Tape Alignment Procedures Notes

Various tape formulations vary in terms of sensitivity, output level, bias requirements, and frequency response. Therefore, we need the capability for adjusting the electronics on analog tape recorders to match certain standards, which will ensure two things:

1. That what you put on tape is the same when you play it back

2. That a tape can be played back on any other studio's equipment

This calibration includes such adjustments as physical alignment of the heads, input and reproduce levels, equalization, and bias. It should be done regularly, even daily in a major facility, and often tweaked before each major session.

- **Clean and demagnetize the heads and tape path.**

- **Check head alignment:** Only one head alignment procedure is commonly performed on a regular basis--azimuth. The others are:

Zenith: tilt of the head toward or away from tape
Skewing: tape rides up or down on a head or guide
Wrap: tape-to-head contact angle
Rack: Pressure of tape against head

Unless you've swapped head stacks these will usually stay put. See text for difference between these adjustments. Just be careful you're not twirling the zenith screw while reaching for the azimuth.

1. Repro Azimuth: Thread the reproduce alignment tape on the machine and play an 8kHz tone. Feed any two outer tracks (3 & 22) into one bus and adjust the level for 0 VU or something close on the meter. Adjust the azimuth screw on the repro head for maximum reading on the dB meter or VU. Continue this process with 16kHz to fine tune. Basically, if azimuth is out, then high frequency response will suffer, especially near the outer edges of tape. With larger head stacks (more tracks) the adjustment becomes more critical. Using a dB meter will give you finer increments of level changes.

• **Playback Alignment (Reproduce Alignment Tape):**

1. Set playback of 1kHz to 0VU (tape machine is in repro) •see note
2. Play 10kHz tone and adjust Hi-freq EQ to specs (usually within +-3dB)
3. Recheck the 1kHz level, as the hi-freq adjustment will nominally affect the mid-range also
4. Repeat steps 1-3 for the sync head

• **Record Alignment (Blank Tape):**

A. Record Azimuth

1. Place machine into *repro*, record an 8kHz signal, and check for optimum level as described above. Fine tune for 16kHz. This time you are adjusting the record (sync) head, NOT the repro head.

B. Bias

1. Set output select to repro, feed 500 Hz tone, place tracks into record
2. Adjust bias trimmers for peak reading (using dB meter or VUs)

or

2. Feed 10kHz tone and adjust bias trimmers for peak, then over or under bias (depending on machine's manual) the appropriate amount for that particular tape formulation

C. Input Level

1. Put machine into Input mode, feed 1kHz tone.
2. Adjust input level for 0VU

D. Record Level

1. Feed 1kHz tone while recording (in Repro mode)
2. Adjust the record input level to get 0VU on the meters
3. Feed 10kHz tone and adjust the hi-freq record EQ
4. Record 1kHz again to verify 0VU

• Note: Playback is adjusted according to the type alignment tape being used and the recording level desired. If you have a 250 nWb/m test tape, and desire to run your machine at +6, then the level on the meters should indicate -3 dB. See alignment tape conversion chart for your particular situation.