

## **FILE FORMATS: .IFF**

**File Format Name:** Interchange File Format. Complete name: Electronic Arts Interchange File Format 1985 (EA IFF 85)

**File Extension(s):** .IFF ( .LBM; .CE for PCs, depending on the application). Generic wrapper format developed for data interchange and interoperability

**Date Introduced:** 1985 Last significant update: 2005-03-22

**Dates in Use:** 1985- to the present. But nowadays they are mainly used to store object data for games like The Sims and its expansions, and The Sims Online (TSO). Otherwise, IFF is a now an almost defunct format.

**Variations:** The IFF format was influential and is cited as the source of ideas and approach by the creators of other tagged formats, e.g., RIFF and SMF

Electronic Arts' IFF standard was used by Apple as the basis for the Audio Interchange File Format (AIFF) and the Audio Interchange File Format for Compression (AIFF-C) specifications. Apple used these formats primarily to store audio data such as sampled sound data or MIDI data, along with associated information about that data. Other manufacturers, SGI for example, have also adopted AIFF as a standard sound file format.

In Windows 3.1, Microsoft introduced its own version of the IFF standard: the Resource Interchange File Format (RIFF). RIFF supports a wide range of data types, including bitmaps, color palettes, audio-video interlaced (AVI) data, MIDI data, and waveform data. The Win32 programming interfaces include support for reading and writing RIFF files.

List of common IFF-based file formats:

- 8SVX (Audio format)
- AIFF (Digital audio format)
- ANBM ((obsolete) animation format)
- ANIM (Animation format)
- BIFF8 (formerly used by Microsoft Excel)
- DOC (pre Word 97 format)
- CDR2D
- FNTR/FNTV
- FTXT (Text format)
- IFRS (known as Blorb)
- IFZS (known as Quetzal)
- ILBM
- PDEF (Deluxe Print page definition)
- PICS (Macintosh QuickDraw picture encapsulated in IFF format)
- PLBM ((obsolete) picture format)
- SHRI
- SMUS (Simple Music format, similar to MIDI format)
- USCR (Uhuru Sound music score)
- UVOX (Uhuru Sound voice)
- VDEO (Deluxe Video Construction Set video)

**Developers:** Electronic Arts, an interactive entertainment software developer, in conjunction with Commodore-Amiga. The goal was to be able to store data (particularly multimedia data such as sounds, images, and animation controls) in a format that made the data easy to move from one operating system to another.

Electronic Arts is a leading video game developer and publisher. It was founded in 1982 by Trip Hawkins. They are the developers and publishers of interactive entertainment software for personal computers and advanced entertainment systems such as the PlayStation2, Computer Entertainment System, the PlayStation, Xbox video game console from Microsoft, the Nintendo GameCube and the Game Boy. EA headquarters is located in Redwood City, California

## **Open Source**

**Associated Operating System:** MS-Dos, Macintosh, Amiga Dos.

**Associated Application(s):** various, such as Amiga Bitmap Graphic (Amiga); Amiga Sound (Amiga); Bitmap Graphic; DESR VFF Greyscale Bitmap Image; ProWrite Document; Simple Musical Score; Sun TAAC Image File; TDI Explore & Alias Wavefront Image; TextCraft Document; The Sims Object/Data File (Electronic Arts (Maxis))

**Compression:** None

**Primary Usage:** The Amiga Interchange File Format (IFF) was primarily used to transfer documents to and from Commodore Amiga computers.

The IFF file standard is extremely flexible, and allows all formats of images and text to be stored inside an IFF file. IFF files can be exported from an Amiga to a PC.

The format could also be created on a PC, but the extension of the file name should then be changed to LBM or to CE (depending on the application). However, the basic file structure remained the same. The standard form for IFF image files created on a PC is called ILBM. ILBM was formed by means of compressing all images as planes. This is much slower, but it means that these compressed files will be accessible by any application able to read an IFF file, even if they are exported back to an Amiga.

By establishing Interchange Format Files (ie, IFF) and releasing the documentation for it, as well as the source code for reading and writing IFF type of files, Electronic Arts made it easier for programmers to develop "backward compatible" and "extensible" file formats.

## **Risks:**

**Conservation Actions:** make reservation digital master in any of the currently preferred long-term archival fomats, keep metadata, documentation and source code information. May require emulation software to be deployed in order to convert the source data into a format that can be viewed by mainstream users. Migrate to .tiff, .xml or .jpeg (preferred archival formats)

## **Resources:**

Morrison, Jerry: EA IFF 85 Standard for Interchange Format Files (Electronic Arts, 1985).

URLs:

EA IFF 85 from the Object Systems Group, University of Geneva, Switzerland:  
<http://cui.unige.ch/OSG/info/ap06.html>

Digital Preservation – Library of Congress: <http://www.digitalpreservation.gov/>

Electronic Arts in Wikipedia: [http://en.wikipedia.org/wiki/Electronic\\_Arts](http://en.wikipedia.org/wiki/Electronic_Arts)

<http://www.users.bigpond.com/james.jacobs/reg/iff> provides a list of registered IFF FORMs, generic chunks, and registered new chunks for existing FORMs.

IFF specification (Morrison, 1985) at many sites on the World Wide Web.

## APPENDIX

EA IFF 85" Standard for Interchange Format Files [excerpt]

Document Date: January 14, 1985  
From: Jerry Morrison, Electronic Arts  
Status of Standard: Released and in use

### 1. Introduction

#### Standards are Good for Software Developers

As home computer hardware evolves to better and better media machines, the demand increases for higher quality, more detailed data. Data development gets more expensive, requires more expertise and better tools, and has to be shared across projects. Think about several ports of a product on one CD-ROM with 500M Bytes of common data!

Development tools need standard interchange file formats. Imagine scanning in images of "player" shapes, moving them to a paint program for editing, then incorporating them into a game. Or writing a theme song with a Macintosh score editor and incorporating it into an Amiga game. The data must at times be transformed, clipped, filled out, and moved across machine kinds. Media projects will depend on data transfer from graphic, music, sound effect, animation, and script tools.

#### Standards are Good for Software Users

Customers should be able to move their own data between independently developed software products. And they should be able to buy data libraries usable across many such products. The types of data objects to exchange are open-ended and include plain and formatted text, raster and structured graphics, fonts, music, sound effects, musical instrument descriptions, and animation.

The problem with expedient file formats typically memory dumps is that they're too provincial. By designing data for one particular use (e.g. a screen snapshot), they preclude future expansion (would you like a full page picture? a multi-page document?). In neglecting the

possibility that other programs might read their data, they fail to save contextual information (how many bit planes? what resolution?). Ignoring that other programs might create such files, they're intolerant of extra data (texture palette for a picture editor), missing data (no color map), or minor variations (smaller image). In practice, a filed representation should rarely mirror an in-memory representation.

The former should be designed for longevity; the latter to optimize the manipulations of a particular program. The same filed data will be read into different memory formats by different programs.

The IFF philosophy: "A little behind-the-scenes conversion when programs read and write files is far better than NxM explicit conversion utilities for highly specialized formats."

So we need some standardization for data interchange among development tools and products. The more developers that adopt a standard, the better for all of us and our customers.

Here is "EA IFF 1985"

Here is our offering: Electronic Arts' IFF standard for Interchange File Format. The full name is "EA IFF 1985". Alternatives and justifications are included for certain choices. Public domain subroutine packages and utility programs are available to make it easy to write and use IFF-compatible programs.

Part 1 introduces the standard. Part 2 presents its requirements and background. Parts 3, 4, and 5 define the primitive data types, FORMs, and LISTs, respectively, and how to define new high level types. Part 6 specifies the top level file structure. Appendix A is included for quick reference and Appendix B names the committee responsible for this standard.

## References

American National Standard Additional Control Codes for Use with ASCII, ANSI standard 3.64-1979 for an 8-bit character set. See also ISO standard 2022 and ISO/DIS standard 6429.2.

Amiga[tm] is a trademark of Commodore-Amiga, Inc.

C, A Reference Manual, Samuel P. Harbison and Guy L. Steele Jr., Tartan Laboratories. Prentice-Hall, Englewood Cliffs, NJ, 1984.

Compiler Construction, An Advanced Course, edited by F. L. Bauer and J. Eickel (Springer-Verlag, 1976). This book is one of many sources for information on recursive descent parsing.

DIF Technical Specification (c)1981 by Software Arts, Inc. DIF[tm] is the format for spreadsheet data interchange developed by Software Arts, Inc. DIF[tm] is a trademark of Software Arts, Inc.

Electronic Arts[tm] is a trademark of Electronic Arts.

"FTXT" IFF Formatted Text, from Electronic Arts. IFF supplement document for a text format.

Inside Macintosh (c) 1982, 1983, 1984, 1985 Apple Computer, Inc., a programmer's reference manual.

Apple(R) is a trademark of Apple Computer, Inc.

Macintosh[tm] is a trademark licensed to Apple Computer, Inc.

"ILBM" IFF Interleaved Bitmap, from Electronic Arts. IFF supplement document for a raster image format.

M68000 16/32-Bit Microprocessor Programmer's Reference Manual(c) 1984, 1982, 1980, 1979 by Motorola, Inc.

PostScript Language Manual (c) 1984 Adobe Systems Incorporated.

PostScript[tm] is a trademark of Adobe Systems, Inc.

Times and Helvetica(R) are trademarks of Allied Corporation.

InterScript: A Proposal for a Standard for the Interchange of Editable Documents (c)1984 Xerox Corporation.

Introduction to InterScript (c) 1985 Xerox Corporation.