



MPEG-1/2 Layer 3 (mp3) Decoder for the ARC Processor

Data Sheet (V1.02)

– subject to change without notice –

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1 Overview

This document describes the key features of the MP3 software decoder for the ARC processor core.

The MPEG-1/2 Layer 3 (MP3) decoder specified in this document is designed to fulfill the requirements for a "Full Layer 3 ISO/IEC 11172-3 audio decoder" as laid down in ISO/IEC 11172-4 (Information technology – Generic coding of moving pictures and associated audio for digital storage media up to about 1,5 Mbit/s, Part4: Compliance Testing). It supports bit and sampling rates defined in both ISO/IEC 11172-3 (MPEG-1) and ISO/IEC 13818-3 (MPEG-2).

The decoder incorporates Fraunhofer IIS's distinct knowledge in high quality audio coding as it is based on Fraunhofer IIS's fixed point reference decoder. It passes the conformance testing procedure defined in ISO/IEC 11172-4, Section 2.6.3

2 Architecture

The basic architecture of the MP3 decoder is shown in Fig. 1 below:

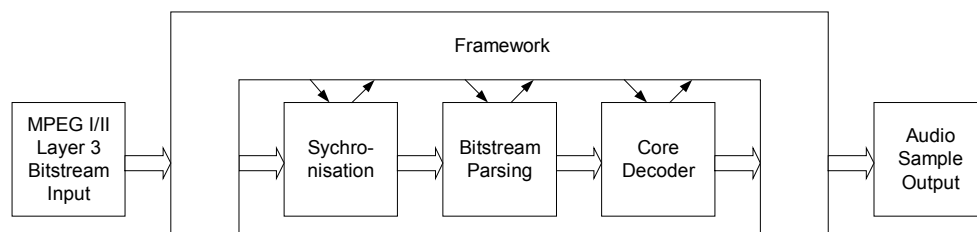


Fig. 1: Decoder Architecture

The decoder is subpartitioned into 3 different layers:

- The overall control framework.
This framework is provided as 'C' source code and defines the control flow in the MP3 decoder. The distribution includes sample framework code for general purpose "file player" type applications. This code may be tailored for application specific requirements, control flow and error handling.
- The input and output "plug-ins".
Generic implementation and sample code for "file I/O" is provided as 'C' source code. This code may be adapted or re-written to connect the MP3

decoder to the system environment, e.g. to receive data over a serial link and to “play” audio data using a D/A converter.

- The MP3 core decoder functions.
These parts are provided as object code only and implement the core MP3 decoder. The core decoder functions are subdivided into a number of stages (like sync detection, bitstream parsing and decoding), controlled and linked together by the framework code. Data flow within the core decoder is not made visible to the framework, but all relevant information (like status, bitstream and program information) is provided.

All MP3 decoder specific functions are clearly de-coupled from the application. This enables the system integrator to adapt this decoder into its application or system specific environment, without tampering the core decoder functionality.

3 Core Decoder Specification

The decoder is designed to handle “error-free” MPEG-1/2, Layer 3 bitstreams. Additional error concealment *may* be implemented by the user as part of the control framework.

Characteristics	Full Layer 3 ISO/IEC 11172-3 audio decoder with un-limited accuracy
Supported Layers	Layer 3 only
Supported Modes for Layer 3	<ul style="list-style-type: none"> – stereo – joint stereo (intensity stereo and/or MS stereo) – dual channel – single channel
Bit Rates (kBits/s)	<ul style="list-style-type: none"> – 32, 40, 48, 56, 64, (...), 320 kbits/s (MPEG-1, see ISO/IEC 11172-3) – 8, 16, 24, 32, 40, 48, (...), 160 kbits/s (MPEG-2, see ISO/IEC 13813-3) – 8, 16, 24, 32, 40, 48, 56, 64 kbits/s (“MPEG-2.5” extension) – free format (MPEG-1/2, fixed bit rate)



Sampling Rates (kHz)	– 44.1, 48, 32 (MPEG-1, see ISO/IEC 11172-3) – 20.05, 24, 16 (MPEG-2, see ISO/IEC 13813-3) – 11.025, 12, 8 ("MPEG-2.5" extension)
Bitstream Formats	format specified in ISO/IEC 11172-3 (MPEG-1) and ISO/IEC 13813-3 (MPEG-2) plus "MPEG- 2.5" extensions
Multi-Channel audio	not supported
Multi-Lingual capabilities	not supported
CRC protection checking	disabled

4 Software Environment

The MetaWare tools for ARC are required to compile and link the 'C' source code and object code modules provided as part of the MP3 decoder distribution. Requires tools version 4.3 or later.