Record with OBS Studio

The biggest challenge when recording from an Android TV Box (video streaming hardware) is to record video and surround sound in sync. I tried several ways of doing this and found one which allows me to do it in one recording without too expensive hardware. I have not found a video capture card on the market which allows to record a protected video stream or multi-channel surround sound.

Note: This guide is not intended to teach you how to circumvent copy protection. Make sure the source or service you are recording from allows you to make a copy for your own use before you record. Creating multiple copies or selling copies is prohibited by law.

Settings

Gear

- Media Player: Nokia Streaming Box 8010 or Xiaomi Mi Box S 4K Android streaming and video player
- BDP: OPPO UDP-203 4K Ultra HD Bluray Disc Player (player with HDMI passthrough and analog surround 7.1 audio outputs)
- Handheld App: Remote Control App
  https://oppodigital.com/blu-ray-udp-203/blu-ray-udp-203-Support.aspx or
  https://apkcombo.com/oppo-udp-20x-mediacontrol/com.oppo.oppomediacontrol/download/apk
- Video Capture: Blackmagic *Intensity Pro* 4K PCI-e capture card
- USB Audio: ESI *U86XT* USB audio interface
- Isolator: Conext Link AD104 RCA Stereo 2 Channel Ground Loop Isolator Signal Noise Filter Suppressor (avoid ground loop)
- NoHDCP: UGREEN 40281 HDMI Audio Extractor (disable HDCP)

With this setup you can record video and 5.1 or 7.1 audio at the same time.

Approximate cost of equipment:

- Android TV streaming box: 70 USD
- Disc Player: 1000 USD (you need to find a premium player or another device with HDMI passthrough and analog surround audio outputs)
- Multi-channel USB audio interface: 300 USD (with 6 or 8 analog inputs)
- Ground Loop Isolators: 30 USD (for 6 channels)
- HDMI to HDMI converter: 30 USD (to remove HDCP)
- TOTAL: less than 1500 USD

Connection diagram

flowchart LR; Isolator["Ground Isolator"]; Capture["Video Capture"]; USBaudio["USB Audio"]; Box["Android TV"]; Box--HDMI-->NoHDCP; NoHDCP--HDMI-->BDP; BDP--"FL/FR C/SW SL/SR $^{(6ch\ RCA)}$"-->Isolator; BDP--HDMI-->Capture; Capture--"PCI-e or USB"-->PC; Isolator--"FL/FR C/SW SL/SR $^{(6ch\ RCA)}$"-

->USBaudio; USBaudio--USB-->PC; click PC "#software"

<u>Notes</u>:

- The UDP needs to be set to *Source Direct* to pass through the video to the capture card.
- Instead of this UDP you can utilitze any 5.1 pre-amplifier which supports an audio codec currently used by *Netflix*, *Disney+*, *Amazon Prime*, *HBO Go*, etc. If you use a pre-amplifier with variable output volume make sure you adjust the volume so you don't need to post-process amplification to it.
- While *Netflix* has a desktop client from which you could separately record 5.1 audio, other streaming clients on Windows do not have this feature.

Steps

1. Switch on Media Player
2. Switch on Disc Player
3. Set Disc Player to HDMI in with remote or handheld app

Software

- *OBS Studio* 27.2.4
- *HandBrake* 1.5.1 (GUI and CLI version)
- *SMPlayer* 22.2.0.10060

Desktop Audio 5.1

- Video: none
- Audio: Windows 10 App

FHD Surround 5.1 (Intensity Pro)

- Video: Mi Box S → 40281 (HDMI) → Intensity Pro (HDMI)
- Audio: Mi Box S → 40281 (SPDIF) → AVR-4308 (5.1 through Pre Out) to U86XT (Line IN 1-6)
- Make sure you connect the U86XT through a Ground Loop Isolator to the AVR to avoid ground loop issues while recording
- Set the AVR-4308 to volume -10 dB

VHS Stereo (Intensity Pro)

- Video: HR-S6711EU (composite) → Intensity Pro (Y - green)
- Audio: HR-S6711EU (stereo) → Intensity Pro (RCA)
- Audio monitor: HR-S6711EU (stereo) → AVR-4308

OBS Studio

Settings

- Output
  Hint: Chose *Simple* or *Advanced*, not both, then save. *Simple* is good for lossless recording of both video and audio. *Advanced* is only necessary for some special use cases.
    - Output Mode: Simple
        - Recording Path
        - Recording Quality: Lossless Quality
    - Output Mode: Advanced
        - Type: Custom Output (FFmpeg)
        - File path or URL
        - Container Format: matroska
        - Audio Bitrate: 256 Kbps
        - Audio Track: 1
        - Audio Encoder: pcm_s16le
- Audio
    - Sample Rate: 48 kHz
    - Channels: 5.1 or Stereo
- Video
    - Base (Canvas) Resolution: 1920×1080
    - Output (Scaled) Resolution: 1920×1080
    - Downscale Filter: [no downscaling required]
    - Common FPS Values: 60

Properties Intensity Pro 4K

- Video Connection: HDMI
- Audio Connection: Analog RCA (we do not record the audio stream)

Properties ESI U86 XT

- Device: U86 Multichannel 8 (ESI Audio Device (WDM) - U86)
- Advanced Audio Properties - Sync Offset: -120ms
- Advanced Audio Properties - Tracks: 1

Filters

- Limiter: Threshold -1.00 dB, Release 60 ms

Deinterlacing

- Disable

How Tos

- Prevent Clipping
- Profiles and Scene Collections
- How to transfer your VHS to Computer
- How to record high quality Wav audio in OBS ?
- Correct settings for capturing VHS
- 5 Best Ways to Deinterlace Video in 2022
- How To Properly De interlace Videos To 50 or 60 Fps Progressive

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