

Audio Chain Fix for HiFiBerry AMP100

Problem

Audio was not playing despite AMP100 being configured. The audio chain was broken at multiple points.

Solution

Created a comprehensive fix script that ensures:

1. AMP100 is detected correctly
2. moOde database has correct card number
3. ALSA ` _audioout.conf` points to AMP100
4. MPD is configured to use the correct device
5. Volume is unmuted and set to safe level
6. MPD is restarted to pick up changes

Files Created

1. Fix Script

Location: scripts/audio/fix-audio-chain.sh

Also installed to: /usr/local/bin/fix-audio-chain.sh (on Pi)

What it does:

- Detects AMP100 card number
- Updates moOde database (`cardnum`, `i2sdevice`, MPD `device`)
- Fixes ALSA ` _audioout.conf` to point to `plughw:0,0` (or correct card)
- Unmutes and sets safe volume (50%)
- Restarts MPD
- Verifies audio chain

Usage:

```
cd ~/moodeaudio-cursor && ./tools/fix.sh --audio
# or directly:
sudo /usr/local/bin/fix-audio-chain.sh
```

2. Systemd Service

Location: moode-source/lib/systemd/system/fix-audio-chain.service

What it does:

- Runs automatically on boot
- Runs after `sound.target` and `mpd.service`
- Ensures audio chain is fixed before MPD starts playing

3. Validation Script

Location: scripts/audio/validate-audio-chain.sh

Also installed to: /usr/local/bin/validate-audio-chain.sh (on Pi)

What it does:

- Checks AMP100 detection

- Verifies moOde database configuration
- Checks ALSA config files
- Verifies MPD status
- Checks volume/mute state
- Provides diagnostic information

Usage:

```
/usr/local/bin/validate-audio-chain.sh
```

Integration

Deployment Methods

Method 1: After Flashing moOde Image (Current Method)

When using a downloaded moOde image and applying fixes after flashing:

1. **Flash moOde image to SD card**
2. **Mount SD card** (bootfs and rootfs)
3. **Run install script:**

```
cd ~/moodeaudio-cursor
sudo ./INSTALL_FIXES_AFTER_FLASH.sh
```

This will:

- Copy `fix-audio-chain.sh` to `/usr/local/bin/` on the SD card
- Copy `fix-audio-chain.service` to `/lib/systemd/system/` on the SD card
- Enable the service to run on boot
- Copy validation script to `/usr/local/bin/`

4. **Eject SD card and boot Pi**
5. **Audio chain will be fixed automatically on first boot**

Method 2: Custom Build

The fix script and service are automatically installed during custom image build via:

- `imgbuild/moode-cfg/stage3_03-ghettoblaster-custom_00-run-chroot.sh`
- Service is enabled automatically

Method 3: Manual Deployment (After Pi is Running)

If the Pi is already running and you need to fix audio:

Via SSH:

```
# Copy scripts to Pi
scp scripts/audio/fix-audio-chain.sh andre@192.168.10.2:/tmp/
scp scripts/audio/validate-audio-chain.sh andre@192.168.10.2:/tmp/
scp moode-source/lib/systemd/system/fix-audio-chain.service andre@192.168.10.2:/tmp/

# On Pi:
ssh andre@192.168.10.2
sudo mv /tmp/fix-audio-chain.sh /usr/local/bin/
sudo mv /tmp/validate-audio-chain.sh /usr/local/bin/
sudo mv /tmp/fix-audio-chain.service /lib/systemd/system/
sudo chmod +x /usr/local/bin/fix-audio-chain.sh
sudo chmod +x /usr/local/bin/validate-audio-chain.sh
sudo systemctl enable fix-audio-chain.service
sudo systemctl start fix-audio-chain.service
```

Or use toolbox (if already deployed):

```
cd ~/moodeaudio-cursor && ./tools/fix.sh --audio
```

How It Works

Audio Chain Flow

```
Music File
↓
MPD (Music Player Daemon)
↓
device "_audioout" (ALSA PCM device)
↓
/etc/alsa/conf.d/_audioout.conf
↓
slave.pcm "plughw:0,0" (or hw:0,0)
↓
HiFiBerry AMP100 (card 0, device 0)
↓
Speakers
```

Key Components

1. **AMP100 Detection**

- Checks `/proc/asound/cards` for `sndrpihifiberry` or `HiFiBerry AMP100`
- Determines card number (usually 0)

2. **moOde Database**

- Updates `cfg_system.cardnum` = AMP100 card number
- Updates `cfg_system.i2sdevice` = "HiFiBerry AMP100"
- Updates `cfg_mpd.device` = AMP100 card number

3. **ALSA Configuration**

- Updates `/etc/alsa/conf.d/_audioout.conf`
- Sets `slave.pcm` to `plughw:CARD,0` where CARD is AMP100 card number
- Also fixes `_peppyout.conf` if PeppyMeter is enabled

4. **Volume Control**

- Unmutes Master and PCM controls
- Sets volume to 50% (safe level)
- Sets MPD volume to 50%

5. **MPD Restart**

- Restarts MPD service to pick up configuration changes
- Waits for MPD to be ready before continuing

Troubleshooting

If audio still doesn't work:

1. **Check AMP100 detection:**

```
cat /proc/asound/cards
aplay -l
```

2. **Check boot configuration:**

```
grep hifiberry-amp100 /boot/firmware/config.txt
Should show: dtoverlay=hifiberry-amp100,automute
```

3. **Check ALSA config:**

```
cat /etc/alsa/conf.d/_audioout.conf
Should show: slave.pcm "plughw:0,0" (or correct card number)
```

4. **Check MPD status:**

```
systemctl status mpd
mpc outputs
mpc status
```

5. **Check volume:**
amixer -c 0 sget Master
amixer -c 0 sget PCM
mpc volume

6. **Test audio directly:**
speaker-test -c 2 -t sine -f 1000 -D plughw:0,0

7. **Run validation:**
/usr/local/bin/validate-audio-chain.sh

8. **Run fix again:**
sudo /usr/local/bin/fix-audio-chain.sh

Common Issues

Issue: AMP100 not detected

Solution:

- Check `dtoverlay=hifiberry-amp100` in `/boot/firmware/config.txt`
- Reboot required after overlay changes
- Check hardware connection

Issue: Wrong card number

Solution:

- Run fix script - it will detect correct card number
- Script updates database and ALSA config automatically

Issue: MPD can't open device

Solution:

- Check `_audioout.conf` points to correct card
- Restart MPD: `sudo systemctl restart mpd`
- Check MPD logs: `journalctl -u mpd -n 50`

Issue: Volume muted or too low

Solution:

- Fix script unmutes and sets volume to 50%
- Check: `amixer -c 0 sget Master`
- Unmute: `amixer -c 0 sset Master unmute`

Related Files

- `moode-source/boot/firmware/config.txt.overwrite` - Boot config with AMP100 overlay
- `moode-source/etc/alsa/conf.d/_audioout.conf` - ALSA output config template
- `moode-source/www/inc/audio.php` - moOde audio configuration functions
- `moode-source/www/inc/mpd.php` - MPD configuration functions
- `scripts/audio/check-audio-chain.sh` - Original diagnostic script (still useful)

Notes

- The fix script is idempotent - safe to run multiple times
- Service runs on boot to ensure audio chain is always correct
- Validation script provides quick diagnostics
- All scripts work from home directory: `cd ~/moodeaudio-cursor && ./tools/fix.sh --audio`