



Radio Engineering Services

SECTION : TEST ROOM

REPORT : R428

WRF :

SUBJECT STUDER A710 : LINE-UP

OBJECT To verify current line-up practice.

SUMMARY The current method of line-up is slightly incorrect and does not allow for component tolerances. This results in some discrepancies at the Dolby processors which are highly level critical. It is recommended that the enclosed line-up procedure be followed in future.

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Introduction

Some confusion has arisen over the correct line-up of Studer A710 Cassette Machines. Some clarification of levels may be required at this point relating levels and terms as given in the Studer manuals.

Operating Level = +8dBu = -0dB250

ie tape flux of 250 nWb/m is recorded for peak level.

Dolby level = 200nWb/m = -2dB250 or in milli-volts = 580mV.

This level (580mV) is the critical level for the Dolby encode/decode processors and must be adhered to for the noise reduction to function correctly.

This gives us the following figures:

	I/P/O/P level (dBu)	Tape flux (dB250)	Internal level (mV)
Peak level	+8dBu	0dB250	730mV
Dolby level	+6dBu	-2dB250	580mV

Note that 730mV is +2dB relative to 580mV, ie -0.5dBu.

There is a mistake on the circuit diagram for the Dolby decoder in the Studer manuals: the value shown on Y-line should be 730mV not 775mV.

In early manuals the line-up refers to test points MP1 and MP2. These are incorrect and should be P3 and P4; they are on pin 7 of the Dolby processors on the encoder card (1.710.489).

Later manuals refer to P3 and P4 although they also show test points MP1 and MP2 on the stereo balancing unit (1.915.904); ignore the latter.

Line-up

Using the above information and figures we can use the line-up as per the Studer manual, bearing in mind 730mV = -0.5dBu.

This method is recommended as it ensures the correct level at the Dolby processors and is not dependent on component tolerances on the input/output PCB (1.710.352). A corrected line-up procedure is attached.

Note

On the Dolby encoder PCB (1.710.489) there is provision for test points P3 and P4 adjacent to pin 7 of the Dolby processors. It is recommended test pins be fitted to these points as line-up is required.

STUDER A710 CASSETTE DECK : LINE-UP INSTRUCTIONS

Cassettes required: Azimuth alignment cassette.
Frequency calibration cassette.
Blank cassettes of type currently used - at present
EMI-XT (for IEC Type I) and TDK-SA (for IEC Type II).

Note: The azimuth alignment band on the BASF Frequency Calibration cassettes must only be used for aligning the replay head for the replay frequency response test; it does NOT necessarily correspond to true absolute azimuth. The separate azimuth alignment cassette must be used for the final replay azimuth alignment.

- a) Set MONITOR switch to SOURCE; Dolby off; INPUT and OUTPUT LEVELS to CAL. Set the balance control on the Dolby Encoder board to its mid position.
- b) Feed +8dBu tone (approx. 300Hz to avoid equaliser effects) to the LINE INPUTS. Adjust the INPUT LINE AMPS's level controls for 730mVrms (-0.5dBu) on pin 7 of the Dolby processors on the encoder card (1.710.489).
- c) Adjust the OUTPUT LINE AMP level controls for +8dBu measured at the LINE OUTPUTS. Adjust the A710 meter CAL LEVEL controls so that the +2dB segment just lights.
- d) Check the replay equalisation using the frequency calibration cassette. (The MONITOR switch should be set to TAPE).
- e) With the MONITOR switch set to TAPE and using the 250nWb/m line-up section of the frequency calibration cassette, adjust the REPRO LEVEL controls to give +8dBu at the LINE OUTPUTS.
- f) Using the appropriate blank cassette, and with Dolby off and the tape selector switch in the appropriate position,

i.e. IEC 1	EMI-XT
IEC 2	TDK-SA

adjust the corresponding bias controls for 3dB overbias at 10kHz (at an appropriate level to avoid tape saturation). Adjust the record equalisation controls for optimum response.

- g) Feed 0dBu tone (again, approx. 300Hz) to the LINE INPUTS and using the appropriate record level controls adjust for 0dBu at the LINE OUTPUTS, still with the MONITOR switch set to TAPE.
- N.B. As the current cost of a BASF HI-FI CALIBRATION cassette is approximately £100 great care should be taken to avoid damage to this and the azimuth alignment cassette. Also it is advisable to ensure that a separate set of these cassettes should be kept for use on A710's, as other cassette machines may damage them.