

Quick Reference Guide to Studer A810:

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- 3 Tension gauges – for adjusting the tape tension
- 4-5 Calibration instruction – the short and quick version
- 6 Calibration sheet – to document the current calibration
- 7 EPROM firmware versions



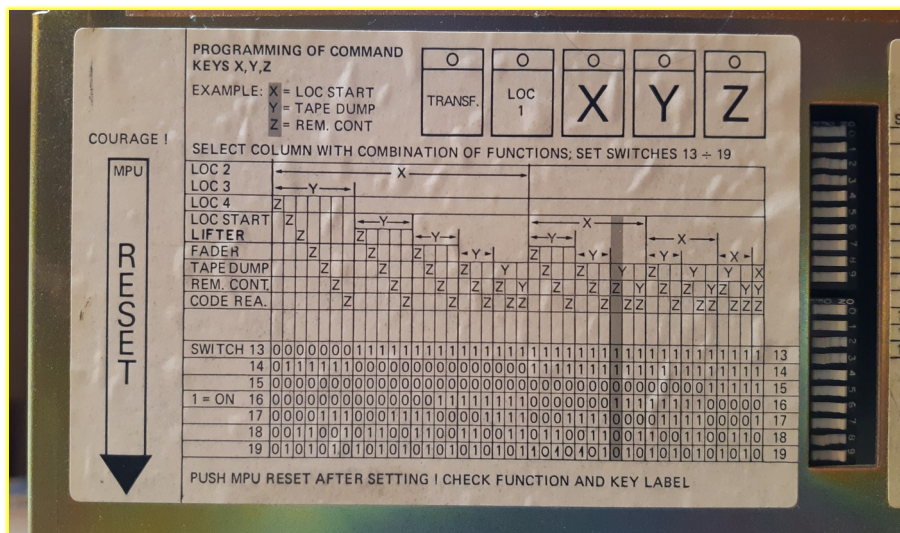
2. Layout of the internal cards



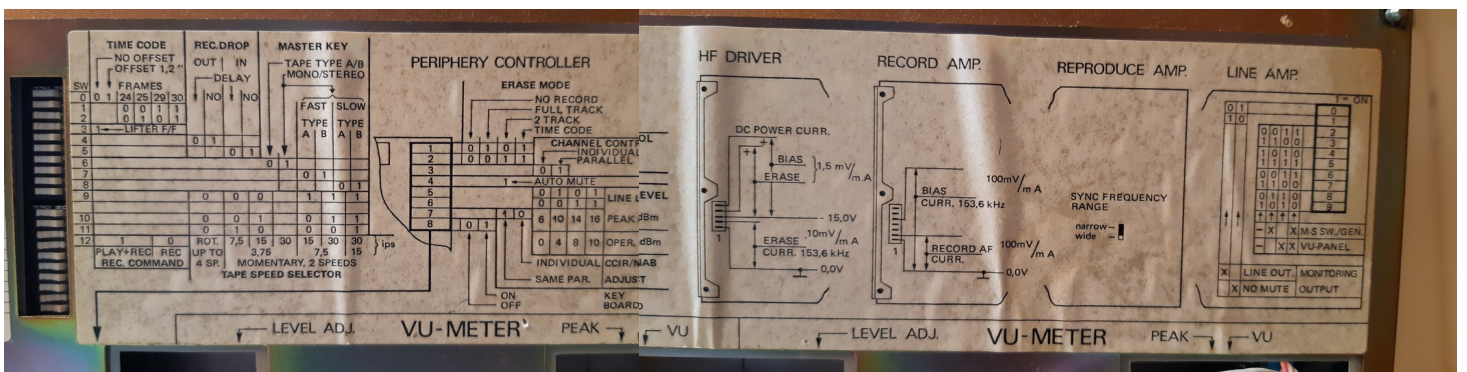
| | |
|----------------------|--------------|
| MPU Unit | 1.820.780.82 |
| Tape Deck Controller | 1.810.750.81 |
| Periphery Controller | 1.810.753.00 |
| Ch. 1: | |
| HF Driver | 1.820.713.00 |
| Record Amplifier | 1.820.712.81 |
| Reproduce Amplifier | 1.820.710.83 |
| Line Amplifier | 1.820.714.83 |
| Ch. 2: | |
| HF Driver | 1.820.713.00 |
| Record Amplifier | 1.820.712.81 |
| Reproduce Amplifier | 1.820.710.83 |
| Line Amplifier | 1.820.714.83 |

Cards could have different revision numbers !

DIP switch settings left side

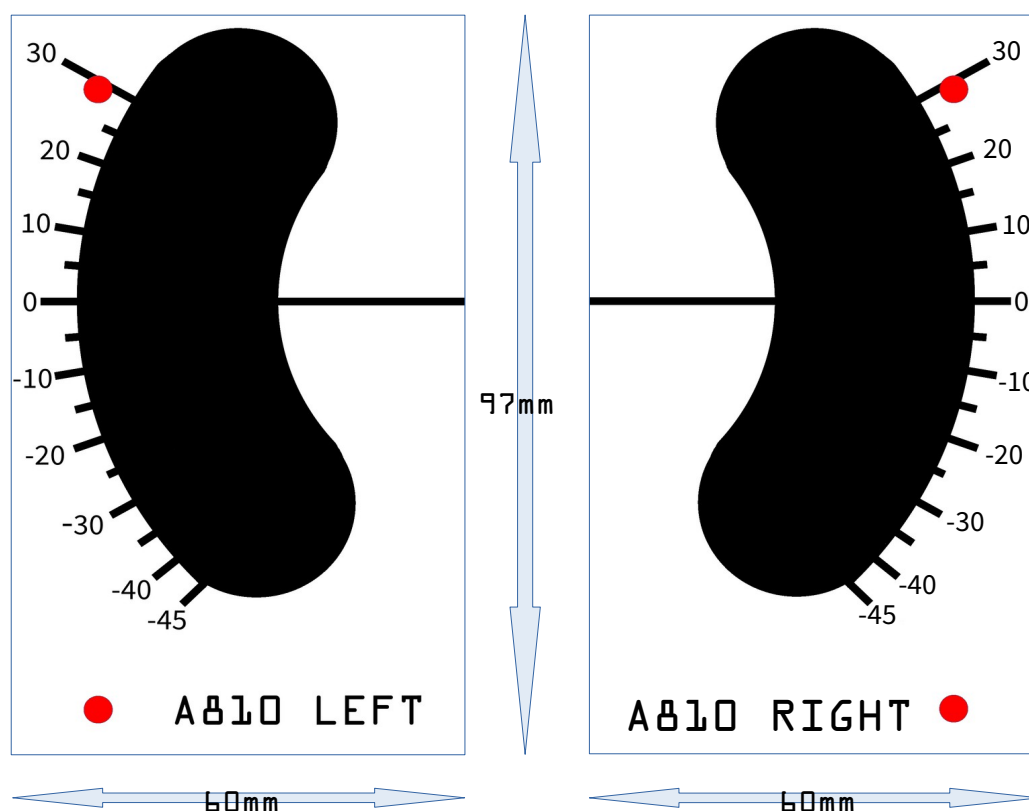


DIP switch settings right side



3. Tension gauges

- print on A4 paper and dimensions should be correct.
- check with the measurements in the drawing
- cut out the black bean shaped section
- install into A810 using the red screw points
- see the service manual section 3.4 for adjustment instructions



4. Calibration instructions

Studer A810 Calibration Quick Reference

The complete instructions are in the Service Manual section 4.2

important definitions

reference level = (magnetic) TAPE level 185, 250, 320, ... nWb/m
operating level = voltage level on the INPUT/OUTPUT studio: +4 dBu = 1,228 V = 0 VU aka line level
a tape recorded with reference level should produce operating level in the output in play mode (!)

the procedure

The calibrating steps should always be performed in the following order, and each section repeated for ch. 2.

1 GENERAL PREPARATORY STEPS: 4.2.1.6

Clean the tape path. Set all switches on the PERIPHERY CONTROLLER to the correct setting 4.2.9.2

check the output level

- feed ch. 1 line input with 1kHz @ operating level
- connect mV-meter line to the output of ch. 1 and load with 600Ω
- press INP and **release** UNCAL
- adjust output level to operating level with the line amplifier trimmer accessible from the front.

check the VU-meter

- VU indication: Operating level should result in a reading of 0 VU
- PPM indication: Operating level should result in a reading of -6 (0 for reference level).
- correct the VU-meter reading with the trimmer potentiometer located on the back of the VU-meter amplifier.

2 REPRODUCE ADJUSTMENTS: 4.2.2

set code switch 8 on: JS 8 = 1 to enable programming

preparatory steps 4.2.2.1

- set tape type, equalization and tape speed as desired
- connect mV-meter line to the output of ch. 1 and load with 600Ω
- press SAFE and REP, **release** UNCAL
- spool reference tape to 'reference level' section (0 dB)

reproduce level adjustment 4.2.2.2

- press CH 1 and **LEVEL** REPRO
- start recorder in PLAY
- read out reproduce level on the mV-meter
- adjust to desired line level by pressing UP or DOWN and press STORE

azimuth alignment of the reproduce head 4.2.2.3

- spool reference tape to 'azimuth alignment section' (-10 dB)
- always adjust to maximum level first and then to minimum phase difference! See SM
- rewind tape to 'reference level section', check level and repeat reproduce level adjustment if necessary!

frequency response adjustment 4.2.2.4

- spool to 'frequency section' of the tape (-20 dB)
- select the corresponding tone:
16 kHz@30 ips, 14 kHz@15 ips, 12.5 kHz@7.5 ips, 8 kHz@3.75 IPS, all at -20 dB
- press CH 1 and **TREBLE** REPRO
- start the recorder in PLAY mode
- adjust to optimum frequency response by pressing UP or DOWN and press STORE
- rewind calibration tape to the 63 Hz tone (-20 dB)
- press CH 1 and **BASS** REPRO
- start the recorder in PLAY mode
- adjust for optimum frequency response by pressing UP or DOWN and press STORE

3 RECORDING ADJUSTMENT: 4.2.3

tape speed 7.5 or 15 ips (or preferred studio speed). Use new (or practically new) unrecorded tape
Studer A810 ver 1.0 | www.reeltofeel.nl | Philip Van der Matten | 15 nov 2024 | page 4/7

preparatory steps 4.2.3.1

- connect 1 kHz at line level to input and mV-meter to output
- press READY and REP, **release** UNCAL

record level adjustment 4.2.3.2

- press CH1 and **LEVEL RECORD** on input keyboard
- *put recorder in record mode (PvdM addition)*
- read output level on mV-meter and press UP or DOWN key for adjusting to line level.
- press STORE

azimuth alignment of the record head 4.2.3.3

- set generator to 10 kHz and decrease level by 20 dB. Connect millivoltmeter to line output channel
- start machine in **RECORD** mode
- correct azimuth by turning screw. If severe adjustment was necessary, repeat preparatory steps

bias adjustment 4.2.3.4

- set generator to 10 kHz and level to **20 dB below** line level. Connect millivoltmeter to line output
- press CH 1 and **BIAS** on input keyboard
- start machine in **RECORD** mode
- press DOWN until MIN light flashes
- search maximum output voltage with UP and write down this value
- continue with UP key until delta dB is reached. See table at page 4/56 (pg. 187 PDF). Press STORE

record level adjustments 4.2.3.6

- set generator to 1 kHz and operating level. Connect millivoltmeter to line output.
- press CH1 and **LEVEL RECORD** on input keyboard
- start machine in **RECORD** mode
- adjust to line level by pressing UP or DOWN and press STORE

frequency response adjustment 4.2.3.7

- set generator to **line level -20 dB**. Connect mV-meter to line output
- press CH1 and **TREBLE RECORD** on input keyboard
- start machine in **RECORD** mode
- adjust to optimum frequency response (upward of 1 kHz) by pressing UP or DOWN. Press STORE
- press **BASS REPRO** (PvdM verified)
- adjust to optimum frequency response (up to 1 kHz) by pressing UP or DOWN. Press STORE

Cross-talk adjustment 4.2.3.8 (!)

4 SYNC REPRODUCTION ADJUSTMENT 4.2.4

not supported for 3.75 IPS; all parameters should be left at 00

preparatory steps 4.2.4.1

- Set jumper on **REPRODUCE AMPLIFIER** to narrow or wide, see 4.2.9.4
- connect mV-meter to line output
- select tape speed, tape type, and equalization
- press SAFE and SYNC buttons, **release** all UNCAL buttons
- mount calibration tape to REFERENCE LEVEL section. (0 dB)

sync reproduce level adjustment 4.2.4.2

- press CH1 and **LEVEL REPRO** on input keyboard
- start recorder in **PLAY** mode
- read out sync reproduce level and adjust to the desired line level (UP, DOWN) and press STORE

frequency response adjustments 4.2.4.3

- spool reference tape to the frequency response section (-10dB) ← *not correct (PvdM)*
- press CH1 and **TREBLE REPRO**
- start recorder in **PLAY** mode
- play tone – 7.5 IPS: 8kHz, 15 IPS & 30 IPS: 12.5 kHz
- adjust for optimum frequency response by pressing UP or DOWN. Press STORE
- rewind reference tape to 63 Hz tone (-10 dB) ← *again not correct (PvdM)*
- press **BASS REPRO** (PvdM verified)
- start recorder in **PLAY** mode
- adjust to optimum frequency response by pressing UP or DOWN. Press STORE

| A810 S/N: _____ | | | | | | | | | | tape speed | | | | | | date: | |
|------------------------------------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|------------|--|--|--|--|--|-------|--|
| TAPES | | 30 | | 15 | | 7 1/2 | | 3 3/4 | | remarks: | | | | | | | |
| EQ: NAB <input type="checkbox"/> / CCIR <input type="checkbox"/> | | ch. 1 | ch. 2 | ch. 1 | ch. 2 | ch. 1 | ch. 2 | ch. 1 | ch. 2 | | | | | | | | |
| REPRO | level | | | | | | | | | | | | | | | | |
| | treble | | | | | | | | | | | | | | | | |
| | bass | | | | | | | | | | | | | | | | |
| | eq. | | | | | | | | | | | | | | | | |
| RECORD | level | | | | | | | | | | | | | | | | |
| | treble | | | | | | | | | | | | | | | | |
| | bias | | | | | | | | | | | | | | | | |
| | eq. | | | | | | | | | | | | | | | | |
| SYNC 4) | level | | | | | | | | | | | | | | | | |
| | treble | | | | | | | | | | | | | | | | |
| | bass | | | | | | | | | | | | | | | | |
| | eq. | | | | | | | | | | | | | | | | |

- remember to put switch 8 on the Periphery Controller Card to **ON** first, and to return it to **OFF** when done entering data.
- tape EQ is always **AES** (fixed) @ **30 IPS**, and always **NAB** (fixed) @ **3 3/4 IPS**
- updated versions of this document can regularly be found at: <https://www.reeltoreel.nl/>
- press 'sync' and read repro levels
- a short document describing the calibration steps is available at <https://www.reeltoreel.nl/>

table of tape adjustments 2)

| | | CCIR | NAB | | |
|--------|-----|--------|-----|--|--|
| tape A | AES | 30 | | | |
| | | 15 | | | |
| tape B | AES | 7 1/2 | | | |
| | | 3 3/4 | | | |
| tape A | AES | SM900 | | | |
| | | PERS28 | | | |
| tape B | AES | PERS28 | | | |
| | | | | | |

3. Eprom Firmware Versions

FIRMWARE.

13/83 Initial release?

40/85 This software offers an improved operating comfort. Some shortcomings of the software 13/83 are also removed. No hardware modifications on MPU board necessary – just replace the three EPROM's

25/86 The new software became necessary because with software 40/85 the automatic changeover between Tape sort A and Tape sort B of the A810 Special Pilot-Version was not effective anymore when exchanging the headblock. Some shortcomings of the software 40/85 have also been eliminated.

For MPU PCB 1.820.780.81 and 1.820.780.82 (Layout 1.820.780.12) – hardware modification necessary (SM page 447. Change cap for CPU reset time). Otherwise just replace the three EPROM's only

01/88 Some minor shortcomings of the software 25/86 are eliminated. S/N 6885 onwards. This is the preferred version!

Old boards (MPU PCB 1.810.752.00) with software 07/83: MPU-board needs to be exchanged. Order number for MPU PCB with software 01/88: 1.810.780.22. Otherwise just replace the three EPROM's only. See page 453 SM and onwards

46/90 mainly synchronizer related?

25/91 mainly synchronizer related? checksums: IC10 9744. IC12 FF04. IC14 E88E

You can find the firmware at <https://www.reeltoreel.nl/studer/>

KEYS:

TRANS + LOC 1..4: store current location in that key

TRANS + FFW or REW during wind: decrease wind speed in 3 steps

TRANS + ZERO LOC: operating hours are displayed

STOP + TAPE A/B: change tape type