Board sticker: M8S PRO R4 S912 3G 32G DDR4 DQ

t=0x8612f20 [0,0]

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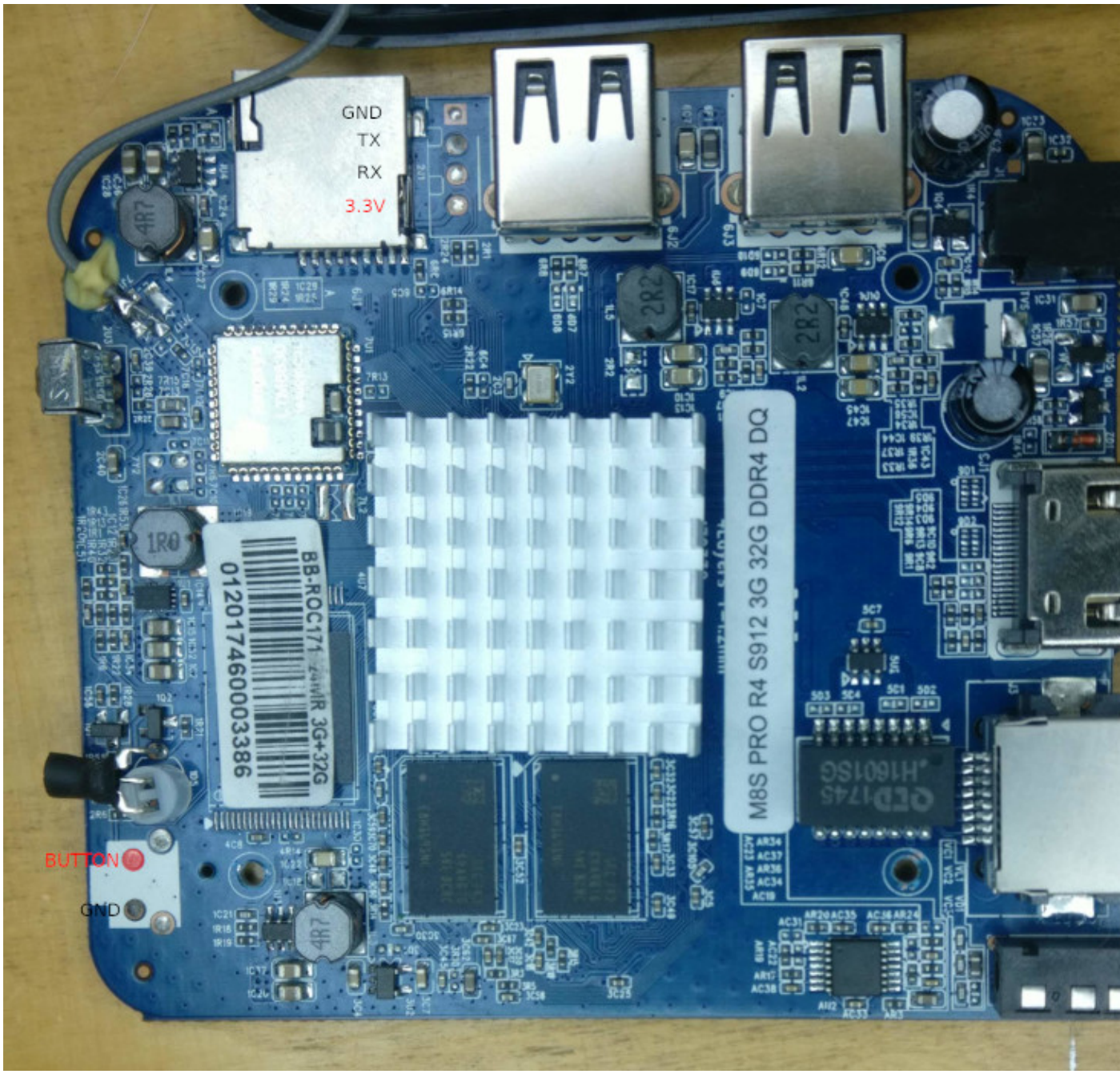

It doesn't have button soldered, it works like power button in android

Serial port is marked on bottom of board (tx/rx are from cpu perspective)

probably:
https://www.geekbuying.com/item/MECOOL-M8S-PRO-S912-KODI-17-0-4K-HDR10-3GB-DDR4-32GB-eM

Android info

Android 7.1 bootlog from serial: m8s-android-bootlog.txt.gz

```
U-Boot 2015.01-g9331ff1-dirty (Mar 15 2018 - 16:16:24)
```

```
DRAM:  3 GiB
...
        aml_dt soc: gxm platform: q20xrmii variant: 3g
        dtb 0 soc: gxm   plat: q20xrmii   vari: 2g
        dtb 1 soc: gxm   plat: q20xrmii   vari: 3g
      Find match dtb: 1
...
parts: 10
00:      logo   0000000002000000 1
01:  recovery   0000000002000000 1
02:       rsv   0000000000800000 1
03:       tee   0000000000800000 1
04:     crypt   0000000002000000 1
05:      misc   0000000002000000 1
06:      boot   0000000002000000 1
07:    system   0000000080000000 1
08:     cache   0000000020000000 2
09:      data   ffffffffffffffff 4

M8SPRO:/ # uname -a
Linux localhost 3.14.29 #46 SMP PREEMPT Thu Apr 12 19:43:12 CST 2018 armv8l

M8SPRO:/ # cat /proc/cmdline
rootfstype=ramfs init=/init console=ttyS0,115200 no_console_suspend earlyprintk=aml-uart,0xc81004

M8SPRO:/ # cat /proc/cpuinfo
Processor       : AArch64 Processor rev 4 (aarch64)
processor       : 0
processor       : 1
processor       : 2
processor       : 3
processor       : 4
processor       : 5
processor       : 6
processor       : 7
Features        : fp asimd evtstrm aes pmull sha1 sha2 crc32 wp half thumb fastmult vfp edsp neon
CPU implementer : 0x41
CPU architecture: 8
CPU variant     : 0x0
CPU part        : 0xd03
CPU revision    : 4

Hardware        : Amlogic
Serial          : 220a82006da41365fedf301742726826

M8SPRO:/ # free
               total        used        free      shared     buffers
Mem:       2876604416  2210639872   665964544           0    31326208
-/+ buffers/cache:     2179313664   697290752
Swap:       524283904           0   524283904

M8SPRO:/ # df
ilesystem        1K-blocks    Used Available Use% Mounted on
mpfs               1404592     504   1404088   1% /dev
tmpfs              1404592       0   1404592   0% /mnt
/dev/block/system   2031440  973788   1057652  48% /system
/dev/block/data    26969964 3050864  23919100  12% /data
/dev/block/cache     507848    2860    504988   1% /cache
/dev/block/tee         5115      45      5070   1% /tee
/dev/fuse          26969964 3050864  23919100  12% /mnt/runtime/default/emulated
/dev/fuse          26969964 3050864  23919100  12% /mnt/runtime/read/emulated
/dev/fuse          26969964 3050864  23919100  12% /mnt/runtime/write/emulated
```

recovery sd

https://www.cnx-software.com/2016/11/19/how-to-create-a-bootable-recovery-sd-card-for-amlogic-tv-boxes/

amlogic info

http://www.linux-meson.com/doku.php

armbian

https://forum.armbian.com/topic/12162-single-armbian-image-for-rk-aml-aw-aarch64-armv8/

```
dpavlin@nuc:~/Downloads$ xzcat Armbian_20.09_Arm-64_bullseye_current_5.8.5.img.xz | dd iflag=full
dpavlin@nuc:~/Downloads$ sudo mount /dev/sdb1 /mnt/sdb1/
dpavlin@nuc:~/Downloads$ cd /mnt/sdb1/

root@nuc:/mnt/sdb1# cp u-boot-s905x-s912 u-boot.ext

root@nuc:/mnt/sdb1# vi extlinux/extlinux.conf

root@nuc:/mnt/sdb1# grep -v '^#' extlinux/extlinux.conf
LABEL Armbian
LINUX /zImage
INITRD /uInitrd

FDT /dtb/amlogic/meson-gxm-q201.dtb
APPEND root=LABEL=ROOTFS rootflags=data=writeback rw console=ttyAML0,115200n8 console=tty0 no_con
```

Note that this board uses **meson-gxm-q201.dtb** which is internal rmii to make ethernet work!

issue `reboot update` from android shell to boot from sdcard

ath10k wifi sdio firmware

After booting, you will get error message about missing firmware:

```
[    7.861827] ath10k_sdio mmc2:0001:1: Failed to find firmware-N.bin (N between 2 and 6) from at
[    7.861838] ath10k_sdio mmc2:0001:1: could not fetch firmware files (-2)
```

Package `firmware-atheros` is installed, so it's a bit puzzeling what file is missing, however, if we go to

https://github.com/kvalo/ath10k-firmware.git

we can find sdio firmware at
https://github.com/kvalo/ath10k-firmware/tree/master/QCA9377/hw1.0/untested

```
dpavlin@m8s:~/ath10k-firmware$ git remote -v
origin  https://github.com/kvalo/ath10k-firmware.git (fetch)
origin  https://github.com/kvalo/ath10k-firmware.git (push)
```

```
dpavlin@m8s:~/ath10k-firmware$ sudo cp QCA9377/hw1.0/untested/firmware-sdio-5.bin_WLAN.TF.1.1.1-0
```

After running `nmtui` and configuring wifi it's available but dies after a while under load.

kernel source

https://github.com/150balbes/Amlogic_s905-kernel

currently, I'm using

```
dpavlin@m8s:~/linux$ git remote -v
origin  https://github.com/xdarklight/linux (fetch)
origin  https://github.com/xdarklight/linux (push)
dpavlin@m8s:~/linux$ git branch
  master
  meson-mx-integration-5.11-20210124
  meson-mx-integration-5.13-20210503
* meson-mx-integration-5.13-20210523
dpavlin@m8s:~/linux$ cat mason-build.sh
# https://github.com/SLAzurin/armbian-aml-s8xx-kernel-build-steps

# https://github.com/xdarklight/linux

make -j 8 Image dtbs modules && sudo make modules_install dtbs_install install
```

Installing armbian kernel package doesn't work because /boot partition is vfat and not ext2/4

u-boot source

https://github.com/150balbes/Amlogic_S905-u-boot

balbes150 updates

installing linux image and headers does return error, but works

https://users.armbian.com/balbes150/

gpiod

```
sudo apt install gpiod
```

button - gpio 2

```
root@arm-64:~# gpioget gpiochip0 2 # not pressed
1
root@arm-64:~# gpioget gpiochip0 2 # pressed
0
```

led - gpio 9

```
root@arm-64:~# gpioset gpiochip0 9=0 # red

root@arm-64:~# gpioset gpiochip0 9=1 # blue (default)
```

u-boot

old https://github.com/endlessm/u-boot-meson

I wanted serial console which seems to be missing from armbian build above

wiki seems to suggest repository

https://gitlab.denx.de/u-boot/custodians/u-boot-amlogic

but we are going to use upstream u-boot

```
dpavlin@m8s:~/u-boot-amlogic$ git remote -v
github  https://github.com/u-boot/u-boot (fetch)

dpavlin@m8s:~/u-boot-amlogic$ libretech-cc_defconfig
dpavlin@m8s:~/u-boot-amlogic$ make -j 8
dpavlin@m8s:~/u-boot-amlogic$ cp u-boot.bin /boot/
```

abort u-boot with key press and boot new one with

```
fatload mmc 1 0x1000000 u-boot.bin
go 0x1000000
```

2020-10 status for amlogic

U-Boot: Porting and Maintaining a Bootloader for a Multimedia SoC Family - Neil Armstrong, BayLibre SAS

https://youtu.be/u0-swEMDFp0