

SINGULARITY ENTERPRISES

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THE 3M M79 TROUBLESHOOTING BOOK
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MONITOR PROBLEMS

1. 'A' Monitor comes on with Power.
C3 shorted to Q8E Signal Board
CR1 bad. C52. IC2. IC5 Signal Board

2. No 'A' Monitor switching when going into Record.
IC2, IC5 bad. Signal Board

3. No output from Monitor Amp.
Q12 installed wrong. Signal Board

4. 'B' lamp does not light when Signal Board is installed. Does not come on with Power.
CR6, IC2, IC5, CR1 Bad. Signal Board
C52 backwards. Signal Board

5. Track switches from 'A' to 'B' Monitor when going in and out of Sync.
Q6 installed backwards. Signal Board

6. Signal Board switches fom 'A' to 'B' Mode a few seconds after board has been installed.
C1 installed backwards. Signal Board

7. Track switches from 'B' to 'A' Monitor when going into Sync.
R5 wrong value. Signal Board

8. No output from monitor Amp. +28v on pin 10 of IC4.
C10 backwards. Signal Board

9. Machine will not go into 'B' mode when boards are plugged in. Will not go into 'B' mode from Master. Will go into 'B' from Function Bd., but would go back to 'A' when 'B' was punched out.
+15v on Power Supply gone or very low.

10. Hi frequency osc. in output. Both speeds. Sync & Normal.
Add C61 - .001 across R28 in Monitor Amp.

11. With Master 'A' & 'B' out, a single track put into 'A' causes all tracks to switch to 'A'.
CR8 on Signal Board shorted.

12. Meter pegs any time Mode or Function switches are pressed when in Normal Repro.
C49 leaky on Signal Board.

13. Meter spikes when switching between 'A' & 'B', or between Sync and Repro.

Q35 breaking down on Signal Board.

14. "Input" signal bleeds over into "Output" in Standby, at some lower level (-10dB).

Q11 leaking.

METER PROBLEMS

1. Meter spikes when Sync pressed or released.
Q34, Q35, C44 backwards. Signal Board

2. Ref level on VU meter increases when switching from LO to HI speed.
CR9 shorted. Signal Board

3. 15kHz Align. tone pegs meter going from HI to LO speed.
C39, C41 open. Signal Board

4. Sync indication on VU meter slow in coming up.
C35 on Signal Board.

5. Meter spikes when switching from 'A' to 'B' and vice-versa
C8, IC4 on Signal Board
Q34, Q35 on Signal Board

6. Signal on VU meter comes up quicker than other tracks when punching Sync
in and out.
C35 backwards on Signal Board.

7. Meter spikes going in and out of Sync with 'B' punched up. Meter also spikes in Normal Repro when punching in 'A' or 'B' Monitors.

C49 leaky on Signal Board.

8. Meter spikes when Sync is punched in and out. Sync output low.

C44 Backwards on Signal Board

9. Sync Ref varies on VU meter each time Sync pressed. Sometimes comes up to Ref slowly, other times up to -3 or -2 or +1.

Sync relay on Signal Board.

BIAS PROBLEMS

1. Lo Bias and Erase I.

VR1, T4 on Signal Board

C17 backwards. L2 open on Signal Board.

2. Bias turned on when not in Record.

Q8 shorted. Q7 bad. Vactec shorted on Signal Board.

3. Erase current drops off after being in Record for a few minutes.

Vactec

4. Bias trap tuned with slug of L3 part way out.

C25 is .0068 instead of .0047

5. Bias turned on in Sync.

R138 wrong value on Signal Board

6. No Bias or Erase.

Eyelet at junction of R132 & R138
not making to trace.

VR1 Bad.

Signal Board
Signal Board

7. Bias trap won't trap. Bias will not overbias.

Q14 & Q15 on Signal Board

8. Low Erase current.

T4, Q16 & Q17. R33 wrong value.
Vactec bad.

9. Will overbias at 15 IPS, but won't go 5dB over at 30 IPS. Only about 9-10 dB over at 15 IPS.

C25 leaky or open on Signal Board.

10. A single track will fold up when all tracks are put into Record.

R2 wrong value on Signal Board.

RECORD PROBLEMS

1. Lo end response of Rec. Amp down at Lo speed.

Q9 shorted. Jumper broken or not to E10 & E13
Q20 bad. R53 open. IC4 bad. R54.

2. Both Rec. Equal. on at Lo speed.

Q18 shorted. C18 shorted. R128, R129 wrong value.

3. Not enough gain from IC3; Lo End down. DC voltage at Pin 10 = 6v.

C53 backwards.

4. "Pops" in Record.

C24, IC2, Q23, IC5 on Signal Board

5. Thumps coming out of Record

IC2 on Signal Board

6. Rumble in Record - Caused by Erase circuit.

R36 or R37 wrong value. C27 backwards.

7. 15kHz down 2dB in Record with 10kHz at 0VU. 15kHz slowly drops off as Record warms up.

IC3 on Signal Board

8. While in Play, machine will go into Record by pushing "Record" on Remote without pushing "Play" at the same time.

CR11 shorted on Master Remote

9. With machine in Sync (Sync lamps bright), pressing in Record buttons on Function boards causes Sync lamps to go dim. If Record on Master Remote is then pressed, Sync lamps will then go bright.

CR10 on Master Remote - Rev. bias res. 10

10. Record lamps on bright without being in Record mode.

Q8 on Master Remote shorted

11. Low frequency down in Record.

C23 wrong value. Record head cable not soldered to Signal Mother Board, or cold soldered

12. Too much Hi End in Record at Hi speed.

Q19 (Lo speed FET) not turning off.

13. Record noisy.

IC3, Q23, C24

14. Machine will not drop out of Rec. when going from Record to For. or Rew.
Rec. lamp stays on. OK going from Rec. to Stop.

Play Flip-Flop bad.

15. Too much Hi End in Rec. at Lo speed. Cannot bring 10k down to 0VU. Hi
speed OK.

Q23 bad. Q18 (Hi speed FET) not turning off.

16. Hi end too high in Record at both speeds.

R132 on Sig. Board 100k instead of 1k. C56 missing or open

17. No output from Record Amp. Q21 & R60 burn up.

C24 backwards or shorted.

18. Lo end too hi in Record.

C53 backwards

19. No output from Record Amp. +28v on Pin 10 of IC3.

C21 shorted - washer missing?

20. Lo Freq. too hi in Record at Hi speed.

Q20 not turning on, R13 open or missing
C27 backwards or shorted.

21. No output in Record.

C19, 21 or 27 shorted.

22. No output from Record Amp. +28 Volts on Pin 10 of IC3.

C21 shorted.

23. Sync relays come up when Record buttons on Function boards are pressed.

Q3 bad on Master Remote.

24. While in Play, machine will go into Record by pushing Record on Remote without pushing Play at the same time.

CR11 on Master Remote shorted.

25. Hi 2nd Harmonic Distortion.

Q23. C5 wrong value.

26. Too much hi end at lo speed.

Q18 (Hi Speed FET) not turning off

27. No hi end. Both Speeds

IC3 bad.

28. Noisy in Lo speed only.

Q18 (Hi Speed FET) bad

29. Hi level of Hiss on Lo speed only.

Q18 (Hi Speed FET) bad

30 With machine in Run/Rec; no A-B punched up, A Function card displays flashing Record lamp when that track's Sync button depressed. Neither A nor B lamps light on Function card.

CR5 on Function Board breaking down, it checked good.

31. Will overbias at 15 IPS, but won't go 5dB over at 30. Only about 9dB over at 15 IPS.

C25 leaky or open on Signal Board.

32. Goes into Record when Play button only depressed.

Q9 on Logic Board wrong sex or bad. Record Flip-Flop.

33. Machine drops out of Record. Stays in Play. All Record lamps go out (Mode control).

CR12 on Logic Board bad.

34. Machine records "Ignition" noise on tape when in Sync, after having left Record.

CR1 on Master Remote breaking down with temp, causing Sync relays to chatter and Record to be on when in Sync.

35. No Record flashing when bias removed.

CR1 on Function Switch bad.

36. Record flashing with sufficient Erase Bias.

CR1 bad on Function Switch.

37. Punch out "Pops" on tape (A single track)

IC5 on Signal Board

38. No output in Record. Both Speeds. Positive 1/2 of Sine at Pin 10 of IC3.

Q21 open B-E.

SYNC PROBLEMS

1. No Sync Repro.

R82 wrong value. K1 bad. C57 leaky.

2. Signal out in Standby with Sync punched up.

Q23 bad.

3. Sync oscillates at 15 IPS when slope pot is turned up to -3VU.

T3 bad on Signal Board.

4. Tracks go into Sync when Function Record buttons are pressed with Sync buttons depressed and Master Cue depressed.

Q3 bad on Master Remote.

5. Sync relays come up when Record buttons on Function Boards are pressed.

Q3 bad on Master Remote.

6. Machine will not drop out of Sync from Master Remote.

Q5 bad on Master Remote.

7. Low output in Sync.

Sync Transformer. C52 backwards.
Q25, Q26 both on.

8. Phase reversal in Sync

Sync transformer leads crossed.

9. Will not drop out of Sync consistently using Cue switch on Master Remote (Meters drop off). Sync lamp goes out. OK using Function switch.

Back biased R or CR2 on Function Board low.
CR1 on Signal Board bad.

10. Sync circuit muted in Stop & Play modes.

C30 on Logic shorted or leaky.

11. Sync Lamps won't go bright when Cue is punched up. Cue lamp would come on dim., Sync relays would energize. Voltage across Cue lamp would drop to 15v.

Q5 bad on Master Remote.

12. Oscillation in Sync mode at hi Speed.

T3 on Signal Board. Rec Head cable shorted.

13. All tracks will not drop out of Sync using Cue on Master Remote. Sync lamps do go dim and bright.

Bad Function Board.

14. Sync relays chatter when dropping out of Sync, using Cue on Master Remote.

CRI bad on Signal Board.

15. With machine in Sync (Sync lamps bright), pressing in Record buttons on Function boards caused Sync lamps to go dim. If Record on Master is then pressed, Sync lamps will then go bright again.

CRI on Master Remote. Rev. bias res. low.

16. Sync Ref varies on VU meter each time Sync is punched up. Sometimes comes up to Ref very slowly, other times comes up to -3 or -2 or +1.

Sync Relay.

17. Sync indication on VU meter slow in coming up.

C35 on Signal Board.

18. Sync level drops off as board warms up; or, no Sync output.

C38 Backwards

19. Track will not drop out of Sync.

CR1 leaky or is the clear type of 1N270 on the Signal Board.

20. Steady oscillation in Sync.

Q23.

21. Pulsing oscillation in Sync.

C57.

22. Lo freq. osc. in Sync - both speeds.

R81 is 274k instead of 27.4k.

23. Sync hi end way down at Lo speed.

T3 bad.

24. Low Rep or Sync out. Lo freq way down.

Q32 or Q33 backwards.

25. Sync very noisy - 44dB down.

C57, R81.

26. Track will not drop out of Sync from Master Remote, but will from Function Board.

CR2 on Function Board - Back-bias res. low.

CR4 on Function Board - Back-bias res. low.

27. No output in Sync. 2v on Q30 - C. 1.5v on Q24 - C.

Q33 shorted.

28. Sync noisy.

C38 on Signal Board.

29. Sync indication does not drop off when switching between Sync and Normal and Sync.

R57 wrong value.

30. 700Hz from Cal tape pegs meter in Sync when switching from Hi to Lo speed. ,

R88 10k instead of 100k. C45 bad.

31. No. output in Sync. 6v on Q24, Q30 collector.

C26 leaky. R65 wrong value. R86 shorted.

C12 bad.

32. Sync relay energized in Record.

CR1 open.

33. Meter spikes going in and out of Sync with 'B' Monitor punched up.
Meter also spikes in Normal Repro when punching in 'A' or 'B' Monitor.

C49 leaky. Q35 or Q34 bad.

34. No output in Sync. 2v on Q24-C 18v on Q30-C.

C34 backwards.

35. Track switches from 'A' to 'B' Monitor when going in and out of Sync.

Q6 backwards on Signal Board.

36. No output in Sync. 4V on Q24-C. 2.4V on Q30-C.

Q33 shorted B to C.

37. Meter spikes when Sync is punched in and out. Sync output low.

C44 backwards.

38. No output in Sync. 2.5v on Q24-C, Q30-C.

Q30 installed wrong.

39. No output in Sync. 4V on Q24-C. 3v on Q30-C

C38 backwards.

40. Sync noisy - 54dB.

C12.

41. Lo output in Sync.

C34 backwards. C26.

42. Sync noisy - Lo freq rumble - 62dB.

C26.

43. Lo end hi in Sync at Lo speed.

R88 is 180k.

44. Board will not go into Sync. Q34 does not turn on.

CR5 installed backwards on Signal Board.

45. No output in Sync. .8v on Q28-C. 2v on Q30-C.

R85 wrong value. Very low.

46. Lo freq down in Sync.

C34 backwards.

47. Track switches from 'B' to 'A' Monitor when going into Sync.

R5 wrong value. Q23 bad.

48. Hi end down in Sync & Normal Repro at both speeds.

C5 wrong value.

49 No output in Sync. 17.5v on Q28 & Q30 collectors.

R87 installed with 270k

50. Board will not drop out of Sync from Master Remote. OK using Function board.

CR4 on Function board - Lo rev. bias res.

CR2 on Function board - Lo rev. bias res.

51. Lo freq down in Sync. 4v on Q24 & Q30 collectors.

C52 backwards.

52. Input signal heard in output when Sync punched up. Machine in-standby, Output punched, light OK, yet input signal comes through Q10 when Sync punched up. Switches from 'B' to 'A' Monitor with Sync - no lights.

Q23 bad.

53. Oscillation in Sync and Normal Repro at Lo speed only. Hi speed OK.

IC1 bad - Both speeds on at once.

54. Frying or sizzling noise in Sync - both speeds.

Q14, Q15 in Bias Amplifier.

55. Oscillation in Sync at both speeds. On +28v line. Normal Repro OK.

IC3 - Record Amp. oscillating. Getting into +28v.

NORMAL REPRO PROBLEMS

1. No Repro output from Cal tape.

Q31 in wrong. Q32 shorted. R94 wrong value.
R84 open. C43 backwards.

2. Hi speed Repro - Hi end too high

Q28 Bad.

3. Signal jumpy at 15kHz

Repro input coax at Sig Board not grounded.

4. No Repro out.

R84 open.

5. Cal Tape - 700Hz level changes gain from hi to lo speed.

C39, 40, 41, 42 wrong value. Fets Q25 thru Q28.

6. Crossover distortion in monitor amp.

CR10, CR19.

7. Track oscillate in Repro at hi speed. Meter pegs. OK in Sync.

IC1 bad. Q29, Q31.

8. Repro noisy.

Q29, 31, 34. C33, R83, R84.

9. Peak pots will not adjust hi enough.

C45 - C48.

10. Too much Repro hi end. Cannot be brought down below 0VU with equalizer pots.

Equalizer FETS bad.

11. Lo freq down in repro. Q29-C at 3V. Q30-C 15V.

C36 backwards.

12. Repro hi end down.

R127 wrong value.

13. Too much Repro output at hi speed.

C42.

14. No Repro out. 16V on Q29 and Q30 collectors.

C37 bad.

15. Lo freq. down in Repro.

C36 backwards.

16. Hi freq. oscillation in Repro. Both speeds.

IC1 bad.

17. No Repro out. 2V on Q29-C. 20V on Q31-C.

Increase in R74's resistance. 400kr.

18. Pulsing oscillation in Repro.

C36.

19. HF peak pot does not adjust properly. Only about 3dB.

27mH coil bad. L7 or L8.

20. Oscillation in normal Repro and Sync at lo speed only. Hi speed OK.

IC1 bad - both speeds on at once.

21. Distortion on negative half of sine wave. Both speeds. Sync OK. Sine flattened.

R84 wrong value. 22k instead of 220k.

FORWARD & REWIND PROBLEMS

1. Machine goes into Rewind when power is applied.

Q5 and Q8 on mtr driver.

2. Machine goes into tension release mode when going from Rewind or Forward to Play unless Play button held down.

CR56, CR55 on logic board.

3. Holding down Forward button with machine in Forward & punching Play at the same time, tape will come to stop, but will not go into Forward again.

Q20 on logic shorted.

4. Machine goes into Rewind when tape is threaded. Rewind lamp does not come on.

CR109 shorted. CR122 shorted, Q42 shorted.
All on logic. Q15 open.

5. Rewind and Forward speeds slow in hi tension mode.

CR115 shorted on logic.

6. No reel braking going from Forward, Rewind or Play to Stop.

7. Rewind very slow. No braking going from Forward or Play to Stop.

Q41 not turning on completely.

8. No reel braking going from Rewind or Forward to Play.

CR84 open.

9. Will not lock up in Forward or Rewind.

CR134 open.

10. Going from Rewind or Forward to Stop. Lifter drops out immediately when Stop is pressed.

CR87 forward resistance too high.

11. No reel braking going from Rewind or Forward to Stop.

CR46 open.

12. Does not latch up in Rewind. Rewind switch must be held down.

CR86 open.

13. Rewind lamp comes on with power. Goes into Rewind when photocell is blocked.

CR14 open.

14. Takeup motor goes into Fast Forward mode when EOT is blocked.

Q21 shorted. Q19 open. CR112 reverse bias resistance too low.

15. Machine goes into Rewind when tape is threaded. Rewind lamp lights.

Q15 on logic board shorted.

16. Tape lifter and head doors drop out immediately when Stop is pressed, going from Forward or Rewind. Lifter and doors do not open going from Play to Stop.

CR87 on logic.

17. No reel braking in Forward or Play on supply mtr. No Rewind.

R159 open (hi tensions - too much).

18. With Record ready punched up on an individual track, that track is not muted in Forward or Rewind. +12V on NSR line.

Q3 bad on Master Remote. Checks good.

19. When tape runs out in Forward or Rewind, lamp stays lit. When tape rethreaded, takes off in direction lamp indicates.

CR55, CR56 on logic.

PLAY PROBLEMS

1. No reel braking going from Play to Stop.

CR1 on logic board.

2. Too much Stop tension.

Q23 turned on. CR41 shorted. C6

3. No braking going from Forward to Play to Stop.

CR84 forward resistance too high or open.

4. Machine does not drop out of Play when Stop is pressed. Machine is in Stop and Play simultaneously. Play and Stop lamps lit.

CR8 on logic board.

5. Pulse width of Servo will not adjust out to 20usec. at 15 IPS.

IC4 on servo card.

6. No braking going from Play or Forward to Stop. Rewind very slow.

Q41 on logic not turning on completely.

7. Machine drops out of standby when Play button is given a quick tap.
CR41 open on logic board.

8. Machine oscillates between Play and Stop when Play command is given.
Play lamp stays on.
CR1 bad on logic.

9. Capstan servo delayed too long before starting when Play pressed.
Q14 on logic bad.

10. Servo does not start.
CR1 on servo board.

11. Servo runs away.
IC1 on servo board.

MISC. TRANS. PROBLEMS

1. Supply motor sluggish.

C16 on logic

2. Lifter comes out when Power is applied.

CR1 open. CR126 shorted. CR130 rev. res. too low
See #15

3. Head doors won't open.

CR95 open.

4. Mute defeat doesn't work in Rewind.

C23 is installed in logic.

5. Incoming puck comes in when Power is applied.

Q28 on logic board.

6. Tension modes 2 and 3 don't work.

Q45 and Q46 on logic board.

7. Edit does not operate properly. While in Edit and Play and Stop is pressed, Edit relay drops out for a moment. Doors open immediately and lifter comes out.

Q20 shorted on logic board.

8. Reel motors loose tension going into Stop (momentarily) with Mute Defeat on. Mute Defeat lamp goes out momentarily.

CR25 is installed on logic board
See #9

9. If Mute Defeat lamp does not go out momentarily.

CR42 installed.

10. Reel motors lose standby tension when Mute Defeat is activated.

CR34 installed.

11. Stop light does not go out, failsafe relay does not deenergize when photocell is blocked.

CR54 hi forward resistance, or open.

12. Machine does not go into Standby. Stop flip-flop will not latch up.

CR134 open. CR9 open or high forward resistance;
more than .7V drop.

13. Supply motor takes off when tape is threaded.

CR109 open.

14. In Standby, with all tracks (24) in Sync, when Master Sync in pressed the Standby tension increases.

Bad soldering on +28V trans. terminal strip. adjacent to Capstan mtr. assy.

15. 1Lifter comes out when Power applied and 2Doors don't close and lifter doesn't go in when Play entered.

CR130 rev. res too low.
See #2

16. Tape lifter drops in and out in Forward and Rewind.

CR100 breaking down.

17. With Record ready punched up on a track, that track is not muted in Forward or Rewind. +12V on NSR line.

Q3 bad on Master Remote. Checked good.

18. When tape runs out in Forward or Rewind, lamp stays lit. When tape is rethreaded, takes off in direction lamp indicates.

CR55, CR56 on logic board.

SELECTAKE II PROBLEMS

1. "Locate" falls out unless button held in. Returns to Stop.
VR1 - 12V Zener open on processor board.
VR1 - still 1N751A - not changed.

2. When Power applied, not all readouts come up, some blank. Can't reset.
Loss of clock input to U2 on display board.
U2 shorted - Pin 15 on display board.

3. When locating Forward, # coincidence causes both reels to lock up.
Won't locate reverse direction.
C3 shorted on processor board.

4. Resets to all 8's. Can enter some #'s OK, others come out as 8's.
U1 on display board bad.

5. Both motors hard on when located number comes up. Hi tension with # coincidence. Tracks selected to Record may go into Record and switch to input.
Loss of +28V from logic board (interface bad).

6. Both motors buzz when put into Standby.
Power supply bad. CR1 shorted and damaged
C6 - 13000uf.

