
mzput Documentation

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This document covers a simple data cable and the software to transfer MZF images from a PC directly to an MZ. Alternatively, the PC can be connected to the data recorder of the MZ, a C64 datasette or other data recorders to transfer MZF images to cassette.

The software is tested on Linux and Windows (NT4, W2k, XP) systems.

Please see [ReadTheDocs](#) for the latest documentation.

CHAPTER 1

Introduction

This project builds upon the [MZF2WAV](#) utility, which is used to convert an MZF image to a file that can be recorded on a cassette. Since cassettes are getting outdated rapidly, and because ordinary sound cards can not be used for speeds exceeding twice that of the normal transfer speed, the parallel port is used for this project instead.

The *turbo loader* is from the related DOS utility [TransManager](#).

2.1 Hardware configuration

2.1.1 Enable the external tape interface

For the MZ-711 and MZ-811, this step can be omitted. For other models, i.e., those with an internal data recorder or a quickdisk, the external tape [interface](#) needs to be enabled, also see a description of the [reverse](#) of this operation.

Enabling the external interface is done by disconnecting the data recorder or quickdisk from connector P-12 and by connecting the *jumper plug*. This plug will wire the read and write signals to the external connectors and it will suppress the “Press play” message.

A jumper plug can be made from a plug similar to the one the data recorder and quickdisk use.

Fig. 1: Jumper Plug

The wires are connected as follows:

MZ	MZ	signal
1	7	write
2	8	read
5	9	sense

These wires can also be soldered directly on the connector and optionally, the sense signal can be wired to an external switch.

The MZ-80K/MZ-80A/MZ-80B do not have external connectors. For these models an internal connection must be made.

Also see an [instruction video](#) on this subject.

2.1.2 Transfer cable

To wire an MZ to a PC, the following cable is used.

Fig. 2: Transfer cable

Wiring is as follows:

PC	MZ	signal
3	read tip	read
10	write tip	write
18-25	both sleeves	ground

2.1.3 Alternative setup

To connect the data recorder to a PC, the following wiring should be used:

PC	Data recorder	signal
3	7	read
10	8	write
18-25	9	ground
9	4	motor on
.	6	+5V

The +5V must be provided by an external power supply (5V / min. 0.3A).

2.2 Software installation

2.2.1 Binaries

The binaries can be found in [this archive](#). After unzipping this archive, the binaries for Linux can be found in `src/linux/release`, those for Windows can be found in `src\w32\release`.

2.2.2 From source

Retrieve the source code with Git.

```
git clone https://github.com/jfjlaros/mzput.git
```

To compile for Linux:

```
cd mzput/src/linux
sh build.sh
```

For Windows, use:

```
cd mzput\src\w32
build.bat
```

The binary will be placed in the `release` subdirectory.

Notes for Windows users:

- This program uses the `callgate` mechanism for real time operations. Since this mechanism is also used by viruses, the virusscanner may need to be disabled.
- The files `callgate.sys` and `callgate.dll` must reside in the same folder as `mzput.exe`, or they can be installed in one of the folders in the system path.

Usage

This program must be run as root or Administrator. This is because of some low-level routines that are used to enable real time operations in multitasking systems like Linux or Windows.

When transferring directly to an MZ, first run the loader program (e.g., type L or C in the MZ-monitor program).

When using a data recorder, first position the tape correctly and push the REC and PLAY buttons.

On the PC, transfer an MZF image named `image.mzf`, using the following command:

```
mzput image.mzf
```

The program recognises the following options:

option	description
-i	sets initial speed mode (0, 1, 2, 3 or 4), default = 0.
-t	sets turbo speed mode (0, 1, 2, 3 or 4), default = 3.
-1	sets correction for fast initial mode (-50 to 50).
-2	sets correction for fast turbo mode (-50 to 50).
-c	sets conventional sending mode.
-s	sets fast sending mode.
-w	sets turbo sending mode (default).
-p	reverse polarity.
-v	displays version information.
-l	displays the license.
-d	displays more info and asks for confirmation before starting.

Note that during transfer, the PC will become completely unresponsive. This is because all interrupts are disabled to allow for real time operations. A running transfer can be aborted by pressing the ESC key.

It is recommended to *sync* the hard disks before each transfer and to install NTP (or something similar). Disabling interrupts also means that the timer interrupt is disabled, so the system clock will lag behind after each transfer.

Note for Windows users, it is recommended to make a *system restore point* and copy the data to a directory inside the windows tree (e.g., `C:\WINDOWS\Restore`) this will enable you to restore the registry in the event of a crash.

3.1 Operation modes

3.1.1 Fast sending mode

This is the easiest way to transfer a file. In this mode the long gap (a tape marker) is 4000 pulses and the short gap is 5000 pulses. Both the header and the MZF image body are transferred once.

3.1.2 Conventional sending mode

This is the safest (and slowest) way to transfer an image, everything is done according to the Sharp MZ series conventions: A long gap is 22000 pulses, a short gap is 11000 pulses. The header and body are transferred twice to allow for errors.

3.1.3 Turbo sending mode

In this mode, the turbo loader is transferred using fast sending mode, this turbo loader enables the MZ to operate at higher transfer speeds. The MZF image is then sent using fast sending mode, but now at a higher speed.

The speed at which the turbo loader is transferred is controlled with the `-i` option, the speed at which the MZF image is sent is controlled with the `-t` option.

3.2 Speeds

Apart from increasing the pulse frequency, the waveforms themselves can be altered in order to increase speed. The “fast waveform” was found by minimising the high and the low states of the pulses independently.

At this time, five speeds are implemented:

- Speed 0: normal speed with normal waveforms.
- Speed 1: normal speed with fast waveforms.
- Speed 2: 2x speed with normal waveforms.
- Speed 3: 3x speed with normal waveforms.
- Speed 4: 3x speed with fast waveforms.

These speeds can be set for all operation modes, although some combinations may not work. The most commonly used speeds are: speed 0 or 1 for initial speed mode and speed 2 or higher for turbo speed mode.

If multiple images are transferred, using speed 3 or 4 with fast sending mode may be preferred.

3.2.1 Corrections

Because the waveforms used by speeds 1 and 4 may not always work, two correction factors for these speeds are implemented, controlled with the `-1` and `-2` options.

3.3 Polarity

The polarity can be reversed with the `-p` option.

CHAPTER 4

Contributors

Original author, maintainer: Jeroen F.J. Laros.

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- His help with wiring the jumper plug.
- Suggesting to make a Windows version of the program.
- Testing the Windows program and giving feedback.
- [Hosting](#) the project.

And Ricky El-Qasem for:

- His [instruction video](#) for making a jumper plug.