APR-5000 Alignment

Cleaners: fantastik(face plate), puck (rubber), brass(ceramic), alcohol (heads and guides), paper towels, swabs, sanding stick, vacuum cleaner
Demagnetiser and gause meter
spring scales 400-500 gr and 100-150 gr, and tentelometer
portable soldering iron (for hours meter)
hand tools, tweeker, Allen wrenches
Scope and probe collection, 14 pin IC dip clip
extender card, digital and analog multimeter
work, blank and test tapes

1	Clean		
2	Demag		
3	Brake Tension pg 6-14 + 6-15	Supply	CCW 360 gr +/- 80 gr
			CW 80 GR +/- 40 GR
		Take-up	CCW 80 gr +/- 40 gr
			CW 360 gr +/- 80 gr
4	Hours meter	rotate connector CNJ-464 180 degrees	
5	Shield	clean and adjust dash-pot if necessary	

6 Tape Tach Sensor (TTS) pg 6-19 IC Dip Clip to IC13 on TIB board fig 6-9
Scope ground to TP1, pos to **pin 8** of IC13 adj RV1 on TTS to 50% duty cycle
place scope pos to **pin 10** adj RV2 for 50% duty cycle

7 Supply Reel Motor Tach (RTS) Sensor scope pos to **pin 2** adj RV1 on supply RTS for 50% duty cycle. Scope pos to **pin 4** adjust RV2 for a 50% duty cycle.

8 Take-up Reel Motor Tach (RTS) Sensor Oscope pos to **pin 6** adj RV1 on take-up RTS for 50% duty cycle. Scope pos to **pin 12** adj RV2 for a 50% duty cycle.

9 DC Offset Back door, Reel Motor Drive (RMD) board fig 6-12. Block EOT sensor hit Edit, volt meter across R22 ground to outside, adj Rv2 for -1 millivolt, across R44 adj RV4 for -1 millivolts

10 Tension Load tape, Tentelometer between timer roller and headstack, adj RV1 for 70 grams +/- 5 gr. Tent between puck and take-up reel, adj RV3 for 120 Grams +/- 5 gr

11 Flutter Dampener Locate Hall Effect Sensor (HES) board under dancer arm. Connect Voltmeter neg to TP1 on TIB board, pos to TPA on HES board. Move dancer arm to extreme right minimum reading should be +5vDC, move arm to the extreme left, reading should be -5vDC. If lower check bar magnet\, IC1 and IC2. Values should be complementary +/- whatever, if not physically move the HES board and recheck until symmetrical readings occur.
pos to TPB note reading from left to right extremes if not 10vDC +/- .25v adj RV1
load tape and play, arm should ride in center of travel if not adj spring and stopper as per pg 6-31

12 End of Tape (EOT) adj. RV2 under keyboard

13 Vari Speed Check MRL 1 KHz check output for 1KHz
Press vari key (light flashes) press 5,0,0 and vari again (light on)
MRL 1 kHz check for 1.5 kHz
Press vari twice (flashes) press +/- key once, display = -50.0 press vari (on) MRL 1 kHz check for 500 Hz

14 Vari Speed Adjustment voltmeter neg to TP1 on TIB board, pos to TP3 on TIB, adj RV1 for -10.24vDc
See pg 6-39 Power down, remove jumper block JU-1 on TIB, power up
Press stop key =TIB test mode #1, 14 pin dip clip to IC 24 see fig 6-21
Frequency counter to pin #17 adj RV2 for 14.4 kHz.
Press stop key again for TIB test mode #2 adj RV3 for 28.8 kHz at pin 7
Replace JU-1.
Re-do # 13 Vari Speed Check procedure.

BIAS and ERASE CLOCK ADJUSTMENT

15 CNL card on extender, pin 30B should read 8.5v p-p for glass D25 (7-13 or 14) or 11.5 for silver epoxy D25. Adjust **RV1**(right hand) **on MST** card

16 load blank tape, scope to output Cal. (Time/div = 5msec, volt/div = 50mV) record ready channel one, punch in and out, adjust **RV4 on CNL** for minimum low frequency artifact repeat for channel two.

17 Record 1 kHz at +10 dB on channels 1+2, rewind and place channel 2 to input mode (no signal) and out of record ready. Hit record on cnl 1 adjust **RV1 on MST** card for 75 dB or more down. Check channel # 2

18 Repeat # 16 and recheck # 15.(low freq artifact =/less than 75 mV)

19 BIAS AND ERASE ENVELOPE RAMP SYMMETRY
CNL card on extender, work tape, record ready, scope to 6A of extender (1v/div + 20 mSec/div).
Punch in and out of record the ramp on and off waveform and duration should be equal. Adj **RV4 on CNL** card for on/off symmetry. Scope to pin 5A (bias) adjust **RV5 on CNL** card for equal waveform and symmetry. Repeat for channel 2.

20 CNL OFFSET VOLTAGE
Channel card on extender, Analog meter to output, hit shield on and off (dim + undim modes) adjust **RV1 on CNL** (hole through heatsink plate) for minimum meter deflection.

21 HEAD WRAP (rearmost screw) and AZIMUTH (left screw) ADJUSTMENTS
Analog meter to CAL OUT connector and press ALL key on ALN panel then peak adj 1kHz. course and 10kHz fine \ repro and sync \ wrap and azimuth

22 INPUT LEVEL CALIBRATION
Connect test equipment as per **figure 6-22** (pg 6-41) **with operating load connected.**
Frequency generator to 1kHz +4 dB to cal input on rear panel.
Front fold down panel, press IND once (cnl # 1) and MON LVL, adj for +4dB on EXTERNAL volt meter, repeat for other channels.

23 METER CALIBRATION
Store above input levels, power down, cnl card on extender, adjust **RV3 on CNL** card for 0 VU on channel meter. Repeat for remaining channels.

24 RECORD Comp FEEDBACK (RCB) and FEEDFORWARD (RCF) settings:

	30 ips	15 ips	7.5 ips
RCF	C0	CB	C4
RCB	C2	C7	C4

Hold control key, press RCF (level) in rec section, display=RCF setting, adj for all speeds
Hold control key, press RCB (hi freq) key in rec section, display=RCB setting, adj for all speeds.

25 REPRO HEAD GAP (RGC) and SYNC HEAD GAP (SGC) COMPENSATION

	30 ips	15 ips	7.5 ips
RGC	C1	CA	CA
SGC	C1	CC	CE

26 REPRO/SYNC LEVEL ADJ 1Khz (load beginning location 28 and end loc 29 and repeat)

27 REPRO/SYNC HIGH FREQ ADJ 10 kHz (load repeat)

28 RECORD and BIAS LEVEL generator to 10 kHz, -3, dB adj Bias Level to peak, then overbias 2 dB @ 15 and 7.5 ips (1.5 dB @ 30 ips).
Generator to 1 kHz +4 dB, adj rec level to 0 VU.

29 RECORD HIGH FREQ generator to 10 kHz, +4dB, adj H.Freq to 0 VU.

30 Low freq REPRO response A. Generator to 40 hz sweep gen for peak, record and adj low freq to 0.5 VU. B. Generator to 100 Hz record and adjust to 0 VU.

31 SYNC LOW FRQ REPRO, Gen to 40 Hz sweep slightly for peak, record 4 min. at 0 VU playback tone and adj low freq sync repro to 0 VU. Check at 100 Hz.

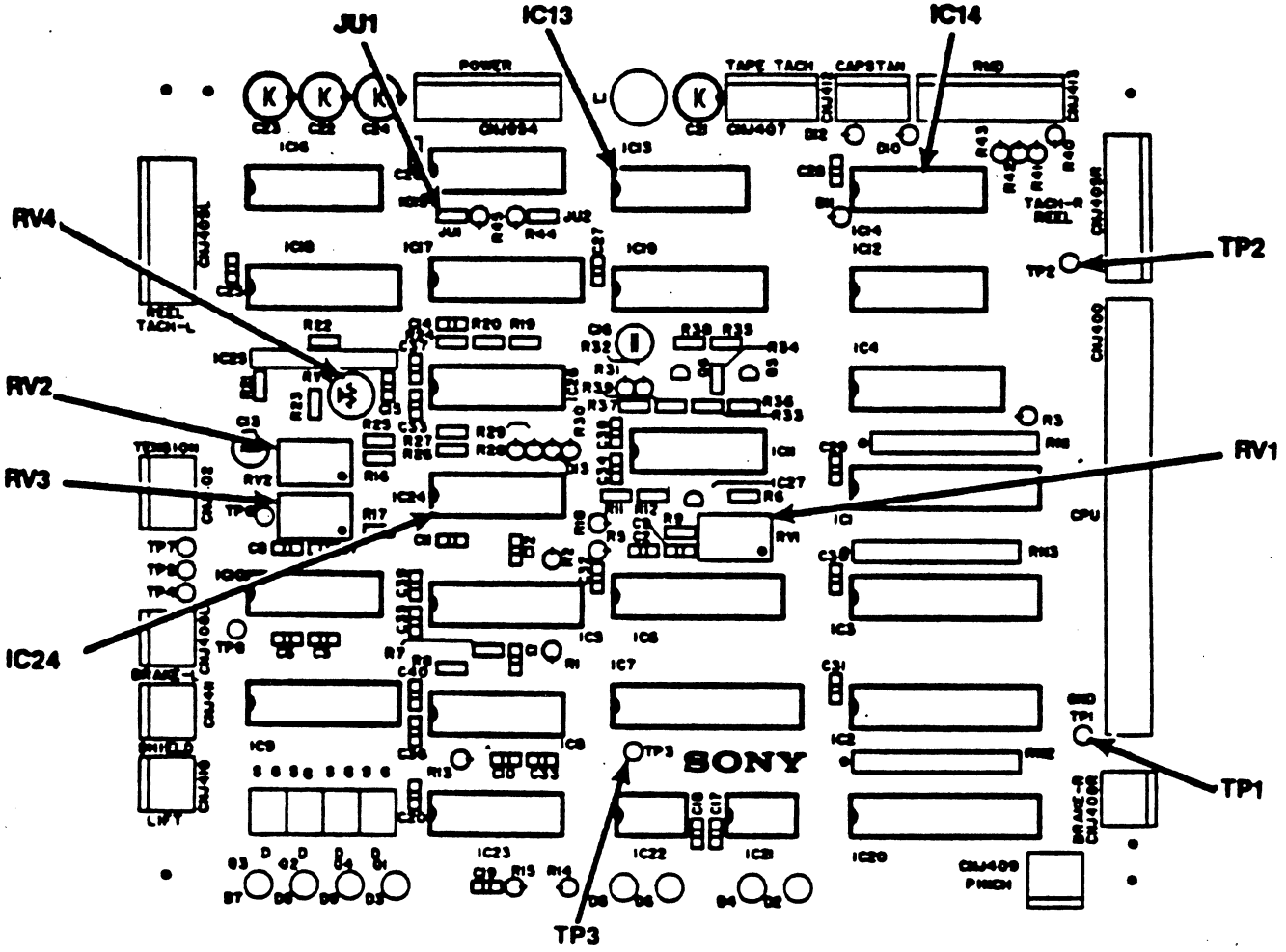


Figure 6-9. TIB Board Layout

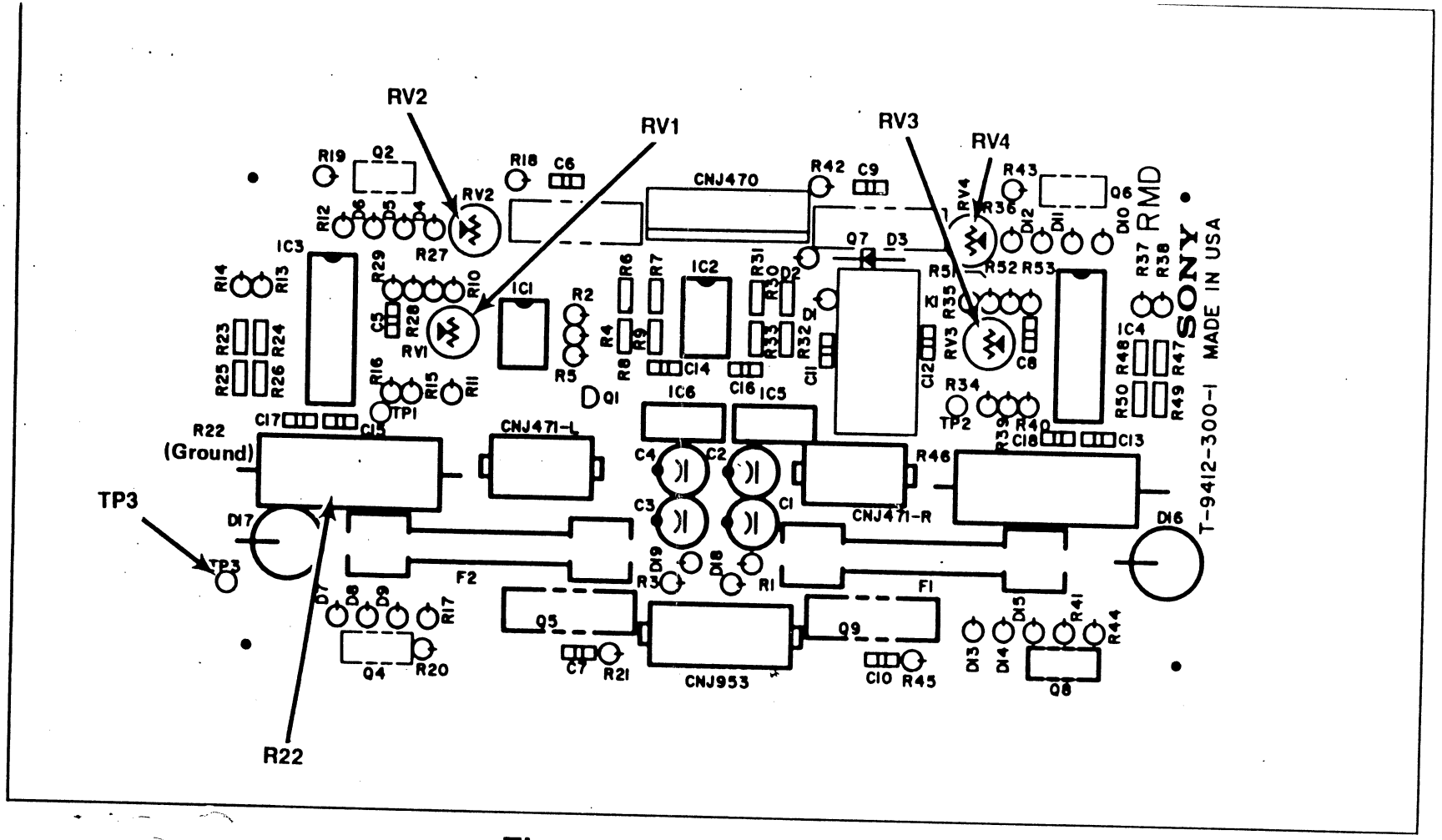


Figure 6-18. RMD Adjustments

OFFSET

open back door / block end of tape sensor / edit mode

R # 22 (ground to outside)
adjust RV # 2 for 1 millivolt DC

R # 46
Adjust RV # 4 for 1 millivolt DC

TENSION

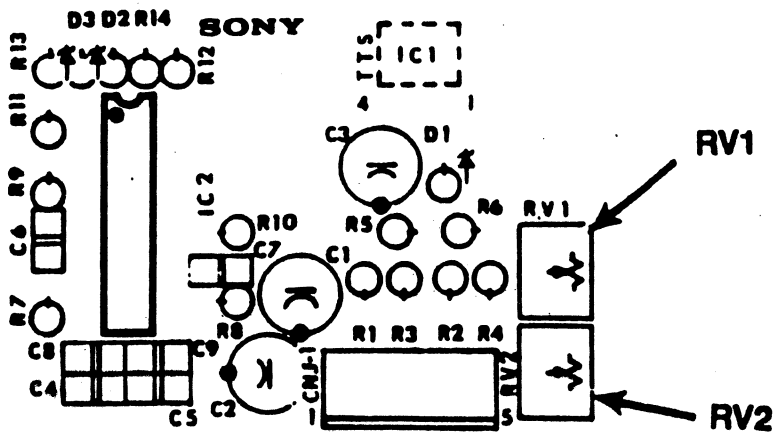
out of edit mode / remove end of tape block / load tape and bring to center / play

SUPPLY

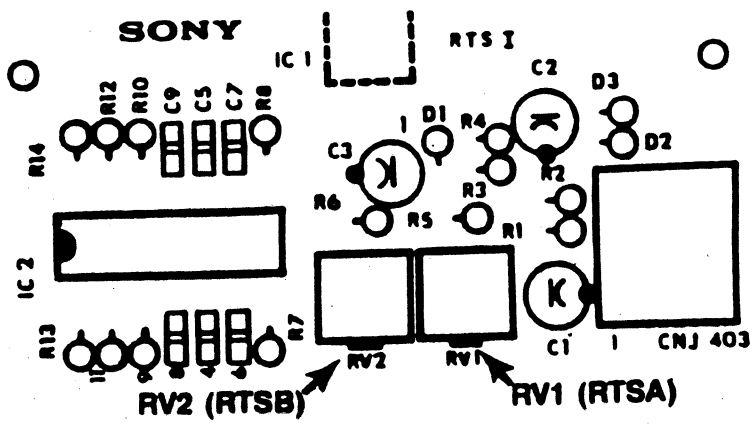
RV # 1 to 75g +/- 5g w/ tentelometer
between tach roller and headstach

TAKEUP

RV # 3 to 120g +/- 5g w/tentelometer
Between last guide and takeup reel



TTS PC Board



RTS PC Board

TAPE TACH (TTS)

(IC 13)

pin # 8 -- RV 1
pin # 10 -- RV 2

REEL TENSION

(IC 13)
SUPPLY

pin # 2 -- RV 1
Pin # 4 -- RV 2

TAKE UP

Pin # 6 -- RV 1
Pin # 12 -- RV 2

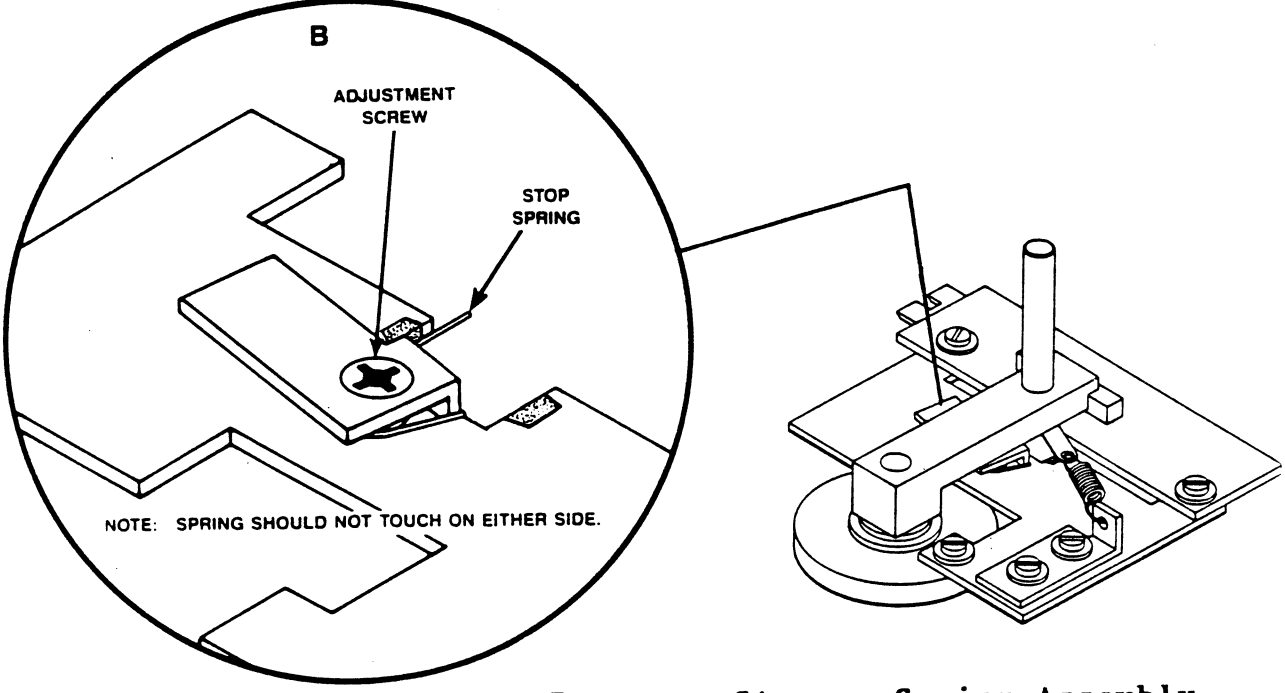


Figure 6-17. Flutter Dampener Stopper Spring Assembly

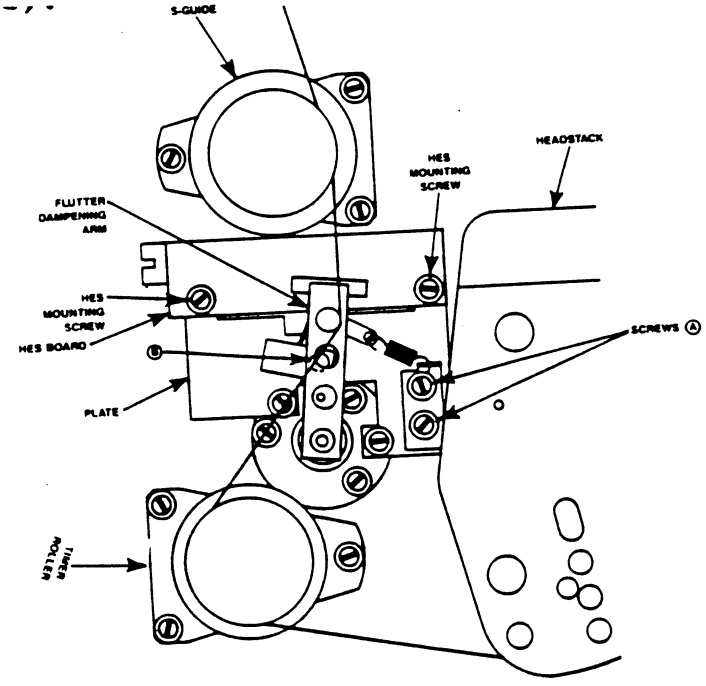


Figure 6-16. Flutter Dampening Arm Assembly

5.2.4 CNL Circuit Description

The Audio Data Buss (ADTA-Ø through 7) is connected to the inputs of IC28 via the edge connector pins 36 through 39 A and B. This device is a data buffer. The data is latched by the array of latches and Digitally Controlled Resistors (DCR) when the WRBS pulse in in an active low true state. Additionally, the Parameter Address bits (PA-1 through 9) are decoded by IC32 into the following dedicated commands:

1) Monitor Calibration
2) Monitor Bias
3) Repro Equalization
4) Record Equalization
5) Secondary Compensation
6) Gap Compensation

These dedicated command lines share a common enable. When the CHAN N command and the DRAWER N command are decoded by the OR gate of IC34A with a resultant low logic state, the parameter command lines are activated. IC29 latches the data for Secondary Gap Compensation control, input and output uncalibration level, Record Enable, Dim Inhibit and other frequency related switching functions (LEM Defeat, etc.).

IC3Ø latches the mode functions that allow the control of Repro/Sync routing to the reproduce circuitry, DIM circuit, calibration input switching, and individual Record/Sync switching. IC31 provides the latching of data for Secondary Record Compensations as well as Bias and Erase Ramp timing. This is accomplished by the use of distributed system clocks, enabling pulses and safety features internal to the system architecture to prevent accidental erasure (REC ENABLE).

The Master Card provides the Bias and Erase pulses required to start the Bias and/or Erase ramp on, and to initiate the completion of the Bias and Erase pulses (ramp off). The Bias and Erase pulses enter through IC42. The record enable command on IC42 allows the proper set enable of IC38 and 39. The Bias and Erase clocks are input to IC41D and IC41A respectively. The output of these devices are connected to IC39 which determines the set or reset of this pulse. These clocks provide a means to determine the rate of the envelope ramp and determine the direction of the ramp to travel (initiation or completion of record). IC36 and 37 provide the up/down count required for initiation of Record as well as completion. The output of the 2 counters provide a 4 bit output that is converted by an R2R ladder network. This provides an envelope amplitude directly proportional to the 4 bit output of IC36 and IC37. This is filtered though IC27 and is the control input to IC26.

supplied signalfrom either the REPRO or SYNC head. The input from the heads is selected by K1; K1 receives the command from user selection on the Remote Control Unit. The output of K1 is connected to a ferrite balun for high frequency rejection. The input amplifier of the reproduce chain is an LM394. The LM394 is a instrumentation type amplifier exhibiting very low noise and high gain qualities. The output of Q7 (LM394) is then routed to IC1Ø. The combination of these two devices provide a very efficient common mode rejection input stage. IC1 provides additional gain and buffering to the input of IC5. The combination of IC2 and IC5 manipulate the low frequency equalization and integration reqired. The second half of IC5 and IC3 provide the high frequency characteristics. Both Low and High frequency equalization are accessable under user control. IC4 is used when various types of head architecture are used. It provides a choice of gap compensations, and control of very low frequency boost control with Low End Modifier (LEM) defeat. This type of control is normally used for 3Ø IPS response. This control is part of the gap compensation programming. The reproduce or sync signal is then directed from the output of IC3 to IC13 whereby output monitor switching is provided.

The output from IC13 is connected to IC8 which is configured as an inverting buffer. The inverted signal is routed to IC12 (1/2). IC12 is not utilized at this time, but may be implemented in the future. The output of the second half of IC8 is then routed to IC21. This provides the amplitude control of the output monitoring circuit. IC47 and IC32 are used to route the command for dimming of the output circuitry under CPU control. IC46 acts as a driver to IC43 (the opto-isolator). During fast wind modes and Stop, the output of IC8 is turned off by IC43. Dim is approximately 4ØdB. Dimming can be either individual cards or the entire machine. The output Hybrid (IC11) provides a low output inpedence and differential output characteristics. IC9 is used as a meter buffer stage and adjustment of meter calibration.

5.2.5 Audio Motherboard (ADM) Overview/Circuit Description

There is one ADM board mounted at the rear of the audio signal section of the **APR-5ØØØ**. The ADM board contains all of the interconnections of the Channel Cards (CNL), the Time Code Card (TCC), the Master Card (MST) and Audio Logic Control from the CPU. In addition, all audio power and ground lines are routed to the audio signal cards via the ADM. There is no active circuitry on the assembly.

IC26 is a constant current 2 quadrant multiplier. The output of IC26 provides an amplitude modulated (AM) signal of 100kHz Erase and 400 kHz Bias drive. These outputs are then routed to IC24 and IC25 (Bias/Record and Erase respectively). The outputs of these amplifiers are sent to Q2 and Q3 (Q4 and Q5). This transistor amplifier increases the erase current to an adequate level. Bias level is controlled by the use of IC21. The command for this level change is performed by the operator via the ALN Panel.

IC23, an analog switch, is a safety device assuring that neither bias or erase can be applied to the respective LEDS without the enable of the record ready signal. In addition, relay K2 provides a redundant safety feature when the record hold signal for the master card is not present. Q6 and the RC time constant of R6 and C161 provide a record relay hold slightly beyond the time of envelope colapse of the bias and erase signals. K2 will energize just prior to the initiation of the erase and bias signals and de-energizes after the envelopes have fully depleted.

Timing of the bias and erase envelope ramps are managed by IC36 and IC37. The timing of IC36 is controlled by the ERASE CLOCK signal from the MST card. IC37 is clocked by the BIAS CLOCK signal from the MST card. IC23 is a digital switch that receives commands from the Q outputs of IC38 and 39 (Ramp Control Circuitry). The external noise reduction control is provided by IC34 and IC44. When the channel card is provided with either a command signal (input or record) the opto isolator IC44 will provide the relay closure required to enable the external noise reduction relay (refer to Section 2 of this manual for interconnection specifications).

The audio input to the CNL card is connected to a thick film differential input stage (IC6). The output of IC6 (input amplifier) is routed (via digital switch IC12). IC12 is not used at this point in time but may be utilized in the future for for feature enhancement. The input signal is connected to another digital switch IC14. IC14 determines the input select source. The SLATE BUS is being utilized for the CALibrate IN (CAL IN) signal routing to tracks. The selected signal is then directed to IC7. The output of IC7 provides the input to IC17 (1/2). This provides record level adjustment under user control. The output of IC15 (1/2) output is connected to the other half of IC17 (2/2). This portion of IC17 is used to control the adjustment of record high frequency equalization under user control. The output of IC15 (1/2) is also connected to IC13 (pin 11), a digital switch. IC13 provides the selection of the output of the machine. This selected signal can be INPUT, REPRO or SYNC. The output of IC15 also directs the signal to the Secondary Feed Forward and Feedback Compensation circuit that is controlled by IC16 and 19. The reproduce chain can be

STEP 15 Remove CNL #1 from extender card and re-insert it into the unit.

STEP 16 Remove CNL #2 and re-install it on the extender card.

STEP 17 Turn APR-5000 ON.

STEP 18 Press RECORD READY channel #2.

STEP 19 Alternately pressing record and play, adjust RV4 for minimum LFA.

STEP 21 Verify depth of erase on all channels of the card cage.

6.8.2 CNL Card BIAS and ERASE Envelope Adjustment

There are adjustments on each of the CNL cards for Bias and Erase ramp symmetry. These adjustments are checked and/or made with the questioned card placed on the extender card and the corresponding channel in RECORD READY mode. The channel is toggled between RECORD and PLAY mode, while checking for the ramp ON and ramp OFF time. The adjustment will set both ramps to the same duration. A symptom of this adjustment being out of specification is, "an unusual punch-in/punch-out noise".

Necessary Tools:
- Oscilloscope
- Work Tape (Scotch 226, etc.)
- Potentiometer Adjustment Tool (tweeker)
- Extender Card

Prerequisites: N/A

STEP 1 Turn the APR-5000 power switch OFF.

STEP 2 Remove the questioned CNL card, and place it on the extender card. Install the CNL/Extender card assembly.

STEP 3 Load a work tape onto the machine and place all channels into RECORD READY mode.

STEP 4 Connect the oscilloscope probe to pin 6A of the extender card.

STEP 5 Set the oscilloscope to 1V/div and 20msec/div.

STEP 6 Alternately punch-in and punch-out of RECORD mode while observing the waveform on the oscilloscope. Ensure that the ERASE ramp is symmetrical (the ramp-on time equals the ramp-off time). If adjustment is necessary, use RV4 (on the CNL card) to adjust the symmetry.

STEP 7 Connect the oscilloscope probe to pin 5A of the extender card.

STEP 8 Repeat STEP 6 (for the BIAS ramp). If adjustment is necessary, use RV5 (on the CNL card).

6.8.3 CNL Offset Voltage Adjustment

When installing a new CNL card or when there is excessive monitor switching transients, the offset voltage potentiometer (RV1) may require adjustment. This transient is due to a DC offset present on the playback signal circuit. The transient is heard when the output amplifiers of the **APR-5000** are switched between the playback circuit feed and other signal source lines (i.e. INPUT, DIM). Refer to the procedure below when making this adjustment.

Necessary Tools:
- ACVM (Hewlett-Packard 400FL or equivalent)
- Potentiometer Adjustment Tool (tweeker)
- Extender Card

STEP 1 Turn the **APR-5000** power switch to the OFF position.

STEP 2 Remove the suspected CNL card from the card cage and place the extender card into this slot. Install the suspected CNL card onto the extender.

STEP 3 Turn the **APR-5000** power switch to the ON position.

STEP 4 Connect the ACVM to the LINE OUTPUT (rear panel) of the suspected channel.

STEP 5 Enter the DIM and UNDIM modes alternately by pressing the SHIELD DEFEAT key. Adjust RV1 on the CNL card for minimum meter deflection on the ACVM. This adjustment will null the DC offset between the playback circuit feed (to the CNL output amplifiers) and the other signal sources (DIM/UNDIM, LINE INPUT, etc.).

NOTE : It is not necessary to remove the heatsink plate for this adjustment. There is a hole provided for easy access to this adjustment potentiometer.

D.1.4 CNL Board

For these descriptions, refer to Figure 7-10A and 7-10B on pages 7-13 and 7-14 of this manual.

JW-1 : Normally OUT on the **APR-5000** Series, this jumper (when installed) will connect the "COLD" lead of the REPRO head to ground. This connection will perform a hard wire single ended signal being returned from the REPRO head. This jumper is not used on any revision of the CNL card.

JW-2 : Normally IN on the **APR-5000** Series, this jumper connects the BIAS signal output (pin 8 of K2) to the edge connector pin 5A.

JW-3 : Normally IN on the **APR-5000** Series, this jumper connects the ERASE signal output (pin 3 of K2) to the edge connector pin 6A.

JW-4 : Normally IN on the **APR-5000** Series, this jumper connects the REC ON N (SYNC N) signal output (collector pin of Q1) to the edge connector pin 34B. This command line is directed to the FEX board for switching control of the FEX relay for channel n. The command will switch the relay on the FEX board to either feed record drive signal to the head, or receive playback signal from the head.

JW-5 : Normally OUT on the **APR-5000** Series, this jumper (when installed) connects the REC ON N (REC ON) signal output (collector pin of Q8) to the edge connector pin 34B. This configuration will a similar operation to that of JW-4.

D.1.5 CNX Board

For these descriptions, refer to Figure 7-12 on page 7-16 of this manual. The configuration of JU-1, JU-2, JU-3, and JU-4 are at the operators discretion. The **APR-5000** Series machines have the capability of either an analog differential line output or an RS-422 output for the LTC port. The normal factory configuration is JU-1 and JU-3 installed. If a change to the output stage of the LTC signal is desired, follow the guidelines shown in the jumper descriptions that follow. JU-5 and JU-6 are mutually exclusive.

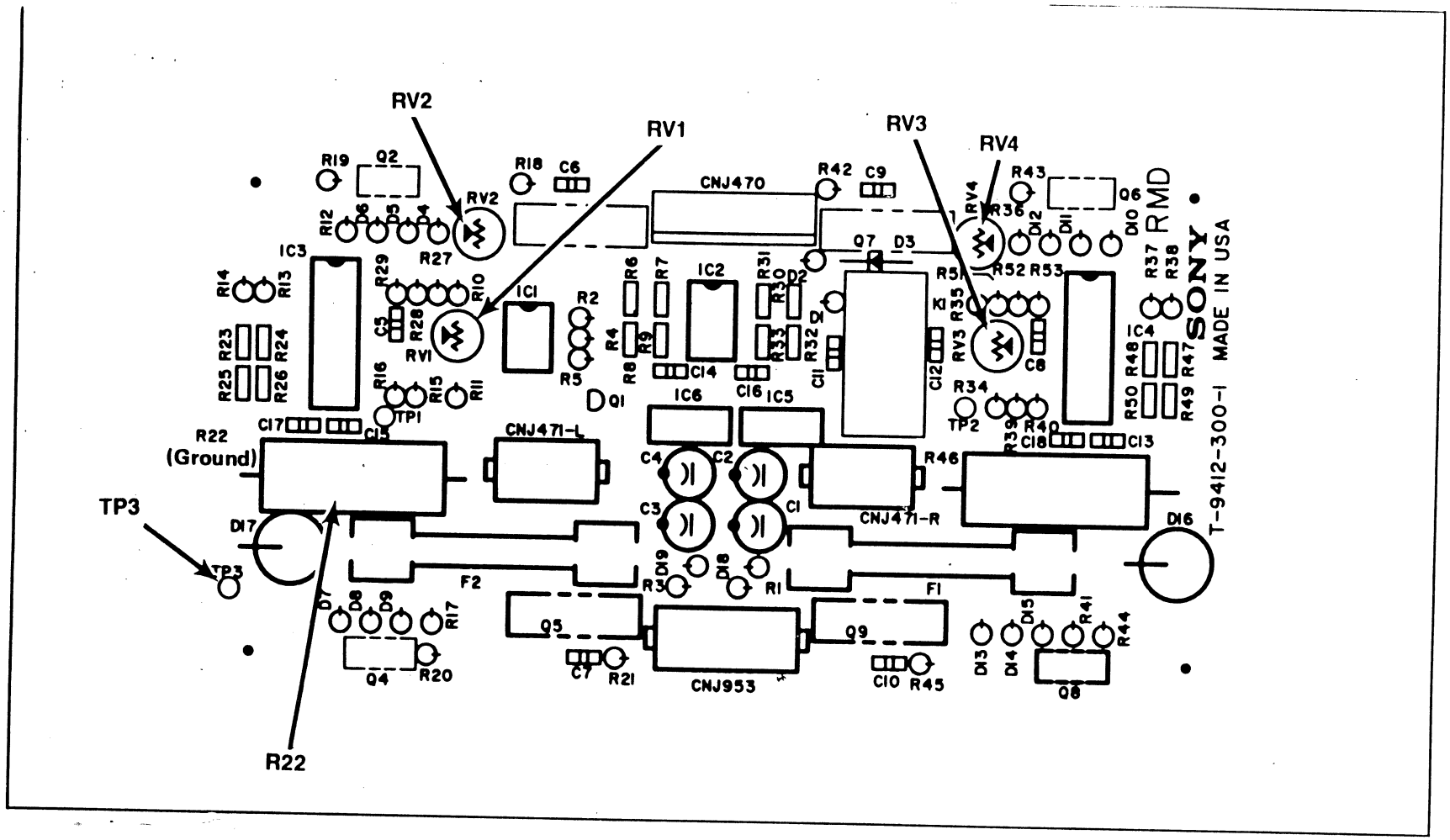


Figure 6-18. RMD Adjustments

OFFSET

open back door / block end of tape sensor / edit mode

R # 22 (ground to outside)
adjust RV # 2 for 1 millivolt DC

R # 46
Adjust RV # 4 for 1 millivolt DC

TENSION

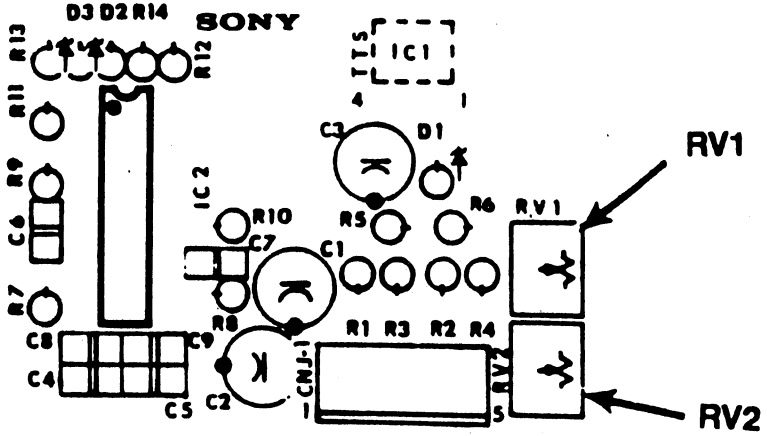
out of edit mode / remove end of tape block / load tape and bring to center / play

SUPPLY

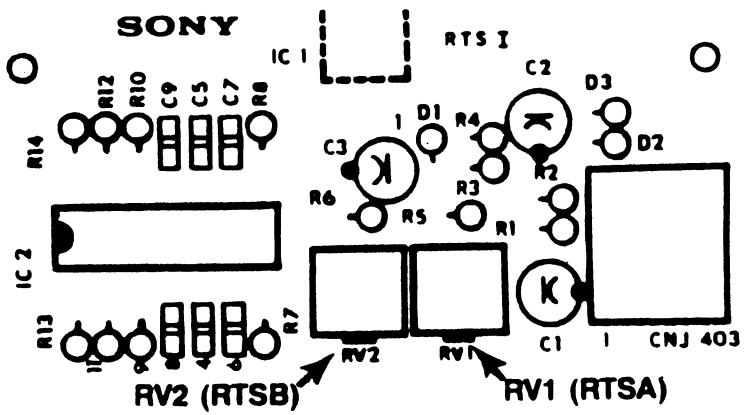
RV # 1 to 75g +/- 5g w/ tentelometer
between tach roller and headstach

TAKEUP

RV # 3 to 120g +/- 5g w/tentelometer
Between last guide and takeup reel



TTS PC Board



RTS PC Board

TAPE TACH (TTS)

(IC 13)

pin # 8 -- RV 1
pin # 10 -- RV 2

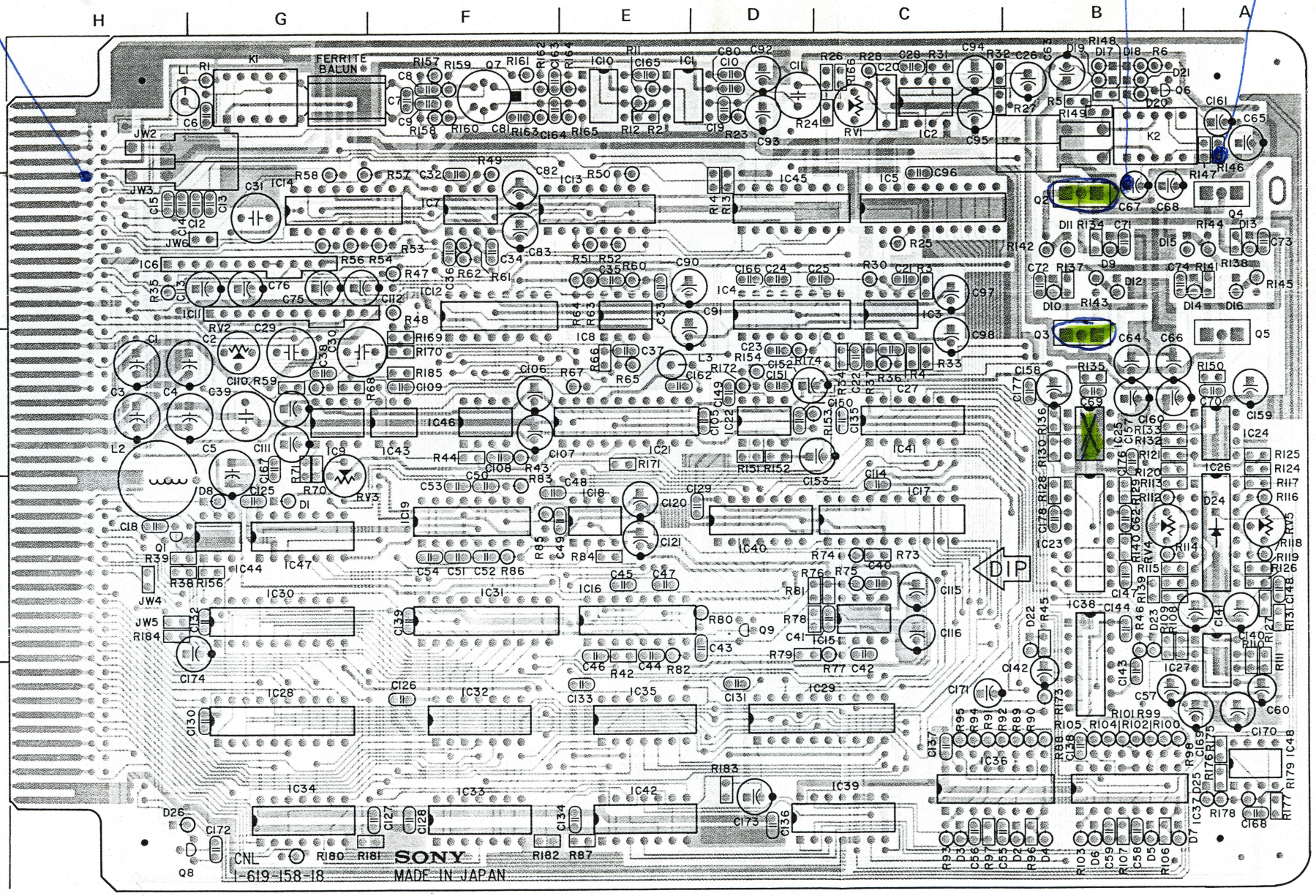
REEL TENSION

(IC 13)
SUPPLY

pin # 2 -- RV 1
Pin # 4 -- RV 2

TAKE UP

Pin # 6 -- RV 1
Pin # 12 -- RV 2

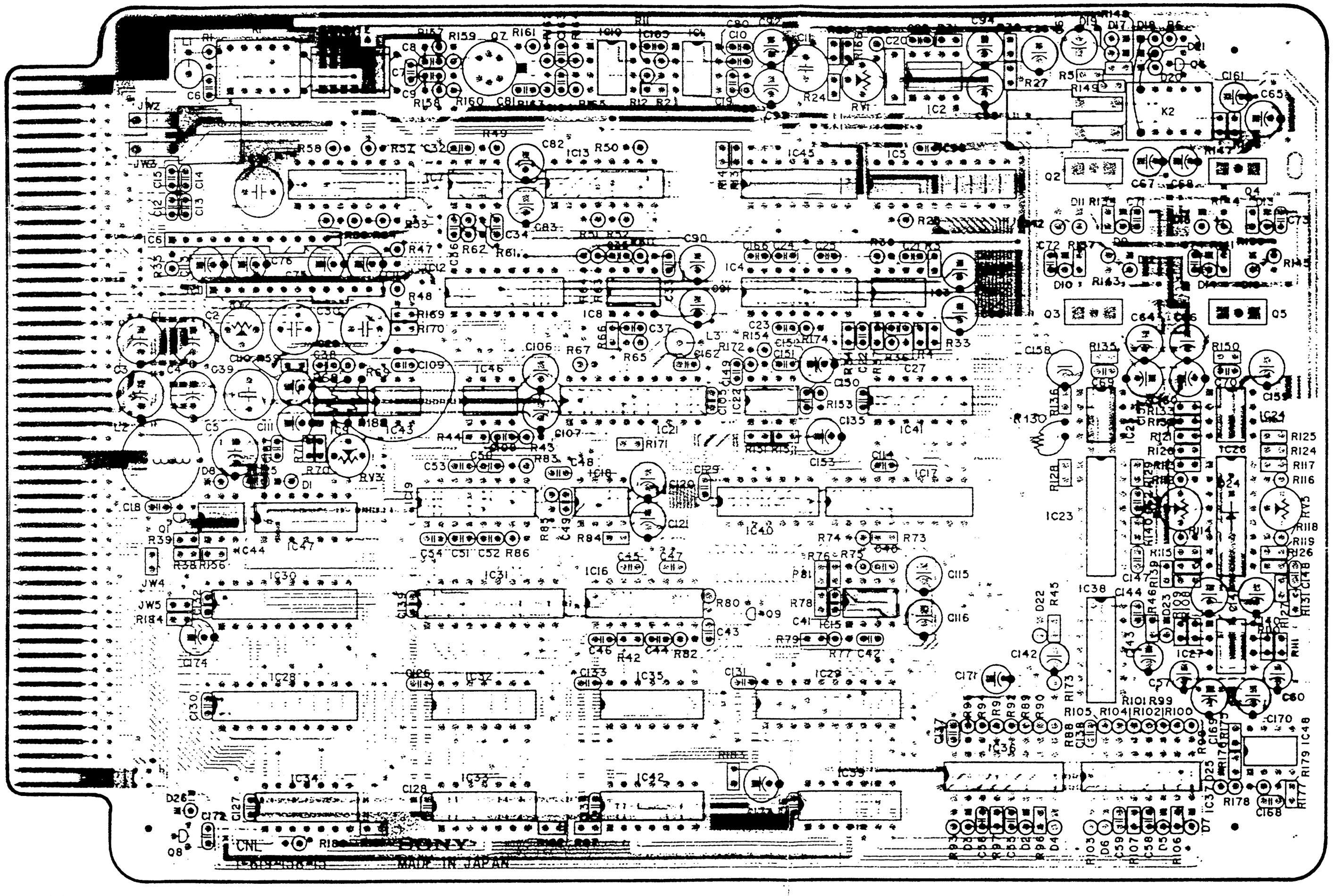


■ SOLDER SIDE PATTERN 1-619-158-18

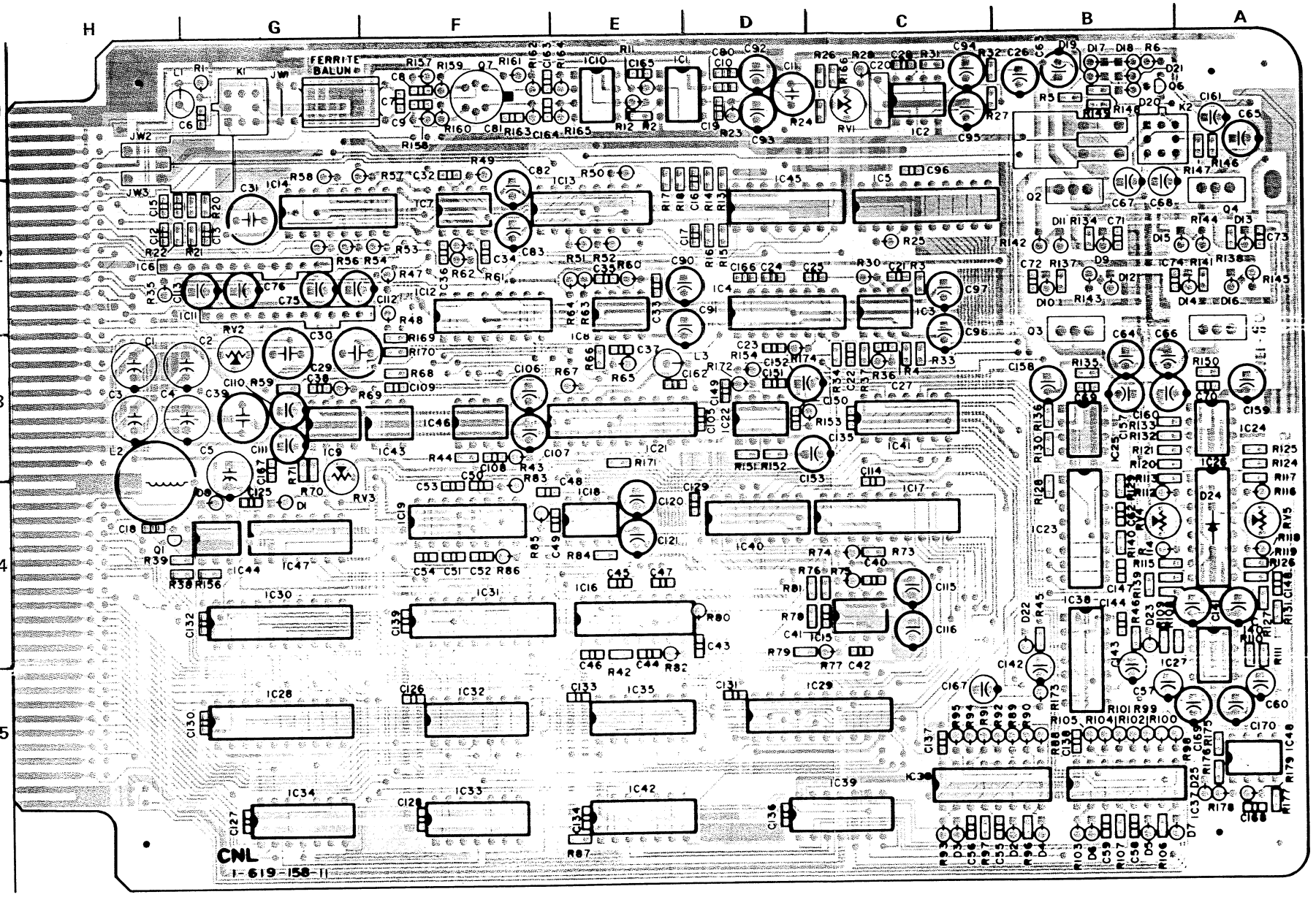
■ COMPONENT SIDE PATTERN 1-619-158-18

(1-619-158-15)
Side

S/N; APR-5002 20301 AND HIGHER
S/N; APR-5003V 10001 AND HIGHER



■ SOLDER SIDE PATTERN 1-619-158-15



E SOLDER SIDE PATTERN 1-619-158-11

CNL BOARD

ERASE AMP

SAFETY SWITCH

BIAS AMP

ramps up erase

bias

erase

BIAS LVL

- SAFETY RELAY

S8-729-313-32 Q2
S8-729-385-72 Q3
K1 + K2 RELAYS
S T 9413-260-1

LOGIC

IC	+5V	GND	CAP*
5	17	5	C105
17	17	5	C96
20	20	10	C130
29	20	10	C131
30	20	10	C132
31	20	10	C139
32	14	7	C128
33	14	7	C128
34	14	7	C127
35	14	7	C133
36	16	8	C137
37	16	8	C138
38	14	7	C144
39	14	7	C136
40	14	7	C129
41	14	7	C135
42	14	7	C134
47	14	7	C125

.1/100

8P AMP'S		
IC	+V	-V
1	C92	C93
2	C94	C95
3	C97	C98
7	C82	C83
8	C90	C91
9	C110	C111
15	C115	C116
18	C120	C121
22	C152	C153
24	C159	C160
25	C157	C158
27	C140	C141
46	C186	C187
48	C170	C189
10	C80	C81

22/35

.1/100

LAST TRANSISTOR Q9
LAST IC IC48
LAST DIODE D26
LAST RESISTOR R184
LAST CAPACITOR C174

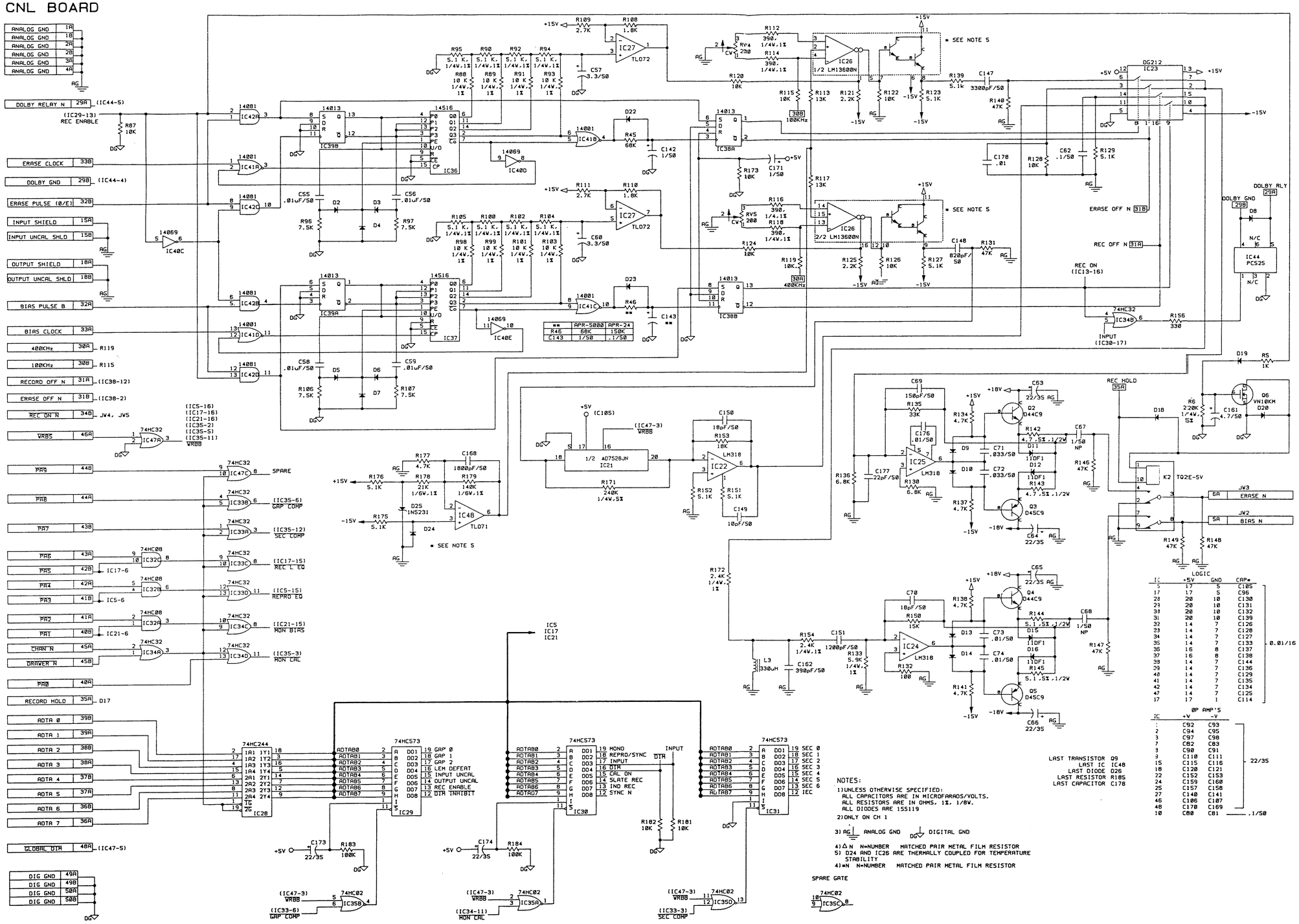
NOTES:
1) UNLESS OTHERVISE SPECIFIED:
ALL CAPACITORS ARE IN MICROFARADS/VOLTS.
ALL RESISTORS ARE IN OHMS. 1%, 1/8W.
ALL DIODES ARE 1N914
2) ONLY ON CH 1
3) AG ANALOG GND DG DIGITAL GND
4) Δ N N=NUMBER MATCHED PAIR METAL FILM RESISTOR
5) D24 AND IC28 ARE THERMALLY COUPLED FOR TEMPERATURE STABILITY
4) ⇔N N=NUMBER MATCHED PAIR METAL FILM RESISTOR

SPARE GATE

CNL BOARD
BOARD NO. 1-619-158-11 & HIGHER
APR-5002/5003V

Figure 7-10B. CNL Board Schematic Diagram

CNL BOARD



CNL BOARD
BOARD NO.1-619-158-11 & HIGHER
APR-5002/5003V

Main Unit | CNL (1/2) | CNL (1/2) | Main Unit

7528 Digital Attenuator tend to fail

CNL BOARD

GAP LEVEL

REPRO HF EQ

NEW BOARDS

REPRO LF

REPRO OR INPUT LEVEL

IN OR OUT OF LM INPUT CAL

OUTPUT CAL-UNCAL

CONTROL FOR LEVEL ON METER

METER BUFFER

REC LVL

REC HF

CAP COMPENSATION RCF RCB

NAB REC EQ

SAFETY SWITCH

MUTING

DIFFERENTIAL OUTPUT

old BOARDS NBC WAY

CNL BOARD
BOARD NO.1-619-158-11 & HIGHER
APR-5002/5003V

Figure 7-10A. CNL Board Schematic Diagram

WESTWOOD ONE COMPANIES

CPU Board
Lithium Batts
T- 9413-327-1

BR-1/2A 3V

WESTWOOD ONE COMPANIES

5002

Older Relay (Black Anodized heat sink)
serial # 20001 - 20300

Newer Relay (non-Anodized heat sink)
serial # 20301 —

5003V
only New
serial # 10001 + higher

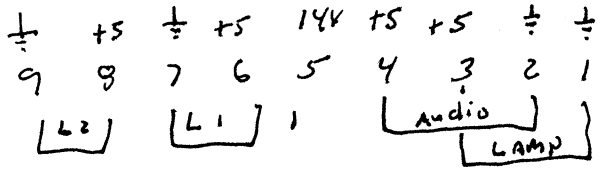
+14V

↳ REG A logic

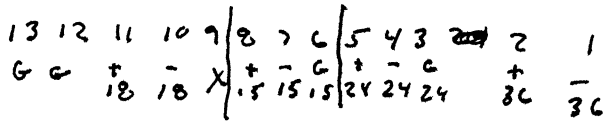
REG B Audio x2 (indicator-)

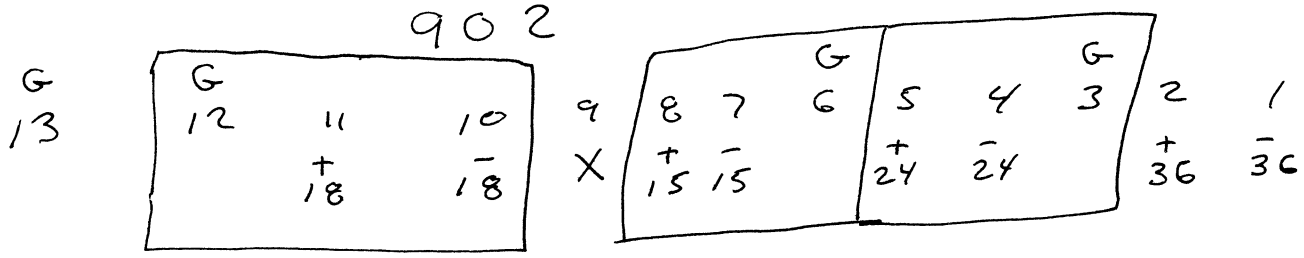
NO indicator TopPanel +drawer-
NO sel drivers

903



902





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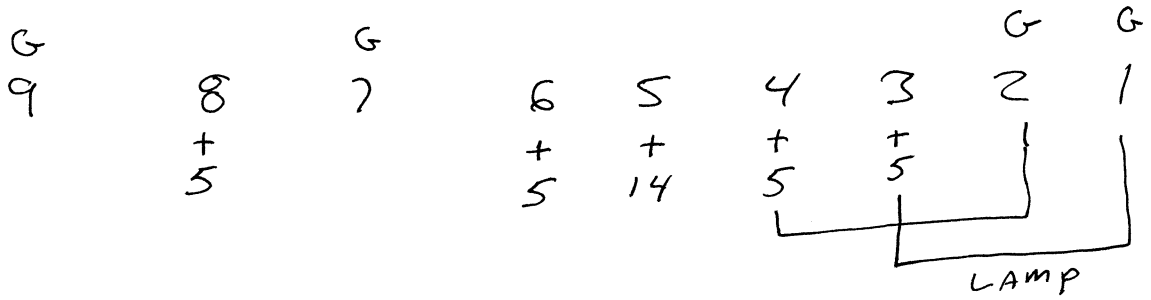
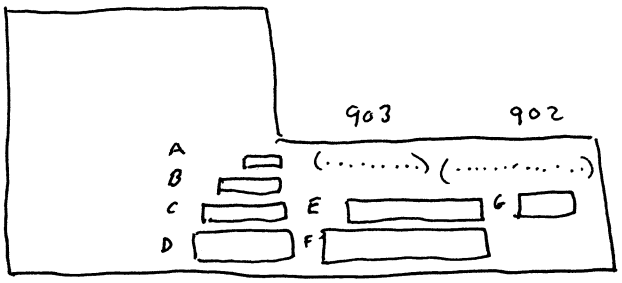


33	34	35	36
A	A	A	A
B	B	(B)	(B)



A CNJ 906

B 904

C 905

D 910

E 911

F 912

G 908

	9	8	7	6	5	4	3	2	1
	G	+5 L#2	G	+5 L#1	+14 V	+5V A	L +5V	A G	G
A OK		✓		✓	✓	✓	✓		
B		1.1		4.9	17.5	0	0		
OK		✓ *				✓ *	✓ *		
C		+ 5		+5	17.5	G ~~+5~~ (*)	0 +5 (*)	✓	
D		+5		+5	17.5	+ 5	+ 5		

+5V LAMP

	13	12	11	10	9	8	7	6	5	4	3	2	1
	A G 1	A G 2	+ 18	- 18	X	+ 15	- 15	15 G	+ 24	- 24	G 24	+ 36	- 36
A OK			✓	✓		✓	✓		✓	✓		✓	✓
B OK			+18	-18		+15	-15		+24	-24		+36	-36
C			+18	-18		+15	-15		+25	-24		+36	-36
D			+18	-18		0 *	0 *		0 *	0 *		+36	-30

"No power"

Blown diode? (1)

Blown FAN (2)

RGD - both fuses ~~blown~~ Replaced

C - OK

B - ~~blown~~ fuse replaced

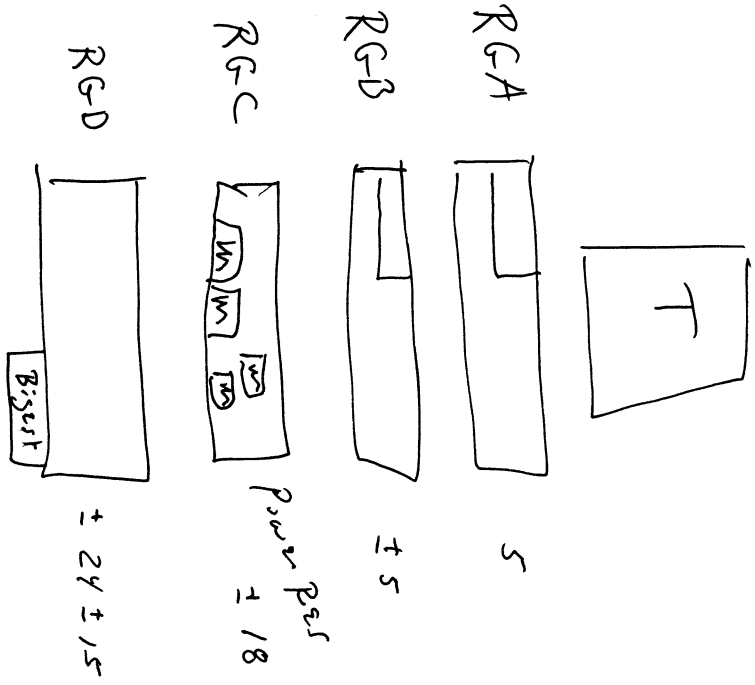
A. - Regulator several

Q4 IT015

Power - REAR TOP

R B IN

O B out



Working deck WAS under biased 6dB? 7.5 +15 ips
REAR Regulator board runs too hot
sounds VERY good

NON-working decks - all three take down power supplies some ±24 and ±15 some just + or just -

Power supplies 3 on floor 2 REPAIRED (one - 24 15 plus odd bit part + FAN gone
found on/off switch, FAN, + many parts
ERIC NEEDED as will 10 hrs in
I haven't the time (4 month wait

NEW	OLD				
RG-1	REG A	+5 ~~Logic~~	IN +14V	logic	
	REG B	+5 Audio x2	IN +14V	LAMP indicato-	
RG-2	REG C	±18	IN ±32		
	REG D	±15 ±24	IN ±36	transport/Audio	I15 AMPS ±24 Transport INTERFACE REEL Motor drive REG to ±15 on board

ACN	Active combining network
ACM	AUdio Control motherboard
ADM	Audio distribution mother
AHB	Audio headstack board
ALN	Audio Alignment panel
CNL	Audio channel PC
CNX	Connector interface board
CPU	central proc unit
CSL	Capstan servo loop board
CTM	VU meter controller board
FEX	Front end transformer board
KBD	Key panel board
LNT	Local/Network transceiver board
MSB	signal muting board
MST	Master Audio CARD
RMD	Reel Motor driver board
RTS	Reel TACH sensor board
SBR early	Silicon Bridge Rectifier board
TCC	Time code channel board
TCM	Time code channel meter board
TIB	TRANSport interface
TTS	Tape tACH sense board

SHIELD DEFEAT

voltage — CHANNEL CARD
① D25 glass or epoxy
② on edge card
③ Adjust RV1 ON MASTER to 8-9v glass 11-12v epoxy

punch noise — scope to line out / blank tape / Adjust CHANNEL RV4 for minimum REC punch

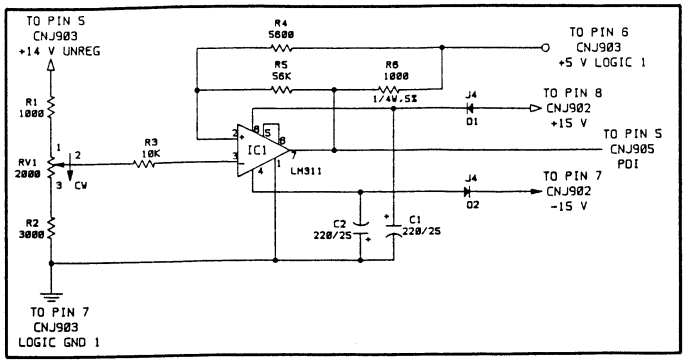
ERASURE — RV1 on MASTER ? then RV4 CHANNEL Again

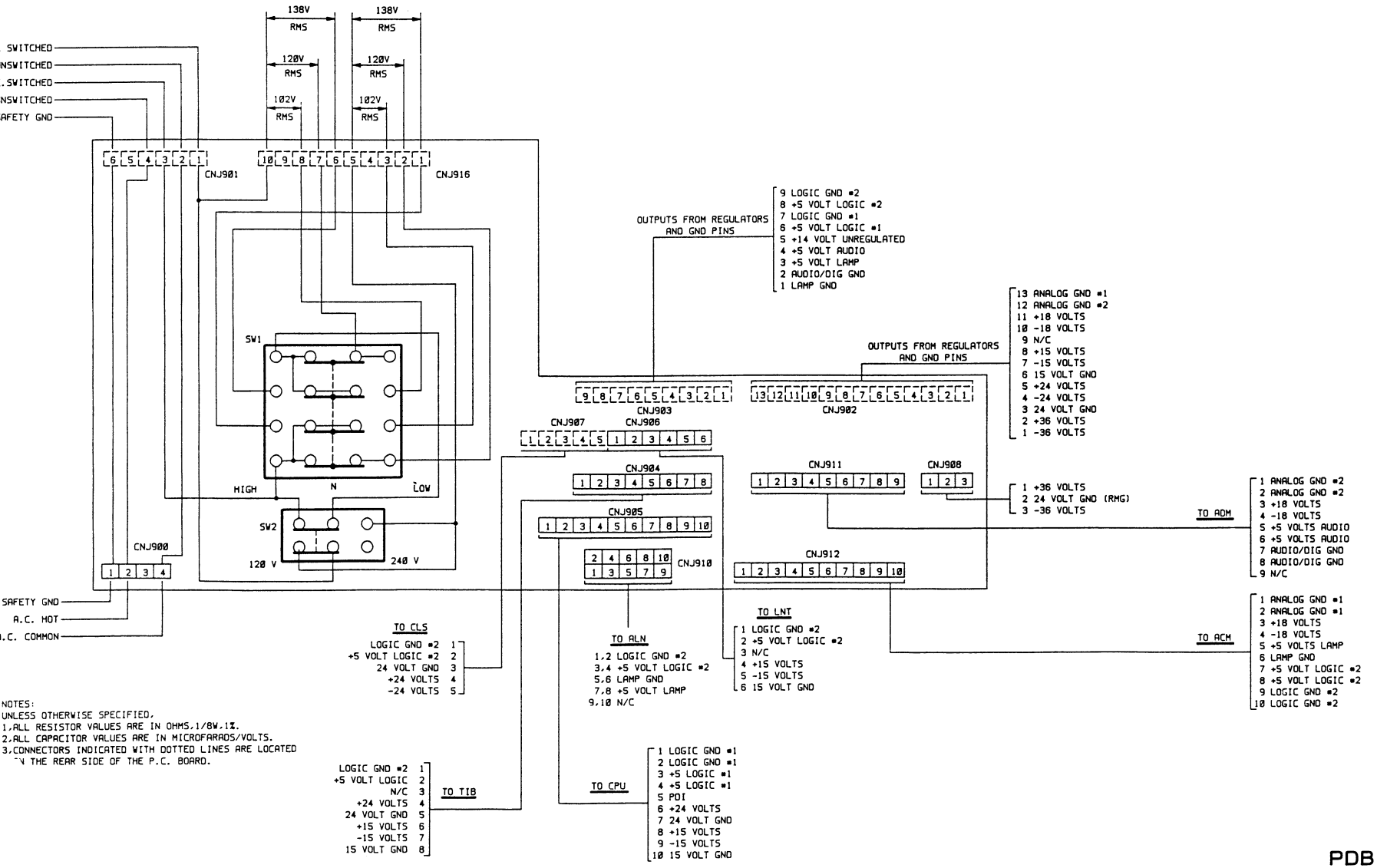
punchnoise — CHANNEL Ramp (bias + erase) symmetry

Ⓐ scope to pin 6A of extender 1V/div + 20 msec/div
✓ WAVEFORM ON + OFF (Punch in + out) symmetrical or Adjust RV4 (ERASE)

Ⓑ Scope to Pin 5A (BIAS) punch waveform adj RV5

switching noise input to play etc. — voltmeter to line out channel card on extender
Adjust trim (through hole in heatsink) hit shield/defeat dim / undim
Repeatedly / Adjust RV1 for min meter deflection





NOTES:
UNLESS OTHERWISE SPECIFIED,
1.ALL RESISTOR VALUES ARE IN OHMS,1/8W,1%.
2.ALL CAPACITOR VALUES ARE IN MICROFARADS/VOLTS.
3.CONNECTORS INDICATED WITH DOTTED LINES ARE LOCATED
ON THE REAR SIDE OF THE P.C. BOARD.

PDB BOARD
BOARD NO.1-619-171-11 & H
APR-5002/5003V

CNL BOARD

7528 Digital Attenuators tend to fail

7528 digital Attenuators tend to fail

Gap Comp

Repro HF lvl

Repro LF

NEW BOARDS

IN or OUT of LM Input cal

Rec LVL

Rec HF

GAP compensation RCF, RCB

old Boards

1/2 Repro OR Input level

1/2 bias

IC21 | Input affects input rec

IC17 | Record effect only REC

Control fu- level on meter

Meter buffer

safety switch

NAB IEC EQ

MUTING

Differential output

CNL BOARD
BOARD NO. 1-619-158-11 & HIGHER
APR-5002/5003V

Figure 7-10A. CNL Board Schematic Diagram