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**MEDIATEK**

# MT7986\_FW\_Bin\_Replacement\_AN

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# Version History

Version	Date	Author (Optional)	Description
0.1	2021-09-26	Shuai feng	First version

# MT7986\_FW\_Bin\_Replacement\_AN

- ❑ FW Bin Path
- ❑ WiFi FW Bin Replace
- ❑ WiFi FW.h mode Replace
- ❑ WO FW Bin Replace
- ❑ WO FW.h mode Replace

## FW Bin Path

- **Untar MT7986 WiFi Driver:**  
`tar -xvf mt7986_xxxx.tar.xz`
- **MT7986 Fw Bin include wifi fw and wo fw , Bin files path:**  
`bin/mt7986/rebb/`
- **Below files should be include in this folder**

bin > mt7986 > rebb

名称

- 7986\_WACPU\_RAM\_CODE\_release.bin
- 7986\_WOCPU0\_RAM\_CODE\_release.bin
- 7986\_WOCPU1\_RAM\_CODE\_release.bin
- mt7986\_patch\_e1\_hdr.bin
- mt7986\_patch\_e1\_hdr\_mt7975.bin
- WIFI\_RAM\_CODE\_MT7986.bin
- WIFI\_RAM\_CODE\_MT7986\_MT7975.bin

# MT7986\_FW\_Bin\_Replacement\_AN

- ☐ FW Bin Path
- ☒ **WiFi FW Bin Replace**
- ☐ WiFi FW.h mode Replace
- ☐ WO FW Bin Replace
- ☐ WO FW.h mode Replace

# WiFi FW Bin Replace(for build flow)

1. Replace the target bin , Path : “build\_dir/xxx/bin/mt7986/rebb/”

build\_dir > target-aarch64\_cortex-a53\_musl > linux-mediatek\_mt7986 > mt\_wifi > bin > mt7986 > rebb

Name	Date modified	Type
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2. Build image , make V=s
3. Check the time stamp , “build\_tar/xxx/root-mediatek/lib/firmware/”  
They should be updated.

WIFI_RAM_CODE_MT7986_MT7975.bin																	×
	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f	
002095a0h:	00	00	00	00	00	60	09	F0	A0	11	00	00	80	00	00	00	; .....δ ...€...
002095b0h:	00	00	00	00	00	00	00	00	00	00	00	00	0F	00	0B	02	; .....
002095c0h:	01	00	00	5F	5F	5F	5F	30	30	30	30	30	30	32	30	32	; ... 000000202
002095d0h:	31	30	39	32	33	31	37	30	30	31	37	00	79	71	F9	EC	; 10923170017.yquì

# WiFi FW Bin Replace(for test update)

1. In dut console: `cd /lib/firmware/ ,`

Below files should be include in this folder

```
root@openwrt:/lib/firmware# ls
7986_WACPU_RAM_CODE_release.bin
7986_WOCPU0_RAM_CODE_release.bin
7986_WOCPU1_RAM_CODE_release.bin
MT7986_ePAAE1NA_EEPROM_AX6000.bin
MT7986_iPAILNA_EEPROM_AX6000.bin
WIFI_RAM_CODE_MT7986.bin
WIFI_RAM_CODE_MT7986_MT7975.bin
WIFI_RAM_CODE_MT7986_TESTMODE.bin
WIFI_RAM_CODE_MT7986_TESTMODE_MT7975.bin
e2p
mt7986_patch_e1_hdr.bin
mt7986_patch_e1_hdr_mt7975.bin
mt7986_patch_e1_hdr_testmode.bin
mt7986_patch_e1_hdr_testmode_mt7975.bin
```

2. Replace the target bin in this folder ( tftp )

3. "wifi reload" or interface down/up ,  
show driverinfo check time stamp  
CPU0 for WIFI\_RAM\_CODE\_xxx.bin  
CPU1 for 7986\_WACPU\_RAM\_CODE\_release.bin

```
# iwpriv ra0 show driverinfo
Driver version: 7.5.0.0
FW ver: 0x8a00, HW ver: 0x2060000, CHIP ID: 0x7986
CPU 0 patch info
  Built date: 20210923165914a
  Platform: ALPS
  HW/SW version: 0x8a108a10
  Patch version: 0xffffffff
CPU 0 fw info
  Chip ID: 0x0f
  Eco version: 0x00
  Region number: 0x0b
  Format version: 0x02
  Format flag: 0x01
  Ram version: 000000
  Built date: 20210923170017
  Common crc: 0xecf97179
CPU 1 fw info
  Chip ID: 0x00
  Eco version: 0x00
  Region number: 0x03
  Format version: 0x02
  Format flag: 0x01
  Ram version: DEV_000000
  Built date: 20210923170048
  Common crc: 0xbc358fe5
```

# MT7986\_FW\_Bin\_Replacement\_AN

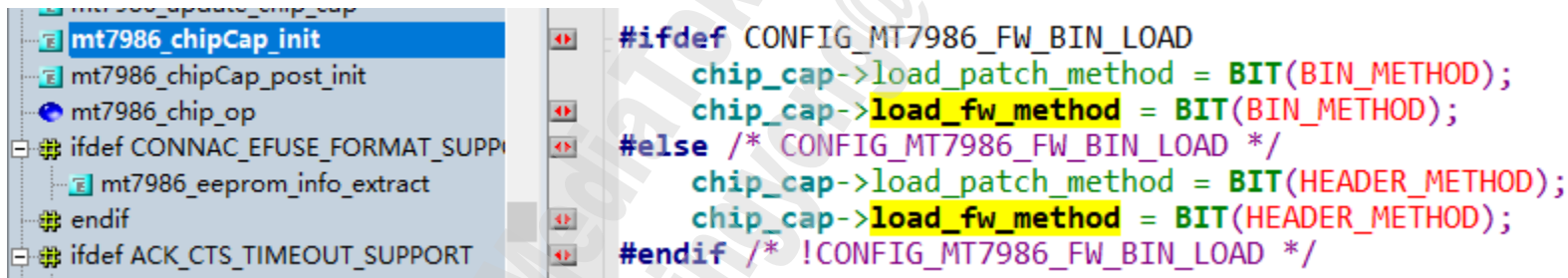
- ☐ FW Bin Path
- ☐ WiFi FW Bin Replace
- ☒ **WiFi FW.h mode Replace**
- ☐ WO FW Bin Replace
- ☐ WO FW.h mode Replace



# WiFi FW.h mode Replace 1/2

MT7986 code default load fw from bin , if you need load fw from header file(.h) , you can disable menuconfig : load wifi fw with bin file

```
PA LNA Type of 1st Card (1PA1LNA) --->
[*] load wifi fw with bin file
(AX6000) Panther SKU Type : AX6000 or AX7800 or S
```



```
#ifndef CONFIG_MT7986_FW_BIN_LOAD
chip_cap->load_patch_method = BIT(BIN_METHOD);
chip_cap->load_fw_method = BIT(BIN_METHOD);
#else /* CONFIG_MT7986_FW_BIN_LOAD */
chip_cap->load_patch_method = BIT(HEADER_METHOD);
chip_cap->load_fw_method = BIT(HEADER_METHOD);
#endif /* !CONFIG_MT7986_FW_BIN_LOAD */
```

# WiFi FW.h mode Replace 2/2

1. Replace the target bin under “build\_dir/xxx/bin/mt7986/rebb/”
2. cd “build\_dir/xxx/mt\_wifi/embedded/”
3. Excute “make build\_tools CHIPSET=mt7986 ADIE=mt7975 SKU=ax6000”, it will transfer FW bin into header files.
4. Check the time stamp of the header files under “mt\_wifi/embedded/include/mcu/”  
They should be updated.
5. Build image.

```
mt7986_firmware.h
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x0f, 0x00, 0x0b, 0x02,
0x01, 0x00, 0x00, 0x5f, 0x5f, 0x5f, 0x5f, 0x30, 0x30, 0x30, 0x30, 0x30, 0x30, 0x32, 0x30, 0x32,
0x31, 0x30, 0x39, 0x32, 0x33, 0x31, 0x37, 0x30, 0x30, 0x31, 0x37, 0x00, 0x79, 0x71, 0xf9, 0xec,
};
```

# WiFi Fw.h mode change cmd

1、iwpriv ra0 set load\_fw\_method=1 //1 from bin, 0 from header

2、wifi reload

```

INT SetLoadFwMethod(
    IN  PRTMP_ADAPTER  pAd,
    IN  RTMP_STRING *  arg)
{
    RTMP_CHIP_CAP *pChipCap = hc_get_chip_cap(pAd->hdev_ctrl);
    UINT Enable; /* enable load from bin */

    Enable = os_str_tol(arg, 0, 10);
    if (!Enable) {
        pChipCap->load_fw_method = BIT(HEADER_METHOD);
        MTWF_LOG(DBG_CAT_ALL, DBG_SUBCAT_ALL, DBG_LVL_OFF,
            ("Load from header\n"));
    } else {
        pChipCap->load_fw_method = BIT(BIN_METHOD);
        MTWF_LOG(DBG_CAT_ALL, DBG_SUBCAT_ALL, DBG_LVL_OFF,
            ("Load from bin\n"));
    }
    return TRUE;
}

```

# MT7986\_FW\_Bin\_Replacement\_AN

- ☐ FW Bin Path
- ☐ WiFi FW Bin Replace
- ☐ WiFi FW.h mode Replace
- ☒ **WO FW Bin Replace**
- ☐ WO FW.h mode Replace

# WO FW Bin Replace(for build flow)

1. Replace the target bin , Path : “build\_dir/xxx/linux-mediatek\_mt7986/warp/bin

```
build_dir > target-aarch64_cortex-a53_musl > linux-mediatek_mt7986 > warp > bin
```

Name

7986\_WOCPU0\_RAM\_CODE\_release.bin

7986\_WOCPU1\_RAM\_CODE\_release.bin

2. Build image , make V=s

3. Check the time stamp , “build\_tar/xxx/root-mediatek/lib/firmware/”  
They should be updated.

7986_WOCPU0_RAM_CODE_release.bin																
	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
00246e50h:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	D0	4F ; .....
00246e60h:	40	41	01	00	00	00	00	00	00	00	00	00	00	00	00	00 ; @A.....
00246e70h:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00 ; .....
00246e80h:	00	00	00	00	00	00	D8	4F	D0	D9	22	00	01	00	00	00 ; .....00DÙ".....
00246e90h:	00	00	00	00	00	00	00	00	00	00	00	00	00	00	03	02 ; .....
00246ea0h:	01	00	00	44	45	56	5F	30	30	30	30	30	30	32	30	32 ; ...DEV 000000202
00246eb0h:	31	30	39	32	33	31	37	30	33	30	36	00	BF	28	5D	C7 ; 10923170306.¿(]Ç

# WO FW Bin Replace(for test update)

1. In dut console: `cd /lib/firmware/ ,`

Below files should be include in this folder

```
root@openwrt:/lib/firmware# ls
7986_WACPU_RAM_CODE_release.bin
7986_WOCPUD_RAM_CODE_release.bin
7986_WOCPUD_RAM_CODE_release.bin
MT7986_ePAeLNA_EEPROM_AX6000.bin
MT7986_iPAiLNA_EEPROM_AX6000.bin
WIFI_RAM_CODE_MT7986.bin
WIFI_RAM_CODE_MT7986_MT7975.bin
WIFI_RAM_CODE_MT7986_TESTMODE.bin
WIFI_RAM_CODE_MT7986_TESTMODE_MT7975.bin
e2p
mt7986_patch_e1_hdr.bin
mt7986_patch_e1_hdr_mt7975.bin
mt7986_patch_e1_hdr_testmode.bin
mt7986_patch_e1_hdr_testmode_mt7975.bin
```

2、 Replace the target bin in this folder ( tftp )

3、 "wifi reload" or interface down/up ,

"cat /proc/warp\_ctrl/warp0/wo" check time stamp

WARP0 for WOCPUDxxx.bin

```
root@openwrt:/# cat /proc/warp_ctrl/warp0/wo
##### WO Firmware #####
Chip ID: 0x0000
ECO version:0
Version: DEV_000000
Build date: 20210923170306
#####
```

# MT7986\_FW\_Bin\_Replacement\_AN

- ☐ FW Bin Path
- ☐ WiFi FW Bin Replace
- ☐ WiFi FW.h mode Replace
- ☐ WO FW Bin Replace
- ☒ **WO FW.h mode Replace**

# WO FW.h mode Replace 1/2

If /lib/firmware no WOCPU\*\*bin , code will load WOO\_firmware.h.

```

00194:  get_region_info
00195:  warp_fwdl_ctrl_init_mcu_mode
00196:  warp_fwdl_ctrl_init_host_mode
00197:  warp_fwdl_write_wed_idx_mcu
00198:  warp_fwdl_write_wed_idx_host
00199:  warp_get_wo_bin_size
00200:  warp_fw_init
00201:  warp_fwdl_mcu_mode
00202:  warp_fwdl_host_mode
00203:  warp_fwdl_ready_check_mcu
00204:  warp_fwdl_ready_check_host
00205:  warp_fwdl_ctrl_deinit_mcu_mode
00206:  warp_fwdl_ctrl_deinit_host_mode

```

```

00194:  warp_dbg(WARP_DBG_INF,
00195:           "loading %s from /lib/firmware/!\n", bin_name);
00196:
00197:  /* suppress warning message */
00198:  if (request_firmware_direct(&fw_entry, bin_name, &pdev->dev) != 0) {
00199:      warp_dbg(WARP_DBG_OFF,
00200:              "%s:fw not available(/lib/firmware/%s), loading embedded version!\n", __func__, bin_name);
00201:
00202:      ctrl->bin_size = warp_get_wo_bin_size(warp);
00203:      ctrl->bin_mode = WO_FW_HEADER;
00204:  } else {
00205:      ctrl->bin_size = fw_entry->size;
00206:      ctrl->bin_mode = WO_FW_BIN;
00207:  }

```



## WO FW.h mode Replace 2/2

1. Replace the target bin under “build\_dir/xxx/linux-mediatek\_mt7986/warp/bin/”
2. cd “build\_dir/xxx/linux-mediatek\_mt7986/warp/”
3. Excute “make build\_tools CHIPSET=mt7986”, it will transfer FW bin into header files.
4. Check the time stamp of the header files under “warp/mcu”  
They should be updated.
5. Build image.

```
WO0_firmware.h
0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x03, 0x02,
0x01, 0x00, 0x00, 0x44, 0x45, 0x56, 0x5f, 0x30, 0x30, 0x30, 0x30, 0x30, 0x30, 0x32, 0x30, 0x32,
0x31, 0x30, 0x39, 0x32, 0x33, 0x31, 0x37, 0x30, 0x33, 0x30, 0x36, 0x00, 0xbf, 0x28, 0x5d, 0xc7,
};
```

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