

## 简介

我们知道，长时间睡眠或冷重启后蓝牙会失效。蓝牙无法在黑苹果里获得固件，因为 macOS 里没有英特尔蓝牙驱动。因此，你可以通过热启动来让蓝牙工作。有三种方式能让你的蓝牙体验更好：

感谢 zxystd 提供 IntelBluetoothFirmware，解决了自带 Intel 蓝牙无法使用的问题。但目前上述驱动不支持部分蓝牙设备。以下是可以让蓝牙体验更好的办法：

- 插入一个 **USB** 蓝牙 / 禁用自带蓝牙
  - 焊接 **D+** 和 **D-**线，飞到 **WLAN\_LTE** 卡槽
  - 焊接 **D+** 和 **D-**线，飞到指纹端口
- 

### 插入一个 **USB** 蓝牙 / 禁用自带蓝牙

- 购买并插入一个受支持的 USB 蓝牙，受支持的型号可见 BrcmPatchRAM README
- 如果是 **Clover** 用户：
  - 替换 /CLOVER/ACPI/patched/SSDT-USB.aml 成 SSDT-USB-USBBT.aml
  - 删除 /CLOVER/kexts/ 里的 BlueToolFixup.kext, IntelBTInjector.kext, IntelBluetoothFirmware.kext 和 IntelBluetoothInjector.kext
    - \* 这几步是用来禁用自带蓝牙
  - 下载 并添加 BlueToolFixup.kext (macOS12), BrcmBluetoothInjector.kext (< macOS12), BrcmFirmwareData.kext 和 BrcmPatchRAM3.kext 到 /CLOVER/kexts/Other/ （不需要做这一步如果你只想关闭内置 **Intel** 蓝牙）
  - 重建缓存并重启
- 如果是 **OC** 用户：
  - 添加 SSDT-USB-USBBT.aml 进 /OC/ACPI/
  - 下载 并添加 BlueToolFixup.kext (macOS12), BrcmBluetoothInjector.kext (< macOS12), BrcmFirmwareData.kext 和 BrcmPatchRAM3.kext 进 /OC/Kexts/ （不需要做这一步如果你只想关闭内置 **Intel** 蓝牙）
  - 打开 /OC/config.plist，更改以下代码：

```
<dict>
  <key>Comment</key>
  <string>USB power injection and customization(Native Bluetooth)</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>Path</key>
  <string>SSDT-USB.aml</string>
</dict>
```

- 然后更改以下代码：

```
<dict>
  <key>Comment</key>
  <string>USB power injection and customization(Disable native Bluetooth)</string>
  <key>Enabled</key>
-  <false/>
+  <true/>
  <key>Path</key>
  <string>SSDT-USB-USBBT.aml</string>
</dict>
```

- 不要忘记禁用 Intel 蓝牙驱动，更改以下代码：

```

<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>BlueToolFixup.kext</string>
  <key>Comment</key>
  <string>Force BlueTool to skip firmware update on Monterey</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>ExecutablePath</key>
  <string>Contents/MacOS/BlueToolFixup</string>
  <key>MaxKernel</key>
  <string></string>
  <key>MinKernel</key>
  <string>21.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>IntelBTPatch.kext</string>
  <key>Comment</key>
  <string>A Lilu base patcher that fix Intel Bluetooth</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>ExecutablePath</key>
  <string>Contents/MacOS/IntelBTPatch</string>
  <key>MaxKernel</key>
  <string></string>
  <key>MinKernel</key>
  <string>16.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>IntelBluetoothFirmware.kext</string>
  <key>Comment</key>
  <string>Bluetooth</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>ExecutablePath</key>
  <string>Contents/MacOS/IntelBluetoothFirmware</string>
  <key>MaxKernel</key>
  <string></string>
  <key>MinKernel</key>

```

```

    <string>16.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>
<dict>
    <key>Arch</key>
    <string>x86_64</string>
    <key>BundlePath</key>
    <string>IntelBluetoothInjector.kext</string>
    <key>Comment</key>
    <string>Bluetooth</string>
    <key>Enabled</key>
-   <true/>
+   <false/>
    <key>ExecutablePath</key>
    <string></string>
    <key>MaxKernel</key>
    <string>20.99.99</string>
    <key>MinKernel</key>
    <string>16.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>

```

- 最后，添加以下代码到 **Kernel - Add**: (不需要做这步如果你只想关闭内置 **Intel** 蓝牙)

```

<dict>
    <key>Arch</key>
    <string>x86_64</string>
    <key>BundlePath</key>
    <string>BlueToolFixup.kext</string>
    <key>Comment</key>
    <string></string>
    <key>Enabled</key>
    <true/>
    <key>ExecutablePath</key>
    <string>Contents/MacOS/BlueToolFixup</string>
    <key>MaxKernel</key>
    <string></string>
    <key>MinKernel</key>
    <string>21.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>
<dict>
    <key>Arch</key>
    <string>x86_64</string>
    <key>BundlePath</key>
    <string>BrcmBluetoothInjector.kext</string>
    <key>Comment</key>
    <string></string>
    <key>Enabled</key>
    <true/>
    <key>ExecutablePath</key>

```

```

<string></string>
<key>MaxKernel</key>
<string>20.99.99</string>
<key>MinKernel</key>
<string>14.0.0</string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>BrcmFirmwareData.kext</string>
  <key>Comment</key>
  <string></string>
  <key>Enabled</key>
  <true/>
  <key>ExecutablePath</key>
  <string>Contents/MacOS/BrcmFirmwareData</string>
  <key>MaxKernel</key>
  <string></string>
  <key>MinKernel</key>
  <string>14.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>BrcmPatchRAM3.kext</string>
  <key>Comment</key>
  <string></string>
  <key>Enabled</key>
  <true/>
  <key>ExecutablePath</key>
  <string>Contents/MacOS/BrcmPatchRAM3</string>
  <key>MaxKernel</key>
  <string></string>
  <key>MinKernel</key>
  <string>19.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>

```

- 如果是 macOS12 用户，启用 BlueToolFixup 是必要的：（不需要做这步如果你只想关闭内置 **Intel** 蓝牙）

```

<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>BlueToolFixup.kext</string>
  <key>Comment</key>

```

```

    <string>Force BlueTool to skip firmware update on Monterey</string>
    <key>Enabled</key>
-   <false/>
+   <true/>
    <key>ExecutablePath</key>
    <string>Contents/MacOS/BlueToolFixup</string>
    <key>MaxKernel</key>
    <string></string>
    <key>MinKernel</key>
    <string>21.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>

```

焊接 D+ 和 D-线, 飞到 **WLAN\_LTE** 卡槽 (仅支持 **TM1701**)

- 购买并插入一个受支持的内置无线网卡 (例如: BCM943602CS) 到 M.2 插槽
- 小心地把 D+ 和 D-线飞到 **WLAN\_LTE** 卡槽, 见#7
- 进入 Windows, 运行 设备管理器 来验证焊接是否成功
- 如果是 **Clover** 用户:
  - 如果成功, 替换 **/CLOVER/ACPI/patched/SSDT-USB.aml** 成 **SSDT-USB-WLAN\_LTEBT.aml**
  - 删除 **/CLOVER/kexts/** 里的 **BlueToolFixup.kext**, **IntelBTPatcher.kext**, **IntelBluetoothFirmware.kext** 和 **IntelBluetoothInjector.kext**
- 如果是 **OC** 用户:
  - 添加 **SSDT-USB-WLAN\_LTEBT.aml** 进 **/OC/ACPI/**
  - 打开 **/OC/config.plist**, 并更改以下代码:

```

<dict>
  <key>Comment</key>
  <string>USB power injection and customization(Native Bluetooth)</string>
  <key>Enabled</key>
-   <true/>
+   <false/>
  <key>Path</key>
  <string>SSDT-USB.aml</string>
</dict>

```

- 然后更改以下代码:

```

<dict>
  <key>Comment</key>
  <string>USB power injection and customization(WLAN_LTE Bluetooth)</string>
  <key>Enabled</key>
-   <false/>
+   <true/>
  <key>Path</key>
  <string>SSDT-USB-WLAN_LTEBT.aml</string>
</dict>

```

- 不要忘记禁用 Intel 蓝牙驱动, 更改以下代码:

```

<dict>
  <key>Arch</key>
  <string>x86_64</string>

```

```

    <key>BundlePath</key>
    <string>BlueToolFixup.kext</string>
    <key>Comment</key>
    <string>Force BlueTool to skip firmware update on Monterey</string>
    <key>Enabled</key>
-   <true/>
+   <false/>
    <key>ExecutablePath</key>
    <string>Contents/MacOS/BlueToolFixup</string>
    <key>MaxKernel</key>
    <string></string>
    <key>MinKernel</key>
    <string>21.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>
<dict>
    <key>Arch</key>
    <string>x86_64</string>
    <key>BundlePath</key>
    <string>IntelBTPatcher.kext</string>
    <key>Comment</key>
    <string>A Lilu base patcher that fix Intel Bluetooth</string>
    <key>Enabled</key>
-   <true/>
+   <false/>
    <key>ExecutablePath</key>
    <string>Contents/MacOS/IntelBTPatcher</string>
    <key>MaxKernel</key>
    <string></string>
    <key>MinKernel</key>
    <string>16.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>
<dict>
    <key>Arch</key>
    <string>x86_64</string>
    <key>BundlePath</key>
    <string>IntelBluetoothFirmware.kext</string>
    <key>Comment</key>
    <string>Bluetooth</string>
    <key>Enabled</key>
-   <true/>
+   <false/>
    <key>ExecutablePath</key>
    <string>Contents/MacOS/IntelBluetoothFirmware</string>
    <key>MaxKernel</key>
    <string></string>
    <key>MinKernel</key>
    <string>16.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>

```

```

</dict>
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>IntelBluetoothInjector.kext</string>
  <key>Comment</key>
  <string>Bluetooth</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>ExecutablePath</key>
  <string></string>
  <key>MaxKernel</key>
  <string>20.99.99</string>
  <key>MinKernel</key>
  <string>16.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>

```

焊接 **D+** 和 **D-**线，飞到指纹端口

- 购买并插入一个受支持的内置无线网卡 (例如: BCM943602CS) 到 M.2 插槽
- 小心地把 D+ 和 D-线飞到指纹端口, 见#246
- 进入 Windows, 运行 设备管理器 来验证焊接是否成功
- 如果是 **Clover** 用户:
  - 如果成功, 替换 /CLOVER/ACPI/patched/SSDT-USB.aml 成 SSDT-USB-FingerBT.aml
  - 删除 /CLOVER/kexts/ 里的 BlueToolFixup.kext, IntelBTPatcher.kext, IntelBluetoothFirmware.kext 和 IntelBluetoothInjector.kext
- 如果是 **OC** 用户:
  - 添加 SSDT-USB-FingerBT.aml 进 /OC/ACPI/
  - 打开 /OC/config.plist, 更改以下代码:

```

<dict>
  <key>Comment</key>
  <string>USB power injection and customization(Native Bluetooth)</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>Path</key>
  <string>SSDT-USB.aml</string>
</dict>

```

- 然后更改以下代码 (如果没有找到, 请自行添加):

```

<dict>
  <key>Comment</key>
  <string>USB power injection and customization(Fingerprint Bluetooth)</string>
  <key>Enabled</key>
-  <false/>
+  <true/>
  <key>Path</key>

```

```
<string>SSDT-USB-FingerBT.aml</string>
</dict>
```

- 不要忘记禁用 Intel 蓝牙驱动，更改以下代码：

```
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>BlueToolFixup.kext</string>
  <key>Comment</key>
  <string>Force BlueTool to skip firmware update on Monterey</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>ExecutablePath</key>
  <string>Contents/MacOS/BlueToolFixup</string>
  <key>MaxKernel</key>
  <string></string>
  <key>MinKernel</key>
  <string>21.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>IntelBTPatcher.kext</string>
  <key>Comment</key>
  <string>A Lilu base patcher that fix Intel Bluetooth</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>ExecutablePath</key>
  <string>Contents/MacOS/IntelBTPatcher</string>
  <key>MaxKernel</key>
  <string></string>
  <key>MinKernel</key>
  <string>16.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>
<dict>
  <key>Arch</key>
  <string>x86_64</string>
  <key>BundlePath</key>
  <string>IntelBluetoothFirmware.kext</string>
  <key>Comment</key>
  <string>Bluetooth</string>
  <key>Enabled</key>
-  <true/>
+  <false/>
  <key>ExecutablePath</key>
```



```

    <string>Contents/MacOS/IntelBluetoothFirmware</string>
    <key>MaxKernel</key>
    <string></string>
    <key>MinKernel</key>
    <string>16.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>
<dict>
    <key>Arch</key>
    <string>x86_64</string>
    <key>BundlePath</key>
    <string>IntelBluetoothInjector.kext</string>
    <key>Comment</key>
    <string>Bluetooth</string>
    <key>Enabled</key>
-   <true/>
+   <false/>
    <key>ExecutablePath</key>
    <string></string>
    <key>MaxKernel</key>
    <string>20.99.99</string>
    <key>MinKernel</key>
    <string>16.0.0</string>
    <key>PlistPath</key>
    <string>Contents/Info.plist</string>
</dict>

```