

CO-POWER SYSTEM GUIDE

For: KAYPRO Models

2X
2/84
4/84
10

(This SWP document is a supplement to the MS-DOS 2.0 User's Manual.)



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Printed in the United States of America

Product	Author	Version	Code	Requirements
IAR/XL.IP	IAR	1.0	L035.HS	
IAR/XL.IPK	IAR	1.0	L030.HS	
C Compiler HS	Microsoft	1.04	L067.HS	
PCCHASIC	Buzzwords	1.3	L004.HS	
BASIC Compiler	Microsoft	5.35	L007.HS	
Business BASIC	Microsoft	1.0	L066.HS	
CODOL HS	Microsoft	1.07	L029.HS	
FORTRAN HS	Microsoft	3.13	L028.HS	
Janus/ADA	RR Software	1.47	L044.HS	
Pascal HS	Microsoft	1.0	L059.HS	
CP-86 Compiler	DRI	2.0	L039.HS	
Pascal/IT-86	DRI	3.2	L005.HS	
PL/I-86	DRI	1.0	L002.HS	
multiSP/multiP	Microsoft	2.15	L032.HS	
multiTI/multiP	Microsoft	2.15	L031.HS	
Macro-HS	Microsoft	1.25	L034.HS	
C86	Comp Innovations	1.32d	L047.HS	
DATABASE MANAGEMENT				
R-base 4000	Microfilm		D015.HS	
Formula II	DMA	2.22	D004.HS	
dbase II	Ashton-Tate	2.4	D018.HS	
Condor 20-1	Condor	2.11	D022.HS	
Condor 20-3	Condor	2.11	D024.HS	
InfoStar	MicroPro		D038.HS	
InfoStar	MicroPro	1.41	D009.HS	
MISCELLANEOUS				
Electronic Circuit	Tatum Labs	1.73	E002.HS	
EB80/86 HS	DMA	1.6	H011.HS	
Conv/CP	IMA	1.3	H002.HS	
SuperSort HS	MicroPro	1.65	H001.HS	
TypeQuick HS	AID	3.14	H014.HS	
DEVELOPMENT TOOLS				
Display Manager	DRI	1.0	T052.HS	
Access Manager	DRI	1.1	T037.HS	
Quick Code	Fox & Geller	2.2	T005.HS	
Assembler + Tools	DRI	1.0	T002.HS	
Vedit	CompView	1.38	T009.HS	
WORD PROCESSING				
WordStar	MicroPro	3.30	W003.HS	
MailMerge	MicroPro	3.30	W004.HS	
SpellStar	MicroPro	3.30	W009.HS	
WordStar Professional	MicroPro	3.30	W010.HS	
StarIndex	MicroPro	1.01	W001.HS	
The Final Word	Mark of Unicorn	1.15	W022.HS	
PLANNING & ANALYSIS				
MicroGANTT	Earth Data	1.94A	P018.HS	
Multiplan	Microsoft	1.10	P034.HS	
Profin	Business Soft	3.12	P067.HS	
Planfin	Business Soft	3.12	P066.HS	
RealEstate Analys	Real Data	1.1B	P156.HS	
RE Comm/Industrial	Real Data	1.1B	P155.HS	
StatPak	NMA	3.1	P002.HS	
T/Maker III	T/Maker	3.02A	P036.HS	

Notes: (*) low-cost demo available (I) 132-column printer required
 (+) another product required (U) 80-column printer required
 (D) hard disk required

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YES 100

MS DOS Software available for Kaypro with Co-Power-88

Product	Author	Version	Code	Requirements
ACCOUNTING				
Income A/P	HC	2.4B	A034.PC	D, I
Income A/R	HC	2.5C	A023.PC	D, I
Income G/L	HC	2.1B	A010.PC	D, I
Income Order Entry	HC	1.1B	A015.PC	D, I+A032.PC
Income Purchasing	HC	1.1B	A013.PC	D, I+A032.PC
Income Inv. Control	HC	3.2B	A032.PC	D, I
Income Job Cost/WIP	HC	1.1A	A014.PC	D, I+A032.PC
Immas Bill of Material	HC	3.2C	A012.PC	D, I+A032.PC
Immas Materials	HC	1.0B	A016.PC	D, I+A032.PC
TOTAL A/P	TCS	2.36	A027.PC	I
TOTAL A/R	TCS	2.36	A026.PC	I
TOTAL A/R(Rev.3)	TCS	3.36	A071.PC	I+A073.PC
TOTAL G/L	TCS	2.36	A025.PC	I
TOTAL Inventory	TCS	2.36	A029.PC	I
TOTAL Inv.(rev.3)	TCS	3.36	A073.PC	I
TOTAL Materials	TCS	3.36	A053.PC	I+A073orA071.PC
TOTAL Payroll	TCS	2.36	A028.PC	I
TOTAL Sales	TCS	3.36	A057.PC	I
Simple	TCS	2.36	A031.PC	I+A073orA071.PC
Q/Label	TCS	2.36	A055.PC	I
Total Utilities	TCS	3.36	A058.PC	I
Client Ledger System	TCS	3.36	A030.PC	I
Fixed Asset Acctg.	Or-Idm	3.94	A068.PC	I
BUSINESS MANAGEMENT				
Billkeeper	Micro Craft	1.2F	B009.PC	J
Verdict	Micro Craft	3.2F	B006.PC	J
Audit	Micro Craft	1.3	B015.PC	J
G/L For Professional	Micro Craft	2.0	B011.PC	J+B006 or B009
Pas-3 Medical	AI	2.1	B001.PC	I
Pas-3 Dental	AI	1.75	B002.PC	I
BidSheet	Comp For Constr	2.1	B008.PC	I
Market Pro	AIM		B004.PC	I
LANGUAGE PROCESSORS				
BASIC HS	Microsoft	5.28	L006.PC	
IAR/6502	IAR	1.0	L045.PC	
IAR/8085	IAR	1.0	L015.PC	
IAR/6809	IAR	1.0	L014.PC	
IAR/8086	IAR	1.0	L046.PC	
IAR/A17000	IAR	1.0	L042.PC	
IAR/A1802	IAR	1.0	L013.PC	
IAR/A6801	IAR	1.0	L025.PC	
IAR/A6805	IAR	1.0	L027.PC	
IAR/A68K	IAR	1.0	L033.PC	
IAR/A604X	IAR	1.0	L012.PC	
IAR/A8501	IAR	1.0	L011.PC	
IAR/AZ80	IAR	1.0	L026.PC	
IAR/A799	IAR	1.0	L043.PC	
IAR/AZ8	IAR	1.0	L036.PC	
IAR/XL INK + 3	IAR	1.0	L037.PC	
IAR/XL INK + 5	IAR	1.0	L038.PC	

Product Author Version Code Requirements

DATABASE MANAGEMENT

Formula II	IMA	2.22	D004.C6	
debase II	Ashton-Tate	2.4	D018.C6	
Condor 20-1	Condor	2.11	D022.C6	" J
Condor 20-3	Condor	2.11	D024.C6	" J
InfoStar	MicroPro		D038.C6	
Dataview	MicroPro	1.41	D009.C6	

MISCELLANEOUS

Electronic Circuit	Tatum Labs	1.73	D002.C6	
El80/86	IMA	1.6	D011.C6	
Conv/RS	IMA	1.3	D002.C6	
SuperSort 86	MicroPro	1.85	D001.C6	
TypeDisk 86	AID	3.14	D014.C6	
Backrest	Stok		D015.C6	D

DEVELOPMENT TOOLS

Display Manager	DRI	1.0	T052.C6	
Access Manager	DRI	1.1	T037.C6	
Assembler + Tools	DRI	1.0	T002.C6	
Vedit	CompView	1.38	T009.C6	

WORD PROCESSING

WordStar	MicroPro	3.30	W003.C6	
MultiMerge	MicroPro	3.30	W004.C6	+W003.C6
SpellStar	MicroPro	3.30	W009.C6	+W003.C6
WordStarProfessional	MicroPro	3.30	W010.C6	
StarIndex	MicroPro	1.01	W001.C6	+W003.C6
WordMaster 86	MicroPro	1.07	W002.C6	
Spellguard 86	Sorclm	2.0	W008.C6	
The Final Word	Mark of Unicorn	1.15	W022.C6	J

TRAINING & ANALYSIS

ProFin	Business Soft	3.12	P067.C6	+L006+D002.MS
PlanFin	Business Soft	3.12	P066.C6	+L006+D002.MS
RealEstate Analysis	Real Data	1.1B	P156.C6	+P052.C6
RE Comm/Industrial	Real Data	1.1B	P155.C6	+P052.C6
StatTak	MA	3.1	P002.C6	J+L006+D002.MS
T/Haker III	T/Haker	3.02A	P036.C6	
CalStar 86	MicroPro	1.4	P019.C6	
SuperCalc 2	Sorclm	2.0	P052.C6	
Hilstone 86	Orgadic	1.08	P003.C6	
Hilmodel 86	FPA	1.43	P001.C6	

Notes: (*) low-cost demo available (1) 132-column printer required
 (+) another product required (J) 80-column printer required
 (D) hard disk required

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Part 4. Expanding CO-POWER Memory

Part 5. Trouble-Shooting: Questions & Answers

Part 6. Registration and Warranty Information

DOCUMENT LIST

You should have received three documents with your CO-POWER:

- The SWP CO-POWER System Guide
- Installation Instructions
- The MS-DOS 2.0 User's Guide

DISKETTES

You should have received two diskettes with your CO-POWER:

- MS-DOS Load Files and RANDISK Software Diskette (a single-sided Kaypro formatted disk)
- MS-DOS 2.11-1A System Diskette (a MS-DOS formatted disk)

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WESTINGHOUSE

CP/H-86 Software available for KayPro with Co-Jover-88

Product	Author	Version	Code	Requirements
ACCOUNTING				
Income A/P	MC	2.4B	A034.C6	D, I
Income A/R	MC	2.5C	A023.C6	D, I
Income C/L	MC	2.1B	A010.C6	D, I
Income Order Entry	MC	1.1B	A015.C6	D, I+A032.C6
Income Purchasing	MC	1.1B	A013.C6	D, I+A032.C6
Income Inv. Control	MC	3.2B	A032.C6	D, I
Income Job Cost/MIP	MC	1.1A	A014.C6	D, I+A032.C6
Immass Bill of Material	MC	3.2C	A012.C6	D, I+A032.C6
Immass Materials	MC	1.0B	A016.C6	D, I+A032.C6
Fixed Asset Acctg.	Origin	3.96	A068.C6	I
BUSINESS MANAGEMENT				
Billkeeper	Micro Craft	1.2F	B009.C6	J
Verdict	Micro Craft	3.2F	B006.C6	J
Audit	Micro Craft	1.3	B015.C6	+B006 or B009
G/L for Professional	Micro Craft	2.0	B011.C6	J
Pas-3 Medical	AI	2.1	B001.C6	I
Pas-3 Dental	AI	1.75	B002.C6	I
BidSheet	Comp For Constr	2.1	B008.C6	I
Market Pro	AIH		B004.C6	I
Pro-Man	American Software		B046.C6	
LANGUAGE PROCESSORS				
Janus/ADA	RR Software	1.47	L044.I6	
CBASIC 86	DRI	1.4	L001.C6	
CB-86 Compiler	DRI	2.0	L039.I6	
CIS COBOL	DRI	4.5	L009.C6	
Level II COBOL	DRI	2.1	L010.C6	
Pascal/PT+86	DRI	3.2	L005.I6	
PL/I-86	DRI	1.0	L002.I6	
C86	Comp Innovations	1.32D	L047.C6	
PCCBASIC 86	Buzzwords	1.3	L004.C6	

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The provisions of this Software License (paragraphs 1, 2, 3, and 4) shall also be applicable to third parties purchasing such software from customer.

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SPECIAL CONSIDERATIONS

A. The Kaypro 10 Universal Board

Each CO-POWER is packaged for a particular computer. The 280 Adapter Board is configured for your specific computer and the MS-DOS and RAMDISK software is also specific to your computer.

Kaypro Corporation has manufactured several versions of the Kaypro 10. The default configuration for SWP CO-POWERs supports the 1984 version.

The Kaypro 2x, 2/84 and 4/84 have what is called the Universal Board as the motherboard in the computer. Lately Kaypro has been making Kaypro 10s with this board in place of the Kaypro 10 motherboard. The Kaypro 10 with the Universal Board requires a different set of CO-POWER components than the original Kaypro 10s. What to do is described below.

You can tell if you have a Universal Board by removing the Kaypro case and looking at the main Kaypro board. Locate J9 (a 50-pin hard disk cable connector). If you have the Universal Board, J9 will be on the extreme right edge of the motherboard. If you have the Kaypro 10 Board, J9 is towards the center of the motherboard.

If you have the Universal Board, then you need to follow the rest of these instructions. If you have the other Kaypro 10 motherboard, then skip this section.

Step 1

CO-POWER's 280 Adapter Board contains a 20-pin programmed PAL chip. This chip is labeled in white letters as SWPKAY10, SWPKP10 or SWPKAY4E. Universal boards need the SWPKAY4E chip. If you have the incorrect one, you can order the correct PAL from SWP for \$10, or you can send the incorrect chip back in exchange for the correct one. The \$10 fee can be charged to MasterCard or Visa and includes shipping by U.S. Mail. Shipping by another means may require additional fees.

If the CO-POWER package was ordered for the Universal Board, then your 280 Adapter Board should have the proper PAL chip, SWPKAY4E.

Step 2

The Universal Board uses a different MS-DOS load file and a different RAMDISK file than the Kaypro 10 board does. These different files are located on your MS-DOS load files and RAMDISK Software Disk. To change the disk (we recommend changing a copy of the disk), do the following:

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- The disk contains these files:

MSDOS.COM MODIFY.M
RAMDISK.COM MODIFY.R

The MSDOS.COM and RAMDISK.COM files are for the Kaypro 10 motherboard. The MODIFY.M and MODIFY.R files are the modified files for the Kaypro 10 with the Universal board. Rename the files as follows:

- Rename the MSDOS.COM file to another name. Example:
REN K10.DOS=MSDOS.COM
renames MSDOS.COM to K10.DOS.
- Rename MODIFY.M to MSDOS.COM. For example:
REN MSDOS.COM=MODIFY.M
- Rename the RAMDISK.COM file to another name. Example:
REN K10.RAM=RAMDISK.COM
renames RAMDISK.COM to K10.RAM.
- Rename MODIFY.R to RAMDISK.COM. For example:
REN RAMDISK.COM=MODIFY.R

Now the files on the MSDOS Load Files Disk are redone for the Universal Board. Read this Guide to learn how to use them.

PART 6. REGISTRATION AND WARRANTY

CO-POWER Warranty

CO-POWER is under warranty for 90 days from the original end user's date of purchase. To be valid the enclosed registration form must be thoroughly completed and returned to SWP Microcomputer Products within 10 days from the date of purchase. (A purchase receipt may be required at the sole discretion of SWP.) The serial number of the CO-POWER must be entered on the registration card. (This number is written on the circuit board.) Under no circumstances will any warranty be honored after 6 months past the last date of a production run or board change.

SWP is not responsible for any changes the user makes to the CO-POWER circuit board, including the improper configuring or connecting of any peripherals. Detailed information on such procedures are in this manual.

SWP is responsible for replacing or repairing malfunctioning components on an under-warranty CO-POWER. The responsibility is void if the user has damaged the board or caused the malfunction or if CO-POWER is resold.

SWP will NOT accept any returned merchandise, FOR ANY REASON, that has not been issued an RMA number by SWP Technical Support. The RMA # must be clearly marked on the outside of the shipping carton.

The user is responsible for shipping charges to SWP for any warranty work. SWP will pay return shipping via ground service within the continental United States.

Repairs on SWP Components Not Under Warranty

Once the warranty has expired, or if the warranty has been voided, SWP will repair malfunctioning CO-POWERs and other SWP products for repair charges (minimum is \$35). These charges will include both the cost of materials used and labor.

The user will be charged for all time spent analyzing and repairing the unit. Any pertinent information sent in writing by the user describing the malfunction will decrease the analysis time, and lower the repair charges.

The customer is responsible for all shipping charges to and from SWP. Repairs must be paid in full before return shipping. SWP accepts checks and credit cards. NO CODs.

- Q. If I think my CO-POWER board has a bad memory chip, what do I do?
- A. First run the MEMENTO program and see if it turns up any bad chips. Directions are in this document. You may be able to locate and replace the bad chip yourself.
- Q. Where do I go for help if I don't understand something in the CO-POWER system?
- A. If you purchased CO-POWER from a dealer, contact them for support. If you bought CO-POWER directly from SWP, contact SWP Technical Support. Tech Support hours are Monday thru Thursday, 9 a.m. to 4 p.m.
- Q. If I have a problem with the CO-POWER hardware can I just ship it back to you for repair?
- A. Not first call and get an RMA#, then ship the unit back. If the CO-POWER is under warranty (90 days) we'll repair it and return it to you at no charge. If the unit is out of warranty, there is a minimum repair charge of \$35. Actual cost depends on problem diagnosed.

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B. The Universal ROM

If you have a Kaypro with the new "Universal ROM" then follow the notes for the Universal Board listed in the previous section.

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PART 5. TROUBLE-SHOOTING: QUESTIONS AND ANSWERS

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- Q. How do I keep up-to-date on CO-POWER information?
 - A. Send SWP your registration card so your name will be added to our CO-POWER mailing list. You'll receive new information and the quarterly issues of CO-POWER NEWS.
- Q. How do I obtain updates on software?
 - A. If a new version of our software is released, send your original SWP disks (both the MS-DOS and Load files disks) to SWP with a check for \$25. You'll receive new software and any new documentation. If your original disks have the Kaypro label instead of the SWP label, the update fee is \$50 and you do not need to send back the original disks. [Texas residents add \$1.28 Sales Tax; Ft. Worth residents add \$1.35 Sales Tax.]
- Q. What is the maximum RAM capacity CO-POWER can have?
 - A. CO-POWER-88 has a maximum RAM of 256k. CO-POWER-Plus has a 1024k RAM maximum.
- Q. What power does CO-POWER take?
 - A. Less than 750 milliamps of +5 volts.
- Q. After running RAMDISK if I reset the computer and rerun RAMDISK without erasing the directory, why do I sometimes get incomplete files or other problems?
 - A. Such problems can happen but it is not the RAMDISK program at fault. The ability to load ramdisk without erasing the file directory is mainly an emergency measure and should be used as such. If the reset pulse is extremely long it can cause the 8088 to drop bits in memory.
- Q. Under CP/M I run a key reassign program. When I use RAMDISK it does not work. What can be done?
 - A. In some cases, both the key reassign program and RAMDISK use the same area of memory. You can try relocating either program. In the case of SmartKey, they have a solution.
- Q. Can I obtain source code for CO-POWER programs?
 - A. No. This is not currently released and because of various contracts SWP is involved with it is not scheduled to be released.
- Q. Can I obtain CO-POWER schematics?
 - A. Yes. First you must sign a non-disclosure agreement. The agreement and schematics are available from SWP Sales. As of May 1985, CO-POWER-88 schematics are available for \$25 and CO-POWER-Plus schematics have not been completed.

INTRODUCTION

CO-POWER adds a new dimension to your Kaypro computer. With it installed you have two computers in one, a CP/M machine and an MS-DOS machine. You can now run programs in either operating system by simply loading the desired system.

You've added more than MS-DOS to your computer. CO-POWER's RAMDISK feature helps speed up CP/M job operation time. If you purchased the CO-POWER-Plus board, then this RAMDISK is expandable all the way to 1024k, giving you a fast, simulated disk drive large enough to process even enormous database files.

If you haven't already done so, install your CO-POWER following the instructions in the enclosed installation instructions. Then use this Guide to learn how to use your new system.

NOTE: Each CO-POWER is packaged for a specific computer. If you do not have the correct package for your system, contact SWP Sales about purchasing a conversion kit.

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PART 4. EXPANDING CO-POWER MEMORY

There are two models of CO-POWER, CO-POWER-88 and CO-POWER-Plus. Expanding each is described below.

CO-POWER-88: This CO-POWER has a maximum memory of 256k. Owners of the older 128k model can expand their board to 256k by purchasing an Add-On RAM card from SWP Sales. If you want to expand past 256k, call SWP Sales for details on the current trade-in policy to swap for a CO-POWER-Plus.

CO-POWER-Plus: This CO-POWER is expandable to 1024k of RAM! There are 32 sockets for RAM chips on this board. Each 8 256k RAM chips that are plugged in give the board 256k of memory. If your board is not populated to the 1024k level, you can purchase additional RAM sets from SWP Sales.

CO-POWER-Plus is expanded with 256k RAM chips that are 200 nanoseconds or faster. Our price as of April 1985 price is \$80 per set of 8. To take a 256k board to 1024k, you would purchase 3 sets of chips at \$80 each, or \$240. (Prices may change without notice. Call SWP Sales for current prices.)

Unlike the IBM-PC which can only use 640k of RAM for the operating system, CO-POWER can use all but 64k of the 1024k available. The top 64k is reserved for SWP drivers. This means you can run IBM programs like LOTUS 1-2-3 and make bigger data files than the IBM can! With a 1024k CO-POWER, after MS-DOS and LOTUS are loaded, there is still over 860k left to construct your spreadsheet.

If you're interested in speed and big operating system memory, then read about the MS-DOS public domain ramdisk program available from SWP Sales. Details are in the MS-DOS section. Also, additional memory is terrific for the CP/M RAMDISK. A 1024k CO-POWER adds a lot of power to your computer.

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C. Differences With the IBM-PC CP/M-86 Manual

With CP/M-86 you received an IBM-PC CP/M-86 manual. There are differences between the IBM manual and the CO-POWER system.

1. Ignore all references to the IBM function keys, IBM ROM, IBM I/O and IBM graphics.
2. Relating to low and high resolution, color and monochrome display, the Kaypro has the same abilities it has with CP/M. A light pen will not interface.
3. The following command files are not part of CO-POWER CP/M-86:

CONFIG	DSKININT	FUNCTION	ASSGN (use STAT for this)
--------	----------	----------	---------------------------
4. Format disks under CP/M.
5. In DDT-86, there are no OI, QQ or SR commands.
6. Appendices F and H do not apply.
7. Boot CP/M-86 as per this document. As with CP/M-86, do a CTRL C when you change disks in any drive.
8. There is not a hardware supported message displayed on the screen during bootup as there is on an IBM.
9. The CP/M-86 control characters that work depend on your computer. CTRL C, CTRL P, and CTRL S work on all systems.
10. Backup disks with PIP.CMD or a CP/M-80 copy program.
11. Regarding physical devices: you do not have IBM hardware in your computer so you cannot use any extra devices that your CP/M system will not support.

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PART 1. CO-POWER'S CP/M RAMDISK

When you are not using CO-POWER as a MS-DOS processor, you can use its memory as a high-speed simulated disk drive for CP/M. RAMDISK can greatly speed up the time it takes to do disk-bound applications like sorting large databases, recalculating spreadsheets or moving around in large word processing files.

The best way to use RAMDISK is to transfer both the application program files and your data files to RAMDISK, then run the program. If you do not have enough space to hold both the program files and the data files, you can still speed up your job time by using RAMDISK for one of them. Experiment to find out if it is quicker to have the program or the data files in RAMDISK.

The RAMDISK can be set up to be any of the possible CP/M drivenames, Drive A - Drive P, including the names of 'real' drives on your computer. (If you name the RAMDISK to the same name as a 'real' drive has, like Drive A, the 'real' drivenames will be renamed alphabetically. I.E., 'real' Drive A becomes Drive B, 'real' Drive B becomes Drive C, and so on.) This enables you to run programs in RAMDISK that are configured so they must be run from Drive A.

A. Running RAMDISK

RAMDISK has four prompts that set it up. Once you learn how to set RAMDISK for your needs, you can use a shorthand method of running the program, described after this section.

RAMDISK is started by running the RAMDISK.COM program found on the MS-DOS LOAD FILES AND RAMDISK SOFTWARE disk. When run (type RAMDISK from the system prompt), four prompts will appear:

Drivename (A thru P) to assign to ramdisk

Enter the letter for the name you want to use. If you press <return> here, the default drive, M:, is used. Again, if you name the RAMDISK to a drivename that is used by a 'real' drive, the 'real' drivenames will shift accordingly.

Erase contents of ramdisk file directory (Y/N?)

Normally enter Y or press <return> to use the Y default. This will erase the contents of the file directory so it can be initialized for use (this is something that CP/M floppy disk formatting programs do). SAFETY FEATURE: By answering N to this prompt you can sometimes recover your data files if you accidentally reset the computer before transferring files back to a real disk.

Ramdisk driver load address or <CR> to use default ...

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Normally press <return>. More on the use of this feature is in the 'Tech Notes' section.

CO-POWER-88 port address or <CR> to use default

Normally press <return>. More on the use of this feature is in the 'Tech Notes' section.

A1. The Shorthand Way to Run RAMDISK

Once you are familiar with the RAMDISK program prompts you can bypass them by using the following 'shorthand' method of running RAMDISK.

Simply enter a space after the command RAMDISK and enter the parameters separated by commas. If you enter less than four parameters, or if two commas in a row are entered, then the default value is taken for the undefined one.

For example, this CP/M command:

```
A>RAMDISK A
```

starts RAMDISK and names it Drive A. The directory is erased and the default parameters for load address and I/O port setting are used.

For example, this command:

```
A>RAMDISK A,N
```

names the RAMDISK Drive A, does not erase the file directory, and uses the other default settings.

For example, this command:

```
A>RAMDISK B,FC00
```

installs RAMDISK as Drive B, erases the directory, and loads the software in the top 1k of 280 memory starting at FC00 hex.

One last example:

```
A>RAMDISK *
```

starts RAMDISK with all the default settings. (Drive name is M.)

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B. Exiting CP/M-86

If you are done using the computer, remove any disks from the drives and power down. To return to CP/M 2.2 to do more work, do the following: (Kaypro 10 owners may want to go to CP/M to run SAFETY before powering down.)

Be sure the disk in Drive A is a bootable CP/M 2.2 disk. (You can make a disk that contains all CP/M-86 files and the CP/M 2.2 system tracks.)

Run the 280.COM file.

That's it. 280 can be run from any drive. Regardless of what drive it is run from, the computer will do a warm boot on Drive A. Be sure that Drive A has a bootable CP/M disk in it before running 280.

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A. Booting CP/M-86

To boot CP/M-86, do the following:

- #1 Boot the computer with CP/M 2.2.
- #2 Put a bootable CP/M 2.2 disk in Drive A that contains these files:

CPM.SYS Z88.COM Z88.CMD

- #3 From the A> prompt, type:

Z88

and press <return>. This file loads CPM.SYS and CP/M-86 is booted.

CPM.SYS must be on the disk in Drive A when CP/M-86 is booted. Z88.COM can be run from any drive. For simplicity, we recommend that they both reside on Drive A. When CP/M-86 is booted it always logs onto Drive A.

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B. Copying files to RAMDISK

Once RAMDISK is set up, use PIP, DISK or another file copy program to transfer files to it. Refer to the RAMDISK drive like a normal drive in the copy program formulas. If you name the RAMDISK to the same drive name that a 'real' drive normally has, be sure to remember the "new" drive names. (I.L. If RAMDISK is A:, then 'real' A: is B: and so on).

B1. Using SUBMIT Files

If you use RAMDISK to regularly work on a specific program, consider creating a CP/M SUBMIT file to automatically move the program and related files to the RAMDISK. SUBMIT is described in your CP/M Owner's Manual. Following is an example of using it.

Situation: Moving WordStar into RAMDISK and running it. When WordStar is exited, copy the WordStar data files back to a real disk. In this case, RAMDISK is Drive A:, the WordStar master disk is copied from Drive B> ('real' Drive A), and the data files are written back to Drive C> ('real' Drive B).

First create the file to be used by SUBMIT: (Enter this exactly as shown.)

TYPE THIS	THEN	THEN
A>PIP SETUP.SUB=CON:	<RETURN>	
PIP A:=B:WS*.*[V]	<RETURN>	<LINE FEED>
WS	<RETURN>	<LINE FEED>
B:PIP C:=A:*.DOC[V]	<RETURN>	<LINE FEED>

End the input by entering <CTRL><Z> and <RETURN>. There is now a file on your disk called SETUP.SUB. To test the above file:

In Drive A have a disk with these files:

WS.COM
WSOVL1.OVR
WSHSGS.OVR
RAMDISK.COM
SUBMIT.COM
PIP.COM

In Drive B place a formatted disk for WordStar data files to be written to. (It can already contain files.) The SETUP.SUB file requires that all data files have the .DOC extent.

Now that everything is set up, you can easily start RAMDISK, transfer WordStar, and transfer .DOC files when you exit. Start the process by:

A>RAMDISK A
A>B:
B>SUBMIT SETUP

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NOTE: If you do not set up the RAMDISK as Drive A, i.e. B-P, then you can also include the RAMDISK command in the SUBMIT file. Using the same example altered so that RAMDISK is Drive C, the SETUP.SUB file is:

```

TYPE THIS
-----
A>PIP SETUP.SUB=CON:
RAMDISK C
PIP C:=A:WS*.*[V]
C:
WS
A:PIP B:=C:*.DOC[V]
<CTRL><Z><RETURN>
-----
THEN
-----
<RETURN>
<RETURN>
<RETURN>
<RETURN>
<RETURN>
<RETURN>
<LINE FEED>
<LINE FEED>
<LINE FEED>
<LINE FEED>
<LINE FEED>
<LINE FEED>

```

To run this, simply enter:

A>SUBMIT SETUP

A NOTE TO KAYPRO 10 Owners: When you use SUBMIT files, you will probably want to tailor them to consider the hard disk user areas. For example, if you run WordStar, running it in User 1 of the RAMDISK makes it easy to transfer files back from it to User 1 of the hard disk. The following SETUP.SUB is a modification to the example where RAMDISK is Drive A:

Create the SETUP.SUB file in User 1 (the WS directory):

```

TYPE THIS
-----
A>PIP SETUP.SUB=CON:
PIP A:=WS*.*[V]
A:
WS
B:PIP C:=A:*.DOC[V]
<CTRL><Z><RETURN>
-----
THEN
-----
<RETURN>
<RETURN>
<RETURN>
<RETURN>
<RETURN>
<RETURN>
<LINE FEED>
<LINE FEED>
<LINE FEED>
<LINE FEED>
<LINE FEED>

```

To activate it, enter the following commands:

```

A1>RAMDISK A
A0>B:
U0>USER 1
B1>SUBMIT SETUP

```

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PART 3. CP/M-86

CP/M-86 is an option for CO-POWER. There are no hardware changes to the CO-POWER system to run CP/M-86, just the addition of the CP/M-86 operating disks.

CP/M-86 is the 16-bit version of CP/M. Many programs that you run in CP/M are also available in CP/M-86. The syntax of CP/M-86 is like CP/M's so it is very easy to learn.

Like MS-DOS, CP/M-86 is customized for CO-POWER. It is entered from a CP/M system file. CP/M-86 has your CP/M disk format. You can store files from CP/M and CP/M-86 on the same disks. Files are distinguished by a different extension: CP/M command files have the .COM extent, CP/M-86 command files have a .CMD extent.

Disks are formatted for CP/M-86 with your CP/M disk format program. Transferring the CP/M-86 operating system to a disk is done by using PIP or a copy program to move the entry files to it.

This section describes portions of CP/M-86 that are particular to CO-POWER. Information on using CP/M-86 in general is in the Digital Research CP/M-86 manual you received with CP/M-86.

We have added some files to the standard Digital Research CP/M-86 files on your system disk. These are:

CPM.SYS	contains the CP/M-86 operating system
Z88.COM	the command file that loads the CPM.SYS file
Z80.CMD	a CP/M-86 command file that exits CP/M-86 and returns the system to CP/M.

Before continuing, backup the CP/M-86 master disks and store the originals. Do this exactly like you backup CP/M disks.

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K. Exiting MS-DOS

If you are going to power down your computer when you are done working in MS-DOS, simply remove any disks and turn off the power. If you want to go back to CP/M to do some work, or if you have a Kaypro 10 and want to run the SAFETY program, then do the following:

Your master MS-DOS disk contains a file called Z80.EXE. This program takes you back to CP/M. Run Z80.

If you entered MS-DOS from a floppy disk, then in a moment the screen will show:

TYPE A CONTROL C TO RETURN TO MSDOS

PLACE A CP/M-80 SYSTEM DISK IN DRIVE A
TYPE ANY OTHER CHARACTER TO GO TO CP/M-80

Insert a bootable CP/M disk in Drive A and press any key.

Kaypro 10 users who have set up the hard disk for MS-DOS will bypass this prompt and automatically return to CP/M 80.

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C. Saving Data When Using RAMDISK

RAMDISK is an electronic disk drive. When the computer is powered down the files in RAMDISK are erased. Before you reset or power down the system, copy any new or modified files back to a real disk.

You can use PIP, DISK or another copy program to do this. Unless a program is modified, there is no need to recopy this type of program since it already exists on the disk it was copied from.

If you frequently use the same data files you may want to create a SUBMIT file to easily copy data for you. More on this is described in the previous subsection.

SAFETY FEATURE: If you accidentally reset the computer before saving files back to disk or if you 'lock up' the computer, you may be able to recover your files. In this situation, rerun RAMDISK making sure to name RAMDISK to the same drivename you were using and answering N to the erase directory prompt. Look at the RAMDISK file directory. Your data should be there and you can now save it to a floppy disk.

The above method should usually recover your data. This does not work if you powered down the system and may not work if the reset button is held down too long. Nonetheless, it is always worth a try!

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D. Running MS-DOS or CP/M-86 After Running RAMDISK

Once RAMDISK is run, you must reset the computer before entering MS-DOS or CP/M-86. This refreshes the memory chips so they can be used for operating RAM.

Remember RAMDISK's safety feature. If you accidentally reset the computer before saving files in RAMDISK, you may be able to save them. In this case, rerun RAMDISK, name it the same drivename and answer N to the second prompt. Check the RAMDISK directory to see if the files are still there.

When the power is turned off, all data in RAMDISK is erased.

J. Using the MEMTEST Program

Your MS-DOS disk contains a memory test program that performs an exhaustive test of CO-POWER's RAM chips. This program displays the addresses of any bad locations. If you think you may have some bad memory chips in the CO-POWER, run this test.

Once MEMTEST is run, you must reboot the computer to use any operating system. MEMTEST repeats itself, relocating itself after each pass so that all RAM chips are tested. MEMTEST takes time! Only run it when you do not need to use the computer for a while.

To run the program, type MEMTEST<return>.

If no errors are detected, a display like this will show on the screen:

```
0000 1.2.....3.4..5.....
```

The first number tells how many times the test has repeated. The other digits (and the dots between them) indicate which section of the test is currently in progress. The five tests performed are:

1. a rotating bit data pattern
2. an incrementing data pattern
3. a varying size checkerboard pattern
4. a memory data retention/refresh test
5. an address fault test

Each full cycle takes at least 10 minutes. CO-POWER-Plus's 256K RAM chips take longer. After a pass is completed, the program relocates itself to a new place in memory and repeats. This makes it possible to test all memory including the area where the program is initially loaded. For this reason, allow at least one pass for each 64k of RAM to insure all memory is tested. This is a good program to leave running all night!

If any bad locations are found, an error message is displayed in this format:

```
(XXXXXX=EE should=DD xor=BBBBBBBB)
```

where: XXXXXX is the hex address of the bad memory

EE is the incorrect data read from that location

DD is the value that was supposed to have been there

BBBBBBBB is the binary (ie. ones and zeros) representation of the bits that are different between the values given by EE and DD.

The above can spot which chip is bad. If you get an instance where many locations are bad and the error message is coming out too fast to read, you can stop the display by typing a key on the keyboard. Typing another key restarts the program.

AH = 3 RETURNS STATUS IN AX

DX = WHICH COMMUNICATIONS PORT, 0 OR 1

CALL WITH MOV AH, 3
 MOV DX, which ; indicate which port to use
 INT 14H

RETURNS WITH AH BITS SET AS FOLLOWS:

BIT 7 = TIME OUT
BIT 6 = TRANSMIT SHIFT REGISTER EMPTY
BIT 5 = TRANSMIT HOLDING REGISTER EMPTY
BIT 4 = BREAK DETECTED
BIT 3 = FRAMING ERROR
BIT 2 = PARITY ERROR
BIT 1 = OVERRUN ERROR
BIT 0 = DATA READY

AL BITS ARE SET AS FOLLOWS:

BIT 7 = RECEIVED SIGNAL DETECT
BIT 6 = RING INDICATION
BIT 5 = DATA SET READY
BIT 4 = CLEAR TO SEND
BIT 3 = DELTA RECEIVE SIGNAL DETECT
BIT 2 = TRAILING EDGE RING DETECTOR
BIT 1 = DELTA DATA SET READY
BIT 0 = DELTA CLEAR TO SEND

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E. Technical Notes

This section describes the RAMDISK program prompts and possible answers in detail. It also details error codes. This is provided for technically-oriented users.

E1. User Definable Parameters

1. Drivename (A thru P) to assign to ramdisk

RAMDISK can be installed with any of the 16 possible drive ID's allowed in CP/M, including one already taken by a 'real' drive. The default drivename, used if you press 'return', is M>. If you assign RAMDISK to a currently existing drivename, then that drive and all others after it are moved in sequence to the next name.

For example if you have a two drive system with Drives A> and B> and you name RAMDISK to B>, then Drive A> does not change, RAMDISK is Drive B> and the 'real' Drive B is now named Drive C>. This assignment of drivename is done purely in software and in no way requires any of the physical disk drive select hardware to be changed.

If RAMDISK is named to Drive A>, the other drivenames are moved as described above, plus RAMDISK has a copy of your CP/M operating system written to it. This happens so that all future warm boots (CTRL Cs) are done from the RAMDISK. This speeds up normal operation and frees you from always having to keep a 'sysgened' disk in physical Drive A>. Because of the extra space taken for CP/M, RAMDISK set up as A> will have slightly less storage space than when it is set up for Drives B> through P>.

2. Erase contents of ramdisk file directory (Y/N ?)

The file directory of a CP/M disk must be initialized to a known state before the disk can be used. Floppy disk formatting programs usually do this for floppies and a similar process must be performed on the RAMDISK. The default for this prompt is Y. Answer Y to this prompt whenever you are loading the software for the first time since powering up the computer, or whenever you load the RAMDISK after previously running MS-DOS or CP/M-86.

SAFETY FEATURE: The directory can be left intact by answering N. Use this if you need to reload the RAMDISK software without losing any of the data in the 8088's memory. This situation could arise if you needed to get out of a lock-up situation by pressing the computer's reset button.

3. Ramdisk driver load address or <CR> to use the default....

This prompt allows you to define where in the 280's memory the ramdisk driver will be loaded. Use the default option (press

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<return>) if you do not know the location of any free space in high memory for the software to use. With the default, the RAMDISK driver will be automatically relocated just below CP/M's console command processor, and the size of the TPA (free memory for user programs) will be reduced by 3k bytes to make room.

If you cannot tolerate the loss of 3k from the TPA, a place for the RAMDISK driver can usually be created by generating a smaller CP/M system using the utility programs 'NOVOPM' and 'SYSGEN'. The precise operation of these programs varies between manufacturers, so consult your system's documentation on how to generate a new CP/M system. Having done that, you can specify the address of a 1k byte block of memory starting on an even 256 byte boundary as the load address of the RAMDISK driver. This address is specified in hexadecimal notation.

4. CO-POWER-88 port address or <CR> to use default

The CO-POWER board communicates with the 280 processor in your Kaypro computer through a pair of jumper-selectable I/O ports. The provided RAMDISK software for your computer has been set for the correct address of your machine, so you will usually respond to this prompt by pressing <return>.

If you are using CO-POWER in a computer not specifically supported by SWP, you will need to enter the starting address of the two ports being used. The input is in hexadecimal with valid values ranging from 0 to FE.

There are two styles of CO-POWER 280 Adapter Boards. On one, the I/O port addresses are defined by 4 jumpers on the CO-POWER 280 adapter board. On the other, they are determined by a PAL chip on the 280 Adapter Board. On the jumper style board, the jumpers allow us to define the value of the upper 4 bits of the port address being decoded. The lower 4 bits are fixed permanently as 1110 ('E' in hexadecimal). This gives 16 possible sets of port addresses in the form 0E, 1E, 2E, etc. through FE. Some custom daughter boards may have hardwired port addresses with different values.

E2. Error Conditions

After loading, displaying the signon message and getting input from either the command buffer or direct from the console keyboard, the ramdisk software will take a moment to communicate with the 8088 processor and then exit back to CP/M. Upon exit a summary of the settings assigned for drive name, directory fill, load address and port number is displayed. If you get to here you are in business, otherwise some kind of error condition exists.

Most of the time this is due to invalid input data. When the program cannot make sense of what you typed in the direct input mode, the prompt is simply reissued and the input must be

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11. Interrupt 14 Calls

AH=0 INITIALIZE THE COMMUNICATIONS PORT

AL= FOLLOWING BIT DEFINITIONS

7	6	5	4	3	2	1	0
----	BAUD RATE	----	PARITY	----	STOP BIT	----	WORD LENGTH
000 -	110		X0 - NONE		0 - 1		10 - 7 BITS
001 -	150		01 - ODD		1 - 2		11 - 8 BITS
010 -	300						
011 -	600		11 - EVEN				
100 -	1200						
101 -	2400						
110 -	4800						
111 -	9600						

DX = WHICH COMMUNICATIONS PORT, 0 OR 1

CALL WITH MOV AL,init ;bits defined as above
MOV DX,which ;indicate which port to use
INT 14H

RETURNS WITH CONDITIONS SET THE SAME AS IN THE STATUS CALL (AH=3)

AH = 1 SEND CHARACTER IN AL, AL IS PRESERVED

DX = WHICH COMMUNICATION PORT, 0 OR 1

CALL WITH MOV AL,character ;character to send
MOV DX,which ;indicate which port to use
MOV AH,1
INT 14H

RETURNS WITH BIT 7 OF AH SET IF UNABLE TO TRANSMIT. THE REMAINDER OF AH IS SET THE SAME AS IN THE STATUS CALL (AH=3).

AH = 2 RECEIVE CHARACTER IN AL

DX = WHICH COMMUNICATION PORT, 0 OR 1

CALL WITH MOV AH,2
MOV DX,which ;indicate which port to use
INT 14H

RETURNS WITH CHARACTER IN AL, ERROR BITS 7,4,3,2,1, ARE SET IN AH AS DEFINED IN THE STATUS CALL (AH=3). AH BIT 7 INDICATES DATA SET READY WAS NOT RECEIVED. THUS, A NON ZERO AH ON RETURN INDICATES AN ERROR.

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I. Enhanced Communications Capabilities

In earlier versions of CO-POWER MS-DOS it was extremely difficult to modify a communications program to work on the CO-POWER system. MS-DOS 2.11-1A has communications capabilities built-in. As with any computer, a communications program must be adapted for the system used. This section tells programmers how to do this.

For the non-technical, your master disk has an assembly file with the interface code to modify the ASCOM package for your Kaypro CO-POWER. This file is named SCP.ASM. Follow the directions in the ASCOM manual to integrate this.

Earlier versions of CO-POWER MS-DOS relied on the CP/M reader/punch BIOS routines for the serial I/O via the AUX: device. This did not allow status checking and serial port reconfiguring as required by many communications applications programs. MS-DOS 2.11-1A now has complete implementation of the IBM interrupt 14 calls through a new pair of MS-DOS devices, COM1: and COM2:.

In computers with two RS-232 ports, COM1: is the port normally used for the modem and COM2: is the port used for the serial printer.

Information on the interrupt 14 calls follows. This can also be found in the IBM technical manual. The COM: devices are modeled on the IBM to the point that the PC-DOS MODE program can be used to set baudrates, parity and so on. Also the CTTY command can be used to switch the console over to the modem port so MS-DOS can be run remotely.

There are three ways to get a communications program going:

1. Find one that already uses the call to the IBM PC interrupt 14 for communications. Before you buy such a program, make sure that:
 - the program uses interrupt 14 calls. (Programs that bypass these calls and do direct hardware calls will not work.)
 - the part of the program that displays data on the screen must use the IBM video interrupt 10. (Programs that write directly into the IBM display memory will not work.)
2. Find one that allows you to write interface code for it, a common practice in communications programs. An example is ASCOM. SWP has written an interface to make this program work. The interface code is in the SCP.ASM file on the master disk.
3. Write your own program.

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repeated. If the data was all included on the command line as described in the previous section, then the program simply displays the following message and terminates:

*** Invalid parameter in command line ***

Here is the current list of errors that will get you in trouble in this respect.

- a) Drivename outside the range A through P.
- b) Response other than Y,N or <CR> to directory fill prompt.
- c) Load address not valid hexadecimal, that is not composed of the digits 0 through 9 or A through F.
- d) Load address below BIOS start or not on even 256 byte boundary.
- e) I/O port address not valid hexadecimal.
- f) I/O port address greater than FE hex.

A couple of other conditions may exist that will make it impossible to load the ramdisk software. One possibility is that the I/O port address for CO-POWER is not really correct for the actual system being used. It is also possible to get the 8088 stuck in a situation where it will not respond. In both cases you will get the following error message:

*** cannot load, 8088 does not respond ***

If you see this message, you should check to see that you are using the correct CO-POWER 280 Adapter Board for your system, and that CO-POWER is correctly connected to the computer. After doing that, press the 280's reset button, reboot CP/M and try running RAMDISK.COM again.

Another error can occur when using ramdisk as logical Drive A>. In this case the ramdisk software must locate your copy of CP/M in memory and transfer it to the ramdisk for use by subsequent warm boots. A special mechanism called a CRC check is used by the software to insure that a valid copy of CP/M is present in memory. If this check fails to verify, you will see the following message:

*** not standard CP/M system, cannot load ***

If this happens you will not be able to use the ramdisk as Drive A> unless you can find what is causing the CRC to fail. The most likely causes are listed below:

- a) The operating system is not CP/M version 2.2, but rather some look alike such as CDO5, TPI, TurbODO5, CP/M+ or R/M. Consult SWP on the availability of ramdisk software for these systems.

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- b) The operating system is CP/M 2.2 but the code has been altered in some way for use on your machine. Also call SMP for help.
- c) The operating environment of your system has been altered by an applications program that was run previously. Any program that alters the BIOS jump table or the BDOS vector at location 5 should be loaded after you load the ramdisk driver, not before. Even if you reverse the load sequence there may be some such programs that will not work with the ramdisk.

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118. Batch Files

Batch files are an MS-DOS feature similar to SUBMIT files in CP/M. A batch file executes a series of commands. Following is one example of a batch file. For more information read about BATCH and AUTOEXEC.BAT in the MS-DOS 2.0 User's Manual.

In section H7 the example shows how to make a subdirectory for WordStar. A batch file can be used to easily change from the main directory to the new directory, to run WordStar and to exit back to the main directory.

In the main directory of Drive A, type the following with <return> at the end of each line: (If you are in a subdirectory use CD \ to return to the main directory)

```
A>COPY CON WS.BAT
CD WS
WS
CD \
<CTRL><Z> (or press F6)
```

There is now a file called WS.BAT in Drive A's main directory. You can verify the contents using the type command (TYPE WS.BAT). The .BAT file is an executable file. Test it by typing WS from the main directory. When you exit WordStar, the directory will change back to the main one.

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117. Using Subdirectories

In CP/M data can be organized on a disk by using different user areas. In MS-DOS this can be done by using subdirectories. While this is most useful for Kaypro 10 users with the hard disk, all Kaypros can use this.

By making a subdirectory, you can create an area to store specific files. This is described in the MS-DOS 2.0 User's Guide. The following is one example of using a subdirectory.

Situation: The main directory on Drive A contains utility files and you want to make a directory for Wordstar. Do the following:

1. To make the directory, we'll call it WS for Wordstar, do this:

```
A>MD WS
```

2. To change the directory to the new one:

```
A>CD WS
```

3. You are now in the new directory. Type DIR and you will see that there are no files (other than the dir files) in the directory. To copy the Wordstar files from Drive C to this directory:

```
A>COPY C:\.* A:\
```

To change out of a subdirectory back to the main directory, use the command "CD \". If you use subdirectories, read about the CD, MD, RMDIR and PATH commands in the MS-DOS 2.0 User's Manual.

NOTE: COPY and other utilities access the logged directory of a drive. The DIR command shows what directory is active, in the second line of its display:

```
Volume in drive A has no label
Directory of B:\
```

\ is the main directory.

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PART 2. MS-DOS 2.11-1A

MS-DOS 2.11-1A is included with your CO-POWER. This version of MS-DOS has many special features that are specifically for the Kaypro CO-POWER (Kaypro models 84 or later). There are also some new features included that are now part of MS-DOS for all CO-POWERS. These include file transfer programs to copy data files between CP/M and MS-DOS, multiple MS-DOS screen drivers so you can install more software, and new communications 'hooks' which make it easy to adapt modem software for your computer.

This MS-DOS section details MS-DOS features that are specific to SWP's system. Information on standard MS-DOS features is included in the MS-DOS 2.0 User's Guide. Thoroughly read this section to learn about your system and to know how to take advantage of CO-POWER's MS-DOS features.

Be sure to read carefully about the new screen driver feature. To use it effectively the computer's screen display must match the installation of your software programs. This is described in Section C.

NOTE: Be sure to read the Special Considerations Section at the start of this document to be sure you have the correct software files.

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A. Booting MS-DOS 2.11-1A

You received two disks for MS-DOS, a MS-DOS system disk and a disk labeled MS-DOS Load Files and RAMDISK Software. The Load Files disk is a single-sided CP/M disk. The MS-DOS system disk is an MS-DOS formatted disk.

MS-DOS is booted in two stages. The first step is done from a CP/M file called MSDOS.COM. The second step uses the MS-DOS 2.11-1A system disk. Our two-step boot saves you MS-DOS disk space! Most MS-DOS systems boot MS-DOS similarly to your CP/M boot; part of the boot reads hidden files from the system tracks of a disk. For CO-POWER this is done from the CP/M MSDOS.COM file instead. This saves you @ 24k of disk storage on MS-DOS disks!

Kaypro 10 Owners have a slightly different boot process that makes use of the hard disk. Follow the section for your computer.

A1. Kaypro 2/84, 2x and 4/84

To boot MS-DOS you need:

- the MS-DOS 2.11-1A system disk
- the MS-DOS Load Files disk
- a bootable CP/M disk to hold the MS-DOS load file

The first time you use MS-DOS, copy the MSDOS.COM file from the Load Files disk (single-sided) to a bootable CP/M disk. This will be your working disk.

To boot:

- #1 Turn on the computer and boot CP/M. (Use your normal procedure)
- #2 With the CP/M disk containing MSDOS.COM in Drive A, enter MSDOS and <return>.
- #3 In a few seconds the screen will show:

... Ready to load MSDOS ...

Insert an MSDOS system disk in one of the drives and type the letter A,B,C or D to indicate which drive to load from.

?

Your answer will finish the MS-DOS boot in the selected drive. Before answering be sure to put the MS-DOS 2.11-1A system disk in the selected drive.

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H6. Installing dBASE II Version 2.4 for CO-POWER

The following tells how to patch dBASE II to work properly with CO-POWER. The patch is to fix an incompatibility with MS-DOS 2.11, NOT with the CO-POWER software.

Have DEBUG.COM on a disk in Drive A and have dBASE II in Drive B. In these instructions <cr> means press the <RETURN> key. XXX indicates the segment that debug is using.

The screen shows:

You type:

A>

B:<cr>

A:DEBUG DBASE.COM<cr>

B>

Both dBASE and debug will load into memory. When done:

XXX:53FB

A53FB<cr>

XXX:53F9

NOP<cr>

XXX:53FA

HOP<cr>

<cr>

You have now made the patch and need to save the patched dBASE onto disk. Do this:

W<cr>

When done, exit dBASE

Q<cr>

B>

dBASE is now patched and saved. During the installation, when you select the type of terminal, we recommend that you choose the IBM-PC terminal. An alternate is Lear Siegler ADM-3A.

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- Q. Delete Line. Default is empty.
R. Enter C to change. Input these values:

Current Value	New Value
00h	1B
00h	:C
00h	:1
00h	:M
00h	

If you entered this correctly, the screen lists it as 1Bh 5Bh 31h 4Dh. Press <return> to accept.

- Q. Insert Line. Default is empty.

- R. Enter C to change. Input these values:

Current Value	New Value
00h	1B
00h	:C
00h	:1
00h	:L
00h	

If you entered this correctly, the screen lists it as 1Bh 5Bh 31h 4Ch. Press <return> to accept.

- Q. Handling of Last Character on Screen. Default is Yes for scroll command.

- R. Press <return> to accept.

3. Now you are back at the TERMINAL INSTALLATION MENU. Select X to exit this menu.

4. You are now back at the main INSTALLATION MENU. If you need to install a printer do so. Once any other selections are done, select X to exit the installation.

Choose option A to save your changes in your preselected filename.

That's it. This ANSI version of MS-DOS Wordstar will display like the Kaypro 10's CP/M version does.

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- 14 The screen will show an SMP copyright message and more:

```
*****
** SMP Microcomputer Products **
** 1000 West Fuller **
** Fort Worth, Texas 76115 **
** Copyright 1983,84,85 **
** 10-June-85 **
*****
```

```
Microsoft MS-DOS version 2.11
Copyright 1981,82,83 Microsoft Corp.
```

```
Command V. 2.11
Current date is: Tue 1-01-1980
Enter new date:
```

Enter the date in the format shown (month,day,year) or press <return> to bypass. (MS-DOS files are time and date stamped in the directory so this can be a very useful feature.)

Next the screen shows:

```
Current time is: 0:00:00.05
Enter new time:
```

Again, either answer or press <return> to bypass. Now MS-DOS is booted and the logged drive prompt shows.

The above boot procedure has you run MSDOS.COM from Drive A. You can run it from any drive and you can do the second boot step from any drive.

NOTE: The boot process automatically runs a file called AUTOEXEC.BAT which loads up the ANSI25 screen driver. Learn about screen drivers and how to change this default in Section C.

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A2. Setting up and booting MS-DOS 2.11-1A on the Kaypro 10

CO-POWER for the Kaypro 10 includes a program that lets you reserve a portion of the hard disk for MS-DOS. During the set up you select how much of Drive A and/or Drive B to reserve for MS-DOS. This portion of the hard disk will be seen in CP/M as a data file named MSDOS.DAT. In MS-DOS you will only access the MS-DOS portion of the hard disk.

Once the system is set up, booting MS-DOS is a snap. You'll have the MSDOS.COM boot file on CP/M Drive A. To change over to MS-DOS you'll type MSDOS<return> and the rest is automatic!

The set up process may take as long as thirty minutes. We advise that you don't start this if you don't have enough time to finish it in one sitting.

You will need:

- the MS-DOS 2.11-1A system disk
- the MS-DOS Load Files disk
- figures for free space on Drive A and on Drive B (use START or D to get this.)

After determining how much free space you have on Drive A and Drive B, decide how much of the space you'd like to be used for MS-DOS. As in CP/M, it is handy to have MS-DOS areas on both drives so you can store programs on A> and data on B>.

You do not have to use portions of both drives. If you only reserve part of A>, you will have a MS-DOS Drive A (hard disk) and Drive C (floppy disk). If you only reserve a part of B> for MS-DOS, it will be named Drive A for MS-DOS (but it will be stored on B: of the hard disk; this will revert back to Drive B if you later reserve part of A>) and Drive C (floppy disk).

- Step 1 First we'll allocate part of the hard disk for MS-DOS. Insert the MS-DOS Load Files disk into Drive C. Log onto Drive C (from A> type C:<return>).
- Step 2 Type DIR and make sure that this disk contains these files:

```
MSDOS.COM      MODIFY.M
RAMDISK.COM    MODIFY.R
DEFDSK.COM     MSDOS.OLD
```

NOTE: You should have already read the Special Considerations at the start of this document. If you have not, do so. If your Kaypro 10 is a 1983 version, you may need an altered version of MSDOS.COM. First try the regular process. If MS-DOS does not run, then rename MSDOS.COM to a new name, and rename MSDOS.OLD to MSDOS.COM. Try running this MSDOS.COM file.

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O. Highlighting. Currently empty.
R. Enter C to change. Enter C to change highlight-on and input these values:

Current Value	New Value
00h	1B
00h	17
00h	1m

If you entered this correctly, the screen lists it as 1Bh 5Bh 37h 6Dh. Press <return> to accept.

O. Highlight-off sequence. Currently empty.
R. Enter C to change. Input these values:

Current Value	New Value
00h	1B
00h	17
00h	1m

If you entered this correctly, the screen lists it as 1Bh 5Bh 30h 6Dh. Press <return> to accept.

O. Erase to End of line. Default is empty.
R. Enter C to change. Input these values:

Current Value	New Value
00h	1B
00h	17
00h	1m

If you entered this correctly, the screen lists it as 1Bh 5Bh 4Bh. Press <return> to accept.

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- Q. Are there characters after the line and column #s?
R. Enter C to change. Type in these values:

Current Value	New Value
00h	:H
00h	

If you entered the above correctly, the screen lists it as 48h. Press <return> to accept.

- Q. Is the line # sent before the column #. Currently no.
R. Do not change this. Press <return> to accept.

- Q. What character is sent for line 1? Default is 20h.
R. Enter C to change.

New Value: ,1

If you entered this correctly it will list it as 1h. Press <return> to accept.

- Q. What character is sent for column 1? Default is 20h.
R. Enter C to change.

New Value: ,1

If you entered this correctly it will list it as 1h. Press <return> to accept.

- Q. What types of codes are sent to show line or col #s. Default is Single byte BINARY value.
R. Enter C to change to Multi Character ASCII.

- Q. The # of ASCII characters sent to represent line or column #s is 1.
R. Enter C to change. Enter 2. Press <return> to accept.

- Q. Terminal Start-up. Default is empty.
R. Press <return> to accept.

- Q. Terminal Exit. Default is empty.
R. Press <return> to accept.

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Step 3 From C> run DEFDSK. The screen will show:

SWP Inc.
Kaypro 10 hard disk Setup Program, V1.0.
(C) Copyright SWP Inc. 1984

Select one of the following:

- 1 - Create MSDOS area on drive A
- 2 - Create MSDOS area on drive B
- 3 - Delete MSDOS area on drive A
- 4 - Delete MSDOS area on drive B
- 5 - Exit program

Enter your selection:

Here you will have to choose for your needs. The example will show selection of Drive A. Do what fits your needs.

We'll select 1 to create room on Drive A. Enter 1 and <return>. The screen now shows:

Do you want ALL of drive A to be a MSDOS drive?
If so, you must ERASE ALL FILES ON THIS DRIVE!
If you have not erased all files, you must exit to do so or make another selection.
Do you want to use all of the drive? (Y/N):

For the example, we do not want all of the drive reserved (we want to keep several CP/M programs!). Answer N. The screen now shows:

You may select MSDOS size of 86 to 1118 blocks.
Each block is 4096 bytes if data storage. If you select 1118 blocks, you will make the drive ALL MSDOS. If you key a "X", you return to the start of the program.
Input MSDOS size:

Don't let this scare you! The Kaypro 10's hard disk has a total of 9 megabytes of formatted storage area, 4.5M for each Drive A and B. We'll reserve approximately 2000K of Drive A. To get the number of blocks we want, divide 2000 by 4.096. To make it easy we'll call it 2000 / 4 or 500 blocks.

Enter 500 and <return>.

(If you try to select more space than there is free, DEFDSK will not accept the input.)

DEFDSK will start creating a CP/M file called MSDOS.DAT on Drive A. Its size in your CP/M directory will be the

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size selected.

As DEFDSK is working it will draw rows of *s across the screen. When it is done, the DEFDSK menu shows on the screen.

If you also want to use part of Drive B for MSDOS, select 2 and answer the prompts. NOTE: Sometimes DEFDSK is finicky. Sometimes it will not reserve a portion of the other drive until you exit DEFDSK and reenter.

Next you must use STAT to set the MSDOS.DAT file(s) to R/W. Use this command on all MSDOS.DAT files:

STAT MSDOS.DAT \$R/W

Now that you've set aside a part of the hard disk for MS-DOS, its time to boot MSDOS and format the reserved section(s) of the hard disk.

With the MS-DOS Load Files Disk still in Drive C, run MSDOS.COM. (C:\MSDOS<return>)

In a few seconds the screen will show:

... Ready to load MSDOS ...

Insert an MSDOS system disk in one of the drives and type the letter A,B,C or D to indicate which drive to load from.

?

Remove the MS-DOS Load Files Disk from Drive C and insert the MS-DOS system disk in Drive C. Press <C> to complete the MS-DOS load.

The screen will show:

```
*****
**
** SMP Microcomputer Products **
** 1000 West Fuller            **
** Fort Worth, Texas 76115    **
** Copyright 1983,84,85        **
** 10-June-85                  **
*****
Microsoft MS-DOS version 2.11
Copyright 1981,82,83 Microsoft Corp.
Command V. 2.11
Current date is: Tue 1-01-1980
Enter new date:
```

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H5. Installing MS-DOS Wordstar 3.3 for a 25-Line ANSI Display

These instructions tell how to create a 25-line ANSI screen Wordstar with the WINSTALL program. With this installation, the MS-DOS Wordstar will display similarly to the Laypro CP/M Wordstar. This installation also makes the screen scroll much faster than non-ANSI installed Wordstar.

1. Run Wordstar's installation program, WINSTALL. Select what the source and destination files for the install will be. From the installation menu choose "B", custom installation of terminals.
2. From the TERMINAL INSTALLATION MENU choose "A" for Automatic installation of all features. You will be asked to answer several questions about the terminal. Following is a list of how to respond.

O. Terminal Name.

R. Enter C to change. Then name the terminal ANSI25.

O. Screen Size. Default is 24 x 80.

R. Enter C to change. Screen height is shown as 24, enter C to change, enter 25. Screen width is shown as 80. Do not change, press <return> to accept.

O. Cursor Positioning.

R. Enter C to change.

O. Function Code Sequence

R. Enter C to change. Type in these values as shown:

Current Value	New Value
1Bh	<return> leaves it unchanged
3Dh	:
00h	:

If you entered this correctly, the screen lists it as 1Bh 5Bh. Press <return> to accept.

O. Are there characters after the line # and before the other dimension?

R. Enter C to change. Type in these values as shown:

Current Value	New Value
00h	:
00h	:

If you entered the above correctly, the screen lists it as 3Bh. Press <return> to accept.

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114. MS-DOS Public Domain Disks Available from SWP

SWP is now offering three MS-DOS disks to CO-POWER users. The programs are all public domain or freeware. Each disk is \$10, including postage, disk and handling. (Disks are 5 1/4" PSDS unless otherwise specified.) The disks are:

#1 Public Domain files sent to SWP by the Capitol ATR peripheral Micro-Users Group. This disk has several utility programs (with document files) that run on CO-POWER. Some are:

MEMBRAN.EXE - a RAMDISK program for MS-DOS! This is a terrific program. Use part of CO-POWER's RAM as operating RAM and the rest as a RAMDISK. Works with both CO-POWERS.

SDIR26.COM
CWEBPL.EXE - An enhanced directory program.

- A utility similar to CP/M's DISK76. Good for file copying, specified file deleting, viewing text and hex files.

NEWDATE.COM - Changes the date on a file.

VOLSER.COM - Changes the volume label on a disk.

KEY.EXE - Displays the code a keystroke produces.

#2 Public Domain and Freeware files submitted by CO-POWER users. This disk contains lots of useful utilities and a freeware database program, PC-FILE. [Freeware means that you can have a free copy of the program. If you like it, there is a suggested contribution.] Among the files are:

LU-DOS.EXE - The library utility program that lets you build, examine, extract, etc., files.

SQUINSOPC.LBR - Contains Squeeze and UNSqueeze. Utilities that let you compress and uncompress files for easier storage and transfer.

PC-FILE.LBR - A library containing PC-FILE, a freeware database, and related files. A file with the manual is included. Suggested contrib: \$35.

SD.LBR - A library with a sorted directory program and complete documentation.

#3 Freeware program, Genealogy ON DISPLAY, submitted by a CO-POWER user.

GENEOLGY.LBR - A library containing the freeware program Genealogy ON DISPLAY and related files. Suggested contribution is \$35. Requires BASICA (Compag version 1.13 works).

LU-DOS.EXE - Library utility program to use with above.

These programs are provided as a service to SWP CO-POWER users. These programs are not supported by SWP Technical Support. Most programs list an author that can be contacted for information and help.

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Enter the date in the format shown (month, day, year) or press <return> to bypass. (MS-DOS files are time and date stamped so this can be a very useful feature.)

Next the screen shows:

Current time is: 0:00:00.05

Enter new time:

Again, either answer or press <return> to bypass. Now MS-DOS is booted and the logged drive prompt shows, C>.

Step 5

Before files can be written to the MS-DOS portion(s) of the hard disk, it must be formatted to the MS-DOS format (it is different than CP/M). Use the appropriate commands to format for your setup.

To format both A> and B> of the hard disk, use these commands:

C>FORMAT A:/H
C>FORMAT B:/H

To format just A>, use this command:

C>FORMAT A:/H

If you only set aside a part of Drive B for MS-DOS, it will be called Drive A. Format it with the command:

C>FORMAT A:/H

Now that the hard disk is set up and formatted, you can copy the MS-DOS system files to Drive A. This command will do the job:

C>COPY *.* A:/V

NOTES: In MS-DOS the 'equation' for utilities is source,destination not CP/M's destination,source. /V tells COPY to verify the transfer. These files are being copied to the main directory, called A\.. MS-DOS lets you set up subdirectories to organize your files. More on this is detailed later in this section and in the MS-DOS 2.0 User's Guide.

The files you have now transferred to the hard disk are described in this document and in the MS-DOS 2.0 User's Guide. For now let's return to CP/M so you can learn how easy it is to enter MS-DOS on your setup system.

From C> type 280 and press <return>. The screen will show:

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TYPE A CONTROL C TO RETURN TO MSDOS

PLACE A CP/M-80 SYSTEM DISK IN DRIVE A
TYPE ANY OTHER CHARACTER TO GO TO CP/M-80

Press any key. The CP/M prompt A> will appear. (Note: In some cases the above note will not appear. You will return to A> without the message.)

A2A. Booting MS-DOS After the Kaypro 10 Initial Set Up

Now that the hard disk is set up for MS-DOS, booting is a snap. There is no disk swapping to do or prompts to answer. To complete the setup, copy the MSDOS.COM file from the MSDOS Load Files Disk to Drive A>. (A>PIP A:=C:MSDOS.COM[V])

To enter MS-DOS, use this command:

A>MSDOS<return>

MS-DOS will load and the screen will pause at the date and time stamps. Returning to CP/M is as easy. From MS-DOS A> type Z80 and <return>. You'll go back to the A> CP/M prompt.

H3. Kaypro 10 Users: Renaming the Floppy Drive to Drive A

Some programs like LOTUS 1-2-3 have to be run from Drive A or they check for a disk in Drive A. The floppy drive on the Kaypro 10 CO-POWER system is named Drive C. When you need a floppy Drive A, run the ASSIGN.COM program and swap the names of Drives A and C. To swap the names, use the equation:

A>ASSIGN A=C C=A

then do a DIR to be sure it worked. To set the drives back to their normal names, rerun ASSIGN:

A>C:ASSIGN (where C is the hard disk)

To avoid confusion, we do not recommend formatting disks while the assignment is swapped.

AS SOON AS THE FILE IS COPIED TO THE LOTUS DISK, REMOVE THE DISK FROM THE DRIVE AND PUT A WRITE PROTECT TAB ON IT.

You can now easily run LOTUS by doing the following:

1. Boot MSDOS and answer the time and date stamps.
2. Place the LOTUS system disk in the floppy drive. From the main Drive A directory (A\), type:

A>START

3. The batch file will:

1. Run ASSIGN and switch the drive names for you.
2. Change the logged drive to the hard disk (now C:).
3. Change the logged directory to the LOTUS directory (123).
4. Run LOTUS.

4. When you exit LOTUS, the batch file will:

1. Rerun ASSIGN to return the drive assignments to normal.
2. Change the logged drive from C: back to A:.
3. You'll be back at the Main directory (A\) as you were before you ran START.BAT.

NOTE: Sometimes when you run LOTUS for a long period of time, when you exit it the MS-DOS system will tell you to insert a disk with COMMAND.COM in the drive and to press return. If this happens, do this and then the batch file will continue. You can also copy the SWP COMMAND.COM to your LOTUS master (removing and replacing the write protect tab) and you will not have to do this disk swap.

Experiment with batch files. They can help make your MS-DOS operations simple to use and easy to show another person how to run one of your programs. Batch files and subdirectories are described in your MS-DOS 2.0 User's Manual.

If you have allocated a portion of both hard disk Drives A and B for MS-DOS, and you have data files for several programs on B:, you can create a subdirectory for the LOTUS data files on Drive B:. (Ex: B>MD 123, CD 123) If so, you can alter the above START.BAT file to suit your needs.

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B. Backing Up The SWP Master Disks

Before learning how to use your new CO-POWER system, it's a good idea to make copies of the SWP Master Disks and to store the originals.

The MS-DOS Load Files and RMDISK Software Disk is a single-sided CP/M disk. Make a backup copy of this disk like you would any CP/M disk. Kaypro 2 and 4 users can use SSCOPY.COM, Kaypro 10 users can use FLPPYFMT.COM and DISK.COM or FIP.COM.

The MS-DOS system disk is a MS-DOS disk. Backup up this disk by booting MS-DOS and doing the following:

1. Run FORMAT and format a new disk.

Single-sided drive users: FORMAT D:/V
where D: is the drive to be used.

Double-sided drive users: FORMAT D:/D/V
where D: is the drive to be used, /D for double-sided

2. COPY all files from A: to another drive by:

Kaypro 2,4: A>COPY *.* B:/V

Kaypro 10: A>COPY *.* C:/V

(COPY is an internal command, not a disk file. /V verifies the transfer.)

For better protection be sure to write-protect the master disks before storing them. 5 1/4" disk users put a foil write-protect tab over the disk notch.

More about formatting and copying disks is described later in this section and in the MS-DOS 2.0 User's Manual.

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C. Selecting and Using MS-DOS Screen Drivers

MS-DOS 2.11-1A has a new feature that lets you select different screen formats. With this new feature you have four screen options including ANSI screens!

ANSI displays are used in many MS-DOS applications programs that are not specifically written for the IBM-PC. Among the ANSI features is inverse video. Other screen options include the choice of a Kaypro screen driver. Using these screen options, Kaypro graphics can be used in MS-DOS.

Not all MS-DOS programs will run under all drivers. The default for your system is the ANSI25 driver. If a program doesn't run correctly under ANSI25, it may under another driver. Experiment and keep track of what driver each of your programs needs.

These drivers will not make IBM-PC programs that are screen or keyboard dependent run. They will allow installation of other programs for your system.

The default screen driver for your computer is the ANSI25 driver. To change drivers, simply run the .COM file of the desired one. Below is a description of each driver.

```
25-lines:      ANSI25.COM - a 25-line ANSI display using
                SWP custom screen driver
                INT10.COM - a 25-line SWP screen that uses
                IBM Interrupt 10 calls

24-lines:      ANSI24.COM - a 24-line ANSI display using
                Kaypro CP/M console output
                NATIVE.COM - a 24-line Kaypro screen
```

C1. ANSI25.COM

This is the default driver for your computer. It is a 25-line ANSI screen that uses an SWP custom screen. This driver is used with 25-line ANSI programs. Among the ANSI features is inverse video.

Many programs can be installed for a variety of screens. An example is MS-DOS Multiplan. Installed for a Lear Siegler ADM-3A (Kaypro), it runs on CO-POWER. However, installed for an ANSI screen it runs with enhanced display features like highlighting and inverse video.

Another MS-DOS program that can be installed for an ANSI25 screen with better results is MS-DOS WordStar 3.3. This installation is listed later in this section. Not only does the WordStar display look better (you get the same inverse sections that you do in

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112A. Tips for Kaypro 10 LOTUS 1-2-3

One of the advantages of running LOTUS 1-2-3 on the Kaypro 10 is the availability of the MS-DOS formatted portion of the hard disk. The following is a suggestion for how to make the most out of your CO-POWER system.

MS-DOS has a subdirectory feature that helps you organize hard disk files. If you put major programs and their data files in a specially defined subdirectory it will be easy to keep track of the related files.

Before copying the LOTUS master disks to your hard disk, make a subdirectory for it by typing:

```
A>MD 123
```

Then change to the new directory using the command:

```
A>CD 123
```

Now copy the LOTUS master disks to the hard disk and install the program following the MONO instructions and the SWP utility instructions above. Also copy the ASSIGN.COM program from the SWP MSDOS master disk into this subdirectory:

```
A>COPY C:\ASSIGN.COM A:/V
```

When running LOTUS on the Kaypro/CO-POWER system, you must run the SWP ASSIGN program to switch the definitions of the floppy and the hard disk drives. You also must be in the 123 directory to run LOTUS. And you must have a LOTUS system disk in the floppy drive. To make it easy to run LOTUS, you can create a MSDOS batch file by typing this:

```
A>COPY CON START.BAT
ASSIGN A=C C=A
C:
CD 123
LOTUS
ASSIGN
A:
~Z
(or press F6)
```

When you press <return> after ~Z, MSDOS will have made the file START.BAT on Drive A>. Because we will be changing the definition of Drive A while this file is being used, you must also have an exact copy of this START.BAT file on your LOTUS system disk.

Remove the write protect tab from your LOTUS system disk and place it in the floppy drive. Copy START.BAT to this disk by typing:

```
A>COPY START.BAT C:/V
```

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H2. Running LOTUS 1-2-3

Your Master MS-DOS system disk contains TD.DRV, a file that lets you run LOTUS 1-2-3 with CO-POWER if your computer has double-sided disk drives. (Kaypro 2/84 owners who upgrade to double-sided 40-track drives can run LOTUS.)

LOTUS will run on CO-POWER like it does on an IBM-PC with a monochrome display. You cannot view graphs on the screen, but you can print them. LOTUS runs under both the ANSI25 and INT10 screen drivers. (Described in Section C) Before purchasing LOTUS, we recommend that you read the LOTUS 1-2-3 license agreement.

Kaypro 2X and 4/84 users: Install LOTUS for a monochrome monitor per their instructions. The installation will generate a file called TD.DRV. Erase that TD.DRV file and replace it with the SMP TD.DRV file. That's it!

Kaypro 10 users: To run LOTUS from hard disk Drive A, install LOTUS for a monochrome monitor following the instructions for using a hard disk. Then replace the generated TD.DRV file with the SMP TD.DRV file. LOTUS requires that you have the LOTUS system disk in Drive A while the program is being run. Your only floppy drive is Drive C. To use LOTUS you will need to use a special SMP utility, ASSIGN.COM.

ASSIGN reassigns drivenames. It lets you temporarily switch the names of hard disk A and floppy disk C. This is done with the command:

```
ASSIGN A=C C=A <return>
```

(You must use capital letters for the drivenames). Do a DIR command to verify that the switch worked. When you exit LOTUS and want to return the drives to their regular names, simply re-run ASSIGN and do not follow it with any specifiers. Remember, the drivenames are switched, so you will say:

```
A>C:ASSIGN
```

(where C is the hard disk)

Notes: When running the LOTUS TUTOR some of the screen graphics will display with 'funny' characters. This is rare and does not cause any problems. Also, due to a lack of keys, the STOP key is not implemented; this function can be done with other keys. The CAPS key sign always shows on the LOTUS screen whether or not your CAPS lock key is on. Again, this does not cause any problems.

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CP/M WordStar), the screen scrolls much faster than it does when installed for a Lear Siegler screen (Kaypro). The ANSI codes make a big difference.

More information on the ANSI crt control sequences is in the MS-DOS 2.0 User's Guide, Appendix C, Sections 1-3. We've added the following two codes:

```
Insert Line = ESC [ 1 L
Delete Line = ESC [ 1 M
```

C2. INT10.COM

This 25-line custom SMP driver uses the IBM interrupt 10 calls. This is the driver that was included with MS-DOS 2.11A. This driver supports inverse video. It is possible that programs that do not run correctly with the ANSI25 driver will run with this.

C3. ANSI24.COM

Although your computer has a 25-line screen, you may want to run some programs written for 24-line screens. This driver uses the ANSI crt control sequences in a 24-line mode with Kaypro screen characteristics. This driver is used to install MS-DOS application programs that use a 24-line ANSI display.

This driver uses Kaypro screen calls. This means you can program Kaypro graphics! For example, if you have a CP/M HBASIC program that uses Kaypro video, you can use the CPM2DOS program to transfer the program to MS-DOS, and then run the program with MS-DOS Microsoft BASIC, 5.28.

C4. NATIVE.COM

This driver is a 24-line Kaypro screen like you have in CP/M. With this installed you can do Kaypro graphics. Another advantage with this driver is that it may enable you to run CP/M code that you have written and transferred to MS-DOS.

This means you can program Kaypro graphics! For example, if you have a CP/M HBASIC program that uses Kaypro video, you can use the CPM2DOS program to transfer the program to MS-DOS, and then run the program with MS-DOS Microsoft BASIC, 5.28.

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C5. Changing the Default Screen Driver

Changing screen drivers is done by running the .COM file for the one you want to use. For example, to change to the INT10 driver, you would run INT10.

If you will not be using the ANSI25 default driver most of the time, you can make the system boot up with a different driver by making a new AUTOEXEC.BAT file as described below. (AUTOEXEC is a file that MS-DOS automatically loads when the operating system is booted. It is described in your MS-DOS 2.0 User's Guide.)

The following example shows how to make an AUTOEXEC.BAT file that loads the INT10 driver on boot up. (Type <return> after each line.)

```
A>COPY CON:=AUTOEXEC.BAT
INT10
<CTRL><Z>
```

You will be back at the A> prompt. Type DIR and list the directory. AUTOEXEC.BAT should be there. You can doublecheck the contents by using the TYPE feature:

```
A>TYPE AUTOEXEC.BAT
```

It should show:

```
INT10
```

You cannot modify an AUTOEXEC.BAT file made like above. To change it, delete (ERASE) the old one and make a new one.

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H. Using MS-DOS Software

This section gives you some tips on using i/S-DOS and i/S-DOS programs. Together with the MS-DOS 2.0 User's Manual, this will teach you how to make the most of your new system.

H1. Buying MS-DOS Software for CO-POWER

Most 16-bit programs are distributed in both MS-DOS and PC-DOS. CO-POWER allows you to run some programs from both. We recommend that you purchase most programs for MS-DOS. SMP's software list lists programs that SMP has verified to work with CO-POWER. When buying other programs to use with CO-POWER follow these guidelines:

MS-DOS

CO-POWER comes with MS-DOS 2.11-1A. CO-POWER MS-DOS has four screen handlers that give you a choice of screens. This feature allows you to run most programs written for MS-DOS. CO-POWER MS-DOS formats disks in the IBM-PC disk format, so when purchasing programs buy them in the IBM-PC format. (If you have single-sided drives, be sure to get single-sided disks!)

PC-DOS

(limited compatibility)

CO-POWER MS-DOS allows you to run PC-DOS programs that are not hardware dependent. Steer away from PC-DOS programs that require graphics, IBM BASIC and that do direct writes to an IBM-PC screen. PC-DOS programs that SMP has tested and found to be compatible are in the software list. They are marked with the "IP" and "PC" codes. This list is not conclusive, there are other nonhardware dependent programs that will run.

CO-POWER MS-DOS is data compatible with the IBM-PC. It formats disks in the IBM-PC disk format. Data disks from a CO-POWER system can be used in an IBM-PC and vice versa. Programs that use IBM BASIC will not run because this BASIC is partially in the IBM ROM. However, recently a CO-POWER user told us that Compaq-BASIC, version 1.13, works on CO-POWER with MS-DOS 2.11-1A.

The exception to this non-hardware dependent rule is that you can run IBM-PC LOTUS 1-2-3, release 1A, if you have double-sided drives. This utility is described next.

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IBM KEYSTROKE

EQUIVALENT KEYPRO KEYSTROKE

First Second (if needed)

F1	Keypad 1	.
F2	Keypad 2	/
F3	Keypad 3	[
F4	Keypad 4]
F5	Keypad 5	a
F6	Keypad 6	b
F7	Keypad 7	c
F8	Keypad 8	d
F9	Keypad 9	
F10	Keypad 0	
Page Up	Keypad -	
Page Down	Keypad ,	
Home	Keypad .	
END	Keypad ENTER	
INS	Keypad ENTER	
DEL	Keypad ENTER	
CTRL	Keypad ENTER	
CTRL	Keypad ENTER	
CTRL END	Keypad ENTER	
CTRL Page Down	Keypad ENTER	
CTRL HOME	Keypad ENTER	
CTRL Page Up	Keypad ENTER	
F11 (uppercase F1)	Keypad ENTER	Keypad 1
F12 (uppercase F2)	Keypad ENTER	Keypad 2
F13 (uppercase F3)	Keypad ENTER	Keypad 3
F14 (uppercase F4)	Keypad ENTER	Keypad 4
F15 (uppercase F5)	Keypad ENTER	Keypad 5
F16 (uppercase F6)	Keypad ENTER	Keypad 6
F17 (uppercase F7)	Keypad ENTER	Keypad 7
F18 (uppercase F8)	Keypad ENTER	Keypad 8
F19 (uppercase F9)	Keypad ENTER	Keypad 9
F20 (uppercase F10)	Keypad ENTER	Keypad 10
F21 (CTRL F1)	Keypad ENTER	SHIFT 1
F22 (CTRL F2)	Keypad ENTER	SHIFT 2
F23 (CTRL F3)	Keypad ENTER	SHIFT 3
F24 (CTRL F4)	Keypad ENTER	SHIFT 4
F25 (CTRL F5)	Keypad ENTER	SHIFT 5
F26 (CTRL F6)	Keypad ENTER	SHIFT 6
F27 (CTRL F7)	Keypad ENTER	SHIFT 7
F28 (CTRL F8)	Keypad ENTER	SHIFT 8
F29 (CTRL F9)	Keypad ENTER	SHIFT 9
F30 (CTRL F10)	Keypad ENTER	SHIFT 0
F31 (ALT F1)	Keypad ENTER	q
F32 (ALT F2)	Keypad ENTER	w
F33 (ALT F3)	Keypad ENTER	e
F34 (ALT F4)	Keypad ENTER	r
F35 (ALT F5)	Keypad ENTER	t
F36 (ALT F6)	Keypad ENTER	y

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F. Formatting MS-DOS Disks

The MS-DOS 2.0 User's Manual tells you how to format disks with FORMAT.COM. This section tells about CO-POWER FORMAT options. We format in the IBM-PC disk format, both single-sided and double-sided, using 9 sectors/track.

FORMAT uses / tags to specify the type of format done. Our MS-DOS uses these tags:

- /D for double-sided disks
- /H for Kaypro 10 hard disk -- initial set up only
- /V to be able to input a volume label on the disk
- /S to format in 8 sectors/track. Used as a transfer method for MS-DOS 1.25 files.

DO NOT USE THE /S TAG MENTIONED IN THE MS-DOS MANUAL. Normally to make an MS-DOS system disk, you place a /S in the format command. This writes hidden files to the system area of the disk (similar to CP/M). CO-POWER loads these files from the CP/M MSDOS.COM file. Not only do you never have to use /S, you save over 24k of disk storage! To make a CO-POWER MS-DOS disk a system disk, simply COPY your COMMAND.COM to it.

SMP is currently working on supporting quad density disk drives. Call SMP for progress and details.

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D3. Changing the Numeric Keypad Back to Its Original Keys

This release of MS-DOS lets you turn on and off the function key feature so the numeric keypad can be used for entering numbers. To do this, simply enter

CTRL 3

from the keypad. This will turn the function keys off. A beep lets you know that it worked.

Another CTRL 3 turns the function keys back on. It also beeps. This toggle works from the operating system and inside most applications programs.

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E. Transferring Files Between MS-DOS and CP/M

This is a new CO-POWER MS-DOS feature. You can transfer files from CP/M to MS-DOS and vice versa. Also, while you are in MS-DOS, you can look at a CP/M disk directory. CP/M files can be transferred to the screen or to disk!

Technical Aspects:

To create this feature we made a device called CPM: in MS-DOS which can be accessed with MS-DOS system calls to read and write data. MS-DOS function 144 hex (I/O control for devices) can be used to send commands to CPM to open, search or create files. Source code for the transfer files is included on your disk. If you make any interesting changes, please let us know!

E1. CPMDIR.COM

This program lets you look at a CP/M disk directory from MS-DOS. You can specify the drive, and use the * and ? wildcards. Kaypro 10 users can use this program to look at the CP/M portion of the hard disk! This is done with a / tag that tells the user area number.

Examples of use:

CPMDIR B: shows the CP/M directory of the disk in Drive B.

CPMDIR A:*.*.DOC shows all the .DOC files in the CP/M directory of Drive A.

CPMDIR A:/3 shows the directory of the files in user area 3 of Drive A.

E2. CPM2DOS.COM

This MS-DOS program transfers a CP/M file to MS-DOS. The file can be transferred to the screen or to disk. The file may be taken from any user area of the Kaypro 10 hard disk! The syntax of this program is like the MS-DOS COPY function. It follows the equation:

CPM2DOS A:TEST.DOC B:

where the file TEST.DOC is copied from Drive A (CP/M) to Drive B (MS-DOS). If the destination filename is not specified, the file is displayed on the console (screen). Example:

CPM2DOS A:TEST.DOC

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