution media
3. Load PIP into memory
4. Tell PIP to copy the files from B: to A:
5. Exit back to CP/M
6. Use MODE to put drive B: back into the normal MMS mode

## 8.0

Now copy the files from the Distribution Disk(s) to your backup disk. Load the PIP utility into memory by entering:

```
A>PIP(cr)
CP/M 3 PIP VERSION 3.0
```

```
*_
```

After PIP signs on with its 'asterisk' (\*) prompt, copy the files from Distribution Disk 1 by entering:

```
*B:=A:*.#EV](cr)
```

PIP will list the files as it copies them onto your backup disk. When all the files have been copied, PIP will again prompt with an asterisk (\*).

If you booted from 8-inch drives, or, your 5-inch drives exactly match the distribution media, skip to step 8.1.

If your 5-inch drives are NOT 40 Track, Single Sided, (as in the Z87) you should place the files from distribution Disk 2 onto the same media as those from Disk 1.

Remove 5-inch Distribution Disk 1 from drive A: and replace it in its jacket. Then place 5-inch Distribution Disk 2 into drive A: and again enter:

```
*B:=A:*.#EV](cr)
```

PIP will list the files on Distribution Disk 2 as it copies them onto your new disk. When all the files have been copied, PIP will again prompt with an asterisk (\*).

Remove Distribution Disk 2 from drive A: and reinsert Disk 1.

## 8.1

Enter a (cr) at the asterisk prompt to return to CP/M:

```
*(cr)
A:
```

### 11.0

Remove the Distribution Disk from drive A: and replace it in its jacket. Then SHIFT-RESET your computer to return to the Monitor prompt.

### 12.0

Test your newly created Distribution Backup Disk 1 by inserting it in your FIRST double density disk drive and gently close the drive door. Enter:

```
A)MS: boot(cr)
```

NOTE: Remember that some computers may require that a 'drive designator' be typed after the 'B', such as Boot 3X(cr), Boot 29(cr), or Boot 50(cr).

### 13.0

Remember to always set the date and time when 'Booting' so that your disk directory time and date stamps will be valid. Enter:

```
A)DATE_SET(cr)
```

```
Enter today's date (MM/DD/YY):08/12/83(cr)
```

```
Enter the time (HH:MM:SS):13:15:00(cr)
```

```
Press any key to set time (cr)
```

```
A)
```

### SETUP.COM (continued)

#### Logical Physical Table

Selecting this option allows definition of the default values for the following CP/M Plus characteristics:

- What Physical Disk Number (PDN) is associated with each of CP/M's Logical Device Names (see Appendix B for a list of Physical Devices). The BNKBIOS3.SPR file being configured MUST include the Disk Driver for the device chosen or an error message will appear. See Appendix D for details on building a new BNKBIOS3.SPR file.
- What Drive Search Order (DSO) should be used in looking for executable files.
- What the Temporary File Drive should be.

See the description of the SETDEF utility in the CP/M Plus User's Guide for details on the usage of these features in CP/M Plus, and how to change the characteristics from the command line.

#### I/O Redirection Vectors

Selecting this option allows definition of the default values for CP/M's I/O Redirection Vectors. See the description of the DEVICE utility in the CP/M Plus User's Guide for an explanation of their use, and instructions on how to make changes from the command line.

#### Set File Type Search Order

Selecting this option allows defaulting to one of the three valid search orders:

- .COM files only, do not check for .SUB file of same filename
- .COM files, then .SUB if no .COM file found
- .SUB files, then .COM if no .SUB file found

See the description of the SETDEF utility in the CP/M Plus User's Guide for additional details on this feature, and instructions on how to make changes from the command line.

SETUP.COM (continued)

Set Character I/O Characteristics

This generalized option may appear with one or more specific titles on the main SETUP menu, depending upon what Character I/O modules are present in the BNKBIOS3 file. All systems should include:

Z89 Standard and interrupt I/O

Selecting this option allows definition of the default values for the following serial I/O characteristics:

- Initialization (I) Yes, initialize on cold boot  
No, don't initialize this port
- Baud Rate 19,200; 9600; 4800; 2400; 1200; 600; 300; 150; 110; and others displayed on CRT.
- Parity (P) Even  
Odd  
None  
stuck at 1  
stuck at 0
- Stop Bits (SB) Use 1 or 2 Stop Bits
- Word Length (WL) Use 7 or 8 bit Word Length
- Software Protocol (S) Yes, use X-on/X-off (not supported with distribution software)  
No, do not use DC1/DC3
- Handshaking Inputs: Output data only when condition specified is met on pin indicated:  
Received Line Signal Detect (RLSD)  
Ring Indicator (RI)  
Data Set Ready (DSR)  
Clear To Send (CTS)
- Handshaking Output: Hold output lines as specified  
Data Terminal Ready (DTR)  
Request To Send (RTS)  
OUT1  
OUT2

77316 MMS Double Density Controller 3.101

Logical Name	Physical Number	Disk Size	Physical Drive			Default Media Mode					
			No of Heads	TPI	Record Density	Step Rate	No of Sides	TPI	Record Density	Media Format	Sector Size
A	29	8"	1	48	Double	10ms	1	48	Double	MMS	512
B	30	8"	1	48	Double	10ms	1	48	Double	MMS	512
C	31	8"	1	48	Double	10ms	1	48	Double	MMS	512
D	32	8"	1	48	Double	10ms	1	48	Double	MMS	512
E	33	5.25"	1	48	Double	30ms	1	48	Double	MMS	512
F	34	5.25"	1	48	Double	30ms	1	48	Double	MMS	512
G	35	5.25"	1	48	Double	30ms	1	48	Double	MMS	512
H	36	5.25"	1	48	Double	30ms	1	48	Double	MMS	512

```

<RED> = Quit (No update)
<BLUE> = End and update A:BNKBIOS3.SPR * allowable options for *
<WHITE> = Restart with original data * selected field will be *
ARROWS = Move to next field * displayed here *
HOME = Jump to top line *****
    
```

Place the cursor over those items which need changing (Physical Drive: Heads and TPI; Default Media: Sides and TPI) to describe your disk drive configuration and choose the proper value from the menu(s) displayed in the lower right corner of the CRT.

When through, verify that your drive configuration is accurately described, and press the 'BLUE' key to return to the main menu.

Place the cursor on and select the next to last option from the main menu:

. Generate new CP/M Plus System

The Digital Research GENCPM utility will automatically execute (displaying a series of questions and answers without operator intervention) and create a new CPM3.SYS file on 'B:' which is configured to match your disk drives.

10.0

Remove Distribution Backup Disk 1 from B: and label it as required by your license agreement:

```

Distribution Backup Disk 1
CP/M Plus v3.101 S/N CP3-175-xxxxx
(c) 1982, 1983 Digital Research and Magnolia Microsystems
Boots on xxxxxx Controller with xx drives
    
```

Be sure to indicate your correct serial number, as well as what controller and what kind of drives (40 or 80 track, Single or Double Sided) the disk is configured to boot from.

15.

Copy the remainder of your distribution disks. First use the MODE utility to set drive B: to match the characteristics of the distribution media:

```
A)MODE_BISS,SI(cr)
```

Then load the PIP utility into memory by entering:

```
A)PIP(cc)
```

Place a BLANK piece of formatted media into drive A:, and a Distribution Disk into drive B:. Then enter:

```
*A:BISS,XLVJ(cr)
```

This process should be repeated as necessary to make backup copies of the Distribution Disks on the correct format media. Be sure to label each disk correctly as required by your license agreement.

## MODE.COM

Syntax: MODE (d:)(option!,option!,...)

Explanation: The MODE utility is used to tell CP/M Plus what format media it should expect to find in the specified drive. If Z37 mode is selected an attempt will be made to find and use Zenith's disk label data to determine the actual media format.

Examples: MODE(cr)

The utility displays operator instructions and returns to CP/M.

```
MODE_B:(cr)
```

The utility displays of the current MODE of drive B:.

```
MODE_B:DB,DS(cr)
```

The utility changes the MODE of drive B: to Double Sided, Double Density

Options: The following options are available:

- DD Expect to find Double Density media in the drive.
- SD Expect to find Single Density media in the drive.
- DS Expect to find Double Sided media in the drive.
- SS Expect to find Single Sided media in the drive.
- DT Expect to find Double Track (96 tpi) media in the drive.
- ST Expect to find Single Track (48 tpi) media in the drive.
- MMS Expect to find Magnolia MicroSystems format media in the drive.
- Z37 Expect to find Zenith Z89-37 format media in the drive. Attempt to read and use the Zenith 'label' data to determine the actual media format.
- ... The formats supported may be found in the GETOP.ASM file on the distribution disk. Limits imposed by a specific controller will be found in the appropriate BIOS.ASM file.

SETUP.COM

Syntax: SETUP (D:)(Filename) (C:)

Explanation: The SETUP utility is used to configure a BNKBIOS3.SPR file (optionally the Currently executing CP/M Plus system) to match a specific hardware configuration.

It is a completely Menu Driven utility which allows the user to define default conditions for the following system characteristics:

- Logical Physical Table: The relationship between CP/M's Logical drive names (A:) and the Physical drives connected to the system.
- I/O Redirection Vectors: The relationship between CP/M's Logical and Physical character I/O devices - see CP/M Plus User's Guide section xxxx
- File Type Search Order: What order the CCP should look for .COM and .SUB files in
- Serial I/O Configuration: How the Character I/O ports should be initialized and used, including Baud Rate, Handshaking, etc.
- Disk I/O Configuration: Physical Drive characteristics and default Media characteristics

The utility can chain to GENCPM upon exiting (GENCPM.COM, GENCPM.DAT, and \*.SPR must be on the same drive as the BNKBIOS3.SPR file being 'SETUP'), or, the operator can exit directly to CP/M.

14.0

Now generate a Configured Master Disk which will be more completely configured to match your hardware. Place another formatted diskette (from step 5 above) into your second (B:) drive. Write a CP/M Plus Label in the disk's directory by entering:

```
A>SETUP_B1:[NAME=CONFMASTER](crl)
```

Then copy the operating system to that diskette by entering:

```
A>COPYSYS_A1_B1(ccl)
```

Now copy all the files from your Distribution Backup Disk 1 onto the new disk by entering:

```
A>PIP_B1:=A11.*(v1)(crl)
```

If you have 40-track, single sided drives as used in the Z87, temporarily place Distribution Disk 2 in drive A:

Then execute the SETUP utility (again) by entering:

```
A>SETUP_B1(crl)
```

Step through ALL the menu selections in order, making any necessary changes to the configuration as you go. Refer to the specific instructions for the SETUP utility as required.

Exit SETUP via the 'GENERATE NEW CP/M SYSTEM' option.

Remove the disk from drive B: and mark it appropriately:

```
Configured Master Disk
CP/M Plus v3.101 S/N CP3-175-xxxxx
(c) 198x, 1982, 1983 Digital Research and Magnolia Microsystems
Boots on xxxxxx Controller with xx drives and xxxx Baud Printer
```

Be sure to indicate your correct serial number, as well as what controller and what kind of drives (40 or 80 track, Single or Double Sided) the disk is configured to boot from.

To increase the amount of space available for other programs and files, you may wish to ERASE the following files from copies of your Configured Master Disk. These files and utilities can be recovered from your Distribution Backup Disk(s) later if you need them again:

```
SETUP.COM *SPR GENCPM.*
```

After you are familiar with the operation of CP/M Plus utilities, you may wish to ERASE the HELP.\* files to gain a significant amount of space on your system disk.

### COPYSYS.COM

Syntax: COPYSYS (d1){(filespec.typ)} (d2) [(option),option],...]

Explanation: COPYSYS is an enhancement of Digital Research's utility with additional features. It is used to copy the Boot Loader for CP/M Plus from one disk to another, as well as copy the CPM3.SYS and CCP.COM files. It is also used to put a new Boot Loader onto a disk from a .COM file.

Examples: COPYSYS A: B:(cr)

When both the source and destination drive are specified in the command line, COPYSYS copies the Boot Loader, as well as the CPM3.SYS and CCP.COM files, from drive A: to B: without operator intervention. This is the syntax which should normally be used to create new bootable disks from a configured master.

COPYSYS (cr)

When called in this manner, COPYSYS duplicates the actions of DR's utility, i.e., it prompts the user for the source and destination drives and media, and copies the CCP.COM file (not CPM3.SYS).

COPYSYS A:CPM3LDR.COM B:(cr) cr

The new CPM3 Boot Loader is taken from the file A:CPM3LDR.COM and placed on the media in drive B:. The CCP.COM file is copied from drive A: to B:, CPM3.SYS is NOT copied. If the second drive designator is omitted, COPYSYS will prompt the operator for the destination drive and media.

Options: The following options are allowed in the COPYSYS command line:

Symbol	Meaning
NC	No Copy of the CPM3.SYS and the CCP.COM files will be made.
NE	No Error will be reported if the Boot Loader does not match the destination drive controller.
n	Force Physical Drive Number 'n' as the boot drive.
S	Setup the Boot Loader mode to match the destination drive. Can not be used with following 'mode' options.
mm	Setup the Boot Loader for a drive with Mode mm, where mm is SS or DS, ST or DT, or SD or DD (see 'Mode' for further details)

### DRIVES.COM

Syntax: DRIVES

Explanation: The DRIVES utility displays the current Logical Physical Table

Example: DRIVES(cr)

DRIVES v3.101 (c) Nagolia Microsystems

```

A: = (50) 77320 SASI Interface (8 partitions) v3.101
B: = (51) 77320 SASI Interface (8 partitions) v3.101
C: = (29) 77316 MMS Double Density Controller v3.101
D: = (30) 77316 MMS Double Density Controller v3.101
G: = (33) 77316 MMS Double Density Controller v3.101
H: = (34) 77316 MMS Double Density Controller v3.101

```

### FIXMSOFT.COM

Syntax: FIXMSOFT (d1)

Explanation: OEM versions of Microsoft products (such as Zenith's HMS-8xx-1 BASIC-80, -2 FORTRAN 80, and -3 COBOL-80) contain hardware dependent code which must be removed before they will run on a Z89 with banked memory.

The FIXMSOFT utility patches any Zenith OEM copy of a Microsoft product found on the specified drive so that it will run on a Z89 with banked memory.

Example: FIXMSOFT B:(cr)

The utility signs on and prompts the user to insert a disk into drive B:. It will then patch all the Microsoft programs on that disk, listing them as 'fixed'. You may continue to 'fix' as many disks as necessary, and exit the utility by pressing (ctrl-C). (If FIXMSOFT has been run previously on any program, the program will be listed as 'already fixed'.)

Note: The version of M80 supplied with the Microsoft Basic Compiler does not need to be patched, and will thus be listed as unrecognizable by FIXMSOFT. This should not be considered an error. All other versions of M80 will be fixed correctly.

## FORMAT.COM

Syntax:     FORMAT {d:}(option[,option],...)

Explanation: The FORMAT utility must be used to prepare all new media for use with CP/M Plus. It tests the media and initializes the directory for CP/M Plus' label (eliminating the need to use INITDIR on new media) and enables Creation and Update Time and Date stamping of files.

Examples:   FORMAT{c}

The utility signs on, and prompts the operator for a drive name (and options, if desired).

FORMAT\_B{c}

The utility signs on with a display of the current MODE (see the description of that utility) of drive B:, and prompts the operator to verify that the display represents what format is desired.

FORMAT\_B:DD,DS{c}

The utility TEMPORARILY changes the MODE of drive B: to Double Sided, Double Density and prompts the operator to verify that the display represents the desired format.

After the operator verifies that the MODE display is correct, the utility prompts the operator to insert the media to be formatted in the drive and press 'Return'.

Upon pressing 'Return', a bar graph representing the media appears on the CRT, with an 'P' displayed by each track as the media is formatted. The 'P' is replaced by a 'V' when each track is verified. An 'E' flags those tracks which can not be verified good, and the operator is given the option to abort the verification process.

After each disk is completed, a display of the number of pieces of media successfully formatted is displayed, and the operator is given the option to format more media or exit to CP/M.

Options:    The following options are available, in addition to those allowed by the MODE utility:

NV   No Verification will be attempted after the formatting.

NI   No Initialization of the directory for date and time stamping.

NS   No Stamping of Time and Date is enabled in the directory.

## Additional CP/M Plus Utilities

Magnolia Microsystems has added these utilities (described in detail on the following pages) to those provided by Digital Research:

COPYSYS.COM

DRIVES.COM

FLXMSOFT.COM

FORMAT.COM

MODE.COM

SETUP.COM

Users upgrading from the Magnolia release of CP/M 2 will find them similar in function to the CP/M 2 utilities of the same name. First time users of Magnolia CP/M will need to become familiar with them.