

NAME

srec_mos_tech – MOS Technology file format

DESCRIPTION

The MOS Technology format allows binary files to be uploaded and downloaded between a computer system (such as a PC, Macintosh, or workstation) and an emulator or evaluation board for microcontrollers and microprocessors.

The Lines

Each line consists of 5 fields. These are the length field, address field, data field, and the checksum. The lines always start with a semicolon (;) character.

The Fields

;	Length	Address	Data	Checksum	CRLF
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Length The record length field is a 2 character (1 byte) field that specifies the number of data bytes in the record. Typically this is 24 or less.

Address This is a 2-byte address that specifies where the data in the record is to be loaded into memory, big-endian.

Data The data field contains the executable code, memory-loadable data or descriptive information to be transferred.

Checksum

The checksum is an 2-byte field that represents the least significant two bytes of the the sum of the values represented by the pairs of characters making up the record's length, address, and data fields, big-endian.

End of File

The final line should have a data length of zero, and the data line count in the address field. The checksum is not the usual checksum, it is instead a repeat of the data line count.

Size Multiplier

In general, binary data will expand in sized by approximately 2.54 times when represented with this format.

EXAMPLE

Here is an example MOS Technology format file. It contains the data "Hello, World" to be loaded at address 0.

```
;0C000048656C6C6F2C20576F726C640454
;0000010001
```

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srec_cat version 1.47

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KIM-1 User Manual – Appendix F – Paper Tape Format

(The following information is reproduced from <http://users.telenet.be/kim1-6502/6502/usrman.html#F> just in case it vanishes from the Web.)

The paper tape LOAD and DUMP routines store and retrieve data in a specific format designed to insure error free recovery. Each byte of data to be stored is converted to two half bytes. The half bytes (whose possible values are 0 to F HEX) are translated into their ASCII equivalents and written out onto paper tape in this form.

Each record outputted begins with a ";" character (ASCII 3B) to mark the start of a valid record. The next

byte transmitted (18HEX) or (24 decimal) is the number of data bytes contained in the record. The record's starting address High (1 byte, 2 characters), starting address Lo (1 byte, 2 characters), and data (24 bytes, 48 characters) follow. Each record is terminated by the record's check-sum (2 bytes, 4 characters), a carriage return (ASCII 0D), line feed (ASCII 0A), and six "NULL" characters (ASCII 00). (NULL characters cause a blank area on the paper tape.)

The last record transmitted has zero data bytes (indicated by ;00) The starting address field is replaced by a four digit Hex number representing the total number of data records contained in the transmission, followed by the records usual check-sum digits. An "XOFF" character ends the transmission.

```
;180000FFEEDDCCBBAA0099887766554433221122334455667788990AFC
;0000010001
```

During a "LOAD" all incoming data is ignored until a ";" character is received. The receipt of non ASCII data or a mismatch between a records calculated check-sum and the check-sum read from tape will cause an error condition to be recognized by KIM. The check-sum is calculated by adding all data in the record except the ";" character.

The paper tape format described is compatible with all other MOS Technology, Inc. software support programs.