MA-3 SMAF/Audio
Outline of Interpretation

General purpose edition

Version 1.2.1
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Yamaha Corporation

Note:

For explanation of definition of functions, the following formats are defined for use.

Definition format	Meaning	Definition format	Meaning
UINT8	8 bits without code	SINT8	8 bits with code
UINT16	16 bits without code	SINT16	16 bits with code
UINT32	32 bits without code	SINT32	32 bits with code

Revision

Ver.	Date	Description
1.0	June 23, 2001	Initial edition
1.0.1	September 10, 2001	Adjusted with SMAF/MA-3 specification.
1.1.0	September 28, 2001	Added SMAF/Audio of SMAF/MA-2 specification.
1.2.0	November 26, 2001	2.3.2 Clerical error of SMAF/MA-3 structure was corrected. 2.3.2 Fs limit of wave form data was changed.
1.2.1	January 30, 2002	Clerical error was corrected.

1 Introduction

This document collects Audio file formats supported by MA-3 as SMAF/Audio. SMAF/Audio type is a standard audio format that is supported by MA-3 SMAF system, and is basically given a structure that conform to SMAF/MA-2 or SMAF/MA-3. For the details, verify the specification for SMAF/MA-2(MA-3). SMAF/Audio interprets only the part needed for reproduction of one stream in SMAF structure.

2 Format structure

Only two data that is given structures designated here are used. This section presents only necessary items, and does not include option. Since the data set on Contents Info Chunk are defined for every group to whom the phone belongs, it is required to follow the application rule issued by the organization who manages the group for details.

2.1 SMAF/MA-2 conformity

```
<File Chunk>
        UINT8           ID[4] = “MMMD”
        UINT32          Size                    // Overall size [bytes]

        <Contents Info Chunk>
                UINT8   ID[4] = “CNTI”
                UINT32  Size                    // Overall size [bytes]
                UINT8   Class                   // Data class
                UINT8   Type                    // type
                UINT8   CodeType                // Designation of character code
                UINT8   CopyStatus              // Definition of copy
                UINT8   CopyCount               // Copy count

        <PCM Audio Track Chunk#0>
                UINT8   ID[3] = “ATR”
                UINT8   Number                  // Track number (= 0)
                UINT32  Size                    // Overall size [bytes]
                UINT8   FormatType              // Format type (= 0)
                UINT8   SequenceType            // Sequence type (= 0)
                UINT16  WaveType                // Data type
                                                //   0x1000: 4kHz ADPCM
                                                //   0x1100: 8kHz ADPCM
                UINT8   TimeBase_D              // Duration time unit (disregard)
                UINT8   TimeBase_G              // Gate time unit (disregard)
                <Wave Data chunk#>
                        UINT8   ID[3] = “Awa”
                        UINT8   Number          // Wave number (1..62) (disregard)
                        UINT32  Size            // Overall size n [bytes]
                        UINT8   Data[n]         // ADPCM data stream
        WORD:   CRC                             //
< End >
```

2.2 SMAF/MA-3 conformity

```
<File Chunk>
        UINT8           ID[4] = “MMMD”
        UINT32          Size                        // Overall size [bytes]

        <Contents Info Chunk>
                UINT8   ID[4] = “CNTI”
                UINT32  Size                        // Overall size [bytes]
                UINT8   Class                       // Data class
                UINT8   Type                        // type
                UINT8   CodeType                    // Designation of character code
                UINT8   CopyStatus                  // Definition of copy
                UINT8   CopyCount                   // Copy count

        <Score Track chunk#5>
                UINT8   ID[3] = “MTR”
                UINT8   Number  = 5                 // Track No.  (5)
                UINT32  Size                        // Overall size [bytes]
                UINT8   FormatType = 1 or 2         // Format type
                UINT8   SequenceType                // Sequence type
                UINT8   TimeBase_D                  // Duration time unit (disregard)
                UINT8   TimeBase_G                  // Gate time unit (disregard)
                UINT8   ChStatus[16]                // Chnnel status(disregard)
                <Stream PCM Data Chunk>
                        UINT8   ID[4] = “Mtsp”
                        UINT32  Size                // Overall size [bytes]
                        <Stream PCM Data Chunk#>
                                UINT8   ID[3] ="Mwa”
                                UINT8   Number  // Waveform number (disregard)
                                UINT32  Size    // Overall size [bytes]
                                UINT8   Format  // Format type
                                UINT8   Fs(MSB) // Sampling frequency [Hz]
                                UINT8   Fs(LSB) // Sampling frequency [Hz]
                                UINT8   Data[]  // Audio data
        WORD:   CRC                             //
< End >
```

2.3 Necessary structures

Since the sections shown below are fixed, data of values that are not designated are deemed faulty. For the order of appearance of chunks, only the one show above is used. The parts that are not designated here are not interpreted.

2.3.1 In the case of SMAF/MA-2 structure

▪ Contents Info Chunk
Class : Environmental dependence.
Type : Environmental dependence.
▪ PCM Audio Track Chunk#0
WaveType: 0x1000: 4kHz ADPCM
0x1100: 8kHz ADPCM
▪ Wave Data chunk
Only the data which appeared first are effective.
Data : Audio data itself
The order of 4 bit ADPCM data in the byte is from LSB side to MSB side.
Pronunciation time should be more than 20 [ms].

2.3.2 In the case of SMAF/MA-3 structure

▪ Contents Info Chunk
Class : Environmental dependence.
Type : Environmental dependence.
▪ Score Track chunk#5
Size : 40 or more.
FormatType : Mobile Standard assignment.（1 or 2）
▪ Stream PCM Data Chunk
Size : 12 or more.
▪ Stream PCM Data Chunk (In the case of SMAF/MA-3 structure)
Only the chunks that appear at the head in the file are treated.
Format : 0x01 : Mono 8bit PCM (2's complement)
0x11 : Mono 8bit PCM (Offset bin)
0x20 : Mono 4bit ADPCM (Yamaha)
Fs : Designated in [Hz]. (4000...16000)
However, it is limited up to 8000[Hz] for PCM.
Data : Audio data itself
The order of 4 bit ADPCM data in the byte is from LSB side to MSB side.
Pronunciation time should be more than 20 [ms].

2.4 Data management information

Data that shows the nature of data is placed in Contents Info Chunk and Optional Data Chunk. Contents Info Chunk contains CopyStatus and CopyCount that show the possibility of copying as necessary information. Information related to music itself such as title can be set to Option of Contents Info Chunk in SMAF/MA-2 form, set to Optional Data Chunk in SMAF/MA-3 form.

2.4.1 Contents Info Chunk

CopyStatus : Information including copiability, transferability, and savableness are contained.
CopyCount : Incremented up to 255 by each copying.

2.4.2 Option of Contents Info Chunk (in the case of SMAF/MA-2 form)
2.4.3 Optional Data Chunk (in the case of SMAF/MA-3 form)

Information of music is contained by using designated character codes. Designated information items are as follows.

Identifier	Meaning
VN	Vender's name
CN	Carrier's name
CA	Category name
ST	Title of music
AN	Artist's name
WW	Writer
SW	Composer
AW	Arranger
CR	Copyright (c)
CD	Date of preparation
UD	Date of update
GR	Name of copyright management organization
MI	Information about copyright management organization