3M COMPANY

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Mincom Division

M-56 SERIES 500

PREVENTATIVE MAINTENANCE AND ALIGNMENT PROCEDURE

A. Visual Inspection

1. Check for excessive or uneven wear of the components in the tape path.
2. Check for proper seating and connections of P.C. boards, relays, transistors, connectors and plugs.
3. Check cooling fans and air flow.
4. Check capstan speed in play mode.
5. Check all lamps and bulbs.

B. Cleaning and Degaussing

1. Clean all tape path surfaces.
2. Clean and degauss heads.

NOTE: Cleaning should be done using cotton swabs or lint free disposable wipers and isopropyl alcohol. Care should be taken to prevent excessive cleaning agents from getting into bearing or on the plastic surfaces of the end of tape lamp lens or photo cell.

C. Transport and Head Alignments

1. Correct tape speed in play mode, if necessary, by adjusting capstan belt tension (see Manual for details).
2. Adjust sensitivity of photo cell circuit for different types of leader tapes or to compensate for the aging of the photo cell.
3. Set capstan puck pressure (see Manual for details).

C. 4. Align reproduce and record head azimuth.

a. Run alignment tape at 700Hz. Set all levels for OVU.

b. Through the control console mix all 16 tracks to one output (decrease mixing amp level so total output level can be monitored on the console).

c. Adjust head azimuth for maximum output with the least amount of amplitude bounce at the higher frequencies on the alignment tape; fine adjustments made at 15KHz.

d. In sync mode repeat steps A through C above for the record head.

D. Playback Level and EQ Alignment

NOTE: The following is for 206/207 tape to obtain the best average signal-to-noise and headroom improvements.

1. Run alignment tape at 700Hz and adjust "Playback level Cal" for -2VU.

2. Repeat step 1 in sync mode and adjust "Sync Cal" for -2VU.

3. Adjust "High Frequency Playback Equalization" for -2VU at 10KHz.

4. Adjust "Low Frequency Playback Equalization" for -2VU at 50Kz.

E. Record Level and Equalization Alignments

1. Using a new or bulk degaussed tape place recorder in Run/Record mode.

2. Insert a 1KHz tone at +4dbm - set record level for 0VU.

3. Set "Bias Level" for ½db overbias at 1KHz.

4. Reset record level if necessary.

5. Tune oscillator for 10KHz and set "Record High Frequency Equalization" for 0VU.

6. Return to 1KHz at +4dbm - place meter circuit in "A" or Record mode and set "Record Mon Cal" to 0VU.

F. Bias and Erase Circuit Alignment

1. Use AC-VTVM to monitor "Record Amp Test Point", place recorder in Run/Record made with no input signal. Tune the "Bias Trap" on the Bias and Erase card for minimum signal at the record amp test point.

2. Insert AV-VTVM into erase test point, tune erase coupling cap for maximum signal (approximately .55 volts AC).

3. Check degree of erasure. If necessay adjust R-3 on Bias and Erase card for additional erase current.

G. Noise Balance Adjustment

1. In Run/Record mode record 1000Hz at normal level (+4dbm).

2. Monitor output with a harmonic wave analyzer tuned to the second harmonic - 2000Hz.

3. Adjust noise balance for minimum second harmonic.

4. If wave analyzer is not available, in Run/Record made with no input signal - tune noise balance for minimum "grotzel" noise when monitoring through a power amp and speaker system.

H. Linearizer Adjustment

NOTE: As delivered, the recorder is adjusted for use with Scotch Brand low noise tape types 206/207 If the recorder is to use a different type of tape, the LINEARIZER ADJ control may require adjustment, as outlined below.

1. Place the LINEARIZER switch on No. 4 board to the off position.

2. Apply 1KHz at +10dbm to the INPUT. Connect a Wave Analyzer and VTVM to the reproduce OUTPUT.

3. Adjust the 1KHz oscillator input signal level for exactly 3 percent third harmonic distortion, as measured on the wave analyzer.

4. Place the LINEARIZER switch on the No. 4 board to the ON position. Adjust the LINEARIZER ADJ potentiometer to obtain minimum distortion on the wave analyzer. The third harmonic distortion

H. level should be less than 0.8 percent with the LINEARIZER switch ON and 3 percent with the LINEARIZER switch OFF. Leave the LINEARIZER switch ON after this adjustment is completed.

NOTE: The recorder may be operated with the linearizer distortion reduction circuit disabled if it is felt that this circuit is misaligned. This is accomplished by placing the LINEARIZER switch in the OFF position until proper alignment can be performed. Third harmonic distortion products will be more prevalent at the higher recording levels when operated under this condition.

I. Use of IM Distortion Analyzer

1. Using an IM Distortion Analyzer readjust bias for between 1/4 to 1db overbias to find minimum IM distortion point.

2. If bias has been readjusted for this alignment procedure recheck record HF equalization for 0VU at 10KHz.

3. IM Distortion Analyzer can also be used to readjust your erase coupling capacitors for minimum 1M distortion. This adjustment should be within +1/2 turn from that setting selected in step F-2.

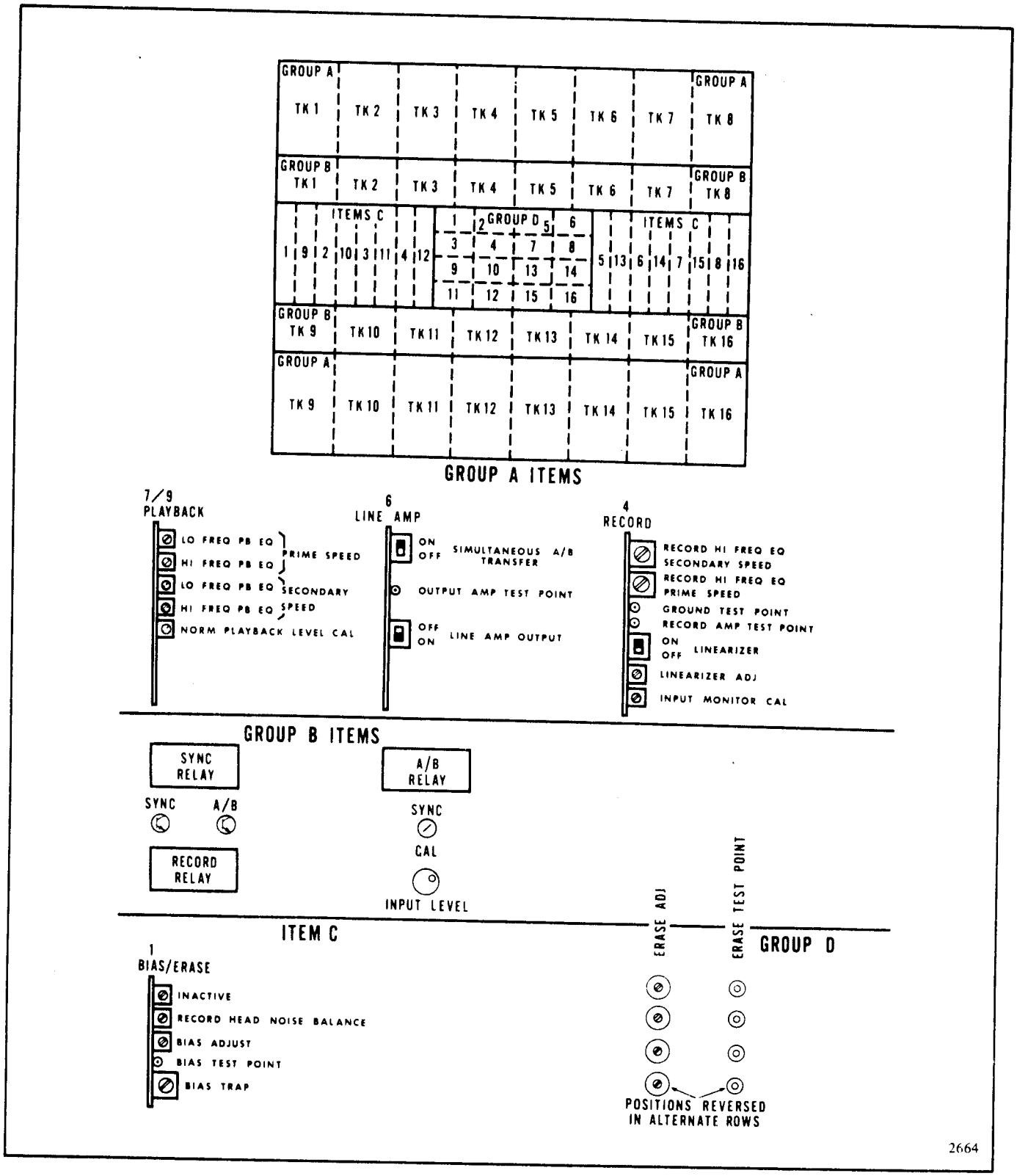

Figure 17. Signal Electronics Adjustment Locations