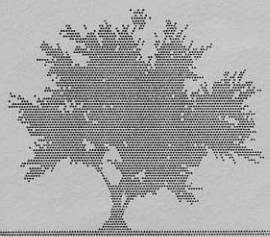
MicroDesign3

Page (.MDP) & Area (.MDA) File Specifications



CREATIVE TECHNOLOGY

The **MDA** (MicroDesign Area) File Formats

There are two different MDA file formats. The earlier MicroDesign2 format uses a simple compression technique to reduce continuous area of white and black, while the more recent MicroDesign3 format uses a more sophisticated technique which generally results in smaller disc files.

MicroDesign2, ProSCAN and Tweak (versions 1 and 2) can only load and save the earlier format, but either format may be loaded or saved in MicroDesign3. In MD3, the filetype is detected automatically on load, but the user must choose whether to save in 'AREA2' or 'AREA3' format.

The format is identified in byte 21 of the initial file 'stamp' record - for a MicroDesign2 area this byte is a "0" (#30), whereas for a MicroDesign3 area it is "3" (#33).

When loaded into memory and uncompressed an Area file can occupy up to 720k of data, but its size on disc is indeterminate due to the compression used. Because of the compression it is not possible to perform 'random-access' reads or writes to the disc file - it must be read sequentially in order correctly to decompress the data.

The OLDER MicroDesign2 Area file format is as follows:

Bytes 0 .. 127: File 'Stamp'

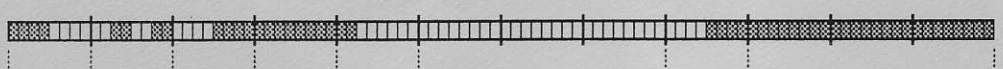
0-3	**.MDA**	File Type	**(4 bytes)**
4-17	**MicroDesignPCW**	Program Identifier	**(14 bytes)**
18-22	**v1.00**	File Version	**(5 bytes)**
23-24	**CR,LF**	*ie* 13,10 decimal	**(2 bytes)**
25-31	**xxxxxxx**	User S/No (ASCII)	**(7 bytes)**
32-33	**CR,LF**	*ie* 13,10 decimal	**(2 bytes)**
34-127	**fill with zeroes**		**(94 bytes)**

Bytes 128 ... File Proper

0-1	**Height in Lines**	must be multiple of 4	**(WORD format: Lo-byte first)**
2-3	**Width in Bytes**	(*ie* Pixels * 8)	**(WORD format: Lo-byte first)**
4-	**Bit-Image Data** as follows		

Bytes read from Left to Right in Lines, Top Line first.
Each byte is standard 1-bit-per-pixel layout where MSB = LH pixel, LSB = RH pixel, 1=White 0=Black.
Each **#00** (all black) or **#FF** (all white) byte is followed by a 'count' byte (*ie* **#00 #03** means 3 whole bytes width of solid black ... **#FF #A0** means 160 bytes width of solid white). A value **#00** for the count byte means **256**. This 'count' can overrun into the next (several) lines.

eg a part of a page line



is stored as **0F CC F0 00,01 3F FF,03 F0 00,03**

Because of this compression the file length is indeterminate, but there must be HEIGHT * WIDTH bytes of actual image data by the time it has been uncompressed.

The NEWER MicroDesign3 Area File Format is as follows:

Bytes 0 .. 127: File 'Stamp'

0-3	.MDA	File Type	**(4 bytes)**	
4-17	MicroDesignPCW	Program Identifier	**(14 bytes)**	
18-22	v1.30	File Version	**(5 bytes)**	N.B. **v1.30** not **v1.00**
23-24	CR,LF	*ie* 13,10 decimal	**(2 bytes)**	
25-31	xxxxxxx	User S/No (ASCII)	**(7 bytes)**	
32-33	CR,LF	*ie* 13,10 decimal	**(2 bytes)**	
34-127	fill with zeroes		**(94 bytes)**	

Bytes 128 ...: File Proper

0-1	Height in Lines	must be multiple of 4	**(WORD format: Lo-byte first)**
2-3	Width in Bytes	*ie* Pixels * 8	**(WORD format: Lo-byte first)**
4-	Image Data as follows		

Data reads from Left to Right in Lines, Top Line first.
Each byte of bit-image data is standard 1-bit-per-pixel layout where MSB = LH pixel, LSB = RH pixel, 1=White 0=Black.

Each line of data is compressed according to one of three LINE TYPES. The first byte of data for each line is the line type.

Line Type Byte
#00: Line is ALL-SAME-BYTE type
#01: Line is DATA type
#02: Line is DIFFERENCE DATA type

The actual data for each line follows this type byte:

ALL-SAME-BYTE type

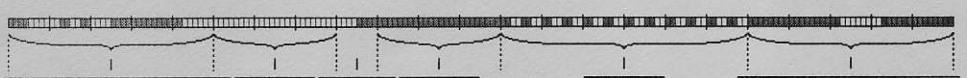
One more byte follows the initial **#00** type byte - this is the actual bit-image data with which to fill the whole line width.

eg Whole line of white = **#00 #FF**, Whole line of black = **#00 #00**

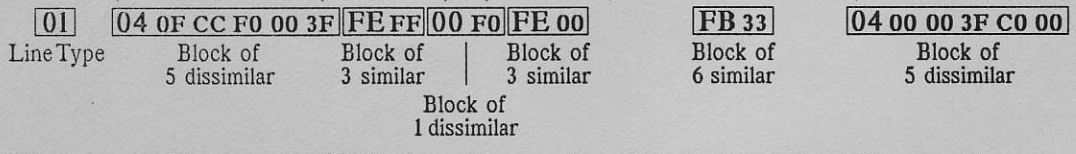
DATA type

Following the initial #01 type byte, the data content of the line is compressed as follows:
Data is encoded in 'blocks', which are of EITHER repeating data bytes OR non-repeating bytes. Each block starts with a control byte, which determines whether the data which follows it is EITHER just one data byte to be repeated OR a sequence of dissimilar bytes.
If the control byte N is negative (-1 to -127), ONE data byte follows which is to be *repeated* -N times. This means there are to be a *total* of -N + 1 occurrences of this data byte.
If the control byte N is positive (0 to 127), it is followed by N + 1 bytes of *dissimilar* data to load directly into the line.

eg a page line



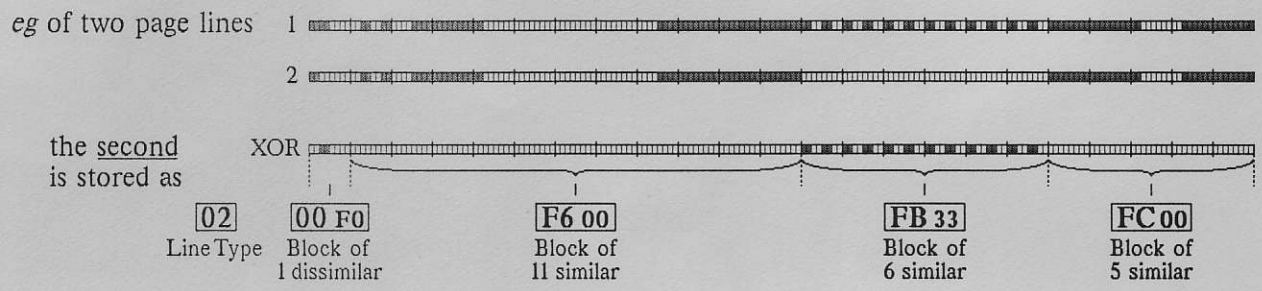
is stored as



Note: *the POSITIVE control bytes are 1 LESS than the number of dissimilar bytes following them, NEGATIVE ones are (MINUS) 1 LESS than the number of occurences of the byte following them.*

DIFFERENCE DATA type

Following the initial #02 type byte, the DIFFERENCE between the data content of THIS line and the content of the PREVIOUS line is stored. *ie* This line is XOR-ed with the previous line to produce a 'difference' line, which is then compressed using the same method as for a DATA type line.



Note: This DIFFERENCE encoding is used if it will result in less bytes of data being stored in the file. The line type of the previous line is irrelevant.

Because of these various types of compression the file length on the disc is indeterminate, but there must be HEIGHT * WIDTH bytes of actual image data by the time it has been uncompressed.

The **MDP** (MicroDesign Page) File Formats

MicroDesign3's Page (.MDP) files are identical to its Area (.MDA) files except for the following differences:

The first FOUR bytes of the file 'stamp' are **".MDP"** rather than **".MDA"**

Bytes 34-36 of the file 'stamp' contain information about the page format as follows:

34	*nn*	dpi	00=240dpi 01=360dpi 02=300dpi	**(1 Byte)**
35	*nn*	Format	00=A5Pt 01=A5Ln 02=A4Pt 03=A4Ln 04=A5Pt(Hires) 05=A5Ln (Hires)	**(1 Byte)**
36	*nn*	Page Ram Required	(in 16k blocks)	**(1 Byte)**

In all other respects a Page (.MDP) file is identical to an Area (.MDA) file (MD3 type)