

CTracTM Write Once

A write-once compact disc mastering tool.



ICOM SIMULATIONS, INC.

Sega Ozisoft

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Credits

| | |
|----------------|-----------------------------|
| Software: | Fred Allen and Todd Squires |
| Hardware: | Todd Squires |
| Documentation: | Donna Manning |

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ICOM Simulations, Inc.
648 South Wheeling Road
Wheeling, IL 60090

1. Introduction

The CTrac Write Once System allows write-once compact discs to be created with the Fujitsu CD Write Once machine (FMCDW101). The CTrac system consists of the write once program and an IBM card. Together, the hardware and software handle all communication with the Write Once machine. The user simply invokes the CTrac write once program with a disc image file name on the command line and the CTrac Write Once System presents the disc image file to the Fujitsu Write Once machine. The image file is then burned onto a compact disc. The compact disc is written in real time with an extra 5 minutes for the lead in and lead out areas.

The disc image file that is used as input to the CTrac Write Once System is a standard disc image produced from the CTrac BuildDisc tool. Generally, BuildDisc combines track images, along with the proper subcode information, and creates a standard compact disc image written to a DOS file. For more information on BuildDisc, see the CTrac BuildDisc documentation.

This documentation assumes a general understanding of the structure of a compact disc. For more information on compact discs, refer to the *N.V. PHILIPS CD Red Book* or *Yellow Book* standards and the *International Standard for CD-ROM Information Processing* booklet (reference number ISO 9660 : 1988 (E)). For technical support, inquiries or proprietary technical information concerning the CTrac Write Once System for the Fujitsu CD Write Once machine (FMCDW101), contact Sega.

2. CTrac Write Once System Contents

The CTrac Write Once System consists of the following:

- CTrac write once card
- 1 floppy disk containing the write once program (WO.EXE)

3. Hardware Requirements

An IBM AT or 100% compatible satisfying the following requirements:

- 640K of RAM
- a free 16 bit expansion slot
- 386 or 486 processor running at 25 MHz or faster
- a large and fast hard drive

Compact discs may contain varying amounts of data up to a maximum of approximately 794 MB, including the subcode. Since the image of a compact disc is stored in a file on the hard drive of the AT, it follows that the hard drive used must be at least as large as the largest image that will be emulated. Moreover, it may be desirable to store the source data and track images that were used to build the disc image on the same hard drive. If this is done, it could more than double the amount of storage space required. Therefore, a 600MB or larger drive is strongly recommended. The hard drive must also be reasonably fast because the CTrac Write Once System requires at least a 300K bytes/second maintainable data rate.

4. Installation

Step One:

Copy the CTrac write once program, WO.EXE, to a directory in your command execution path on the AT hard drive. Store the original floppy in a safe place.

Step Two:

Examine the write once board for any obvious signs of damage. If it is damaged, do not attempt to install the board.

While examining the board, make sure the DIP switches are set correctly.

The JP1 DIP switch controls the interrupt setting. Only one switch may be set ON at a time. The IRQ10 interrupt should be enabled on the write once board by default.

| | IRQ9 | IRQ10 | IRQ11 | IRQ12 |
|-------|------|-------|-------|-------|
| JP1-1 | on | off | off | off |
| JP1-2 | off | on | off | off |
| JP1-3 | off | off | on | off |
| JP1-4 | off | off | off | on |

The SW1 and SW2 DIP switches control the address that the board is mapped in to. The board requires 8K of memory. Make sure the area of memory the board uses does not conflict with other cards, EMS memory or BIOS ROM's. If the memory segment does conflict and needs to be reconfigured, the table below shows some examples of possible memory locations and the corresponding switch settings. The write once board should be set to DC00 by default.

| | A13 | A14 | A15 | A16 | A17 | A18 | A19 | |
|------|-------|-------|-------|-------|-------|-------|-------|---------|
| | SW2-1 | SW2-2 | SW2-3 | SW2-4 | SW1-1 | SW1-2 | SW1-3 | SW1-4-8 |
| E800 | on | on | off | on | on | off | off | on |
| CC00 | on | off | off | on | on | off | off | on |
| D000 | on | on | on | off | on | off | off | on |
| D400 | on | off | on | off | on | off | off | on |
| D800 | on | on | off | off | on | off | off | on |
| DC00 | on | off | off | off | on | off | off | on |
| E000 | on | on | on | on | off | off | off | on |
| E400 | on | off | on | on | off | off | off | on |
| E800 | on | on | off | on | off | off | off | on |
| EC00 | on | off | off | on | off | off | off | on |

If the address and/or interrupt needs to be reconfigured, the following two commands can be defined in the AUTOEXEC.BAT file. The write once software uses the values specified to locate the board.

```
SET WOADDRESS=XXXX
```

```
SET WOINTERRUPT=XX   where X is a hex digit
```

For example, if the address was changed to D400 and the interrupt was changed to IRQ11, the commands would be defined as follows:

```
SET WOADDRESS=D400
```

```
SET WOINTERRUPT=0B
```

Step Three: Disconnect power from the AT, open it and locate a free expansion slot. Remove the metal flange from the empty slot and retain the screw.

Step Four: Place the write once card in the slot firmly. Do not screw in the card or close the AT until it has been verified that the board is operational.

Step Five: Connect the interface cable, supplied with the Fujitsu Write Once machine, from the back of the Write Once machine to the board in the AT.

Step Six: When invoked with the `-t` option, the CTrac write once program tests the FIFO RAM on the board in the AT, verifies that the interrupts are operating and reports the results. Invoke the write once program with the following command:

```
WO -t
```

If the following error message appears or any other error that cannot be traced and fixed occurs, the card is not operational:

```
FIFO test failure.
```

If this is the case, check for address and IRQ conflicts. If errors are still occurring, power off the AT and remove the card.

Step Seven: Using the screw from the metal flange, screw down the card in the expansion slot firmly. The CTrac Write Once System is now ready for use. Run the WO program with the `-v` command line option before attempting to burn a disc. This will confirm that the hard drive and computer are fast enough to maintain the required data transfer rate and it will confirm that the CTrac WO program is communicating properly with the Fujitsu WO machine.

5. Invoking the Write Once Program

Insert a blank write-once compact disc into the Fujitsu Write Once machine. Invoke the CTrac write once program, using the following command format:

```
WO [options] [imageFileName] [options]
```

The image file specified must be a valid disc image. If it is not, an error message will be displayed and the program will halt execution. The compact disc is written in real time with an extra 5 minutes for the lead in and lead out areas.

5.1 Command Line Options

At least one space must be used between the write once invocation command and the command line options. If multiple options are specified, they must be separated by at least one space. Extra spaces are ignored. All options are case sensitive. If an option is specified incorrectly, a listing of the options and a brief description of each will appear at the DOS prompt.

-b <numBuffers>

Allocate the number of buffers specified for data transfer. Each buffer requires 63700 bytes of memory. If the -b command is not used, 6 buffers are used by default. Setting the number of buffers higher uses more memory but allows for fragmented disks, slow-downs and interruptions.

-p

Prints progress information while the write once program is executing. The information printed includes the results of memory and disc image validation tests and initialization progress. At the end of execution, the total execution time, the number of errors and the number of warnings are also printed.

-s

Inhibits the sending of the write-stop command to the Fujitsu WO machine. If the Fujitsu WO machine is encountering difficulty when it writes the lead out area of the disc image, use this command.

-t

Tests the write once card and reports the results. If the -t option is used on the command line along with an image file name, execution of the write once program proceeds as normal if there are no error messages generated.

-v

Executes the CTrac write once program without burning the disc image onto a compact disc. This is used for verifying the speed of the hard drive to ensure that it can maintain an adequate transfer rate. If the hard drive is too slow during execution with the -v option, an error message will appear. If the hard drive cannot transfer data at a fast enough speed during normal execution, the compact disc that is written will be invalid.

-w

Do not report warning messages. For a list of the warning messages that are generated by the WO program, see Appendix B Warning and Error Messages.

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Appendices

Appendix A Warning and Error Messages

Appendix A Warning and Error Messages

The following is a list of messages that the CTrac WO program can generate and some of their possible causes. When an error message is generated, execution is ended.

Warning Messages

Board address 'boardAddr' is not a valid hex number

Check 'set WOADDRESS=XXXX' command

Default is 'DC00', it will be used

The address specified with the SET WOADDRESS=XXXX command was invalid. The default address is used instead.

interNum is not a valid interrupt number

interNum is not a valid hex number

Check 'set WOINTERRUPT=XX' command

Default is 'CA', it will be used

Either the interrupt specified with the SET WOINTERRUPT=XX command was not a valid interrupt number or it was not a valid hex number. The default interrupt is used instead.

Error Messages

Failed to send parameter byte XX

Did not get acknowledge of command, instead, got XX

Did not get acknowledge of command

Failed to send CR byte

Failed to send command byte

Failed to send STX byte

Could not send ACK

Did not get CR of status command

Did not get CR of status command, instead, got XX

Did not get status command

Did not get STX of status command

Did not get STX of status command, instead, got XX

Failed to reset write-once unit

These errors indicate that there is a communication problem between the CTrac WO program and the Fujitsu WO machine. Make sure that the cable is connected properly between the WO board in the AT and the back of the Fujitsu WO machine. Execute the WO program in test mode with the -t command. If the error condition persists, contact Sega.

Could not allocate memory OS Reports: "message"

If the CTrac WO program was executed with a buffer size larger than the default (6) with the -b option, specify a smaller buffer size. If the default buffer size was used, specify a smaller buffer size with the -b option. If a smaller buffer size does not stop this message from appearing, increase the amount of memory in the AT. See section 3. **Hardware Requirements** for the amount of memory required to run the CTrac Write Once System.

Interrupt routine had failed to keep FIFOs full

This message will occur if the host computer is too slow. See section 3. **Hardware Requirements** for the specifications required by the host computer to run the CTrac Write Once System.

File read could not keep up

The hard drive and/or computer is too slow. Increase the buffer size with the -b command line option. Execute the WO program with the -v option to verify that the data transfer is occurring at the required rate. If increasing the buffer size doesn't help, try a faster hard drive, a larger cluster size or defragmenting the hard drive.

The write-once unit has signaled an error

This message indicates that the Fujitsu WO machine has sent an error. Refer to the Fujitsu CD Write Once machine (FMCDW101) user manual for a list and explanation of its error messages.

ImageFileName is not a valid disc image (Could not read TOC)

Could not open disc image file OS Reports: "message"

The image file specified is not a valid disc image. See the CTrac BuildDisc documentation for more information on disc images.

Could not locate write-once board

Check 'set WOADDRESS=XXXX' and 'set WOINTERRUPT=XX' commands

The board cannot be located by the WO program. Check the DIP switches on the board and make sure they are set correctly. If the address and interrupt used are not the defaults, the commands, SET WOADDRESS=XXXX and SET WOINTERRUPT=XX (where X is a hex digit), must be specified.

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