# Proposal for a Default Formats Register

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Overview

The purpose of a defaults formats register is for a device to advertise in the discovery packet what audio (and or video) formats it can handle by default without having a controller have to enumerate all the formats. With this information, a controller can connect two devices easily without full enumeration. This is similar to the "Level 1"[1] connection management that was employed for AVC firewire devices. This is meant to be a limited subset of what a device can support, not an complete list. This format bit map will allow for simple connections to happen between devices whose defaults format registers match certain bit patterns. It is assumed for audio devices that all samples are 24bit LPCM left justified in a 32bit word. Smaller bit depths can be accommodated by left justifying the sample and zero filling the lsb's.

Default Formats Register
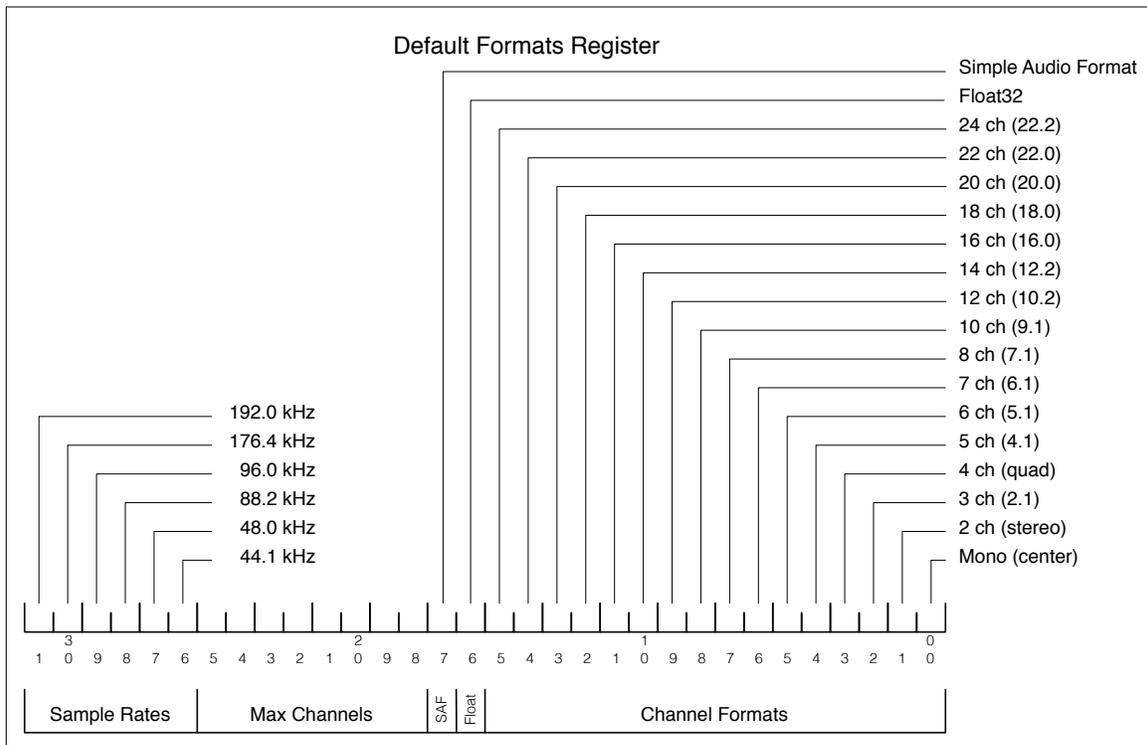
Field Definitions

Sample Rates: a bit set in this 6 bit field indicates that this sample rate is supported at all the channel formats specified in the **Channel Formats** field.

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[1] Level 1 connection management (CM) connected isochronous streams between devices at its default format with stream connection order indicating clock master relationship. Level 2 CM was full device enumeration and CM and clock routing.

Channel Formats: a bit set in this 16 bit field indicates that this specific channel format is supported at the sample rates indicated in the **Sample Rates** field. It is important to note that this is an inclusive list with the sample rates. If the device supports 192kHz but the channel count goes down at this sample rate, only report the channels formats supported at all rates indicated. If no bits are set in the **Channel Formats** field, then the **Max Channels** field is used to indicate that the device can handle any number of channels up to **Max Channels**.

The channel layouts specify the channel naming and ordering rules as defined by AES-XXXX or Dolby-XXXX

Max Channels: an 8 bit field that contains the maximum number of channels this device can accept in a stream irregardless of the channel formats specified. This is to allow a device to specify the largest stream it can receive even if that stream is larger than the device reports in the **Channel Formats** field. This is to allow a larger channel format stream to be received and the device picks (or is told) which of the channels to actually render.

SAF: this 1 bit field specifies that this device can also handle Simple Audio format as well as 61883-6 audio packet types. This bit not set indicates that it only supports 61883-6 as the default format.

Float: this 1 bit field specifies that this device can also handle Float32 format audio samples as well as LPCM. This bit not set indicated that it only supports LPCM as the default format.

Recommended practices

For optimal connections scenarios, a simple rule should be followed to allow maximum connectivity between devices. The rule is "talkers may be selective while listeners should be receptive". The more flexible the listeners are at accepting a large number of sample rates and formats the more they allow for compatible connection opportunities.

For example, a microphone can chose a single sample rate to transmit and a mixer or amplifier should support multiple sample rates and channel formats. A personal computer can be very flexible in allowing connection to almost any type of device.

Clocking routing is defined by connection order. The first stream direction connected implies master clock stream.

Connections

Once received, the same Default Format Register is sent back (via SCMP to be described later) to the device for a connection to start with one sample rate bit enabled,

the **Max Channels** set to the number of channels in the stream that the device should transmit or receive and one format bit set. If the device had no bits set in the **Channel Formats** field to begin with, then the **Channel Formats** field shall have no bits set and the **Max Channels** field indicates the number of channels to render.

Default Video Formats Register

Video devices usually support an even more limited format range than audio devices have to support. A video device like a web cam, can support a number of resolutions but the transport is usually fixed (IIDC). Below is a defaults format register definition for video devices.
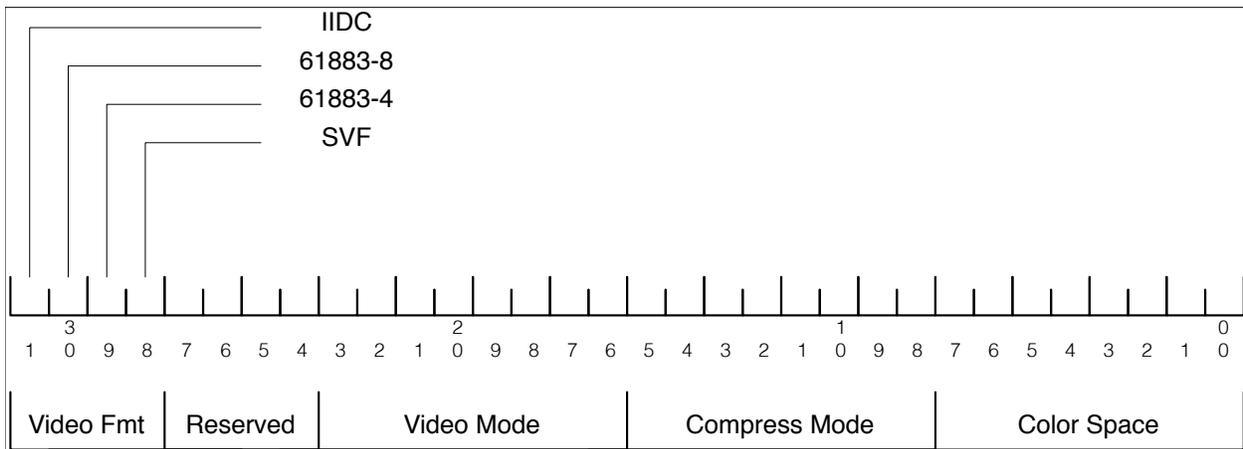
The video format register follows the tables in section 5.2 of the 61883-8 (BT-601) specification for the bottom 3 bytes labeled Video Mode, Compress Mode and Color Space.

The Video Fmt field defines the type of video, either IIDC, BT-601, MPEG or Simple Video Format.

To start a video stream, one of the Video Fmt bits has to be set and the appropriate values for each section filled in.

On the reception of the register in the SDP packet, the Video Mode listed is the default or preferred format.