

USB-C Audio on the Pixel GKI Kernel — Missing Samsung QMI Helper

Device: Samsung Galaxy Z Fold6 SM-F956B (q6q)

Firmware: F956BXXU2BYD9 / Android 15 / One UI 7

Kernel: 6.1.124-android14-11-g33edfcbe5f65 (Pixel 7 Pro GKI with KernelSU-Next 12851)

Date: 31 October 2026

Status: Confirmed 31 October 2026 — QMI helper loads and binds, USB-C car audio works, and V4A + USB was verified with V4A enabled (narrow XML patch) and AML off.

1. Summary

The USB-C car cable is a **TTGK Technology USB-C Audio** DAC. The phone enumerates it correctly:

- `/proc/asound/cards` shows it as **card 1** (`USB-Audio - USB-C Audio`).
- Audio policy exposes **USB Headset Out** port 423 (`card=1;device=0`).
- `dumpsys audio` shows the active device as `usb_headset(4000000)` with music volume **15**.
- AudioFlinger creates `AUDIO_DEVICE_OUT_USB_HEADSET` patches.

Despite that, the car stayed silent. The actual fault is one level lower: Samsung's `snd-usb-audio-qmi.ko` is listed in `/vendor/lib/modules/modules.load` but **fails to load** on the Pixel GKI kernel:

```
snd_usb_audio_qmi: Unknown symbol __tracepoint_android_vh_xhci_suspend (err -2)
snd_usb_audio_qmi: Unknown symbol __tracepoint_android_vh_xhci_resume (err -2)
```

Those two vendor hooks exist in the Samsung kernel but are not exported by the Pixel GKI kernel. Without the QMI helper, the Samsung audio HAL cannot bring up the USB audio path properly, even though the DAC is enumerated.

A 15 KB GPL shim now exports the two missing tracepoints with the exact CRCs the Samsung module expects. The fix module loads the shim and then the stock `/vendor/lib/modules/snd-usb-audio-qmi.ko` in `post-fs-data.sh`, before audioserver starts. The QMI platform driver binds to `soc:usb_audio_qmi_dev`.

2. What was ruled out

Check	Result
USB DAC enumeration	Pass — card 1, <code>TTGK Technology USB-C Audio</code>
USB audio policy port	Pass — <code>USB Headset Out</code> , card 1, device 0
Audio route	Pass — <code>Devices: usb_headset(40000000)</code>
Media volume	Pass — USB headset volume 15
Kernel <code>snd_usb_audio</code>	Built in (<code>CONFIG_SND_USB_AUDIO=y</code>)
“Disable USB audio routing”	Not set
ViPER4Android/AML	Not the cause — the same silence occurs with both disabled and the stock effects XMLs restored
USB host mode	Pass — the phone is host to the DAC (<code>host_connected=true</code>)
QMI helper	Fail — unknown xHCI tracepoints

The earlier V4A/AML investigation found a real but separate problem: V4A 8.0 rewrites every `audio_effects*.xml` and leaves AudioFlinger partially loaded. Disabling V4A/AML cleans that up, but it does **not** fix the USB-C silence.

3. Evidence

3.1 The DAC is present and routed

```
$ cat /proc/asound/cards
0 [pineapplemtpsnd]: pineapple-mtp-s - pineapple-mtp-snd-card
1 [Audio             ]: USB-Audio - USB-C Audio
                        TTGK Technology USB-C Audio at usb-xhci-hcd.2.auto-1, full
speed

$ dumphw media.audio_policy
4. Port ID: 423; "USB Headset Out"; {AUDIO_DEVICE_OUT_USB_HEADSET,
@:card=1;device=0}
   "USB-Audio - USB-C Audio"
   Profiles:
     [dynamic format]; AUDIO_FORMAT_PCM_16_BIT; 48000 Hz; stereo

$ dumphw audio
4000000 (usb_headset): 15\150
Devices: usb_headset(4000000)
```

3.2 The QMI helper fails to load

```
$ insmod /vendor/lib/modules/snd-usb-audio-qmi.ko
snd_usb_audio_qmi: Unknown symbol __tracepoint_android_vh_xhci_suspend (err -2)
snd_usb_audio_qmi: Unknown symbol __tracepoint_android_vh_xhci_resume (err -2)
```

The module is in `modules.load`:

```
$ grep snd-usb-audio-qmi /vendor/lib/modules/modules.load
snd-usb-audio-qmi.ko

$ modinfo snd-usb-audio-qmi.ko
description: USB AUDIO QMI Service Driver
vermagic: 6.1.93-android14-11-30958522-abF956BXXU2BYD9 SMP preempt mod_unload
modversions aarch64
depends: qmi_helpers,qcom_ipc_logging,usb_notify_layer
alias: of:N*T*Cqcom,usb-audio-qmi-dev
```

3.3 The shim matches the module's expected CRCs

```
$ modprobe --dump-modversions snd-usb-audio-qmi.ko | grep xhci
0xbc052dab __tracepoint_android_vh_xhci_suspend
0x62ed3550 __tracepoint_android_vh_xhci_resume

$ grep xhci xhci_tp_shim/Module.symvers
0xbc052dab __tracepoint_android_vh_xhci_suspend EXPORT_SYMBOL_GPL
0x62ed3550 __tracepoint_android_vh_xhci_resume EXPORT_SYMBOL_GPL
```

3.4 After the fix

```
$ lsmod | grep -E 'xhci_tp_shim|snd_usb_audio_qmi'
snd_usb_audio_qmi      53248  0
xhci_tp_shim           20480  1 snd_usb_audio_qmi

$ ls /sys/bus/platform/drivers/uaudio-qmi
bind module soc:usb_audio_qmi_dev uevent unbind

$ dmesg | grep uaudio
uaudio-qmi soc:usb_audio_qmi_dev: Adding to iommu group 51
```

4. Why the QMI helper matters

The Samsung audio HAL uses the QMI service to manage USB audio offload. The USB audio class driver (`snd_usb_audio`) can enumerate the DAC and create an ALSA card without the QMI service, which is why `dumpsys` looks correct. But the vendor audio path does not complete: the USB route is created and then torn down/falls back, and no audio reaches the DAC.

The Pixel GKI kernel does not provide the two Samsung xHCI vendor hooks (`android_vh_xhci_suspend` , `android_vh_xhci_resume`). The stock Samsung QMI module references them, so it cannot load. The shim supplies those two tracepoints; the QMI module's own CRC checks then pass, and the platform driver binds.

5. Fix package

File: f956b-usb-qmi-fix-v1.0.zip (7.7 KB)

SHA-256: fd98df0cfc9f9e65462187a7ec0695ca1e154c645bb3ba753b2e4b2706a4d54f

The module:

- Checks for SM-F956B / q6q and kernel 6.1.124-*; aborts otherwise.
- Ships xhci_tp_shim.ko (15 KB, GPL, vermagic 6.1.124 SMP preempt mod_unload modversions aarch64).
- post-fs-data.sh loads the shim, then the stock /vendor/lib/modules/snd-usb-audio-qmi.ko , before audioserver starts.
- service.sh writes a post-boot status log.
- Does **not** disable V4A/AML and does **not** modify /vendor .
- Loads the QMI helper on every boot; the vendor’s early modules.load attempt still fails, but the retry after the shim succeeds.

Install through KernelSU Next / Magisk → Modules → Install from storage. Reboot. Do not flash in TWRP.

6. Verification status

Check	Before	After
xhci_tp_shim	absent	loaded
snd_usb_audio_qmi	load failed	loaded
QMI platform driver	unbound	soc:usb_audio_qmi_dev bound
USB DAC enumeration	card 1	card 1
USB audio policy port	present	present
Car audio	silent	works — confirmed
V4A + USB	not tested	works — V4A enabled, AML off

Check	Before	After
Root / modules / Wi-Fi	intact	intact

Confirmed 31 October 2026: plugging the USB-C car cable in with the QMI fix active produced sound. V4A was then enabled with the narrow XML patch (primary `audio_effects.xml` + Samsung `audio_effects_sec.xml`, AML off) and the car audio still worked. No boot images were changed.

7. V4A / AML status

The V4A/AML effects corruption is a **separate** issue:

- V4A 8.0 rewrites all `audio_effects*.xml` files, including Samsung's `audio_effects_sec.xml`, spatializer, and haptic configs.
- Disabling V4A/AML restores the stock effects XML and removes the `skipped 6 elements` partial load.
- But the USB-C silence persisted with V4A/AML disabled, so V4A was not the cause of the USB failure.

Confirmed: V4A + USB works. The working setup is:

- QMI fix active (`xhci_tp_shim` + `snd_usb_audio_qmi`).
- ViPER4Android FX (WSTxda app + WSTxda ViPERFX_RE driver module v8.0).
- AML **off** — not needed for V4A alone.
- The V4A effect is added to **both** `/vendor/etc/audio_effects.xml` and `/vendor/etc/audio_effects_sec.xml`. On this Samsung firmware AudioFlinger loads the Samsung `sec` config; patching only the primary config leaves the effect unregistered and the app says “No driver found”.
- `audio_effects_spatializer.xml` and `audio_effects_haptic.xml` are **not** patched; AudioFlinger stays at the stock `skipped 4`.
- The app shows the full UI with **Enabled** on, and `dumpsys` reports `Library v4a_re` (UUID `90380da3-...`, type `ec7178ec-...`).

If the V4A module is updated, re-apply the two XML overlays and the narrowed `post-fs-data.sh` patch (or use the site’s V4A patch note).

8. Files and hashes

File	Size	SHA-256
f956b-usb-qmi-fix-v1.0.zip	7.7 KB	fd98df0cfc9f9e65462187a7ec0695ca1e154c645b4
xhci_tp_shim.ko	15 KB	see package
Stock /vendor/etc/audio_effects.xml	1,833 B	a229c622ee9f96911f491f23c54315dbc898fa2b39a
Stock /vendor/etc/audio_effects_sec.xml	4,687 B	e635c4eaceef26e18eb10c51a2bb95e6d382a29bb4

9. Reproduction / commands

```
# Confirm the DAC
cat /proc/asound/cards
dumpsys media.audio_policy | grep -A12 'USB Headset Out'
dumpsys audio | grep usb_headset

# Confirm the QMI failure
su -c 'insmod /vendor/lib/modules/snd-usb-audio-qmi.ko'
su -c 'dmesg | grep snd_usb_audio_qmi'

# Confirm the shim CRCs
modprobe --dump-modversions /vendor/lib/modules/snd-usb-audio-qmi.ko | grep xhci

# After the fix
su -c 'lsmod | grep -E "xhci_tp_shim|snd_usb_audio_qmi"'
su -c 'ls /sys/bus/platform/drivers/uaudio-qmi'
```

Report prepared 31 October 2026. The QMI helper is loaded and bound; the car head-unit test is the final physical confirmation.

F956B USB Audio QMI Fix · v1.0 · 31 October 2026 · Independent community fix. Not affiliated with Samsung.