



# BACCH SDK Product Brief

**v2.0**

**April 5, 2022**

## 1 BACCH SDK Overview

The BACCH SDK provides the patented BACCH 3D Sound processing technologies as a single library giving developers the ability to easily enable their application with BACCH's immersive spatial processing technologies.

The v2.0 SDK supports multiple platforms, includes several BACCH 3D Sound profiles, and is complete with documentation and example applications with source for each of the supported platforms.

### 1.1 Included BACCH 3D Sound profiles(filters)

A limited number of universal filters are available via download with the BACCH SDK, including:

- Universal BACCH Speakers
- 3D Soundstage for Headphones
- Virtual Speakers for Headphones

BACCH regularly develops new filters measured for specific devices and adds them to a digital filter library. A current list of available filters can be found at <https://sbacch.bacch.com/sound-profiles>

To request a measured filter for your device, email [sales@bacch.com](mailto:sales@bacch.com).

### 1.2 Supported platforms

- Android: 8.0 (Oreo) and later
- Apple
  - iOS: 12.0+
- Mac OS X: 10.13+
- AppleTV: tvOS 12.0+
- Mac Catalyst: UIKit for macOS
- Windows: Windows 10
- Linux (Intel/AMD/ARM)



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- Ubuntu 14.04 LTS
- Ubuntu 18.04 LTS
- Debian 10.5
- RaspberryPi 3 A+
- NanoPi Neo

### 1.3 Documentation

Documentation for the SDK and supported platforms can be accessed via <https://developer.bacch.com> (valid account required)

### 1.4 Licensing

There are a two licensing options which are flexible enough to be adjusted depending on client implementation and requirements.

#### **End-user licensing**

- describes licenses that are to be purchased and used by individuals to gain access to a product that incorporates the BACCH native library
- system comprised of multiple services designed to issue, manage and verify end-user licenses
- includes both trial and paid subscription types
- a mix of offline and online license validation

#### **Third-party application and OEM licensing**

- describes application-wide licenses where a single license is issued for a single client application and it provides that application access to the BACCH library
- possibility of offline-only validation depending on implementation and requirements

### 1.5 Remote filter management

This SDK feature allows querying and downloading of BACCH universal as well as device-specific filters from our remote service.

- through the library API any client can look-up filters for a particular audio output device based on a known set of device identifiers for each device
- based on the look-up response the library API can be leveraged to download the found filters locally so that they can be used with the library



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### 1.6 SDK Packages

Platform specific SDK packages contain necessary header files, shared libraries, and example applications and are available with a valid account. There is a downloadable support package for each of the supported platforms.

Example Applications:

- Android: fully featured media player based on ExoPlayer (<https://github.com/google/ExoPlayer>) that demonstrates integration of BACCH technologies with the ExoPlayer Audio Processor Extension. This example application also demonstrates configuration of the BACCH library when device orientation or audio output device/routing changes.
- Apple: embedded audio playback application that demonstrates the use of BACCH's AudioUnit (AUv3) processing extension for Apple platforms.
- Windows and Linux variants: command line-based applications which demonstrate the integration of BACCH's technology using the BACCH API.

### 1.7 BACCH 10 Implementation

The BACCH SDK v2.0 includes full support for BACCH 10 filters, a vast improvement to BACCH 3D Sound, making any BACCH 3D image tonally transparent, natural, and exceptionally cohesive. The very few criticisms of previous BACCH filters have been resolved. Some of these improvements are as follows:

- True linear frequency response for BACCH filters with absolutely no dynamic range loss or tonal distortion.
- Center Channel Convolution that seamlessly reintegrates the center channel into the BACCH filter.
  - Improved preservation of common signal, more consistently and cohesively keeping the entire image right in front of the listener, including the center.

### 1.8 Changes between v1.0 and v2.0

- Prior to v2.0 a rudimentary licensing system was in place. The v2.0 licensing system is more advanced and allows for multiple use-cases as described in the relevant section above.
- Previously, filters were most often embedded within SDK builds. The SDK now allows querying and downloading of filters from our remote service. Details of this new mechanism are described in the relevant section above.
- The BACCH SDK v2.0 includes full support for BACCH 10 filters.