WORKSHEET FILE FORMAT

FROM LOTUS

INTRODUCTION AND QUICK REFERENCE

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PREFACE

Lotus Development Corporation's 1-2-3(TM) and Symphony(TM) perform user selected operations upon a data matrix that is termed a "worksheet".

Worksheet files are such matrices stored on disk.

A worksheet file is an unbroken sequence of binary coded records defining a single worksheet.

Both 1-2-3 and Symphony accept externally created data files if the files

are in the worksheet file format. Other programs can decode and process worksheet files created by 1-2-3 or Symphony.

The following document provides information required to create or access a worksheet file by describing the records used to create a worksheet file.

It is assumed that the reader is familiar with Lotus products and has ready access to 1-2-3 or Symphony documentation.

Note that the worksheet files for 1-2-3 and Symphony are similar, but not necessarily interchangeable. 1-2-3 and Symphony share some record types, but also have record types unique to that product. Symphony can read 1-2-3 records, but 1-2-3 cannot read Symphony records.

All efforts have been made to ensure that this information is clear and useful since Lotus will not be providing customer assistance with this booklet. Lotus will, however, incorporate any necessary corrections if they are reported in writing to:

Lotus Development Corporation
Worksheet File Format
161 First Street
Cambridge, MA 02142

WORKSHEET FILE FORMAT

Worksheet files are organized as an unbroken sequence of variable length
binary records. Each record consists of a 4-byte header followed by the
record body. The header defines the record's type and length, as the
example below shows.

The header's composition is as follows:

Byte Number	Byte Description
0,1	Record type code
2,3	Record body length (bytes)

Example: Record Header

Record Header

	Record Type		Record Length	
Byte Number	0	1	2	3
Hex Code	1C	00	20	00
Decimal Equivalent	28		32	

The record body can be of many different types; most have predetermined
length, but some vary in length.

The record type code is 28.

In a hex dump of the file, the record type appears as 1C 00h, noting that
the 8086/88 stores the most significant byte of word in the higher memory
address.

The record length is 32 bytes.
In a hex dump of the file, the record length appears as 20 00h.

Record types with Column/Row Coordinates

Some record types contain column/row coordinates to identify a cell, or one
of the two points that define a range. Numbering starts at zero in the
upper left corner of the worksheet.
For example:

Cell A1 = column 0, row 0

SUMMARY OF RECORD TYPES

This section describes the different record types found in 1-2-3 and
Symphony.

There are to Quick Reference tables ordered by Opcode and by Product,
followed by a detailed reference section ordered by Opcode. In the
reference section, there are examples for the more commonly used records.

It is assumed that the reader is familiar with 1-2-3 or Symphony and has
access to Lotus' documentation.

Quick Reference by Opcode

Type	Code (hex)	Length (bytes)

Description			
BOF	0	2	Beginning of file
EOF	1	0	End of file
CALCMODE	2	1	Calculation mode
CALCORDER	3	1	Calculation order
SPLIT	4	1	Split window type
SYNC	5	1	Split window sync
RANGE	6	8	Active worksheet range
WINDOW1	7	31	Window 1 record
COLW1	8	3	Column width, window 1
WINTWO	9	31	Window 2 record
COLW2	A	3	Column width, window 2
NAME	B	24	Named range
BLANK	C	5	Blank cell
INTEGER	D	7	Integer number cell
NUMBER	E	13	Floating point number
LABEL	F	variable	Label cell
FORMULA	10	variable	Formula cell
TABLE	18	25	Data

table range
 ORANGE 19 25 Query
range
 PRANGE 1A 8 Print
range
 SRANGE 1B 8 Sort
range
 FRANGE 1C 8 Fill
range
 KRANGE1 1D 9
Primary sort key range
 HRANGE 20 16
Distribution range
 KRANGE2 23 9
Secondary sort key

range
 PROTEC 24 1 Global
protection
 FOOTER 25 242 Print
footer
 HEADER 26 242 Print
header
 SETUP 27 40 Print
setup
 MARGINS 28 10 Print
margins code

 Type code (hex) Length (bytes)
Description

 LABELFMT 29 1 Label
alignment
 TITLES 2A 16 Print
borders
 GRAPH 2D 437
Current graph settings

NGRAPH	2E	453	Named graph settings
CALCCOUNT	2F	1	Iteration count
UNFORMATTED	30	1	Formatted/unformatted print
CURSORW12	31	1	Cursor location
WINDOW	32	144	Symphony window settings
STRING	33	variable	Value of string formula
PASSWORD	37	4	File lockout (CHKSUM)
LOCKED	38	1	Lock flag
QUERY	3C	127	Symphony query settings
QUERYNAME	3D	16	Query name
PRINT	3E	679	Symphony print record
PRINTNAME	3F	16	Print record name
GRAPH2	40	499	Symphony graph record
GRAPHNAME	41	16	Graph record name
ZOOM	42	9	Orig coordinates

expanded window			
SYMSPLIT	43	2	Nos. of split windows
NSROWS	44	2	Nos. of screen rows
NSCOLS	45	2	Nos. of screen columns
RULER	46	25	Named ruler range
NNAME	47	25	Named sheet range
ACOMM	48	65	Autoload.comm code
AMACRO	49	8	Autoexecute macro
address			
PARSE	4A	16	Query parse
information			

Quick Reference by Product: 1-2-3 only

Type	Code (hex)	Length (bytes)	Description
SPLIT	4	1	Split window type
SYNC	5	1	Split window sync
WINDOW 1	7	31	Window 1 record
WINTWO	9	31	Window 2 record
COLW2	A	3	Column width,

window 2			
NAME	B	24	Named range
QRANGE	19	25	Query range
PRANGE	1A	8	Print range
SRANGE	1B	8	Sort range
KRANGE1	1D	9	Primary sort key range
KRANGE2	23	9	Secondary sort key range
FOOTER	25	242	Print footer
HEADER	26	242	Print header
SETUP	27	40	Print setup
MARGINS	28	10	Print margins code
TITLES	2A	16	Print borders
GRAPH	2D	437	Current graph settings
NGRAPH	2E	453	Named graph settings

Quick Reference by Product: 1-2-3 and Symphony

Type	Code (hex)	Length (bytes)	Description
BOF	0	2	Beginning of file
EOF	1	0	End of

file			
CALCMODE	2	1	Calculation mode
CALCORDER	3	1	Calculation order
RANGE	6	8	Active worksheet range
COLW1	8	3	Column width
BLANK	C	5	Blank cell
INTEGER	D	7	Integer number cell
NUMBER	E	13	Floating point number
LABEL	F	variable	Label cell
FORMULA	10	variable	Formula cell
TABLE	18	25	Data table range
FRANGE	1C	8	Fill range
HRANGE	20	16	Distribution range
PROTEC	24	1	Global protection
LABELFMT	29	1	Label alignment
CALCCOUNT	2F	1	Iteration count
UNFORMATTED	30	1	Formatted/unformatted print
CURSORW12	31	1	Cursor location

Quick Reference by Product: Symphony only

Type	Code (hex)	Length (bytes)	Description
WINDOW	32	144	Symphony window settings
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PASSWORD	37	4	File lockout (CHKSUM)
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ZOOM	42	9	Orig coordinates expanded window
SYMSPLIT	43	2	Nos. of split windows
NSROWS	44	2	Nos. of screen rows

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RULER	46	25	Named ruler range
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