SSF Data Format Definition

Subject: Standard Software Framework (SSF) Data Formats
Date: 30 Jul 99
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Status: Draft

This document defines data formats used in the CF Standard Software Framework (SSF).

Files using this format permit traceability from the product to the sources from which the product was created. Additionally, each file includes information critical to the experimental setup, including geometry, instrument and source configurations.

General

To maximize cross-platform readability, files are plain text (ASCII), tab-delimited, CR terminated.

Lines containing data always begin with, and contain only, numeric characters. Numbers may be integer, fixed or floating point, scientific or engineering exponential notation. Lines containing keywords and parameters will always begin with a master keyword, and may contain alpha and numeric characters. Keywords may be in any order.

Filenames assume the operating system supports 32 character filenames. As a result, the naming convention is not compatable with MS-DOS. Filenames consist of the file generation timestamp, the source name, and an extension. Between the timestamp and the source name is an underscore character. Between the source name and the extension is a period character. The source name length must not to exceed 13 characters.

Filenames:	YYYYMMDDHHMMSS_sourcename.ext			
	where	YYYY	year, ie 1999	
		MM	month, ie 05 for May	
		DD	day	
		HH	hours in military time, ie 13 for 1 pm	
		MM	minutes	
		SS	seconds	
		sourcename	source name	
		ext	DAT	Datafile
			CAL	Calibration file
			STD	Standard file

File name timestamps have second resolution. When such resolution is not required, zero characters may be used for the hour, minute, and second positions, as appropriate.

To ease sorting burdens on the MacOS, the primary CF operating system, files include creator and type parameters. The creator parameter indicates the program which generated the file. The type parameter is essentially the same as the extension field described above.

Keywords

Within each file, numerous keywords may be used to describe and define parameters. These parameters describe experimental setup or conditions; they also define traceability for the data. Keywords may be in any order.

Keyword	Kind	Type	Level	Description
VERSION	MASTER	Integer	REQUIRED	Version of the file format
NAME	MASTER	Alpha	REQUIRED	Name of the individual who collected or processed data in this file.
INSTRUMENT	MASTER	Alpha	DAT	The instrument used to collect the data in the DAT file. Additional keywords define the instrument state.
SOURCE	MASTER	Alpha	DAT	Source which was scanned for the data in the DAT file.
STANDARD	MASTER	Alpha	DAT	The standard used when calibrating a source or secondary standard.
BLOCK	MASTER	Boolean	DAT	Is this a blocked beam scan.
UNITS	MASTER	Alpha	REQUIRED	Defines the units of the data
TIMESTAMP	MASTER	Numeric	CAL, STD	Time which the data was generated.
DATAFILE	MASTER	Alpha	CAL	Indicates which datafiles were used in generation of the calibration.

DATAFILE (DAT) FORMAT

When data is collected by any instrument, it is recorded in this format.

Version 1

Validity Start: Not yet valid
Validity End: Unspecified

Sample data file

Filename is "19990502133000 HARDY.DAT"

```
VERSION=1
NAME=MARKETON
INSTRUMENT=750 INSLIT=0.00250 OUTSLIT=0.00250 DETECTOR=18 INPUT=7463
SOURCE=HARDY LAMPS=16 CURRENT=6.51 APERTURE=0.2540 DISTANCE=0.3350
STANDARD=84164 CALIBRATION="19990502133000 84164.STD" CURRENT=8.20 DISTANCE=0.5000
BLOCK=YES DIAMETER=.0100 DISTANCE=0.2000
UNITS=W/(cm^2*nm*sr)
19990502133000 380 1.234E-10 1.234E-10 1.234E-10 1.234E-10 ... 1.234E-10
19990502133001 390 1.234E-10 1.234E-10 1.234E-10 1.234E-10 ... 1.234E-10
...
```

CALIBRATION (CAL) FORMAT
This format is used to record the calibration of a source or secondary standard.

Version 0
Validity Start: 1 Mar 99
Validity End: Unspecified

This is an interim version of the CAL format, which is being used to present calibration data for the CF IRS on the CF Web site.

Four lines containing required keywords are followed by lines containing radiance at wavelength.

Required keywords are:

VERSION=0	Indicates the standard file conforms to CAL format version 0.
NAME=lastname	The name of the individual who collected or generated this calibration.
UNITS=W/cm^2*nm*sr	Indicates the units of the data.
TIMESTAMP=	Indicates calibration date of the source. HH, MM, and SS fields are each set to 00.
SOURCE=sourcename	Name of the source whose calibration is defined in this file.
COLS=col1 <tab> col2 <tab> … <tab> coln	Titles of the calibration data columns, where col1 is the title of column 1, etc.

Format for the lines containing radiance values is:

λ <tab> value 1 <tab> value 2 <tab> … <tab> value n

where λ is in nm, and values are in the units defined in the UNITS keyword.

Sample data file
Filename is "19990502000000 HARDY.CAL"

```
VERSION=0
NAME=MARKETON
UNITS=W/(cm^2*nm)
TIMESTAMP=19990502000000
SOURCE=HARDY
COLS=16 12 6 2 1
380 1.234E-10 1.234E-10 1.234E-10 … 1.234E-10
390 1.234E-10 1.234E-10 1.234E-10 … 1.234E-10
...
```

Version 1
Validity Start: Not yet valid
Validity End: Unspecified
This format is used to

Sample data file
Filename is "19990502133000 84164.CAL"

```
VERSION=1
NAME=MARKETON
DATAFILE="19990502133000 84164.DAT"
DATAFILE="19990502133010 84164.DAT"
...
DATAFILE="19990502133050 84164.DAT"
UNITS=W/(cm^2*nm)
TIMESTAMP=19990502133000
380 1.234E-10
390 1.234E-10
...
```

NIST STANDARD (STD) FORMAT

This format is used when defining the calibration of a NIST standard lamp, used as a CF master irradiance standard. Secondary standards use the CAL format.

Version 1

Validity Start: Not yet valid
Validity End: Unspecified

Three lines containing required keywords are followed by the irradiance at standard wavelengths.

Required keywords are:

VERSION=1	Indicates the standard file conforms to STD format version 1.
UNITS=W/cm^3	Indicates the units of the data, and is as indicated on the report of calibration for the standard.
TIMESTAMP=	Indicating calibration date of the standard. HH, MM, and SS fields are each set to 00.

Format for the lines containing irradiance values is:

λ <tab> value

where λ is in nm, and value is in the units defined in the UNITS keyword.

Sample data file

Filename is "19990502133000 F463.STD"

```
VERSION=1
UNITS=W/cm^3
TIMESTAMP=19990502133000
250  0.201
260  0.352
...
```

Revision History

Date	Status	Author	Change
5 Apr 99	Proposed	John Marketon	Original proposed format for automatic data generation systems.
30 Jul 99	Draft	John Marketon	Changed document title. Document structure modified. Added text to better describe each type. Added Keyword section. Added validity dates for each type. Added VERSION=0 definition to CAL type. Deleted XFR type.