

THUNDER 186 - CCP/M-86 CONFIGURATION INFORMATION (6/25/84)

1.0 INTRODUCTION

Congratulations on the purchase of one of the most advanced S100 bus CPU boards available today. LOMAS DATA PRODUCTS has tested your board thoroughly and is confident that it will serve well for many years. The following sections have been prepared to help the user get their THUNDER 186 up and running quickly. Sections have been prepared for the following topics:

- Cabling for THUNDER
- Setting up your terminal
- Setting THUNDERS baud rate
- Jumpering your disk drives
- Booting the operating system
- Formatting new diskettes
- Creating backup boot diskettes
- Changing between virtual terminals
- User configurable options

1.1 ADDITIONAL DOCUMENTATION

CONCURRENT CP/M-86 is provided along with the CONCURRENT USERS MANUAL. The CONCURRENT PROGRAMMERS REFERENCE MANUAL is available at a price of \$40.00. This manual is necessary only if you intend to write assembly language programs under CCP/M or if you wish to make modifications to the CCP/M XIOS.

2.0 CABLING FOR THUNDER

There are five connectors along the top of THUNDER. The function of these five connectors are as follows:

J1	Console (Main terminal port)
J2	Serial printer port
J3	Parallel printer port
J4	5 1/4" Floppy disk drive connector
J5	8" Floppy disk drive connector

The connectors are not in sequence. They are in the following order from left to right: J2, J1, J3, J5, J4. LOMAS DATA PRODUCTS offers cables to connect the board connectors to the rear panel of an enclosure or to disk drives as required. The following is a list of cables and their LDP part numbers:

J1/J2 to rear panel	033-00020-01
J3 to rear panel	033-00026-01

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J4 (5 1/4" floppy) to drive(1)	033-00034-01
J4 (5 1/4" floppy) to drive(2)	033-00034-02
J5 (8" floppy) to drive(1)	033-00050-01
J5 (8" floppy) to drive(2)	033-00050-02

Call for pricing information.

2.1 EXTERNAL CABLING

The cable from the rear panel to the terminal should connect the following pins in a direct one to one configuration: 1, 2, 3, 4, 6, 7, 20.

The serial printer cable (connected to J2 of THUNDER) requires TxData, pin 3, printer ready, to pin 20 and 4, and pins 1 and 7 for ground.

The parallel printer cable uses the same pinout as the IBM-PC, purchasing an IBM-PC cable for your parallel printer will make the correct connections.

3.0 SETTING THUNDERS BAUD RATE

THUNDER may be set to the following baud rates:

BAUD RATE	SW1	SW2
9600	ON	ON
1200	OFF	ON
300	ON	OFF
110	OFF	OFF

Thunder is set at 9600 baud as shipped.

4.0 DISK DRIVE JUMPERING

Disk drives have option jumpering to configure them for specific controllers and applications. The following table lists the drives and recommended jumper configurations for THUNDER. (also see the section on user configurable options for setting step rates.)

DRIVE JUMPERING FOR THUNDER 186

QUME DATA TRACK 8:

On Qume Data Track 8 drives, the mini jumpers should be installed and removed as shown below, and the DIP shunt should be altered

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as specified.

Installed (C, 2S, DL, DSx) Removed (T40, GND, DS, D, DC, Y, HA)

Shunt: Cut HL and X, all others intact. Terminator resistors should be installed on the last drive of the cable.

SHUGART 800/801:

On a Shugart 800/801 drive, the following mini jumpers should be installed and removed on all drives:

Installed (T2, A, B, C, Z, 800) Removed (D, DC, X, Y, HL, DS)

Drive select (DSx) should be installed appropriately and the terminators T1, and T3-T6 should be installed on the last drive of the cable.

SHUGART 850/851:

On a Shugart 850/851 drive, the mini jumpers should be installed and removed as shown below and the DIP shunt should be altered as required.

Installed (C, 2S, S2, IW, RS, DL, IT, AF, M 850)

Removed (FS, TS, Y, DS, HLL, HI, D, DC, NF)

Shunt: Cut H1 and X, all others intact. Terminator resistors should be installed on the last drive of the cable.

SIEMENS MODEL FDD 100-8:

On Siemens Model D drives, the mini jumpers should be installed and removed as shown.

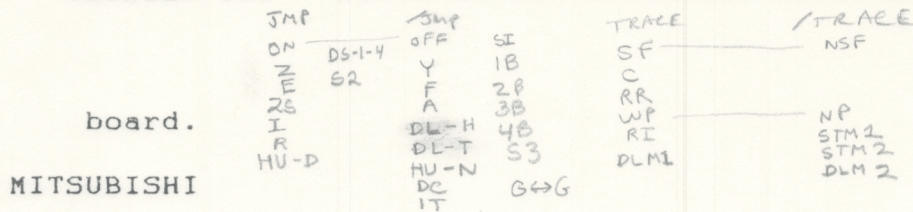
Installed (SS, SE, E, D, RR, O, 2, F, RI, L, U, H)

Removed (HS, 8, 16, 32, 1 TE, A, V, B, J, K, M, G)

The following modifications to the PC board are required for using two or more drives:

1. Remove the PC board and cut the trace leading to IC 6C Pin 9.
2. Connect IC 6C Pin 9 to IC 6C pin 12 and reinstall the PC

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JUN 1982

M2894-63B

On Mitsubishi drives the following jumpering should be used:

Install (E, Z, 2S, I, R, S2, IW, C, WP)

Remove any other shunts.

Cut PJ4, PJ5.

SHUGART SA455/465

5 1/4"

Jumpers MM and DS along with the appropriate device select, DS1, DS2, DS3, or DS4, should be installed.

TANDON TM100-2

The only shunt that should be installed is the appropriate device select shunt. Remove all terminators except the last drive.

On systems with both 8" and 5 1/4" drives, only one of the 8" drives should have the terminators installed. There should not be a terminator in the 5 1/4" drive also.

5.0 BOOTING THE OPERATING SYSTEM

THUNDER may boot either 5 1/4" diskettes or 8" diskettes. The type of diskette THUNDER expects to boot is determined by the position of switch 4. With Switch 4 in the on position THUNDER expects to boot from 8" disk drives, with switch 4 off THUNDER expects to boot from 5 1/4" disk drives. Switch 3 determines whether THUNDER will automatically boot after its initial diagnostics or whether it will enter the onboard monitor program. With switch 3 on it will automatically attempt to boot after diagnostics and with it off THUNDER will enter the monitor. Once in the monitor you may boot with the 'B' command.

6.0 FORMATTING NEW DISKETTES

6.1 8" FORMAT UTILITY

A utility to format uninitialized diskettes is included with the system, FORMAT. FORMAT will allow formatting any of the three

types of diskettes supported by the system, single sided single density (SSSD), single sided double density (SSDD), and double sided double density (DSDD). In order to format a new diskette simply type the command FORMAT in response to the system prompt. **WARNING FORMAT MUST BE THE ONLY TASK RUNNING, DO NOT HAVE A BACKGROUND TASK RUNNING AT THE SAME TIME.** Once in the program, FORMAT, operation is self prompting. Diskettes will be formatted automatically if double density is selected and the diskette installed is a double sided diskette. Of course the disk drive must also be capable of double side operation.

6.2 5 1/4" FORMAT UTILITY

MFORMAT will format uninitialized 5 1/4" diskettes. All 5 1/4" diskettes are formatted in double density format. The user is asked whether the diskette should be formatted on one or two sides. Normally two sides should be formatted as only a double sided format is supported by the operating system currently.

6.3 MEDIA COMPATIBILITY

When software must be interchanged with other systems, the format and definition of the diskette must coincide on both systems. Thunder supports two different standard media types for interchange of data, one 8" and one 5 1/4". On 8" diskettes the standard interchange format is single sided single density. Most software vendors support that format for distribution of software to customers. This format is standard across CP/M, CP/M-86, MP/M-86 and CCP/M-86. The IBM-PC double sided format is supported on 5 1/4" diskettes. This is the most popular format for distributing software to 5 1/4" 16 bit systems supporting any of the DIGITAL RESEARCH operating systems. An IBM-PC system will not recognize the format on the 5 1/4" diskette unless the boot track is installed on the diskette. This must be done even if the diskette is not meant to be bootable.

7.0 CREATING BACK UP DISKETTES

In order to create a backup boot diskette a two drive system must be used. The second drive may be either a floppy disk drive or a winchester drive. The following discussion assumes the second drive is a floppy disk drive. First the diskettes must be initialized with the appropriate formatter, FORMAT or MFORMAT. Next use PIP to copy all the files on drive A: to drive B: with the following command:

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PIP B:=A:*. *[RV]

This will copy all files on drive A: to drive B: and verify that no errors were made in the transfer. You may want to do this step for several diskettes at the same time. You must next transfer the boot tracks to new diskette. This involves use of the THUNDER onboard monitor. After creating several diskettes as described above, reset the system and get into the monitor program. The monitor Load command is used to read in the system tracks of the distribution diskette and the monitor Write command is used to write the system tracks back to the new boot diskette. The following steps should be followed to perform this process:

8" SYSTEMS

- 1 - Insert the original distribution diskette or any previously created boot diskette in drive A:
- 2 - Use the Load command to read in the system tracks as follows:

L 500 2 0 8

- 3 - Replace the diskette in A: with a new diskette created as described above.
- 4 - Use the Write command to write the data back to the new diskette:

W 500 2 0 8

- 5 - Repeat step 4 for as many diskettes as were created with the formatter and PIP.
- 6 - You may now use any of the diskettes just created to boot your system.

5 1/4" SYSTEMS

- 1 - Insert the original distribution diskette or any previously created boot diskette in drive A:
- 2 - Use the Load command to read in the system tracks as follows:

L 500 0 0 8

- 3 - Replace the diskette in A: with a new diskette

created as described above.

- 4 - Use the Write command to write the data back to the new diskette:

W 500 0 0 8

- 5 - Repeat step 4 for as many diskettes as were created with the formatter and PIP.
- 6 - You may now use any of the diskettes just created to boot your system.

8.0 CHANGING VIRTUAL TERMINALS

The Concurrent CP/M-86 that comes with your THUNDER 186 supports four virtual terminals. All virtual terminals are supported in buffered mode, that is when output is sent to a terminal that is currently in background mode the data is stored in a temporary disk file. When you reattach to the terminal, data in the temporary file is sent to the terminal. A memory image of the terminal is not kept, therefore programs that use screen positioning functions, such as screen editors, will have a garbled image if you detach from them and later reattach. This problem can usually be corrected by issuing a command to update the screen. A two key sequence is used to change virtual terminals. The first key struck is a control D. The second key may be an A, B, C, or D corresponding to virtual terminals 0, 1, 2, and 3 in that sequence. Control D followed by any other key will be passed to any process requesting keyboard input. The first time a background virtual terminal is attached to a signon message is sent to the physical console. After the first attachment no indication is given for subsequent attachments unless there is output buffered for that virtual console. Typing a return will usually cause a prompt to be displayed if the virtual terminal is ready to accept a command.

9.0 USING YOUR PRINTER

CCP/M is configured for two printers, a serial printer on the second serial port of THUNDER (J2) and a parallel printer on the THUNDER parallel port (J3). When booted the parallel printer is the default printer (PRINTER 0) and the serial printer is PRINTER 1. In order to switch between printers use the PRINTER command. The serial printer port is initialized to 1200 baud.

10.0 USER CONFIGURABLE OPTIONS

The Concurrent CP/M you have received has several options which may be configured by the user easily. The leadin character used to change virtual terminals and the step rates of the drives you are using may be changed without reassembling the XIOS and regenerating the system. These parameters are kept as bytes of information in the first sector, first track of the boot diskette. The information is contained in 9 bytes beginning with byte 20h in the first sector. The following is a list of the bytes with their default settings:

BYTE OFFSET	5 1/4" diskette	8" diskette	function
20H	04H	04H	change leadin
21H	DFH	8FH	DRIVE A: STEP RATE
22H	DFH	8FH	DRIVE B: STEP RATE
23H	8FH	DFH	DRIVE C: STEP RATE
24H	8FH	DFH	DRIVE D: STEP RATE
25H	09H	81H	* DRIVE TYPE BYTE A:
26H	09H	81H	* DRIVE TYPE BYTE B:
27H	81H	09H	* DRIVE TYPE BYTE C:
28H	81H	09H	* DRIVE TYPE BYTE D:

* Do not attempt to change these bytes unless you thoroughly understand the XIOS.

It may be desirable to change the leadin change character for changing between virtual terminals if the selected control D (D) conflicts with software you are using. Possible alternatives to control D might be ESCAPE (1BH) or control A (01h). The value should be chosen so that the character does not conflict with application packages that you intend to use. The step rate byte may be determined from the following table:

STEP RATE TABLE		
BYTE VALUE	STEP RATE 8"	STEP RATE 5 1/4"
FF	1MS	2MS
EF	2MS	4MS
DF	3MS	6MS
CF	4MS	8MS
BF	5MS	10MS
AF	6MS	12MS
9F	7MS	14MS
8F	8MS	16MS
7F	9MS	18MS
6F	10MS	20MS

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To make a change to the step rate or leadin character, use the monitor to read in the first sector into memory:

```
L 500 2 0 1      (8" DRIVE)
L 500 0 0 1      (5 1/4" DRIVE)
```

Next use the E command of the monitor (see the THUNDER186 manual for monitor use and commands) to change the byte in memory. The table will reside in memory from 520 to 528 after being read with the load command. After the byte has been changed in memory with the E command write the first sector back to the disk with the write command as follows:

```
W 500 2 0 1      (8" DRIVE)
W 500 0 0 1      (5 1/4" DRIVE)
```

When you boot the system these new values will be used. It is not recommended that the user change the DRIVE TYPE BYTE unless he is familiar with the XIOS.

EXAMPLE:

Change the lead in character from control D to control A.

```
L 500 2 0 1
E 520 01
W 500 2 0 1
```

The above three command sequence first loads the first sector from the boot diskette. Next the location corresponding to the leadin character is changed. Finally the data is written back to the diskette. When the diskette is booted the new leadin character will be required to change between virtual terminals.

The procedure to change the step rates is the same except for which byte to change. Select the desired value from the table and change the appropriate byte to the new value.

11.0 MULTI USER CCP/M FOR THUNDER

If you have multi-user CCP/M-86 for THUNDER there are several differences between the single user version and the multi-user version. The differences are summarized below:

1. There are no virtual terminals. Each user may execute only one task at a time.
2. The second serial port of THUNDER is used to support a

terminal and not a printer. All terminals are set at 9600 baud. This value may be easily changed, see section 11.1 for directions.

3. Either two or four users may be supported. The diskette you have received is configured for two users using only the serial ports of THUNDER. If you desire a four user system using a HAZITALL for two additional serial ports rename the file CCPM.SYS on the diskette to CCPM2USR.SYS and rename CCPM4USR.SYS to CCPM.SYS. When you reboot the system the system will be configured for four users.
4. Two user systems support one parallel printer on the parallel port of THUNDER. Four user systems support two printers, one on the parallel port of THUNDER and one on the HAZITALL parallel ports. The printer attached to THUNDER is PRINTER 0 and the one attached to the HAZITALL is PRINTER 1.

11.1 CHANGING BUAD RATES

Multi-user systems may have the baud rate of each serial device set separately by adjusting values in the parameter area which is contained in the first sector on the first track. This is the area which is described in section 10.0. The following four bytes are used to define baud rates for the additional terminals:

BYTE OFFSET	DEFAULT VALUE	FUNCTION
29	01	User 0 baud rate
2A	01	User 1 baud rate
2B	01	User 2 baud rate
2C	01	User 3 baud rate

The above offsets are specified as hex values. The following table defines the different values that may be used to specify the baud rates of the different ports:

BUAD RATE	PARAMETER	
19200	00	(THUNDER MAX BAUD = 9600)
9600	01	
4800	02	
2400	03	
1200	04	
600	05	

The maximum baud rate that may be specified for the users

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attached to THUNDER is 9600 baud. The bytes in the first sector of track 0 may be changed in the same manor as outlined in section 10.0

11.2 JUMPER CHANGES FOR MULTI-USER

In order to use THUNDER in multi_user configurations an additional interrupt is used. This interrupt must be enabled by adding a wire-wrap from pin 14 to pin 4 in the interrupt wire wrap area below U28 and U29 on THUNDER. If this wire is not added CCP/M will not respond to any terminal input. The HAZITALL must have two additional wire-wraps added to it to support users 2 and 3 if a four user system is desired. Pins 4, 6 and 13 on the HAZITALL should be connected together.