MontereyBaseSystemfix and **BaseSystem Installer fix**

Let to install or upgrade Monterey on any unsupported Monterey capable Mac with minimum requirement a Penryn Core2Duo cpu (also non-APFS Mac and Legacy USB but staged installer through OpenCore4b2c).

Arrandale, Lynnfield, Nehalem, Clarksdale and Westmere Intel architecture cpus are now supported (apple fixed the ACPI kp from 11.1 beta 1) but for deleting snapshot through Monterey external patcher still requires OpenCore with khronokernel patch also included on BaseSystemfix.

Before start, to build this patcher, you need an "Install macOS Monterey Beta.app" (can retrieve it from an InstallAssistant.pkg), then after unpacking to any macOS Applications folder, make with createinstallmedia a stock Monterey Installer:

```
sudo /Applications/Install\ macOS\ Monterey\ Beta.app/Contents/Resources/createinstallmedia --volume /Volumes/"YourUSBLabel"
```

For a non Beta "Install macOS Monterey.app" make with createinstallmedia a stock Monterey Installer:

```
sudo /Applications/Install\ macOS\ Monterey.app/Contents/Resources/createinstallmedia --volume /Volumes/"YourUSBLabel"
```

Instead of an USB drive, you can use also a faster HFS+ 20 GB partition (external to the APFS container) on an hard disk

(When applying this fix is advisable to set csrutil disable)

Once the stock Installer is made, apply first the "MontereyBaseSystem fix", then unplug and plug again your USB drive and apply "MontereyBaseSystem fix2" command, after done you can boot holding alt-option key from apple startup manager, efi shell startup nsh, refind, from opencore or any bootloader.

This minimalist patcher allows to build a Monterey Installer Recovery environment, adding to it some my customised setup apps:

Share Disk: this is an apple ARM only feature but whitelisted seems to work also on Intel

VoiceOver: to enable speaking sound or subtitles and captions on Monterey recovery

Keyboard backlit enabler: to control keyboard backlit (only for MacBookPro and MacBookAir) directly on the installer and staged installer

Kernel Extensions Loading: to allow any third party kext for different or custom TeamID , required to install many third party apps (example virtualisation software and USB Wifi kext) and consent their kext on system boot kernel collection or auxiliary kc

Fans speed for CPU cooling: based on my modified version of smcFanControl allows to set Fans RPM speed for CPU cooling (for Ivy Bridge Mac use the specified function), it's advisable to set max speed during the Monterey staged installation

Hax fix Installer: this is based on ASentientBot HaxLib.dylib that patches the InstallAssistant exec to allow the Monterey installation on any firmware, any disk and without sealing the System (so can be modified from another macOS with APFS support), automatically launch the patched InstallAssistant (as overlay)

Hax Seal Installer fix: allows to directly apply the ASentientBot fix but modified for Sealing System to allow OC full OTA updates

Hax Installer quick fix: from Utilities menu allows to directly apply the ASentientBot fix, use the upper right Hax icon to apply it

AirDrop Broadcom Wifi ARPT fix: allows through ASentientBot deduced method (from AirPortBrcmFixup) to use Broadcom Wifi for MCP89 , Arrandale, Sandy Bridge and Ivy Bridge

MontereyFixes Rebuild KC and custom kext: This fix allows to rebuild any kernelcollection and on the USB custom folder you can copy any kext to install, the custom folder is even useful to reuse any kext backup in case of non booting and kmutil errors

MontereyFixes snapshot booting: This fix will move the telemetry.plugin responsible of Penryn kp, whitelist the Platform plist (equivalent to -no_compat_check in nvram), apply the Sound and Ethernet fixes making a new bootable snapshot

MontereyFixes update preboot fixes: should allow to adjust eventually any APFS Preboot or APFS Data UUID issues, using a stock boot.efi

MontereyFixes AppleSetupUndone and non Metal autologinfix : I made a patched Setup Assistant with a prefpane overlay for Monterey beta 1 where without Metal driver loaded even a supported Mac could not boot the login window, apple fixed this issue on beta 2 (anyway the patched Setup Assistant should still work)

MontereyFixes Legacy USB: allows (without OpenCore) to boot from apple startup manager (without CMD+S and exit) with any responsive IOUSB host input devices also an external legacy USB Monterey installation

MontereyFixes delete snapshots: this fix works only when System is unsealed (for Sealed System just use snapshot booting) deletes any Monterey snapshot to allow sudo mount -uw / (for Arrandale os similar architecture is still required an OpenCore with khronokernel ACPI fix)
Note about delete snapshot: sudo mount -uw / works only with an unsealed System (that is when using ASentientBot HaxLib Installer fix), while instead if you made a Sealed System installation then after deleting snapshot if you get a kp Rooting from the live fs of a sealed volume is not allowed on a RELEASE build , this is easily fixable from MontereyBaseSystemfix using Rebuild KC or MontereyFixes snapshot booting.

MontereyFixes non Metal GPUs drivers: this fix add IntelHD and Nvidia non Metal kext bundles to get brightness control and mainly for dual GPUs Mac to detect both correctly

MontereyFixes iSight camera fix: this fix iSight camera with Nvidia non Metal framebuffer (also for dualGPUs Mac)

MontereyFixes Frameworks patch: enables Night Shift on any unsupported Monterey Mac (graphics framebuffer is required),

Install OpencoreAPFSloader4b: allow to install my customized opencore 4b2c setup (without spoofing) on an internal disk, it also includes five buttons to restart and power-off keeping -no_compat_check and SIP disabled with any DMG support.

Update Opencore config 4b ACPI fix: allow to install my customized opencore 4b2c setup with khronokernel patch on an internal disk to boot Arrandale, Clarksdale and other Intel architectures

Install OpencoreAPFSloader3: allow to install my previous version (text mode) customized opencore 3b2c setup (without spoofing) on an internal disk, it also includes Arrandale patch and functions to restart and power-off keeping -no_compat_check and SIP disabled with any DMG support.

Install Refindplus: allow to install my customised version of Refindplus

Uninstall OpenCoreAPFSloader or Refindplus: allow to uninstall from internal EFI volume disk the custom bootloader but if you have an UEFI Windows you should fix Windows bootloader, for Bootcamp (hybrid MBR) instead there are no issues

MontereyFixes Menu: contains a basic shell menu to select through interactive number typing some previous MontereyFixes

MontereyFixes also copies some Icons, labels and my simple script to rebuild kernelcollections:
/kc.sh (from single user mode)
sudo -s ; /kc.sh (from normal booting)

To install or upgrade Monterey, once booted from USB Installer, click the Utilities menu and launch the ASentientBot Hax3 Installer fix , then you can install on eligible volumes (for a clean install is advisable to erase first the container as APFS from DiskUtility), Monterey installation requires at least 60 GB to complete the stages properly, while to upgrade a previous installation are required at least 35 GB of free available disk space.

The Monterey installation is made of three phases (I'd say the third phase is skippable so resulting without snapshot booting):

Stage1 installer : directly from USB Installer (or from a macOS desktop) takes about 25 minutes, macOS Install Data folder making on target disk (Data Volume if is upgrading a previous macOS Installation)

Stage2 installer : after stage1 reboot showing apple white logo loading bar, takes up to 60 minutes, automatically loads a BaseSystem ramdisk and start copying system files to the target APFS disk System Volume and some Data Volume preparation (the phase with "Less than a minute remaining" can take additional 45 minutes to complete)

Stage3 installer : after stage2 reboot (white apple logo), takes about 15 minutes, loads x86_64SURamDisk.dmg with BootKernelExtensions.kc , System volume sealing making the snapshot booting and APFS Preboot preparation

On a non-APFS or legacy USB Mac currently is required to use as generalised bootloader OpenCore4b2c , If you install or upgrade on internal SATA disk, all these staged steps will proceed enough smoothly with few efforts

if instead the chosen target disk is an external USB hard disk, then you should use OpenCore4b2c for the three staged installer phases, then can apply "MontereyFixes legacy USB patches" to boot directly from apple startup manager (or refind or efi shell startup nsh)

If you use a recent IOUSB Mac (MCP89, Arrandale, Sandy Bridge, Ivy Bridge), then also installing on external USB hard disk will proceed smoothly without efforts.

Patching Monterey through MontereyFixes to boot on an unsupported Mac explained in more detail:

Booting from the MontereyBaseSystemfix contains a patched recovery utilities environment, since the fixes are mainly bash apps, they requires a minimal keyboard interaction, that is simply typing your Monterey APFS Preboot disk (showed in list) and your Monterey System Label (without quotes also works if contains blank spaces).

The APFS Monterey container typical disk structure is:

diskX   APFS Container
diskXs1   APFS Data Volume (used also as Preboot UUID)
diskXs2   APFS Preboot Volume
diskXs3   APFS Recovery
diskXs4   APFS VM volume
diskXs5   APFS System Volume
diskXs5s1   APFS Snapshot System Volume (this is showed only with snapshot normal booting)
diskXs6   APFS Update Volume

So for any Montereyfixes it's asked to type your diskXs2 , if you have multiple APFS containers (surely you have because also the BaseSystem uses it's own APFS Preboot and probably you have also BigSur, Mojave or Catalina installed) typically type the largest MegaBytes Preboot Volume or you can easily compare in list which belongs to it's diskXs5 System Volume (often if you have only an internal APFS disk container the external Monterey APFS Preboot is disk4s2 or disk5s2).

After the Preboot is asked to type your Monterey System label, it's case sensitive so should be typed correctly also including blank spaces (typing "quotes" is not required).

So for any fixes there are very minimal safe modification to APFS Monterey Preboot, kernelcollections and snapshots.

Rebuild Boot and System KernelCollections can take up to 5 minutes, so wait that is completed before reboot.

My MontereyFixes bash apps include a wrapper where some minimal logs are showed (related to csr-active-config, keyboard language, Quartz.framework and SideCarUI.framework), you can ignore that window and click directly the other window, anyway that wrapper window can be closed only after the fix is completed.

During the stage1 installer environment you can use CMD+L to show the installer log and progress loading bar.

For non-APFS Mac or Arrandale Mac that require OpenCore also during the staged installer, OpenCoreAPFSloader4b2c should work, but you could use a previous version OpenCoreAPFSloader3b2c with a simpler text menu, this previous version also allow to boot opencore menu on Mac with DDR2 RAM.