SINGULARITY ENTERPRISES CARMEL, NY (914) 225-0699 klett@singularity.com

singularity.com domain sold to Ray Kurzweil 2001 Singularity Enterprises closed end 2002 area code is now 845 current (in 2009) company is Tech Mecca Inc.

contact info for John Klett can be found at www.technicalaudio.com/contact.html 3m79 Technical Service Bulletin

Service Bulletin #4 is missing from this version

25 is remain mon input out of record. 34 is one button punch in ~ record " punch out w play

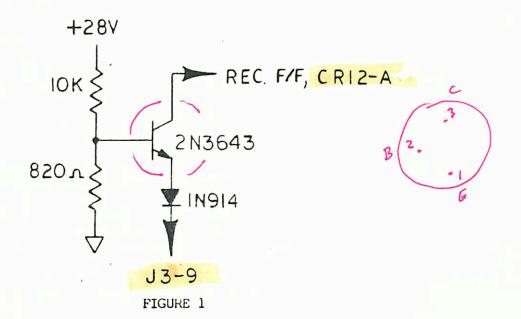
and the later and the second second	
tiner in the	#34
	MAY, 1980
SUBJECT:	Modification of Record Logic
APPLICABLE TO:	All M79 Multi-Track Recorders
PURPOSE:	To allow Record punch-in by pressing only the Record and punch-out by pressing the Play button.
REQUIRED PARTS:	<pre>1 Ea Xstor 2N3643 83-1530-2234-4 1 Ea Diode 1N914 83-1530-0083-7 1 Ea Res 10k, 1/4w 2% 83-1520-7308-2 1 Ea Res 820ohm,1/4w,2% 83-1520-7227-4 1 Ea Standoff #4 x 3/8 83-9350-0227-5 1 Ea Screw 4-40 x 5/8 83-9260-4519-2 1 Ea Nut 4-40 83-9260-2003-9 1 Ea Washer, Lock, #4 83-9261-4203-1 2 Ea Washer, Nylon, #4 83-0822-6610-7 A/R Wire, 24AWG, Solid Perforated Vector Bd. 3/4" x 1"</pre>
PROCEDURE:	<ol> <li>Lift Transport to the raised position.</li> <li>Locate diode CR2 on the Play switch</li> </ol>
	<ol> <li>Replace CR2 with jumper wire. Refer to Composit Schematic, Figure 6-1 of manual</li> </ol>
	4. Remove Master Control Ass'y - Remote
	5. Locate diode CRll on Master Remote (Between El3 on P.C. board).
	<ol> <li>Replace CRll with jumper wire. Refer to Master Ass'y - Remote schematic, Figure 6-7 of manual.</li> </ol>
	<ol> <li>Remove bottom cover from Selectake II (For M79's equipped).</li> </ol>
	8. Locate diode on Play switch.
	9. Replace diode with jumper wire. Refer to Select schematic, Figure 5 of Selectake II manual.
	10. With Steps 1-9 completed, Record punch-in may no initiated from the Play mode by pressing only the button at any of the three Transport mode contro locations.

# 34

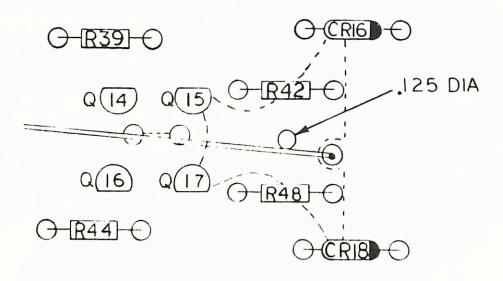
NOLE:

Modification of Play switch circuit must be done at all Transport mode control locations.

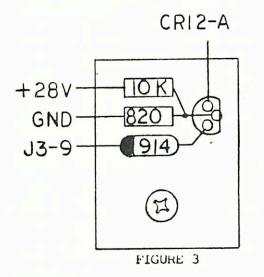
- Remove Logic and Master Bias Supply board from rear of M79.
- 12. Add the circuit shown in Figure 1, below, to the Logic board.



- a. Locate the ground plane between R42 and R48 (lower left quadrant of Logic board), on the rear side of board. See Figure 2, below.
- b. Drill .125 Dia. hole through ground plane, ensuring that hole does not cut any traces on component side of board. See Figure 2, below.



c. Fabricate circuit shown in Figure 1, above, on 3/4" x 1" perf board, using Figure 3, below, as a guide.



- d. Attach perf. board to Logic board, using 3/8 standoff and mounting hardware; ensuring that hardware is isolated from traces by nylon washers.
- e. Connect the 24 AWG wire from the components on the perf. board to Logic Board.
  - 1. Attach wire from 10k resistor to +28v (bottom side of R44).
  - Attach wire from 820ohm resistor to gnd (top side of R48).
  - 3. Attach wire from cathode of 1N914 diode to J3-9 (lower left connector).
  - 4. Attach wire from collector of transistor to anode of CR12, in Record F/F.
  - NOTE: For those M79's not equipped with Selectake II; a 390hm, lW resistor must be added in series between J3-9 and the common collectors of Q5 and Q6. For those M79's with Selectake II, Bulletin #22 should have previously been incorporated.
- 13. With Steps 1 12 completed, Record punch-out may now be initiated by pressing the Play button at any of the three Transport mode control locations.

Page 4

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NOTE: This modification depends on Play lamp current through the 39ohm resistor to develop punch-out voltage for resetting the Record F/F. As such, it is imperative that at least two of the Play lamps be functional.

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If this change is incorporated, please alter the affected schematic diagrams to reflect this change.

### Ressional Audio. Res Buildean

#33

MARCH, 1980

SUBJECT: Modification of Head Door Circuit.

APPLICABLE TO: ALL M-79 Recorders.

### PURPOSE: To allow Record and Reproduce Head Doors to remain closed upon entering STOP mode.

### PROCEDURE: 1. Remove power from M79.

- 2. Remove black cover (scalp) plate from transport.
- 3. Locate Logic Board connector Jl (to the rear and left of Capstan Servo Card).
- 4. Remove and sleeve wire from pin V of Jl (lower right hand pin).
- 5. M79 Head Doors should now remain closed at all times except when in FWD, RWD and tension release modes. Doors may be opened in STOP mode by lifting the tape from the EOT sensor.
- 6. If this change is incorporated, please alter the Composite Schematic diagram to reflect this change.

Bulletin No. Date 32 February, 1980

PROCEDURE:

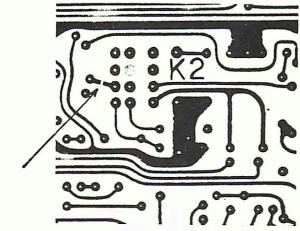
### SUBJECT: Modification of Capstan Braking Circuit

APPLICABLE TO: All M-79 Logic Boards

PURPOSE: To prevent possible failure of Q6, the Capstan Servo drive transistor.

- 1. Remove power from the M-79.
  - 2. Remove the logic board.
  - 3. Cut the trace from K2-2 to J2-8. See Figure 1, below.

Top of Board



Cut trace

Figure 1

4. If this recommended change is incorporated, please alter the affected schematic diagram to reflect this change.



Bulletin No. Date	#31 MARCH, 1980			
SUBJECT:	Replacement of uA741 OP Amps on Signal Electronics P.C. Boards with LF356A Op Amps			
APPLICABLE TO:	All M79 Signal Electron	ics Boards		
PURPOSE:	To improve the performance characteristics of the M79 by upgrading the parameters of the Op Amps used in the Record and Monitor Amplifiers.			
		uA741	LF356A	
	Power B.W. Slew Rate Input Noise V	8kHz – Typ 0.5V/uS – Typ 25nV//Hz – Typ	4.5MHz - Typ 12V/uS - Typ 12nV//Hz - Typ	
REQUIRED PARTS:	I.C LF356A Cap02uF, 100V I.C. Socket - 8 Pin Mylar Tubing	83-0003-2012-3 83-1510-1008-5 83-1620-0290-7	2/Channel 2/Channel 2/Channel As Required	
PROCEDURE:	1. Remove IC3 and IC4	from their sockets.		
	<ol> <li>Unsolder and remove 14 pin sockets for IC3 and IC4</li> <li>Install and solder 8 pin sockets; leaving pins 1, 7, 8, 13 and 14 open. See Figure 1, below.</li> </ol>			

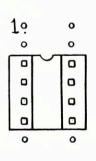
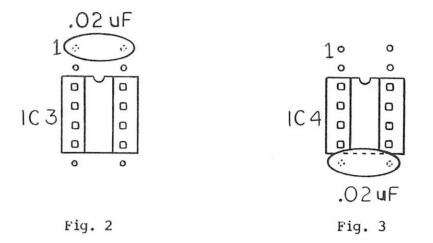


Fig. 1

NOTE: Pin numbers called out in steps 3-7, refer to original 14 pin IC layout.

- Install one .02uF cap in vacant holes 1 and 14 of IC3. See Figure 2, below.
- 5. Install the other .02uF cap in vacant holes 7 and 8 of IC4. See Figure 3, below.



- 6. Using Mylar sleeving over cap leads; solder .02uF cap to traces from IC3 pins 6 and 11. See Figure 4, below.
- 7. Using Mylar sleeving over cap leads; solder .02uF cap to traces from IC4 pins 6 and 11. See Figure 5, below.

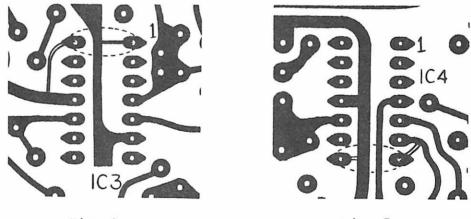


Fig. 4

Fig. 5

8. If this recommended change is incorporated, please alter the Signal Electronics schematic diagram to reflect this change.





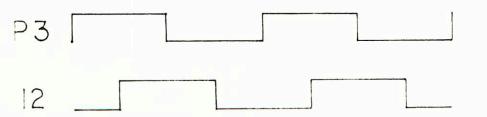
Cleaning and adjustment of Selectake II Sensor Assembly.

#30

All M79's equipped with Selectake II

To insure accuracy of time and tape position by offsetting affects of dirt and age on Sensor Assembly.

- 1. Lift Transport to its raised position.
- Loosen and remove 1/4-20 socket head cap screw securing base of Reversing Idler.
- 3. Remove reversing idler by lifting up.
- Clean octagon mirror on base of idler body with dry cotton swab.
- 5. Replace idler and secure, insuring that mirror surface does not strike Sensor Assembly.
- 6. Return Transport to its normal position.
- Remove protective cover from Power Supply/Interface module (located on inside of left side panel of M79 when viewed from rear).
- Connect vertical inputs of scope to TP3 and lower end of Rl2 (see Page 9 of Selectake II manual).
- 9. Place M79 into a Rewind or Forward mode and adjust R4 for best symmetry at TP3. Adjust R9 for best symmetry at R12.
- 10. The waveform relationship at this time should be such that there is no coincedence of either the positive or negative transition points between either waveform, as shown below.



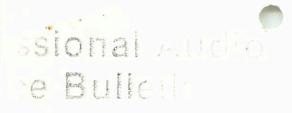


: No. 30

Page 2

- 11. Verify accuracy of time and tape position by running M79 in Fwd, Rwd and Play.
- 12. The above procedure should be repeated on a weekly basis for cleaning the mirror and on a monthly basis for adjusting the sensors.

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# 294

29A OCTOBER 1979

5:

1.

All Selectake II

To increase reliability by slowing 2.2 m Sec Clock (U10). Prevents intermittent mode dropouts.

- l ea Plastic Capacitator (.012-.018uF)
  - 1. Remove bottom cover from Selectake II remote unit.
  - 2. Connect isolated scope probe to U2 pin 40.
  - Check timing of 2.2 m Sec clock and trim capacitator C2 for 1.9-2.1 m Sec. (value should fall between .012 and .018uF.





Bulletin No. 28 April 17, 1979

SUBJECT: Modification of Mute Circuit

APPLICABLE TO: All M-79 Logic Boards

PURPOSE: To decrease turn-on time of Mute circuit when entering Forward or Rewind modes; delay turn-off of Mute circuit when entering Stop mode from Forward or Rewind, until tape comes to a complete stop.

#### REQUIRED

PARTS: 1 Ea. 1N914 Diode 83-1530-0083-7 1 Ea 47K, 1/4w Resistor 83-1520-7204-3

#### **PROCEDURE:**

- Replace R173 (on lower left quadrant of Logic Board) with the 47k Resistor.
- 2. Add diode across (in parallel with) R173. Cathode of diode towards R173, R171 junction.
- 3. If this change is incorporated, please alter the affected schematic diagram to reflect this change.
- Note: Refer to Bulletin #20 for Stop mode muting.





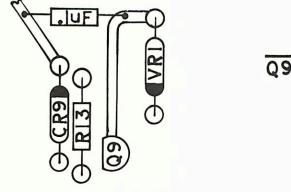
Bulletin No. 27 Date Ja

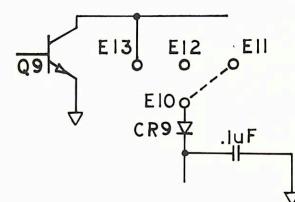
January, 1979

- SUBJECT: Modification of Record Amplifier Circuit
- APPLICABLE TO: All M-79 Signal Electronics Boards.
- PURPOSE: To prevent possible re-recording or "ECHO" phenomenom associated with instruments having high level and fast attack time, such as kick drum, etc.
- REQUIRED PARTS: 1 Ea. 0.luf, 50v capacitor 81-2711-5382-7

PROCEDURE:

1. Add Capacitor between the cathode of CR9 and the anode of VR1 (ground) as shown in figures below.





- 2. Repeat for each Signal Electronic Board.
- 3. If this recommended change is incorporated, please alter the affected schematic diagram to reflect this change.



Bulletin No. Date	6A (Supersedes Bulletin #26, dated December, 1979)
MA	Y, 1980
SUBJECT:	Reproduce and Record Alignment Procedure
APPLICABLE 'TO:	All M23, M64, M56 and M79 PAR's
PURPOSE:	To normalize the Reproduce and Record alignment of the PAR's in order to match the "Standard Reproduce Alignment Tapes" to the various "Mastering" tape types used by most studios.

Note: This Procedure assumes that the PAR's will be aligned for OPTIMUM performance of the particular Mastering tape in question. For desired fluxivity levels on the Mastering Tapes other than those shown in the chart below (optimum), refer to Step 5.

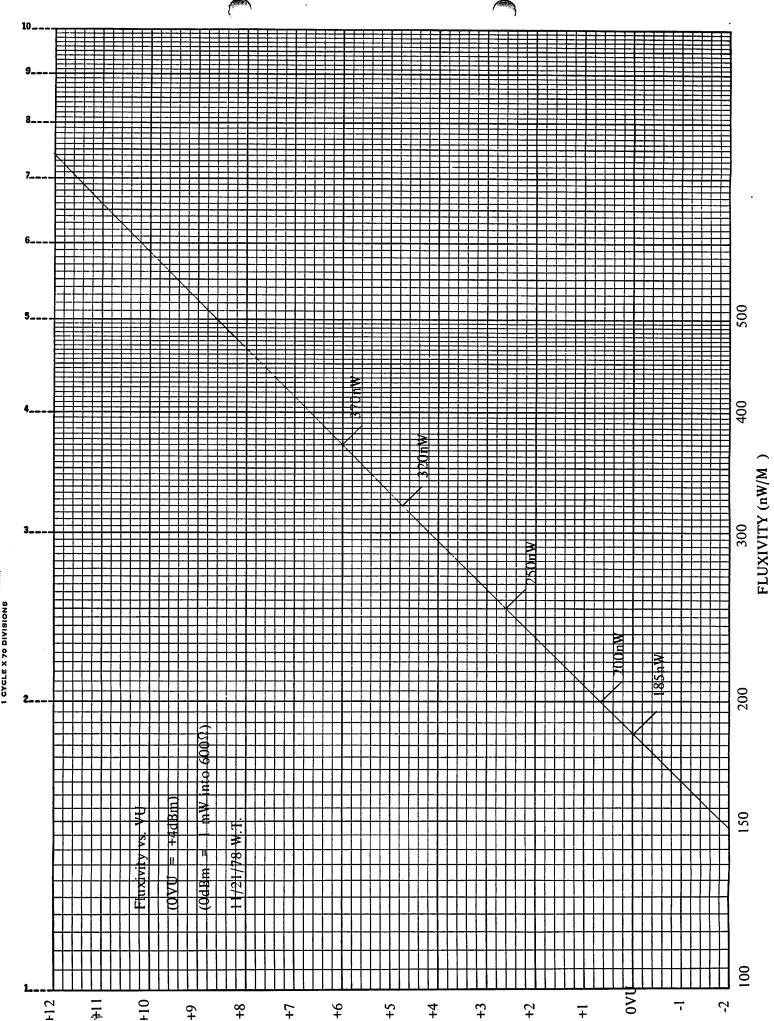
#### PROCEDURE:

1. Determine the Fluxivity level of the Reproduce Alignment Tape and cross-reference that level to the type of Mastering tape to be used per the chart below. This resultant level (in VU) will become the Reproduce Reference level for optimum performance of the Mastering tape to be used.

		1et 20e	EP 1		
	1º				
MASTERING A	tivity plice	185114/12	oonwin	150mm/m	32001W/W
SCOTCH 226	-6VU	-5VU	- 3VU	-1VU	0VU*
SCOTCH 250	-6VU	-5VU	-3VU	-lVU	0VU*
AMPEX 456	-6VU	-5VU	- 3VU	-1VU	0VU*
SCOTCH 207	- 3VU	-2VU	0VU*		
SCOTCH 206	-3VU	-2VU	0VU*		
AMPEX 407	- 3VU	-2VU	0VU*		
AMPEX 406	- 3VU	-2VU	0VU*		

\*Maximum Recommended reference Fluxivity.

All VU levels rounded off to the nearest VU.



SEMI-LOGARITHMIC 359-51G KEUFFELA ESSER CO. NADEINU. 5.A. 1 CYCLE X 70 DIVISIONS

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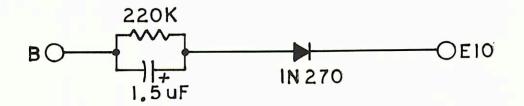
### Bulletin No. Date

BULLETIN NO. 25

SUBJECT:	Modification of Master Remote Ass'y and Signal Electronics P.C. Boards.
APPLICABLE TO	: All M79 8, 16 and 24 Track Recorders
PURPOSE:	To allow any channel, armed in Record, to remain in 'A', or Input Monitor, when Play-Record has been terminated by Stop. Automatically switches to 'B' when Play is entered and remains in 'B' until Play-Record is re-initiated.
REQUIRED PART	rs:
	A. Master Remote Ass'y.
	<ol> <li>1 Ea. – 220k, ¼w, 2% Resistor 83-1520-7301-7</li> <li>2. 1 Ea. – 1.5uf, 35v TA Capacitor 83-1510-6183-1</li> <li>3. 1 Ea. – 1N270 Diode 83-1530-0263-5</li> </ol>
	B. Signal Electronics Board
	1 per Channel – 100pf, 500v Capacitor 83-1510-5155-0

PROCEDURE:

- 1. Remove R126 from each Signal Electronics Board.
- 2. Replace C1 on each Signal Electronics Board with the 100pf capacitor.
- 3. Add the following circuit to the Master Remote Ass'y, between Pin 'B' and E10.



4. If this change is incorporated, please alter the affected schematic diagrams to reflect this change.

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Bulletin No.	#24
Duto	SEPTEMBER, 1978
SUBJECT:	Logic Board "Cutout" Circuit Modification
APPLICABLE TO:	All M-79 Logic Boards
PURPOSE:	To prevent short term or false triggering of "end of tape" sensor.
REQUIRED PARTS:	l ea. 10K ohm, 1/4W resistor 83-1520-7308-2 2 ea 0.1 microfarad, 200V capacitor 83-1510-4499-3
PROCEDURE :	1. Replace R143 with the 10K ohm resistor
	2. Solder one of the 0.1 microfarad capacitors across R143.
	3. Solder the other 0.1 microfarad capacitor from base to

collector of Q33.

### WI/MINCOM DIVISION

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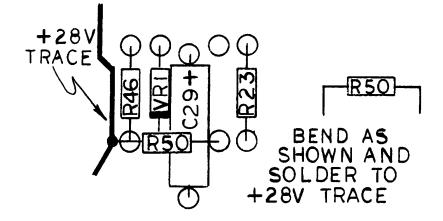
### **BULLETIN NO. 23**

- CT: Selectake II Processor Board Changes
- CABLE TO: All Selectake II's
- DSE: To assure proper latching of mode control flip-flops on logic board.
- IRED PARTS: 1 ea. 20K ohm, ¼W resistor, 83-1520-7259-7 1 ea. 12V Zener Diode 1N963B, 83-1530-0252-8

### EDURE:

Applicable to "A" versions. Serial numbers 100 - 199.

- 1. Remove R50.
- 2. Install 20K ohm resistor as shown in figure 1.



3. Replace VR1 with 12V Zener

pplicable to "B" versions. Serial numbers 200 and above.

- . Replace R50 with 20K ohm resistor
- Replace VR1 with 12V Zener

this recommended change is incorporated, please alter the schematic diagram to reflect this range.

# vice Bulletin

# 27

**BULLETIN NO. 22** 

- JBJECT: Logic Board Flip-Flop resistor changes
- PPLICABLE TO: All M-79 Logic Boards used with Selectake iI
- RPOSE: To assure proper latching of mode control flip-flops.
- QUIRED PARTS: 8 ea. 1.2K ohm, ¼W resistor, 83-1520-0363-4 4 ea. 240 ohm, ¼W resistor, 83-1520-0358-4 1 ea. 3.0K ohm, ¼W resistor, 83-1520-7313-2 4 ea. 39 ohm, 1W resistor, 83-9520-4122-2

### **OCEDURE:**

- 1. Replace R8, R9, R20, R21, R36, R41, R47 and R52 with the 1.2K ohm resistors.
- 2. Replace R10, R19, R37 and R48 with the 240 ohm resistors.
- 3. Replace R31 with the 3.0K ohm resistor.
- 4. Add the 39 ohm resistors in series with the following traces on the component side of the board.
  - a. J3-10 to Q1, Q2
  - b. J3-9 to Q5, Q6
  - c. J3-7 to Q12, Q13
  - d. J3-6 to Q16, Q17
- 5. If this recommended change is incorporated, please alter the Logic Board schematic diagram to reflect this change.
- TE: This change on the Logic Board must be done in conjunction with the change affecting the Selectake II Processor Board. See Service Bulletin number 23.

**Bulletin No.** 

Date



### **BULLETIN NUMBER 21**

### SUBJECT: Modification Effecting Erase Set Up Voltage At Test Point "1" on Signal Electronic Cards APPLICABLE TO: All M-79 Recorders Special Emphasis To 24 Track PURPOSE: To Prevent Erroneous Bias Failure Indications (Blinking of Record Lights) **EXPLANATION:** Due to normal aging of the vactec (L.D.R.), the bias signal at the output of the erase amplifier can fall below the warning circuit threshold. This causes the record lamps to flash without affecting the recording process. This would be more likely to occur on a 24 track recorder since the erase level is set for 1 volt RMS, and the warning threshold is approximately 0.8 volts RMS. This threshold voltage can vary from card to card due to component tolerances. SOLUTION: Effective with M-79 serial number 500, resistor R-39 (27 ohm) was changed to a 56 ohm resistor. This raises the erase set up level from 1 volt RMS to 2 volts RMS for a 24 track recorder and from 1.2 volt RMS to 2.4 volts RMS for all other track configurations. This change also increases the usable life of the vactec. PROCEDURE: Replace R-39 on the signal electronics PCB with a 56 ohm <sup>1</sup>/<sub>4</sub> watt resistor Mincom catalog number 83-1520-0349 or equivalent, change your manual set up procedure, page 4-13 section 4-41 step 4 to read 2.0 volt RMS for 24 track and 2.4 volts RMS for other recorders.

November, 1976



Bulletin No. Date

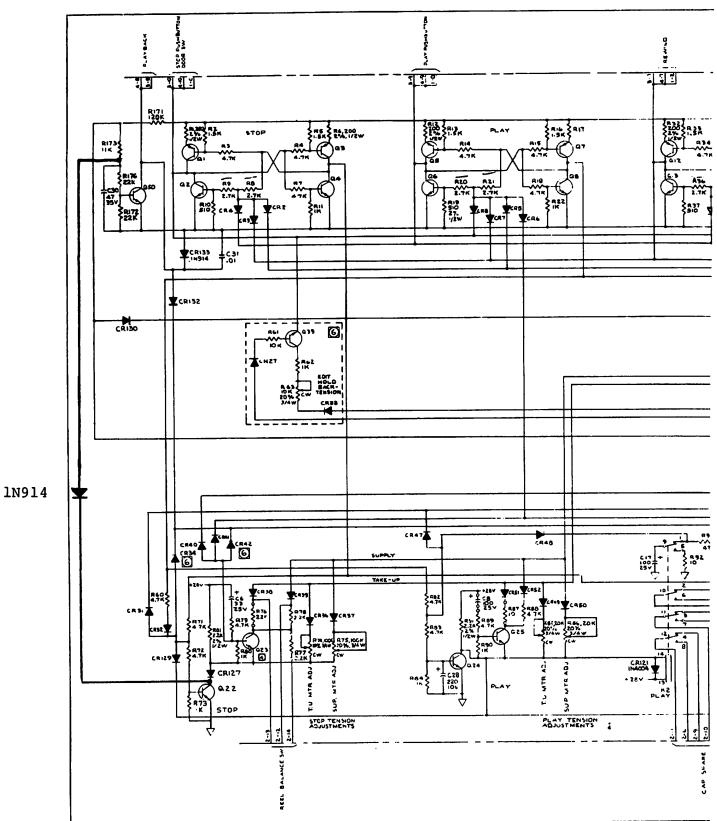
Bulletin No. 20

SUBJECT:	Modification To Mute Signal Electronics When In Stop Mode
APPLICABLE TO:	8, 16 and 24 track M-79 recorders
PARTS NEEDED: 1 EA.	1N914 Diode Catalog No. 83-1530-0083-7 \$.60

### **PROCEDURE**:

- 1) Remove logic pc Board from recorder.
- Install lN914 diode from collector of Q-22 to junction of R-173 and R-176. (cathode of diode to collector of Q-22) see Fig. 1. Use tubing on leads of diode.
- 3) Install logic pc board into recorder.
- 4) Thread a roll of tape onto the recorder which has a signal recorded on it and press stop button.
- 5) Manually move tape back and forth. Signal from tape should not be heard nor appear on meters.
- Press mute defeat switch and repeat step five. Signal should be heard and should appear on meters.
- 7) This mod will not effect the monitoring of input signals.

STOP MUTE MODIFICATION FIGURE 1





**Bulletin No. 19** 

### Bulletin No. Date

### MODIFYING M-79 FOR IMPROVED HIGH FREQUENCY RESPONSE AT 7½ IPS

PURPOSE:	To preclude the necessity of readjusting bias when switching between $7\frac{1}{2}$ ips and 15 ips.
NOTE:	If machine is used at 30 ips or CCIR with these modifications, C-23 should be shorted with a jumper wire.

### PARTS NEEDED PER TRACK:

K-A 1 ea.	Reed Relay - SPDT - 24-28V 83-1550-3620-1 or equivalent \$38.00 Ea.
CR-A	1N4004 Diode 83-1530-0151 .35 Ea.
R-13	33K ¼ watt resistor 83-9520-2109-1 .45 Ea.
R-A	750 ohm ½ watt resistor 83-1520-7357-9 .35 Ea.
R-41A	200 ohm variable resistor83-1520-15725.30 Ea750'' x 1.750'' perf brd or pc brd(see figure 2)

### PROCEDURE:

- 1. Remove Q-20, R-13, R-19, CR-9 and discard.
- 2. Remove any jumper connected to points E-10 through E-13.
- 3. Remove TP-2 (white) from board. Use care in not lifting pads from pc board (see figure 1).
- 4. R-41-A will be mounted in place of TP-2. Clip off rear lead of R-41-A. Drill a hole midway between and slightly above TP-2 mounting holes. This hole and forward most hole will be used to mount R-41-A (see figure 1).
- 5. Locate trace running from R-42 to wiper of R-41. Cut this trace about an inch from R-42.
- 6. Drill a hole behind bottom lead of C-14 (erase trimmer). Do not drill through any traces.

- 7. Locate same trace as in Step 5 and drill a hole into this trace between C-14 and Q-16 (see figure 1).
- 8. Mount relay K-A on a piece of perf board and mount the perf board to the mounting screws of Q-16 and Q-17 using two 6-32 nuts (see figures 1 and 2).
- 9. Install new R-13 (33K ohm).
- 10. Install CR-A into holes from which R-19 was removed.
- 11. Install R-A (750 ohm) between E-11 and E-12.
- 12. Connect a pair of wires to coil of relay K-A and route across top of board to terminals E-12 and E-13. Connect one wire to E-12 and the other to E-13.
- 13. Connect a wire from the wiper of K-A to R-42. Connect to the end of R-42 closest to the relay.
- 14. Connect a wire from the normally closed contact of K-A to trace going to wiper of R-41 through hole drilled in Step 7 above.
- 15. Install R-41-A in location vacated by TP-2 (a drop of selastic will hold it in place).
- 16. Connect a wire from the normally open contact of K-A (through hole drilled in Step 6 above) to the wiper of R-41-A.
- 17. Connect a wire from front term of R-41-A to front term of R-41.
- 18. Fill in (with solder) the rear mounting hole of TP-2. This trace must not be broken.
- 19. Place signal brd on extender card and install in machine.
- 20. Place machine in record at low speed and monitor the wiper of R-41 with scope. A bias waveform should be visible.
- 21. Switch recorder to high speed (maintaining record mode); bias waveform should disappear. Switch scope to wiper of R-41-A; bias should be present.

NOTE: If bias is the reverse of Steps 20 and 21, the wires going to the normally open and normally closed contacts of K-A should be reversed.

22. Monitor TP-1 with VTVM (record mode) and adjust R-121 for 2.4V RMS (2 volt on 24 track).

NOTE: Before continuing with record alignment, reproduce alignment should be checked and adjusted if necessary.

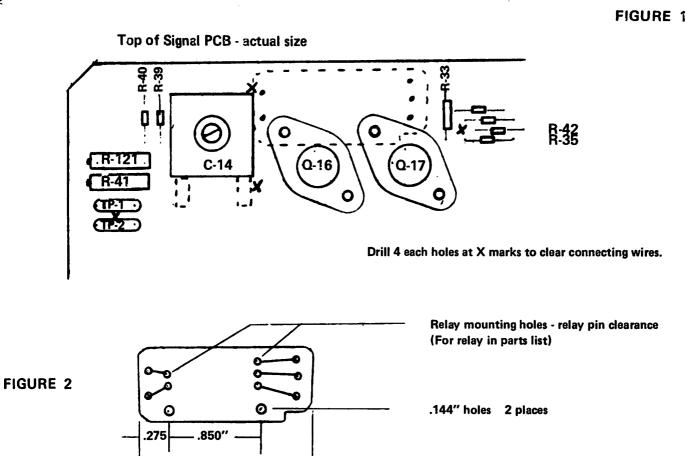
- 23. To align bias the upper bias adjust R-41 is used for low speed and the lower R-41-A for high speed.
- 24. The bias must be adjusted (using appropriate pot) for 5db overbias at 15kHz for any speed (including 7½ ips).

Typical record response with above bias settings are:

7½ ips (-10VU input) flat to 15kHz -3VU 19kHz 15 ips ( 0VU input) flat to 20kHz -3VU 24kHz 30 ips ( 0VU input) flat to 20kHz -3VU 24kHz

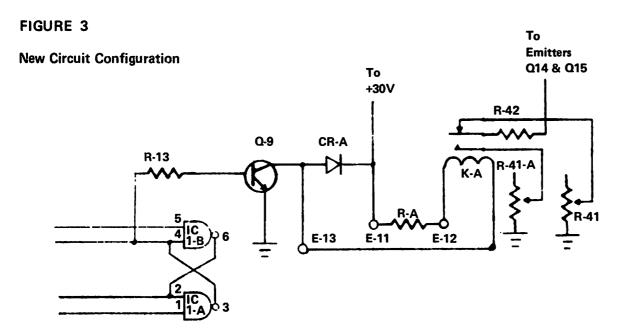
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\_\_\_\_\_ 1.750<sup>′′′</sup> \_\_\_\_\_

Relay mounting board actual size - top shown



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### essional Audio ce Bulletin



#18

Bulletin No. 18

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- T: Installation of Replacement Capstan Motor Assemblies Cat. No. 83-5920-2020
- ABLE TO: 8, 16 and 24 Track M-79 Recorders

E: Modify Head Connector Mounting to Minimize Motor Noise Pickup by Head Cables.

URE:

- Remove old motor assembly as follows:
  - a. Remove four 4-40 screws securing belt guard and remove bottom half of belt guard.
  - b. Remove capstan drive belt.
  - c. Remove screw securing flywheel and remove flyweel (holding capstan on top of transport to prevent its turning).
  - d. Remove upper half of belt guard by removing screws securing it.
  - e. Disconnect capstan motor connector J-7.
  - f. Remove two cable clamps which secure head cables to motor assembly. (Save clamps)
  - g. Remove capstan motor assembly by removing four screws securing it to transport (2 screws on each side).

Removal of old head connector brackets. (Complete work on reproduce bracket before starting on record side.)

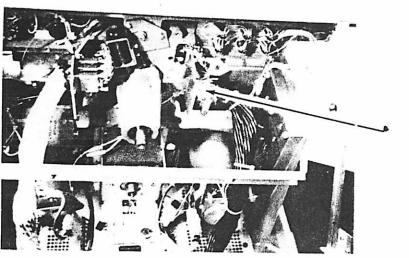
- a. Disconnect head connector(s) and move aside.
- b. Remove three screws holding reproduce connector bracket to transport. Save screws for reuse in step 3b.
- c. Remove and save 2-56 posts and nuts securing connector(s) to bracket. Make a note of male post location in reference to pin number on connector, for ease in reassembly.
- d. Old bracket will have to be cut in order to remove connector(s). Be careful head cable is not nicked.

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- 3. Installation of new head connector brackets, 83-3320-2963 right bracket and 83-3320-2964 left bracket.
  - a. Mount connector(s) on new bracket in reverse order of removal making sure of locater pin position as noted in step 2c.
  - b. Install new bracket assembly onto transport. (Figure 1)
  - c. Reconnect head connector(s). (Figure 2)
- 4. Repeat steps 2 and 3 above for bracket on record side.
- 5. Install replacement capstan motor assembly leaving mounting screws loose.
- 6. Reinstall top half of belt cover.
- 7. Reconnect motor connector J-7.
- 8. Reinstall flywheel hold capstan to prevent turning.
- 9. Reinstall capstan belt and refer to section 4-30 of the manual for belt tension adjustment.
- 10. Reinstall lower belt cover.
- II. Install head cable mounting bracket 83-3320-2962 as shown (Figure 3). Use existing screw on right side, use 8-32 x 1/2" screw on left side.
- 12. Attach head cables to bracket using clamps removed in step lf. Use 10-32 hardware furnished (Figure 3).
- 13. Install a spring from each head cable bundle to rear of transport wrap around (See Figure 3).
- 14. Remove transport cover (scalp plate) to allow access to capstan servo p.c. brd.
- 15. Perform servo adjustments in sections 4-16 and 4-17 of manual - refer to section 4-18 to change speed range if necessary.
- .6. Replace transport cover.



Arrow points to reproduce-connector mtg bracket

Figure 1

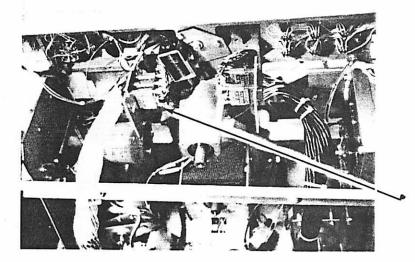
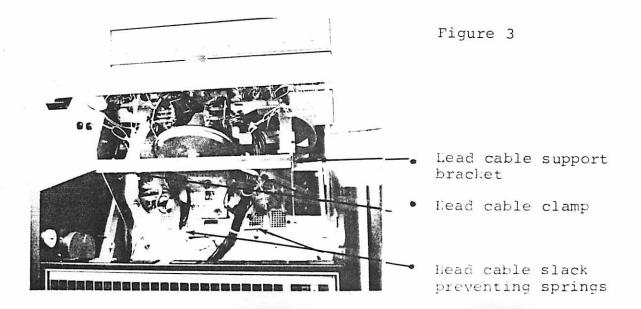


Figure 2

Arrow shows head connectors reconnected





As Required

#### BULLETIN NO. 17

### Bulletin No. Date

SUBJECT:	Modification o	f Signal Electronics PC	Board for DOLBY In	terface.
APPLICABLE TO:	All M-79 Record	ders		
PURPOSE:	Prevent Oscillations of Signal Electronic when DOLBY unit is disconnected.			
REQUIRED PARTS:	Component	Description	Mincom <u>Catalog No.</u>	Quantity per Board
	Capacitor Resistor	.001µf, 1000V, 10% 15 ohms, 1/2W, 2%	83-1510-1024 83-1520-7267	1 1

(for the insulation of component leads)

#### **PROCEDURE:**

1. Drill four holes .041/.046 inches in diameter at points indicated on figure 1.

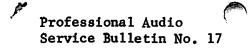
#### CAUTION

When drilling holes adjacent to circuit traces, do NOT drill into the trace.

2. Cut the printed circuit trace as indicated on figure 1.

Teflon Tubing

- 3. Install the capacitor, designated C-62 in the holes drilled in the finger contacts (see figure 2). Insure the leads lie flat against the board to prevent shorts to the board brace.
- 4. Install the resistor, designated Rl39, as indicated in figure 2. Bend the leads to make contact with the trace on the back of the board and solder. R-139 must be bent as shown to prevent accidental short circuits and to permit the board to be installed in the Recorder.
- 5. Change Instruction Manual schematics (see figure 3) and parts list to reflect C-62 and R-139.



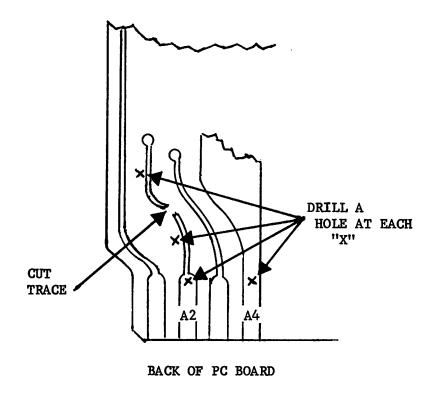
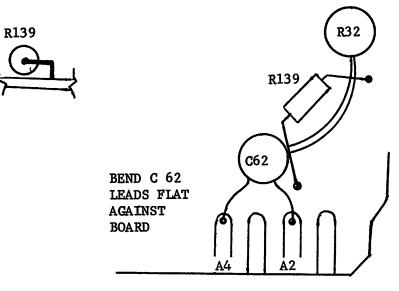
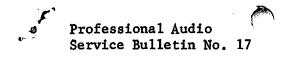


FIGURE 1



FRONT OF PC BOARD

FIGURE 2



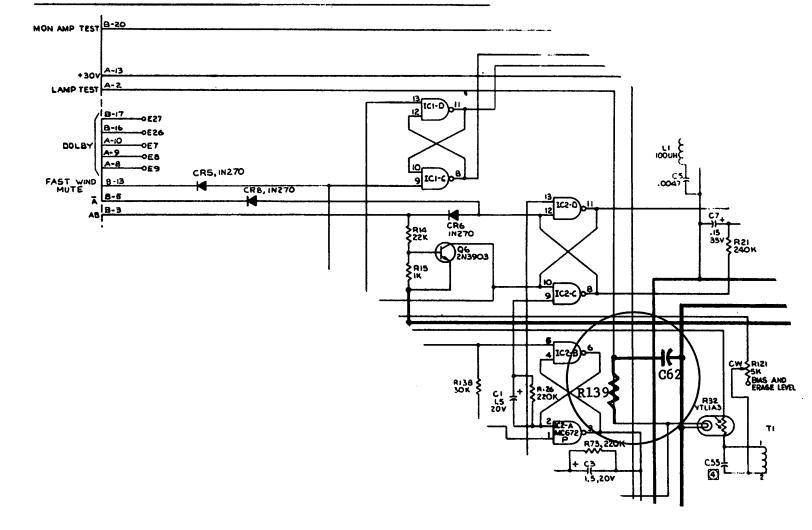


FIGURE 3



### Bulletin No. Date

BULLETIN NO. 16

SUBJECT:	Modification to S	ync Amplifier (	Circuitry	
APPLICABLE TO:	A11 M-79, 8, 16 a	nd 24 Track Rec	corders	
PURPOSE:	Eliminate possible meter deflections and monitor "POP" on track in sync when adjacent tracks are put into record			
REQUIRED PARTS:	Component D	escription	Mincom Catalog No.	Quantity per Board
	Capacitor 560p	f, 500V, 5%	83-1510-5122	1

### PROCEDURE:

- 1. Remove Capacitor C-57 which is connected between the collectors of Q-30 and Q-24 (see figure 1).
- Drill one hole using a .030/.035 inches, drill adjacent to the emitter connection of Q-24 (see figure 2).

### CAUTION

DO NOT drill into the traces on the back of the board.

- 3. Install the new 560pf capacitor, designated C-57, between the collector of Q-30 and the emitter of Q-24 (see figure 2). Insert capacitor lead through new hole, then bend the lead to the emitter trace of Q-24, then solder.
- 4. Check Recorder alignment and adjust if necessary.
- 5. Change Instruction Manual schematics and parts list to reflect the new location of C-57 as indicated by figure 3.

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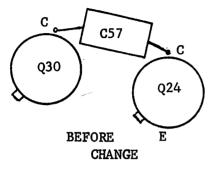


FIGURE 1

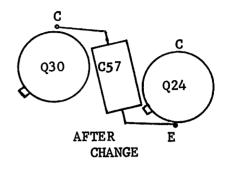
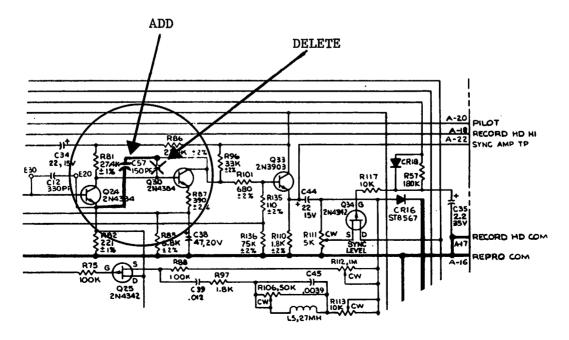


FIGURE 2





Bulletin No. Date

BULLETIN NO. 15

SUBJECT:	Modification of Line	Amplifier Circuitry		
APPLICABLE TO:	All M-79 Recorders			
PURPOSE:	Prevent possible hig amplifier	h frequency oscillati	ions in the line	
REQUIRED PARTS:	Component	Description	Mincom Catalog No.	Quantity per Board
	Capacitor	.001µf, 1000V, 10%	83-1510-1024	1

#### **PROCEDURE:**

1. Drill two holes .030/.035 inches in diameter at points in figure 1.

#### CAUTION

Do NOT drill into traces on the back of the board.

- 2. Install the .001 $\mu$ f capacitor (designated C61) by inserting leads through new holes, bend leads to touch adjacent traces, then solder.
- 3. Check Recorder alignment and adjust if necessary.
- 4. Change Instruction Manual schematics (see figure 2) and parts list to reflect the new capacitor, C-61.

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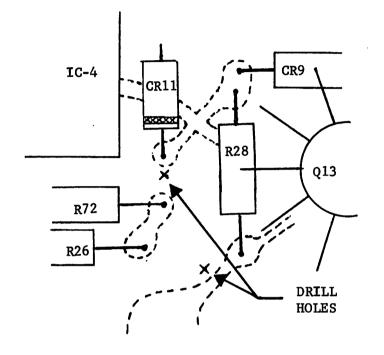
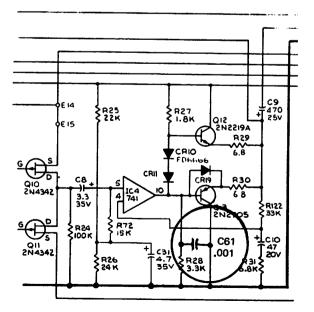


FIGURE 1





### Bulletin No. Date

#### BULLETIN NO. 14

SUBJECT:	Modification	of	Record	Amplifier	Circuitry
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APPLICABLE TO: All M-79 Recorders

PURPOSE: Improve the low frequency response of the amplifier

REQUIRED PARTS:	Component	Description	Mincom Catalog No.	Quantity per Board
	Capacitor Capacitor Resistor Resistor	.0027µf, 200V, 5% 6.8µf, 35V, 10% 15K ohms, 1/4W, 2% 2.2M ohms, 1/4W, 5%	83-1510-4575 83-1510-6144 83-1520-7231 83-1520-0487	1 1 1

#### **PROCEDURE:**

Replace the following components in the record amplifier with component having the values indicated.

Component Designation	New Component Values		
C-23	.0027µf, 200V		
C-53	6.8µf, 35V		
<b>R-</b> 50	15K ohms, 1/4W		
<b>R-</b> 55	2.2 Megohms, 1/4W		

Check Recorder alignment and adjust if necessary.

Change Instruction Manual schematics and parts list to reflect the component values and catalog numbers.

GM:rb October, 1974



Bulletin No. Date BULLETIN NO. 13

SUBJECT:	Modification to Function Switch Assemblies
APPLICABLE TO:	All M-79, 8, 16 and 24 Track Machines
PURPOSE:	To improve Reliability of the Mute Function during forward and rewind operation.
PARTS REQUIRED:	Diode 1N914, Mincom Catalog No. 83-1530-0083, 1 per Function Switch Assy.

#### **PROCEDURE:**

Excessive leakage through CR-6 (type 1N270 diode) in the Function Switch Assembly can cause muting to fail in forward and rewind modes. This condition occurs when the leakage is sufficient to set the flip-flop ICl-C/ICl-D on the signal electronics pc board to the sync condition (ICl-D pin 11 low) turning on FET Q-34.

To eliminate possible muting failures, replace CR-6 with a type 1N914 diode on each Function Switch Assembly.

Change the Instruction Manual schematic and parts list to reflect the new diode type.



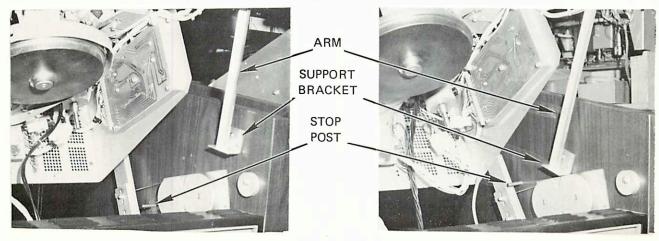
Bulletin No.	#12B (Supersedes Bulletin #12A dated January, 1975)
Date	July, 1980
SUBJECT:	M-79 Conversion to 14" Reels
APPLICABLE TO:	All M-79 Professional Audio Recorders 8, 16 and 24 Tracks
PURPOSE:	Convert.M-79 Recorders to 14" Reel Operation
MATERIAL REQUIRED:	

COMPONENT	DESCRIPTION	CATALOG NO.	QUANTITY
Qx Ra (See Table Pg. 5)	2N3643 470 ohms 1K ohm 2K ohms	83-1530-2234 83-9520-2116 83-9520-2088 83-9520-2148	1 1 1 1
Rb	20K ohms, 1/4W Kit, Conversion To 14" Reels	83-9520-2162 83-5990-1595	1 1

- CAUTION: 1) Use of 14" reels is not recommended for recording studio operation.
  - 2) When reels over 10 1/2" are used, operate the recorder at 7 1/2 or 15 IPS. Operation at 30 IPS with the over 10 1/2" reel will result in poor tape handling.

#### **PROCEDURE:**

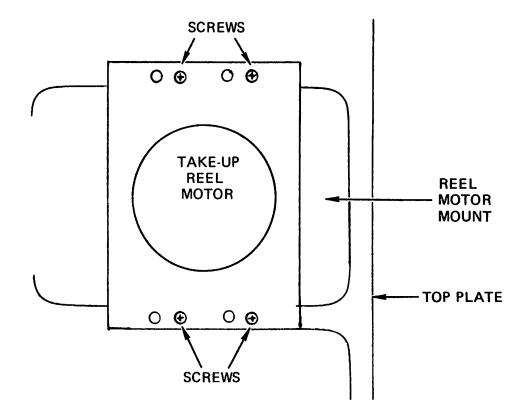
1. Raise the tape transport and observe the position of the support bracket and the stop post. If they appear as in figure 1, proceed with step 3. If they appear as in figure 2, proceed with step 2.



Correct Positions FIGURE 1

Older Model Positions FIGURE 2 • •

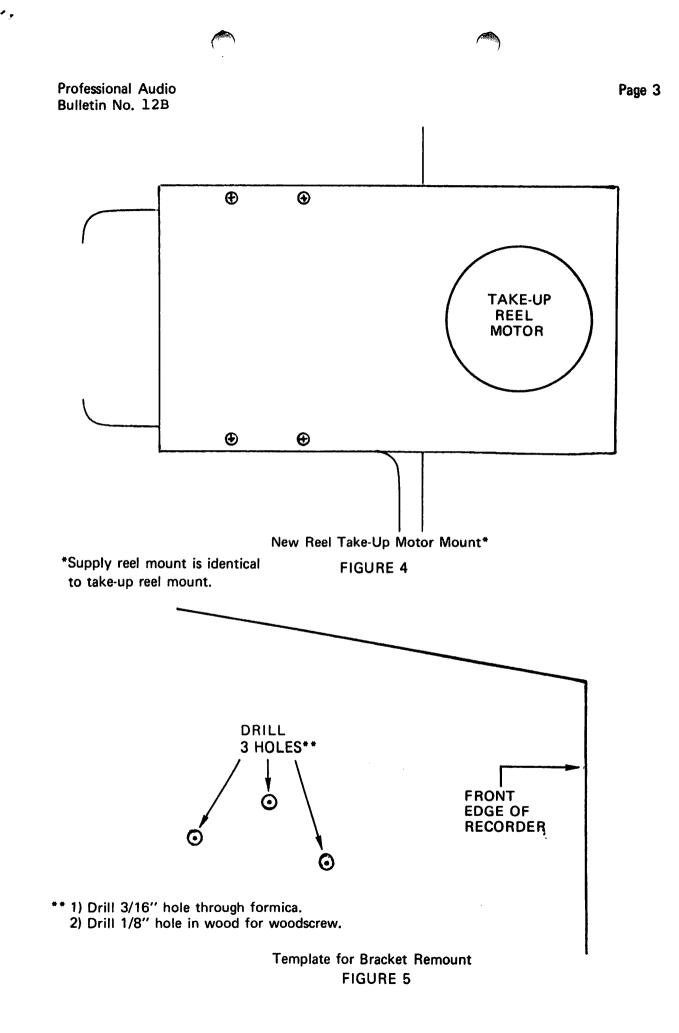
- 2. Modify the recorder to match figure 1 as follows:
  - a. Relocate support bracket using the template (figure 5) to locate the holes to be drilled.
  - b. Relocate the stop post so it is centered approximately 1 inch behind the pulley (see figure 1) by drilling a 1/4 inch hole and glueing in post.
  - c. Remove existing arm and replace it with a new 11 inch arm (part of conversion kit).
- 3. Disconnect supply and take-up motor connectors from wiring connectors; remove the four (4) screws holding each reel motor mounting plate and remove motor assembly (see figure 3).
- 4. Install motors on new motor mounting brackets (supplied in kit).
- 5. Install reel motor assemblies on recorder top plate (see figure 4). Install harness assemblies (supplied with kit) between respective motor assembly connector and wiring connectors.
- 6. Install new tape transport cover (supplied with kit).



Existing Take-up Reel Motor Mount \*

#### FIGURE 3

\* Supply reel mount is identical to take-up reel mount.



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- 7. Modify Capstan Servo p.c. board (see figure 6).
  - a. Connect resistor Rb between GROUND and the base of Transistor Qx.
  - b. Connect resistor Ra between the junction of R17 and C7 (junction nearest to p.c. board side) and the junction of Rb and Qx base.
  - c. Connect the emitter of Qx to ground.
  - d. Connect the collector of Qx to the junction of R28 and IClB pin 13.
- 8. Adjust capstan servo p.c. board pulse width and speed if necessary.
- 9. Perform reel alignment procedure.
- NOTE: In the event replacement of items supplied in the conversion kit becomes necessary, use the following information for ordering. The conversion kit contains the following:

1.	Plate, reel motor	83-3330-0523	2 ea.
2.	Cover, tape transport	83-3310-1925	l ea.
3.	Harness Assy (Takeup)	83-4570-0946	l ea.
4.	Harness Assy (Supply)	83-4570-0947	l ea.

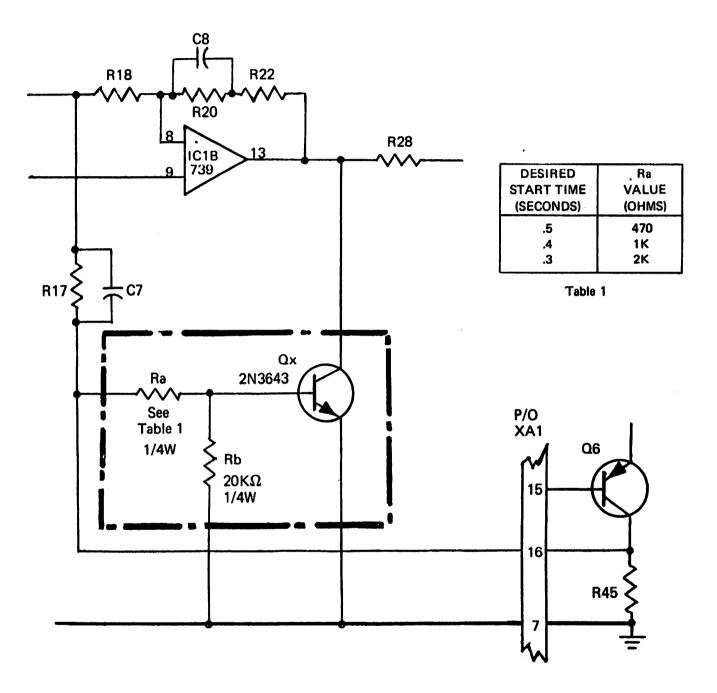
NOTE: If your M79 is configured as shown in Fig 2, you must order the shorter support arm separate from the conversion kit.

Arm, Support (11 inches) 83-3340-0895 1 ea.

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Bulletin No. Date

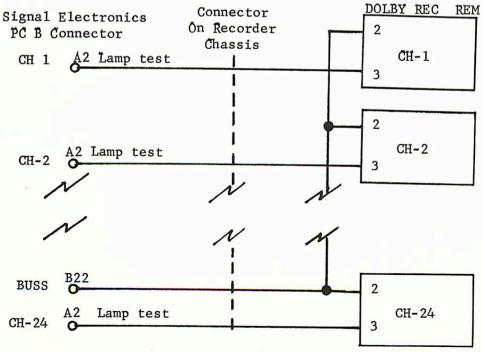
BULLETIN NO. 11

5.2	Subject:	DOLBY interface with M-79 Professional Audio Recorder
	Applicable to:	M-79 Record which interface with DOLBY M series or DOLBY A-type units.
	Purpose:	Provide remote connection of DOLBY units to M-79 recorder
	Remote connection o	of M series DOLBY units to M-79 (see figure 1).
		n A-2 of each channel signal electronics pc board to pin 3 of unit through a suitable connector on the recorder chassis.
	2. Connect pi	n B-22 bus on signal electronic pc board pin 2 of ALL DOLBY units

3. Insure R102 and R108 in CAT 44 Interface Module are 6.8 K ohms (earlier models had 2.7 K ohm or 3.3 K ohm resistors); if the resistors are not the correct values, replace them with resistors of the correct value.

NOTE: Increasing the resistor values to 6.8 K ohms increases remote sensitivity to 6 volts "ON" and 4 volts "OFF".

4. Correct operation is when the voltage between pin 2 and pin 3 of the DOLBY unit is 10.5 volts "ON" and 0 volts "OFF".



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#### FIGURE 1

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Remote connections of A-type DOLBY units to M-79

- 1. Connect Pin A2 of each M-79 Signal Electronics PC Board to Pin 3 of the DOLBY Remote Connector through a suitable connector on the recorder chassis.
- 2. Connect Pin B-22 buss on the M-79 Signal Electronics PC Boards to Pin 2 of ALL DOLBY units.
- 3. Modify DOLBY interface by adding circuit as shown in Figure 2. NOTE: Refer to DOLBY 361 Interface circuit in the DOLBY Manual.

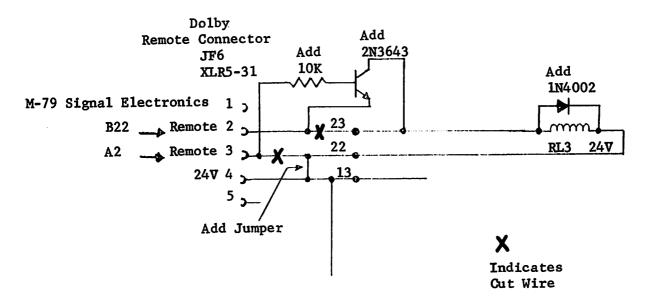
Parts Required:

1 ea. 2N3643 Transistor

1 ea.  $10K_{\Omega}$  1/4W Resistor

1 ea. 1N4002 Diode

#### FIGURE 2



NOTE:

Added Circuit may be mounted on a Vector Board inside the DOLBY unit.



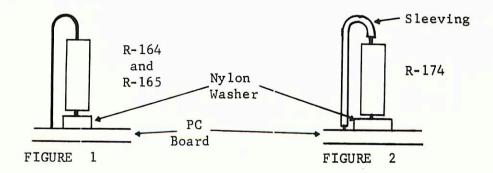
#### BULLETIN NO. 10

### Bulletin No. Date

Subject:	Logic Board Modification to Prevent Overdissipation of Bias Oscillator Resistors
Applicable to:	All M-79 8, 16 & 24 Track Recorders
Parts Required:	2 ea. 33 ohm 2W Resistor - Mincom Catalog No. 83-9520-5514 1 ea. 10 ohm 2W Resistor - Mincom Catlaog No. 83-9520-5508 3 ea. Nylon Washer - Mincom Catalog No. 83-9630-0435 1 1/2" AR #16 Teflon Sleeving
Procedure:	

This modification involves changing R-174, R-164 and R-165 from 1/2 watt to 2 watt values.

- 1) Remove Logic Board from machine.
- 2) Unsolder and remove R-164, R165 and R174.
- Enlarge Resistor lead holes in pc board using a #54 drill to accept new resistor leads.
- 4) Install 33 ohm 2W resistor in place of R164 and R165 (see figure 1).
- 5) Install 10 ohm 2W resistor in place of R174 (see figure 2).
- 6) Install Logic Board in machine.
- 7) Change instruction manual parts list and schematic to reflect the changes.





Bulletin No. Date BULLETIN NO. 9

Subject:	Supply PC Board to	ructions for the M-79 Log o eliminate Bias Beating lose proximity to each ot	when two machines
Procedure:			
Tools necessary	to accomplish task:		
1. Drill 2. No. 7	Motor O Twist Drill		
Parts necessary	to accomplish task:		
Part		Mincom Catalog No.	Quantity
Coil, 100 Capacitor	uh , 4.7µf, 35V	83-1540-0535 83-1510-6210	1 2

1) Remove all power from machine.

2) Remove the following from Logic and Master Bias Supply PC Board in sequence:

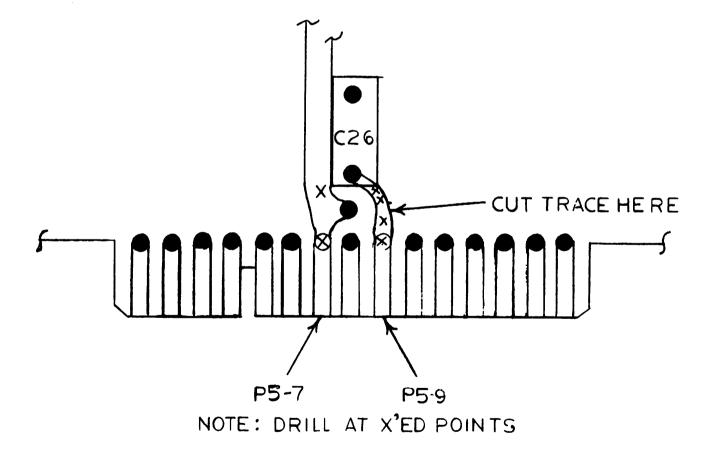
- a) Connectors
- b) 2; 6-32 Hold Down Screws
- c) PC Board from machine.
- 3) Place board on bench component side up and three connectors facing toward you.
- 4) Locate P-5. It will be to the extreme right of the board. Locate contact 9 and note that trace runs from contact 9 to the bottom side of C-26. Cut this trace.

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- V. Utilizing the drill motor and the #70 twist drill, put 6 holes thru the PC Board. Location of these holes are as follows: (See Figure I)
  - A. Top of Contact Finger #9
  - B. Top of contact Finger #7
  - C. Between contact Finger #9 and cut in trace.
  - D. In trace running to the left of C-26 near lower left hand edge of C-26.
  - E. Between cut in trace and bottom of C-26, drill 2



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- VI. Install 4.7uf capacitor between holes drilled at top of contacts 7 & 9. (See Figure 2)
- VII. Install 4.7uf capacitor between holes drilled just below and to the left and right of C-26. (See Figure #2)
- VIII. Install 100 $\mu$ h coil in two remaining holes (See Figure 2)

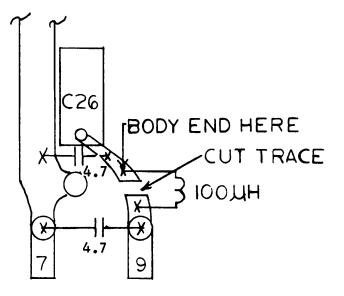


FIGURE 2



### Bulletin No. Date

#### BULLETIN NO. 8

Subject:	Modification to	Eliminate I	Possible	Sync	Oscillation
Applicable to:	All M-79 Profes	sional Audio	o Recorde	rs	

#### Procedure:

- 1) Remove power from machine.
- 2) Remove Track 1 Signal Electronics board from housing.
- Remove L-10, 100uh coil and replace with 110 ohm, 1/4W, 5% resistor (Mincom Catalog No. 83-9520-2131 or 83-1520-0353).
- 4) Remove C-54, .0047uf capacitor and replace with 75k ohm, 1/4W, 5% resistor (Mincom Catalog No. 83-9520-2171 or 83-1520-0377).
- Repeat steps 3 and 4 for each Signal Electronics board in the particular M-79 that is to be modified.
- 6) Change Signal Electronics board schematic to reflect these changes.

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Date	#7
	FEBRUARY, 1974
SUBJECT:	Pendar Switch #S13011, Mincom Catalog Number 83-1550-5467
APPLICABLE TO:	All M-79, M-56, M-64 and M-23 Machines

When ordering replacements and spares in all cases except in the M-56 Remote Box, Pendar Switch #S13011 will be replaced by Pendar Switch #S180-11, Mincom Catalog No. 83-1550-5177.

#### WI/MINCOM DIVISION

### January 1974

### Bulletin No. Date

SUBJECT:	Modification to Eliminate Power Off Erase Surge
APPLICABLE TO:	All M-79 Signal Electronics Printed Circuit Boards

REQUIRED PARTS:

Description	Mincom Catalog No.	Quantity
Transistor - 2N3905	83-1530-2281	One per P C Board
Resistor - 2K 1/4W 2%	83-1520-7203	One per P C Board
Resistor - 30K 1/4W 2%	83-1520-7281	One per P C Board
Resistor - 11K 1/4W 2%	83-1520-0368	One per P C Board

#### PROCEDURE:

- 1) Remove Power from machine.
- 2) Remove Track 1 Signal Electronics Board from housing.
- 3) Remove R6 and replace with 11K 1/4W 5% resistor.
- 4) Drill 4 holes using a .030/.035 diameter drill as shown in Figure 1. Use Caution not to drill into traces on the component side of the board.
- 5) Cut trace as shown in Figure 1.
- 6) Remove Q7 the 2N3903 and replace with the 2N3905 transistor as shown in Figure 2.
- 7) Install R137 the 2K 1/4W resistor as shown in Figure 2.
- Install R138 the 30K 1/4W resistor as shown in Figure 2 use teflon tubing on the leads.
- 9) Solder component leads to traces shown in Figure 1 and brush clean all joints.





#### BULLETIN No. 6



Bulletin No. Date	5A (Sup JULY, 1	ersedes Bulletin #5 dato 979	ed January, 1974)
SUBJECT:		Electronics PC Board Mo wind and Fast FWD Speeds	odification to Read Digital Code (SMPTE) •
APPLICABLE TO:	All M-	All M-79 Professional Audio Recorders using SMPTE Time Code Equipment.	
PURPOSE:	To Ext	To Extend Signal Bandwidth	
REQUIRED PARTS:		10K ohm 1/4W Resistor IC-LM318 .01 uf Capacitors 15pF Capacitor	Mincom Catalog #83-1520-7308 Mincom Catalog #83-1530-8263 Mincom Catalog #83-1510-1048 Mincom Catalog #83-1510-5265
PROCEDURE:	In most cases, the last or edge track is modified to read code in the electronics, i.e., track 8 on 8 track machine.		
	1.		/4W resistor: See Note 6 of the Signal Figure 6-10 or 6-12 of the M-79 Manual.
	2.	Remove CR5, 1N270 (Clip	out).
	3.	Remove IC4, the 741, an socket of IC4 pin 11 to close as possible to pi	d install a .01 uf capacitor from the ground. NOTE: Install the capacitor as n ll.
	4.	Install the LM318 in pl	ace of the 741.
	5.	Install a .01 uf capaci reproduce pre-amp to gr possible to the collect	tor from the collector of Q32 in the ound. Install this capacitor as close as or.
	6.	Install the 15pF capaci	tor from pin 3 to pin 10 of IC4.
	7.	Remove (clip out) Ll an	d C5 in the line amp circuit.
	8.	De-tune the 15 ips equa 6 pots fully CCW.	lizers, both Norm and Sync, by turning all

WT/Mincom Division



BULLETIN NO. 4

SUBJECT: Variable Speed Modification Installation Instructions

APPLICABLE TO: M-79 Professional Audio Recorders Mono thru 4 Tracks

REQUIRED PARTS: Pilot Light, Amber 24V Mincom Catalog No. 83-1550-2590 1 EA. PER MACHINE Resistor - Var 2.5 K ohm "Catalog No. 83-1520-1627 Knob "Catalog No. 83-1270-0708 Plate - Stripper, Switch "Catalog No. 83-3320-2789

#### **PROCEDURE:**

- 1) Remove Power to Machine
- 2) Remove Capstan Speed Switch Knob.
- 3) Raise Deck and Secure
- 4) Remove Nuts that secure power and reel balance switches, use caution as the switches have spacers on the under side.
- 5) Remove the four Phillips Screws that hold the Capstan Speed Switch Assembly to the deck. This allows the Switch Assembly to drop back far enough to replace the Stripper plate. See Figure 1.
- 6) Mount Amber Lamp and 2.5 K ohm Variable Resistor. See Figure 2
- Remove Ty-raps that secure wires with the Amp Connectors and connect to Amber Lamp. See Figure 2 and 3.
- 8) Solder a 3 inch length of 22 ga. wire from the open lug of TB5 to the wiper of R2, the 2.5 K ohm variable resistor. See Figure 3
- 9) Locate the white 22 ga.wire removed from the Ty-raps marked R2/1→ 104J2A, and solder to the lug on R2 as shown in Figure 3.
- Solder the Black ground wire marked R2/3 → TB3 to the lug on R2 as shown in Figure 3.
- 11) The two tabs located on the Capstan Speed Switch S3 should be bent down, this adds the two positions for Var Hi and Var Low when the Knob is turned clockwise. See Figure 4.

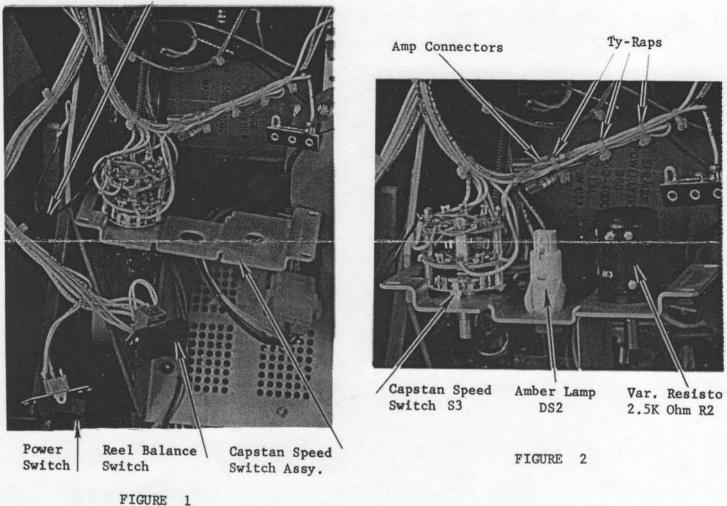
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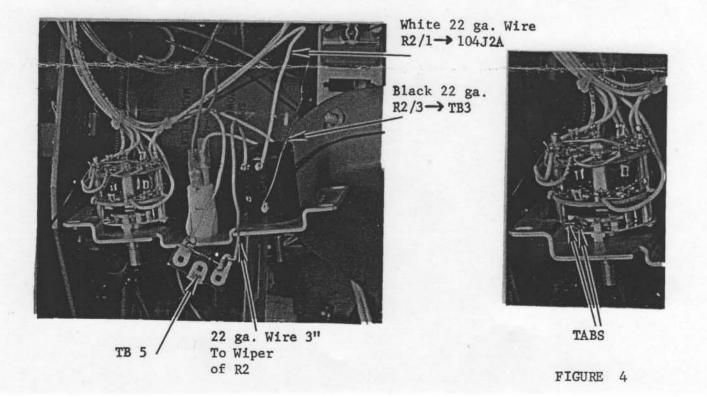
- 12) Install Power and Reel Balance Switches.
- 13) Install Capstan Speed Switch Assembly and insure that the ground wire coming off the switch is attached to one of the Phillips screws.
- 14) Install Variable Speed Knob and Speed Switch Knob.
- 15) Check to insure all connections are made properly and apply power. Insure that the Amber Lamp lights in the Var Hi and Var Low Switch position and Capstan Speed does vary when rotating variable speed knob.
- 16) Insure Equalization Switching in the Var Hi, Var Low position by checking continunity between B-11 and ground for Hi Equalization and B-9 and ground for Lo Equalization at the Electronics Board, using the extender card.

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Ground Wire





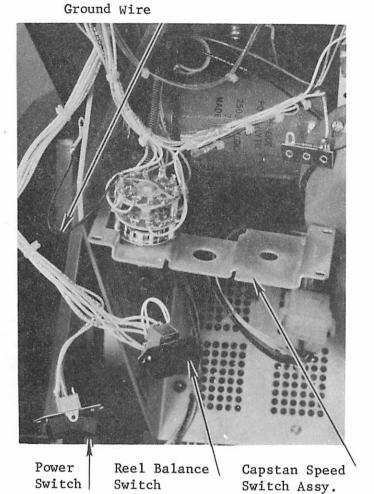


Bulletin No.	
Date	

BULLETIN NO. 3

Subject:	Change Current Limiting of Transport Power Supplies
Applicable to:	Custom Electronics Design Power Supplies Serial No. 007 through 090
Materials Required:	Resistor 51 ohms, 1/2 watt, 5% Catalog No. 83-1520-7222 - 1 each
Purpose:	Increase power supply fold-back current limiting point from 16 amps to 18-20 amps
Procedure:	Remove resistor R-7 for printed circuit board and replace with the 51 ohm resistor.

### Professional Audio Bull n No. 4



Amp Connectors

Capstan Speed An Switch S3

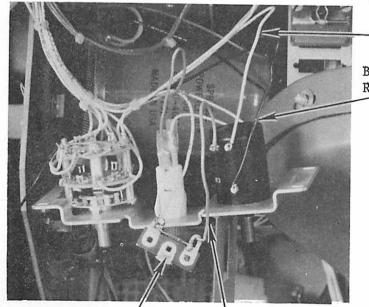
Amber Lamp DS2 Var. Resistor 2.5K Ohm R2

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FIGURE 2

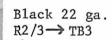
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FIGURE 1



TB 5 /

22 ga. Wire 3" To Wiper of R2 White 22 ga. Wire R2/1→ 104J2A



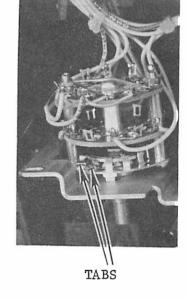


FIGURE 4

FIGURE 3





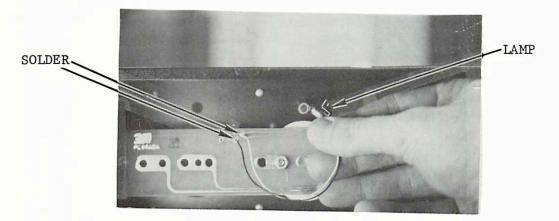
### Bulletin No. Date

BULLETIN NO. 2

SUBJECT:	Replacement of MURA type Meter Lamps
APPLICABLE TO:	ALL M-79 Professional Audio Recorders
PURPOSE:	Improved Lamp Reliability
REQUIRED PARTS:	<ol> <li>Lamp, Type 388, Mincom Catalog No. 83-1550-2689</li> <li>Lamp Holder, Mincom Catalog No. 83-1620-0294</li> </ol>

#### **PROCEDURE:**

- I. Remove MURA type meter lamp from the white line cap above the meter and unplug the wires from meter mother board.
- II. Solder wires on lamp holder 83-1620-0294 in place of the removed wires on the mother board (see Figure 1).





- III. Insert the lamp, type 388, in holder (83-1620-0294) and insert entire assembly in the white lens cap.
- IV. Future replacement of failed lamp will be accomplished by replacing the lamp only.



Bulletin No. Date

BULLETIN NO. 1

SUBJECT:	Signal Electronics PC Board FET Replacement
APPLICABLE TO:	All M-79 Signal Electronic PC Boards which use Motorola FET'S
PURPOSE:	To improve the reliability of the Signal Electronics PC Boards
REQUIRED PARTS:	Transistor 2N4342 or 2N4343, Manufactured by Fairchild or National ONLY, Mincom Catalog No. 83-1530-2462

#### **PROCEDURE:**

- I. Replace all Motorola 2N4342 transistors on the signal electronic PC board with Fairchild or National components.
- II. Change the Instruction Manual signal electronic PC board parts list to read FAIRCHILD or NATIONAL instead of MOTOROLA for Q10, Q11, Q18, Q19, Q20, Q25, Q26, Q27, Q28, Q34 and Q35.

