

Moode Audio Pi4B – Topping D90SE DAC Tips and Tricks.

Pi4B to Topping D90SE via USB

1. Short 0.5M USB Cable on Blue USB connector on Pi

I've tried several "Audiophile" grade cables and there was no difference to my chosen cable. In fact some were worse. Not sure if they meet the USB cable specs. That's important. Use the USB 3 port and make sure nothing else is on the same USB controller on the Pi:

```
pi@nagra:~$ lsusb -tv
/: Bus 02.Port 1: Dev 1, Class=root_hub, Driver=xhci_hcd/4p, 5000M
   ID 1d6b:0003 Linux Foundation 3.0 root hub
/: Bus 01.Port 1: Dev 1, Class=root_hub, Driver=xhci_hcd/1p, 480M
   ID 1d6b:0002 Linux Foundation 2.0 root hub
   |__ Port 1: Dev 2, If 0, Class=Hub, Driver=hub/4p, 480M
      ID 2109:3431 VIA Labs, Inc. Hub
      |__ Port 2: Dev 6, If 0, Class=Audio, Driver=snd-usb-audio, 480M
         ID 152a:8750 Thesycon Systemsoftware & Consulting GmbH
      |__ Port 2: Dev 6, If 1, Class=Audio, Driver=snd-usb-audio, 480M
         ID 152a:8750 Thesycon Systemsoftware & Consulting GmbH
      |__ Port 2: Dev 6, If 2, Class=Application Specific Interface, Driver=,
480M
         ID 152a:8750 Thesycon Systemsoftware & Consulting GmbH
      |__ Port 2: Dev 6, If 3, Class=Human Interface Device, Driver=usbhid,
480M
         ID 152a:8750 Thesycon Systemsoftware & Consulting GmbH
```

2. Use a standard Pi power supply.

I tried a few Linear PSU and some sounded worse. So I'm back on the base standard for now. Note my mains power is via a dedicated ring main circuit.

Pi4b

1. Make sure all non essential hardware / software is disabled.

Video controllers, I/O ports etc.

Moode:

1. Music Library is NFS mounted

2. MPD SoX Resampling. 24 bit / 384 gives:

Input / Output

- Source format FLAC 24 bit 48 kHz, Stereo
- Decoded to PCM 24 bit 48 kHz, Stereo, 1.776 Mbps
- Output format PCM 32 bit 384 kHz, Stereo, 24.576 Mbps
- ALSA mode Direct (plughw)
- Audio chain MPD → Parametric EQ → plughw → Device

DSP operations

- Resampling 24Bit, 384kHz, Stereo
- Quality very high
- Selective Source < target rate
- Parametric EQ On

- CamillaDSP Off
- Volume type Fixed (0dB output)
- Volume levels Knob 0, ALSA none, CDSP -120dB

Audio Device

- Device D90SE
- Mixer name n/a
- Interface USB
- Formats S32_LE, SPECIAL, DSD_U32_BE
- Pi model Pi-4B 1.5 4GB

DSD support

Format
Native DSD (Default) ⓘ

Silence before stop
No ⓘ

Thesycon patch
No ⓘ

SoX Resampling

Enabled
Yes ⓘ

The Selective resampling option will appear when SoX is enabled and a sample rate is specified.

Bit depth
24 ⓘ

Sample rate (kHz)
384 ⓘ

Channels
Stereo ⓘ

Selective resampling
Upsample if source < tar ⓘ

Selected: Upsample if source < target rate

Quality
Very high ⓘ

Individual quality parameters will appear when Quality is set to "Custom recipe".

Multithreading
Yes ⓘ

Set the Multithreading to Yes.

Set gain to off as volume is controlled from the DAC

Gain and Normalization

- ReplayGain ⓘ
- ReplayGain preamp ⓘ
- Normalize volume ⓘ

Resource allocation

- Audio buffer (MB) ⓘ
- Output buffer (MB) ⓘ
- Max Queue items ⓘ
- Input cache ⓘ

HTTP Proxy

- Server ⓘ
- Userid ⓘ
- Password ⓘ ⓘ

Other options

- Log level ⓘ
- Device buffer (ms) ⓘ
- Device period (ms) ⓘ

Audio Output

Select from Pi HDMI/Headphone, I2S or USB audio devices. These settings can

Output device

2: D90SE

SCAN



Volume type

Fixed (0dB)



Set volume to a low level before changing these options

Named I2S device

None

or DT overlay

None

After setting a device or overlay, reboot and then select

Driver options

None available



Chip options

EDIT

ALSA Options

Advanced Linux Sound Architecture (ALSA) is a software framework and part of

Max volume



Output mode

Direct



ALSA: hw:2,0

Loopback

☐

OFF



Multiroom

CONFIGURE

Equalizers

The Equalizers are supported by MPD, AirPlay, Spotify and Bluetooth inbound. They are mutually exclusive. Enabling one will disable the others.

CamillaDSP

Off



Signal processing is off

EDIT

CamillaDSP settings

Parametric EQ

Default curve



EDIT

EQ curve

Graphic EQ

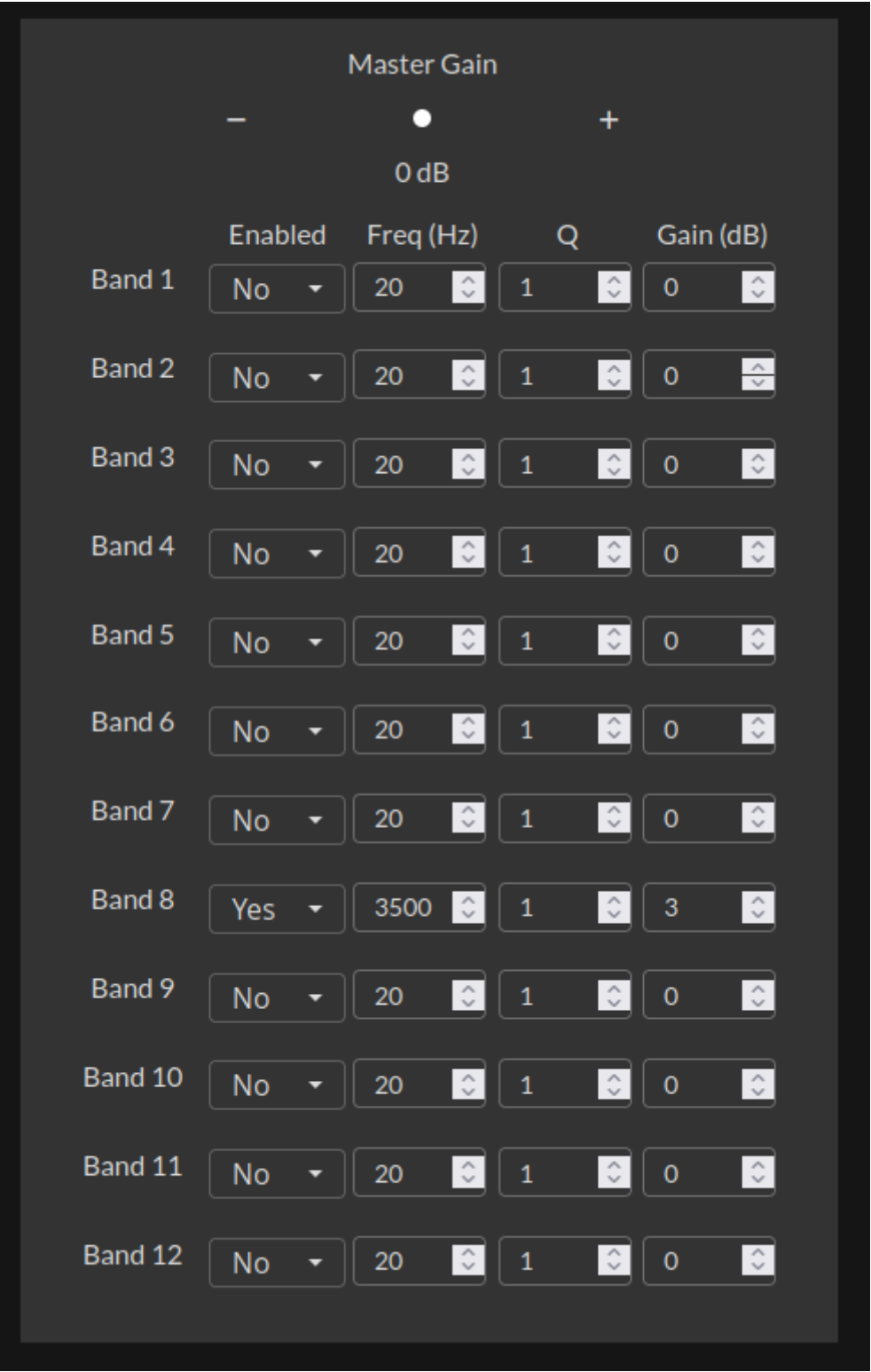
Off



EDIT

EQ curve

Yes I have the Parametric EQ on I've tweaked the filter after having an interesting discussion with a Sound Engineer mate. It can be quite an revelation to those that don't realise how little tweaks can change the sound stage and overall presentation.



System information

H A R D W A R E A N D O S

mo0de release = 9.0.8 2024-08-21
RaspiOS = 12.5 Bookworm 64-bit
Linux kernel = 6.6.31 64-bit
Pi model = Pi-4B 1.5 4GB
Architecture = aarch64 (64-bit)
Home directory = /home/pi
System uptime = up 23 hours, 5 minutes
Timezone = Europe/London

Current time = 2024-09-18 06:29:16

Host name = nagra
Ethernet address = 192.180.0.38
Ethernet MAC = d8:3a:dd:72:9c:8e
WLAN address = unassigned
WLAN MAC = no adapter
WLAN country = US
WLAN AP SSID = Moode
WLAN AP addr = 172.24.1.1/24

SoC identifier = bcm2711
Core count = 4
Kernel timer freq = 250 Hz
Warranty = OK

RootFS size = 27.9G
RootFS used = 3.9G
RootFS available = 22.6G
Memory total = 3883 MB
Memory free = 3453 MB
Memory used = 430 MB
SoC temperature = 42.4°C
Throttled bitmask = 0x0
Throttled text = No throttling has occurred

Worker responsiveness = Default
CPU governor = ondemand
PCI express = Off
Reduce power = Off (Pi-5 only)
Pi integrated WiFi = Off
Pi integrated BT = Off
HDMI output = On
LED state = 1,1
IP addr timeout = 90 (secs)
Ethernet check = No
HTTPS mode = Off
SSH term server = Off

SMB file sharing = Off
NFS file sharing = Off
NFS access =
NFS options = rw,sync,no_subtree_check,no_root_squash

PHP-FPM version = 8.2.18
NGINX version = 1.22.1
SQLite3 version = 3.40.1
Python version = 3.11.2
Nodejs version = Not installed
PyLGPIO version = 0.2.2

A U D I O C O N F I G U R A T I O N

Audio device = D90SE
Interface = USB
Mixer name = none
Hardware mixer = No
Supported formats = S32_LE, SPECIAL, DSD_U32_BE
ALSA max volume = 100
ALSA output mode = Direct (hw)
ALSA loopback = Off
MPD max volume = 100
Volume step limit = 5
Display dB volume = Off
Audio source = Local
Output device = Local
Resume MPD = No
Volume knob = 0
Volume mute = Unmuted
Saved MPD vol = -1
Preamp volume = 0
ALSA version = 1.2.8-1+rpt1
SoX version = 0.1.3-4
CDSP verion = 2.0.1

Bluetooth controller = Off
AirPlay receiver = Off

Spotify receiver	= Off
Squeezelite	= Off
UPnP client	= On
DLNA server	= On
Plexamp	= Not installed
RoonBridge	= Not installed
GPIO button handler	= Off
Multiroom sender	= Off
Multiroom receiver	= Disabled

Auto-shuffle	= Off
Ashuffle mode	= Track
Ashuffle window	= 7
Ashuffle filter	= None
Autoplay	= Off
Rotary encoder	= Off
Encoder params	= 100 2 3 23 24
USB volume knob	= Off
Polarity inversion	= Off
Crossfeed	= Off
Crossfade	= Off
Parametric EQ	= On
Graphic EQ	= Off
CamillaDSP	= off
CamillaDSP volsync	= Off
MPD httpd	= Off
Ignore CUE files	= No

P R E F E R E N C E S

Appearance

Theme	= Default
Accent color	= Carrot
Alpha blend	= 0.75
Adaptive background	= No
Background image	= No
Cover backdrop	= Yes
Cover blur	= 5px
Cover scale	= 1.25
Renderer backdrop	= Yes
Font size	= Normal
Native lazyload	= Yes

Playback

Show Queue thumbs	= Yes
Show Now-playing icon	= Waveform
Show CoverView playbar	= Yes
Show extra metadata	= encoded,output,track,date,composer
Search site	= Google
Playback history log	= No

Library

One touch album	= Show tracks
One touch radio	= Play
One touch playlist	= Show items
One touch ralbum	= No action
Albumview sort order	= by Artist/Year
Tagview sort order	= by Album/Year
Track play	= Track
Recently added	= 1 Month
Show sample rate	= HD only
Cover search pri	= Embedded cover
Pixel ratio	= 1
Thumbgen scan fmts	= Default
Thumbnail resolution	= 600px,60
Thumbnail columns	= 6/2 (Default)

Library (Advanced)

Tag view genre	= Genre
Tag view artist	= Artist
Album key	= Album@Artist (Default)
Include comment tag	= No
Library filter	= full_lib

Library filter str =
Ignore articles = a,an,the
Show tagview genres = Yes
Show tagview covers = Yes
Ellipsis limited text = No
UTF8 character filter = No

CoverView

Timed display = Never
Automatic display = Off
Backdrop style = Gradient (Linear)
Display mode = Cover art
Layout = Default
Extra metadata = Yes

R A D I O M A N A G E R

Sort tag = Name
Group method = No grouping
Show mo0de stations = No action
Show other stations = No action
Stream monitor = Off

P L A Y L I S T M A N A G E R

Sort tag = Name
Group method = No grouping

M P D

Version = 0.23.14
Volume type = none
SoX resampling = 384000:24:2
Selective resampling = Upsample if source < target rate
SoX quality = very high
SoX multithreading = on
DSD over PCM (DoP) = no
Replaygain = off
Replaygain preamp = 0
Volume normalization = no
Audio buffer = 16 (MB)
Output buffer size = 256 (MB)
Max playlist items = 16384
Input cache = 256 MB
Device buffer = 500 (ms)
Device period = 125 (ms)

B L U E T O O T H

Version = 5.66
Bluealsa = v4.2.0
Pi-Bluetooth = 0.1.20
Pairing agent = 2.0 (bluez-tools)
PIN code = None
ALSA max volume = 100%
CDSP max volume = 0 dB
Resume MPD = No
PCM buffer time = 500000 (µs)
ALSA output mode = Default (_audioout)

A I R P L A Y

Version = 4.3.3
Friendly name = Nagra AirPlay
Interpolation = soxr
Output bit depth = S16
Output sample rate = 44100
Session interruption = no
Session timeout = 120 (ms)
Latency offset = 0.0 (secs)
Audio buffer = 0.2 (secs)
Resume MPD = No

S P O T I F Y C O N N E C T

Version = 0.4.2

Friendly name = Nagra Spotify
Bitrate (kbps) = 320
Format = S16
Dither = Automatic (Default)
Volume curve = log
Volume range (dB) = 60
Initial volume (%) = 0
Volume normalization = No
Method = dynamic
Gain type = auto
Pregain (dB) = 0
Threshold (dBFS) = -2
Attack (ms) = 5
Release (ms) = 100
Knee = 1
Autoplay = No
Resume MPD = No

S Q U E E Z E L I T E

Version = 1.9.9-1449 "DSD/SRC enabled"
Friendly name = Nagra
ALSA device = _audioout
ALSA params = 80:4::1
Output buffers = 40000:100000
Task priority = 45
Codec list = flac,pcm,mp3,ogg,aac,alac,dsd
Other options = -W -D 500 -R E -S /var/local
Resume MPD = No

L O C A L D I S P L A Y

Local UI display = Off
Wake display on play = On
Mouse cursor = Off
On screen keyboard = Enable
Screen blank = 1200 Secs
HDMI CEC = off
HDMI 4K 60Hz = off
Brightness = 255
Pixel aspect ratio = Default
Rotate screen = 0 Deg

M O O D E S T A R T U P L O G

20240917 072400 worker: --
20240917 072400 worker: -- Start moOde 9 series
20240917 072400 worker: --
20240917 072400 worker: Successfully daemonized
20240917 072401 worker: Wait for Linux startup
20240917 072407 worker: Linux startup complete
20240917 072407 worker: Boot config is ok
20240917 072407 worker: Cleaned cfg_radio (238)
20240917 072407 worker: Session loaded
20240917 072411 worker: Package locks applied
20240917 072412 worker: File check complete
20240917 072412 worker: Debug logging off
20240917 072412 worker: --
20240917 072412 worker: -- System
20240917 072412 worker: --
20240917 072413 worker: Host name: nagra
20240917 072413 worker: RPi model: Pi-4B 1.5 4GB
20240917 072413 worker: moOde release: 9.0.8 2024-08-21
20240917 072413 worker: RaspiOS: 12.5 Bookworm 64-bit
20240917 072413 worker: Linux Kernel: 6.6.31 64-bit
20240917 072413 worker: MPD version: 0.23.14
20240917 072413 worker: User id: pi
20240917 072413 worker: Home folder: /home/pi
20240917 072413 worker: Time zone: Europe/London
20240917 072413 worker: Kbd layout: gb
20240917 072413 worker: HDMI ports(s): on
20240917 072413 worker: HDMI-CEC: off
20240917 072414 worker: Sys LED0: on
20240917 072414 worker: Sys LED1: on
20240917 072414 worker: Reduce power: n/a
20240917 072414 worker: CPU governor: ondemand
20240917 072414 worker: Integ audio: vc4-kms-v3d

```
20240917 072414 worker: --
20240917 072414 worker: -- Network
20240917 072414 worker: --
20240917 072414 worker: Eth0
20240917 072414 worker: Ethernet: adapter exists
20240917 072414 worker: Ethernet: timeout off
20240917 072414 worker: Ethernet: method dhcp
20240917 072414 worker: Ethernet: address 192.180.0.38
20240917 072414 worker: Ethernet: netmask 255.255.255.0
20240917 072414 worker: Ethernet: gateway 192.180.0.254
20240917 072414 worker: Ethernet: pri DNS 192.180.0.254
20240917 072414 worker: Ethernet: domain poodle.net
20240917 072414 worker: Wlan0
20240917 072414 worker: Wireless: adapter does not exist
20240917 072414 worker: --
20240917 072414 worker: -- File sharing
20240917 072414 worker: --
20240917 072414 worker: SMB file sharing: off
20240917 072414 worker: NFS file sharing: off
20240917 072414 worker: DLNA file sharing: on
20240917 072414 worker: --
20240917 072414 worker: -- Special configs
20240917 072414 worker: --
20240917 072414 worker: Plexamp: not installed
20240917 072414 worker: RoonBridge: not installed
20240917 072414 worker: Allo Piano 2.1: not detected
20240917 072414 worker: Allo Boss 2: not detected, OLED script ok
20240917 072414 worker: IQaudIO AMP*: not detected
20240917 072414 worker: --
20240917 072414 worker: -- ALSA debug
20240917 072414 worker: --
20240917 072414 worker: Cards: 0:vc4hdmi0 1:vc4hdmi1 2:D90SE 3:empty
20240917 072414 worker: 4:empty 5:empty 6:empty 7:empty
20240917 072414 worker: Mixers: 0:(PCM) 1:none 2:none 3:none
20240917 072414 worker: 4:none 5:none 6:none 7:none
20240917 072414 worker: --
20240917 072414 worker: -- Audio configuration
20240917 072414 worker: --
20240917 072414 worker: Audio device: 0:D90SE
20240917 072414 worker: ALSA card: has been reassigned to 2 from 0
20240917 072415 worker: MPD config: updated
20240917 072415 worker: ALSA output: USB
20240917 072415 worker: ALSA mode: Direct (hw)
20240917 072415 worker: ALSA mixer none exists
20240917 072418 worker: ALSA volume: controller not detected
20240917 072418 worker: ALSA maxvol: 100%
20240917 072418 worker: ALSA loopback: off
20240917 072418 worker: MPD mixer Fixed (0dB)
20240917 072419 worker: Audio formats: S32_LE, SPECIAL, DSD_U32_BE
20240917 072419 worker: CamillaDSP: off
20240917 072419 worker: CDSP volume: 0dB
20240917 072419 worker: CDSP volrange: 60dB
20240917 072419 worker: --
20240917 072419 worker: -- MPD startup
20240917 072419 worker: --
20240917 072419 worker: MPD service: started
20240917 072419 worker: MPD port 6600: accepting connections
20240917 072419 worker: MPD ALSA Default: on
20240917 072419 worker: MPD ALSA Bluetooth: off
20240917 072419 worker: MPD HTTP Server: off
20240917 072419 worker: MPD volume: 0
20240917 072419 worker: Saved MPD vol: -1
20240917 072419 worker: Saved SRC vol: 0
20240917 072419 worker: MPD crossfade: off
20240917 072419 worker: MPD ignore CUE: no
20240917 072419 worker: MPD CDSP volsync: off
20240917 072419 worker: --
20240917 072419 worker: -- Music sources
20240917 072419 worker: --
20240917 072419 worker: USB drives: none
20240917 072419 worker: NVMe drives: none
20240917 072419 worker: NAS source: Plexlib-Music (nfs)
20240917 072419 worker: --
20240917 072419 worker: -- Feature availability
20240917 072419 worker: --
20240917 072419 worker: Input select: available, Source: MPD, Output: D90SE
```

20240917 072419 worker: Bluetooth: available, PIN: None, ALSA/CDSP maxvol: 100%/0dB, ALSA outmode: Standard
20240917 072419 worker: AirPlay: available
20240917 072419 worker: Spotify Connect: available
20240917 072419 worker: Squeezelite: available
20240917 072419 worker: UPnP client: started
20240917 072419 worker: Plexamp: not installed, ALSA maxvol: 100%
20240917 072419 worker: RoonBridge: not installed
20240917 072419 worker: Multiroom: available
20240917 072419 worker: GPIO buttons: available
20240917 072419 worker: HTTPS mode: available
20240917 072419 worker: Stream recorder: n/a
20240917 072419 worker: --
20240917 072419 worker: -- Peripherals
20240917 072419 worker: --
20240917 072422 worker: Local display: off
20240917 072422 worker: HDMI 4K 60Hz: off
20240917 072422 worker: On-screen kbd: off
20240917 072422 worker: Rotary encoder: off
20240917 072422 worker: USB volume knob: off
20240917 072422 worker: LCD updater: off
20240917 072422 worker: --
20240917 072422 worker: -- Miscellaneous
20240917 072422 worker: --
20240917 072422 worker: Software update: Automatic check off
20240917 072422 worker: Auto-CoverView: off
20240917 072422 worker: CoverView timeout: Never
20240917 072422 worker: Auto-shuffle: off
20240917 072422 worker: Auto-play: off
20240917 072422 worker: Web SSH server: off
20240917 072422 worker: Maintenance task: 360 mins
20240917 072422 worker: Current view: reset to Playback
20240917 072422 worker: Active flags: all false
20240917 072422 worker: Reset flags: skipped
20240917 072422 worker: Session check: ok
20240917 072422 worker: --
20240917 072422 worker: -- Startup complete
20240917 072422 worker: --
20240917 072422 worker: Mount monitor: started
20240917 072422 worker: Radio monitor: off
20240917 072422 worker: Watchdog monitor: started
20240917 072422 worker: Responsiveness: Default
20240917 072422 worker: Ready
20240917 132005 worker: Job mpdcfg
20240917 133111 worker: Job mpdcfg
20240917 133348 worker: Job alsa_output_mode
20240917 133413 worker: Job alsa_output_mode
20240917 134127 worker: Job mpdcfg