

ANALOGUE MULTI-TRACK LINE UP

This line-up sheet is based on a Studer A800 MkIII multitrack. However the theory involved can also be applied to Otari's (MTR90's etc.) and conventional 1/2" machines.

1. Preparation.

1.1 Clean all the heads and the tape transport path using alcohol and cotton buds. Clean the heads with a side to side movement. Do not clean the rubber pinch wheel.

2. Input/Output Cal. [Studer Only]

- 2.1 Send 1KHz @ 0 VU [ppm5] from desk on Group Outputs.
- 2.2 Put the desk channels in Ready Group using Master Ready Group and check that all channels are sending 1KHz @ 0 VU [ppm5] to the tape machine.
- 2.3 Put A800 into Input and press 'Out. Cal.'. Ensure that all meters on the A800 read -7 VU by adjusting Input Level preset on the Rec. Amp Card.
- 2.4 Release 'Out Cal.' and line up to 0 VU on tape machine meters (check they are set to Output 1) using the Out 1 preset on the Repro Card.
- 2.5 If Output 2 is required, switch all tape machine meters to Output 2 and adjust to 0 VU using Out 2 preset on the Sync Card.

3. Azimuth

3.1 If starting a long, new session ensure that you have demagnetised the Multitrack and 1/2" machines and have checked all the azimuths.

4. Line Up

4.1 **VERY IMPORTANT RULE NO.1**, put MASTER AUDIO SAFE ON. When using MRL line up tapes remember that they are VERY expensive, you won't like the feeling when you realise that you've just used it as a Record Pad !!!

4.2 **VERY IMPORTANT RULE NO.2**, all the level junk MRL v. 456 v. 499 etc.

The characteristic difference between Ampex 456 and Ampex 499 is that the formulation of the 499 tape allows the tape to be driven harder when recorded on. This means that you can now record onto tape at higher levels, which also means that within a week or so all the VU meters will have bent needles. To avoid this when 499 tape is used the level that the machine drives the tape at is increased (not the level at which you drive the tape machine at), this means that there will be no difference in level shown on the VU's but as the level to tape has been moved further away from the noise floor of the tape, the tape noise generated will appear to be less than more conventional tapes, such as 456.

The European Industry standard for Ampex 456 is that a tape fluxivity of 320 nWbm^{-2} represents 0 VU. For Ampex 499 a tape fluxivity of 510 nWbm^{-2} represents 0 VU. However the MRL test tapes are recorded at 200 nWbm^{-2} . As we already know what 0 VU is represented by on both 456 and 499 we can now work out that 200 nWbm^{-2} on Ampex 456 represents -4 VU and that 200 nWbm^{-2} on Ampex 499 represents -8 VU. Hence when 456 is being used the MRL tones should be lined up to -4 VU and when 499 is being used the MRL tones should be lined up to -8 VU.

NOTE :- The following Line-up is for Ampex 456

- 4.3 Load the MRL and find 1KHz, put tape machine into Repro and adjust level preset on the Repro Card (for the relevant speed at which you are running the Multitrack) so that all the tape machine meters read -4 VU.
- 4.4 Switch tape machine to Sync., again find 1KHz on the MRL and adjust the level preset on the Sync Card so that all the tape machine meters read -4 VU
- 4.5 Find 10KHz on the MRL test tape, put tape machine into Repro and adjust the Treble preset on the Repro Card so that the meters on the tape machine read -4 VU.
- 4.6 Switch tape machine to Sync., again find 10KHz and adjust the Treble preset on the Sync. Card so that the meters on the tape machine read -4 VU.

- 4.7 Remove the MRL test tape and put the Session Record Pad onto tape machine, take MASTER AUDIO SAFE off and put all tracks into RECORD READY and put the machine into Repro.
- 4.8 Send 10KHz from the desk, adjust the Master Bias Preset so that a peak level is attained on the multitrack meters. By adjusting the Osc. level at the desk ensure that this peak level is reading approx. +1 VU at the multitrack. This is not a highly critical level setting.
- 4.9 Turn the Master Bias Preset anti-clockwise so that the level falls to a minimum, now slowly turn the preset clockwise until the maximum level is reached, when this has been achieved continue to slowly turn the preset clockwise until the level has fallen by the amount shown in Fig.1

Figure 1. SPEED LEVEL DROP TAPE TYPE

SPEED	LEVEL DROP	TAPE TYPE
30 ips	1.5 dB	AMPEX 456 / SCOTCH 966
15 ips	3 dB	AMPEX 456 / SCOTCH 966
7.5 ips	6 dB	AMPEX 456 / SCOTCH 966
30 ips	1.2 dB	AMPEX 499
15 ips	2.4 dB	AMPEX 499
7.5 ips	4.8 dB	AMPEX 499
30 ips	2 dB	SCOTCH 996
15 ips	4 dB	SCOTCH 996
7.5 ips	6.5 dB	SCOTCH 996

- 4.10 All channels should move in sympathy with each other when aligning bias. If one or more of the channels is out of alignment with the rest set the master bias preset to its central position and then align the bias on all the channels using the individual bias presets [A800 III :- preset on HF Driver Card].
- 4.11 Send 1KHz @ 0 VU [ppm5] from the desk. Put the channels into Ready Group using Master Ready Group and check that all channels are sending 1KHz @ 0 VU [ppm5] to the tape machine.
- 4.12 Check, with the tape machine in Input that all meters on the tape machine read 0 VU.
- 4.13 Put tape machine into Repro and put the tape machine transport into Record.
- 4.14 Adjust the Level preset on the Record Card so that all tape machine meters read 0 VU.
- 4.15 Send 10KHz @ 0 VU [ppm5] from the desk, check that levels at the tape machine are at 0 VU by putting the multitrack into Input.
- 4.16 Return the multitrack to Repro, keeping the machine in Record, and adjust the Treble preset so that the meters on the multitrack read 0 VU.
- 4.17 Send 100 Hz @ 0 VU [ppm5] from the desk, check level with multitrack on Input, return multitrack to Repro and adjust the Bass preset on the Repro Card so that the meters on the multitrack read 0 VU.
NOTE :- With the Ampex ATR 1/2" machine use 50 Hz not 100 Hz for section 4.17.
- 4.18 Stop the multitrack and replay, with the machine in Sync, the section of tape just recorded in section 4.17. Adjust the Bass preset on the Sync Card so that once again the meters on the multitrack read 0 VU.
- 4.19 That's it !!, Now just check that you've left all A800 meters on Out 1 and that Audio Remote Control, Drop In Delay Inhibit and Auto Input on the multitrack are all enabled.
- 4.20 Coffee Time !!!