

## 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

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### 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/Other/ 里的 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>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></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>

```

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/Other/** 里的 **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>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></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/Other/ 里的 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>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></string>
  <key>MinKernel</key>
  <string>16.0.0</string>
  <key>PlistPath</key>
  <string>Contents/Info.plist</string>
</dict>

```