AIFF Audio File Format

Brady Boettcher, MUMT 621

The Audio Interchange File Format (AIFF)

- Storage of uncompressed audio samples
- Developed by Apple in 1998 (before the WAV format!)
- `.aif` or `.aiff` file extension
- Larger than lossy formats (.mp3)
  - 5 minutes of stereo audio ~50MB
- Based on the IFF format

(FileFormat, 2022)

(Library of Congress, 2021)

The Interchange File Format (IFF)

- Created for Amiga computers in 1985
- Generic file format, can "interchange" between software
- Basic file types such as audio, photo, video, etc.
- Rarely need importers and exporters
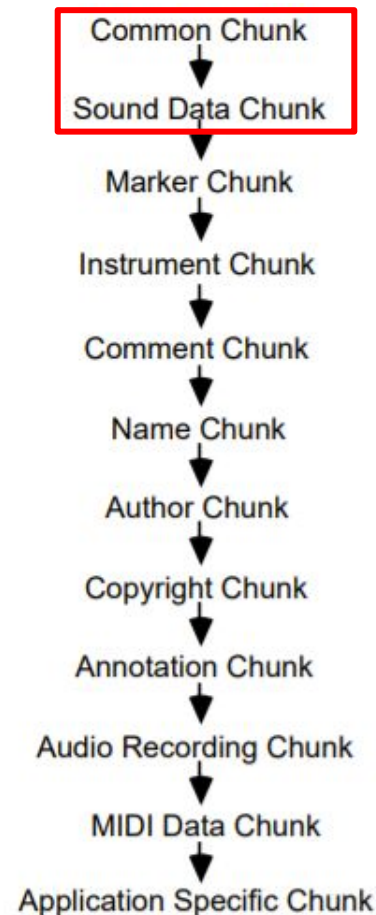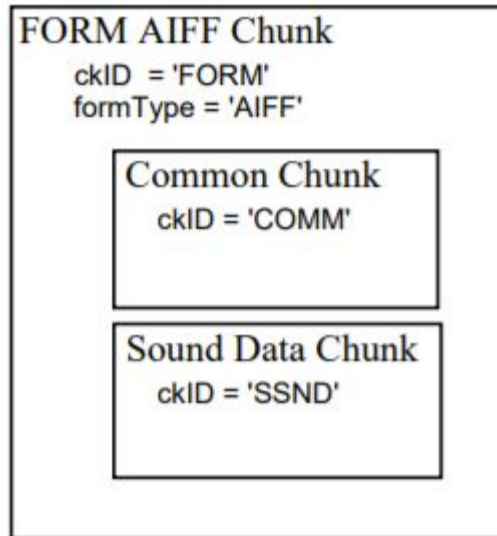- One basic disk storage format

(Morrison, 1988)

IFF Chunks

- Chunk ID, size, and data
- Bitmaps (ILBM), Animations (ANIM), **Audio (AIFF)**
- Account for backwards compatibility with special ids for each version

Example: Color Map chunk in ILBM file

char typeID[4]	'CMAP'	in an ILBM file, CMAP means "color map"
unsigned long dataSize	48	48 data bytes
char data[ ]	0, 0, 0, 255, 255, 255 ...	16 3-byte color values: black, white,....

(Morrison, 1988)

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AIFF, finally

- Common chunk
  - Number of channels
  - Number of sample frames
  - Sample size (in bits)
  - sampleRate (samples per second)
- Sound data chunk
  - Offset (typically 0)
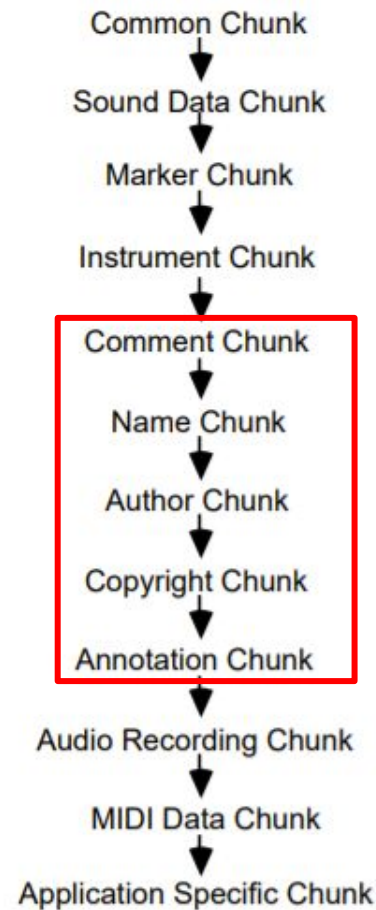 - blockSize (also typically 0)
  - soundData[]
- Many optional chunks

FORM AIFF Chunk
ckID = 'FORM'
formType = 'AIFF'

Common Chunk
ckID = 'COMM'

Sound Data Chunk
ckID = 'SSND'

Common Chunk
↓
Sound Data Chunk
↓
Marker Chunk
↓
Instrument Chunk
↓
Comment Chunk
↓
Name Chunk
↓
Author Chunk
↓
Copyright Chunk
↓
Annotation Chunk
↓
Audio Recording Chunk
↓
MIDI Data Chunk
↓
Application Specific Chunk

(Apple, 1989)

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AIFF optional metadata chunks

- Position markers
- Instrument behavior for samplers
  - Pitch constraints
  - Looping information

Common Chunk
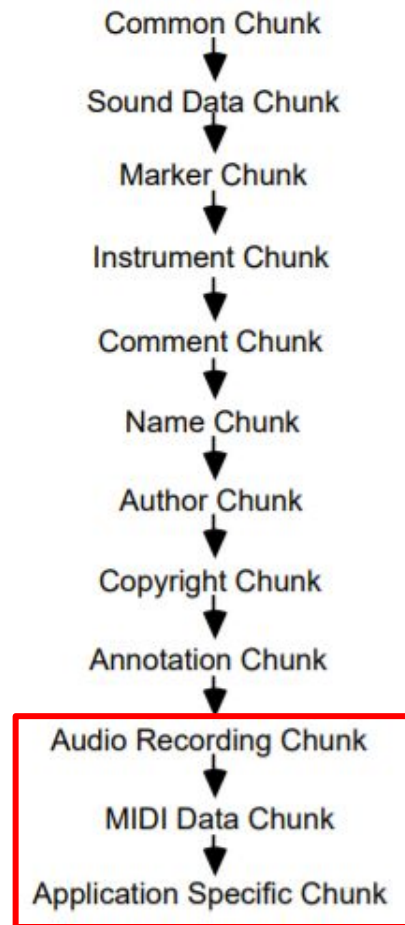
Sound Data Chunk

Marker Chunk

Instrument Chunk

Comment Chunk

Name Chunk

Author Chunk

Copyright Chunk

Annotation Chunk

Audio Recording Chunk

MIDI Data Chunk

Application Specific Chunk

(Apple, 1989)

AIFF optional metadata chunks

- Comments- linked to specific markers
- Name, author, copyright, annotation metadata

Common Chunk
↓
Sound Data Chunk
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Marker Chunk
↓
Instrument Chunk
↓
Comment Chunk
↓
Name Chunk
↓
Author Chunk
↓
Copyright Chunk
↓
Annotation Chunk
↓
Audio Recording Chunk
↓
MIDI Data Chunk
↓
Application Specific Chunk

(Apple, 1989)

AIFF optional metadata chunks

- Recording configuration information
- MIDI system exclusive messages for advanced instruments
- Application specific data

Common Chunk
↓
Sound Data Chunk
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Marker Chunk
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Instrument Chunk
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Comment Chunk
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Name Chunk
↓
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Copyright Chunk
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Annotation Chunk
↓
Audio Recording Chunk
↓
MIDI Data Chunk
↓
Application Specific Chunk

(Apple, 1989)

AIFF-C

- Extended from AIFF in 1991
- Ability to store compressed audio samples
- Adds compression type field to Common Chunk
  - Support for many obsolete compression formats

(Kabal, 2017)

A chat with Mark Lentczner

- One of the two principal authors of AIFF
- Managed the first sound engineering team at Apple
- AIFF's concepts ruined by business politics
  - Endianness of Microsoft computers reversed
- Little support for AIFF's true functions
- AIFF `extended` type sample rates
  - 80 bit value
  - Due to the original Macintosh's 22.255 kHz sample rate
  - Easy conversion to `double`

(Mark Lentczner, video chat with author, February 4, 2022)
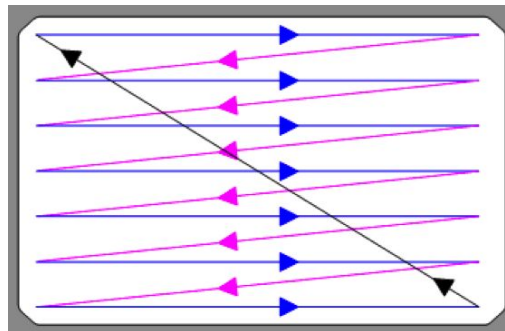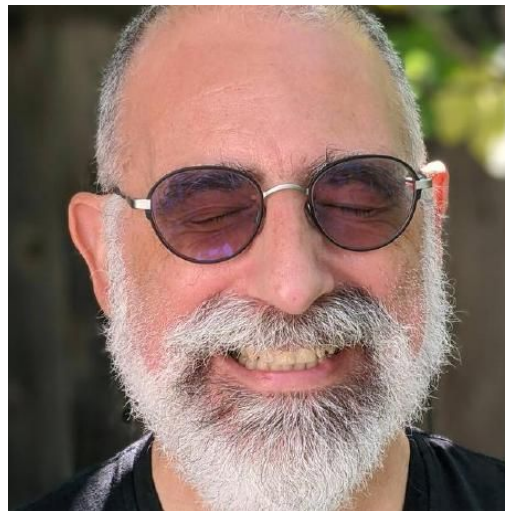
Thank you! References:

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