# 5K50 Alignment Procedure

## HEADS HEIGHT ADJUSTMENT & AZIMUTH ADJUSTMENT

1. Load the test tape and check the tape transport mechanism
   (A) At 'Play' position, check that tape is not curled by two tape guides fitted with Erase & Playback Heads.
   (B) Adjust heads' height to eliminate shift of tape to make tape horizontal by repetition of 'Play' and 'Stop' actions.
   (C) Provisionally adjust azimuth and tilt of Playback head to obtain the highest level of output of both 333Hz and 10KHz signal recorded in the tape.

2. Load the test tape, MTT-150(400Hz 200nW/m), and adjust Playback head to obtain the max. level of output, and at the same time, adjust to make waveforms of L & R channels in phase.

3. Load test tape MTT-114(10KHz -10dB), and check that the output level is at max., and the waveforms of L and R channels are in phase. Set the other side of the tape up, and adjust azimuth and tilt alternately so that both max. output level and waveforms in phase between L and R channels can be obtained.

4: After the above adjustment, check to get proper tape transport adjusted as a final step by the 1st test tape.

## P/B AMP DC BALANCE ADJ.

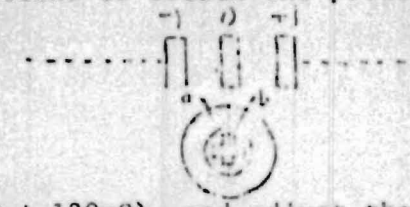
Connect either of the oscilloscope, DC VTVM and multimeter to the test points, B Tp1 C Tp2 for L ch., B Tp4 C Tp3 for R ch. on P/B AMP PC Board, and adjust the semifixed resistors, RT01a, RT01b to obtain drift within ±50mV from the centre of meterneedle. Remember that the final DC balance adjustment is required after all the above-mentioned adjustments.

## P/B EQ AMP LEVEL ADJ. (TAPE POSITION)

Load the test tape MTT-150(400Hz 200nW/m), and adjust the semifixed resistors, RT03a, RT03b on the P/B AMP PCB, to obtain 575mV at Dolby PC board terminal 8(7) for L ch. and 4(3) for R ch. respectively, while setting at 'Tape Monitor' position. Also check that the output level is at approximately 517mV while making the above adjustment.

## METER ADJ.

After PB level adjustment, adjust the semifixed resistors RT01a, RT01b on the SW PC board to obtain 0dB display at the bar-graph peak level meter: Turn RT01a, RT01b first to A position to obtain -1dB display, and then at the B position to obtain +1dB display, and finally turn both RT01a, RT01b in the midway between A and B positions to obtain the precise 0dB display.




## P/B EQ FREQUENCY ADJ.

Load the test tape, MTT-216(3180mS + 120mS), and adjust the semifixed resistors, RT02a, RT02b on the P/B AMP PC board to obtain frequency response in the range of 31.5Hz - 14KHz within ±3dB. Moreover, adjust the variable resistors to reach the deviation within 0 ~ +1dB at 10KHz, and within +1 ~ +2dB at 14KHz.

P/B DOLBY LEVEL ADJ.

Load the test tape, MTT-150(400Hz 200nW/m), and adjust RT01a, RT01b on the Dolby PC board to minimize the difference of the output levels within ±0.05dB between Dolby Sw-on and Sw-off. At the same time, check to obtain the output levels of 580mV at the check points a(L ch.), b(R ch.) respectively.

CUE REV

Load the test tape, MTT-150(400Hz 200nW/m), and confirm the output level is at around 580mV(-5dB ~ +3dB) with CUE or REVIEW mode.

'P/B MUTE' CHECK

Confirm that no hissing noise is generated from the LINE OUT when 'Play' is changed into 'Stop' mode.

'P/B HUM' CHECK

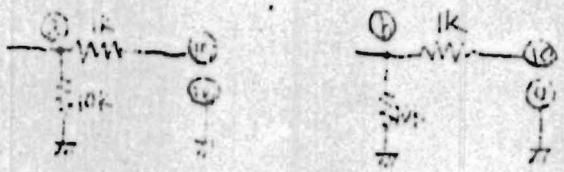
Load quality blank tape(unrecorded), and check hum level at the output filtered off by means of 'CCIR' rule and without this filter respectively with 'Play' mode.

LINE SOURCE MONITOR LEVEL(SOURCE POSITION)

Setting Monitor SW to Source position, apply to LINE INPUT signal source of 400Hz with output impedance of 600 ohms, and fix INPUT LEVEL by means of attenuator to obtain output of 577mV at terminal 22(21) for L ch., and 15(14) for R ch. on Dolby PC board respectively. Confirm that input level is at 100mV±20mV, and at the same time output level is at about 517mV, while bargraph's indicating 0dB. When the above adjustment is carried out, confirm that LINE VOL, OUTPUT VOL. are both at Max. positions, and the Dolby is switched-on. Also confirm that MIC VOL is at Min. position, and that the channel balance is within ±0.5dB.

REC DOLBY LEVEL ADJ.

Load tape under Rec mode, and adjust semifixed resistors RT02a, RT02b to obtain output level of 580mV ±0.2dB at check points, a(Lch), b(Rch) on the Dolby PC board by means of VTVM and/or oscilloscope, with the input level adjusted for the above-mentioned MONITOR LEVEL. Note that the Dolby switch has to be turned on.



MPX FILTER ADJ.

While constant input level with 19.00KHz is applied to the LINE INPUT, adjust to obtain min. level by turning the coils(red sides), LPFa, LPFb.

- Level should be more than -30dB at 400Hz
- Dolby Sw is set to MPX ON position

MIC MONITOR LEVEL(SOURCE POSITION)

Set Monitor Sw to Source position, and apply signal source of 400Hz with output impedance of 600 ohms to LINE INPUT. And adjust INPUT LEVEL by means of attenuator to obtain output level of 577mV at the check points of the terminals Nos. 22(21) for L ch., Nos. 15(14) for R ch. on the Dolby PC board. Set the input level at 0.25mV±0.05mV. In this case, MIC VOL, OUTPUT VOL are both at max. position, and LINE VOL is at min. position, while Dolby is switched-on. Also, the channel balance should be with ±1dB.

SOURCE MONITOR FREQUENCY

Check the following frequencies are obtained for L and R channels respectively;

LIN 10 - 50KHz ±3dB
MIC 30 - 20KHz ±3dB

- Capacitance of shielded cord used to hook up deck and measuring equipment, is within 100pF
- Output level is at 517mV

MIX LOSS

Confirm that output level fluctuates only between ±1dB, when MIC VOL is turned from one end to the other, applying signal source to LINE INPUT, and vice versa when LINE VOL is turned from one end to the other, applying signal source to MIC INPUT.

HEAD PHONE LEVEL

Confirm that when LINE OUTPUT LEVEL is at 517mV, headphone level is at 90mV±9mV under 8-ohm loads.

- Signal source is of 400Hz and Frequency responce ranges 20-30KHz±3dB.

BIAS ADJ.

Set BIAS Sw to Normal position, BIAS VOL to Centre position, and connect VTVM to the test points, HTP2, CTP1 for L ch., and HTP4, CTP3 for R ch. Be sure that other parts of VTVM than test leads are fully isolated from the deck under test, and that capacitance/inductance of test leads is sufficiently low. Then adjust semifixed resistors, RT01a, RT02b on BIAS PCB to obtain output level of 110mV. Also confirm that the Bias Frequency is 105KHz±3KHz.

REC LEVEL ADJ.

Adjust SOURCE LEVEL to obtain output levels of 577mV at No. 22, 15 terminals on the PCB(dolby), and load tapes mentioned hereunder under REC mode, while Dolby is switched-on, and set Monitor Sw to Tape position. Turn BIAS VOL. to obtain max. output, and then adjust the following semi-fixed resistors to obtain output level identical to that of Source.

| | TAPE | SEMIFIXED R. | FREQ. |
|---|---|---|---|
| Normal | AC221 | RT05a, RT05b | 400Hz |
| CR02 | SA511 | RT04a, RT04b | 400Hz |

REC EQ ADJ.

a) Peaking Frequency Adj.

By adding C09a, C09b between the pins AD1 and AD2 for L ch (in parallel with the one fitted originally), AD4 and AD3 for R ch respectively, adjust the peaking frequency to 20KHz.

1) Value of C09 is about 850pF, which varies depending on inductance of R cord lead. Remember that VTVM must be perfectly isolated from unit under test except for test leads.
2) Output level is at 52mV, 400Hz, and measuring points are HTP5, CTP6 for Lch and at HTP7, CTP8 for Rch.

b) Frequency Response Adj.

Using the following tapes, adjust to obtain 10KHz within (+1dB, -∞) with the output level of 52mV at 400Hz.

1) Both Peak bias at 400Hz and Azimuth adjustment at 10KHz are required wherever different tape is loaded.

2) Check that the azimuth and freq. response remain unchanged when tape is reversed into the other side.

| | TAPE | SEMIFIXED R. | FREQ. |
|---|---|---|---|
| Normal | AC221 | RT02a, RT02b | 25 - 20KHz |
| CR02 | SA511 | RT01a, RT01b | 25 - 20KHz |

BIAS TRAP ADJ.

Load tape under REC mode, and adjust BIAS TRAP only after adjustment of BIAS itself.

a) Adjust TRAP a, TRAP b on P/B AMP PC board to obtain min. level of BIAS leakage at the OUTPUT(better than 45dB).
b) Turn on Dolby, and adjust TRAP a, TRAP b on DOLBY PCB to obtain min. level of BIAS leakage at the output.

- In case the effect of BIAS TRAP adjustment can't be confirmed, disconnect BIAS TRAP circuit from P/B AMP, and adjust BIAS TRAP circuit alone. Then readjust BIAS TRAP after incorporating into the original circuit.

TEST TONE ADJ.

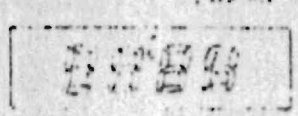
a) Set TEST TONE SW. to PEAK BIAS position - - - 400Hz
As adjustment, turn RT002 on the REC PC board to obtain display of bargraph up to -8 position, when 'peak bias' is obtained at recording/playback. Confirm that when peak bias is applied, PEAK BIAS lamp comes on and continues to light during variation of output level within -0.25dB as compared with its maximum level.
b) Set TEST TONE SW. to Azimuth position - - - 6KHz
As adjustment, turn RT001 on the REC PCB to obtain display of bargraph up to -8 position, while optimum 'azimuth' is procured at recording/playback.

- Tapes used: (normal) AC221, (CR02) SA511

c) REC CAL
Get Rec. mode. Set test tone to 400Hz, and MONITOR to "Source". Then adjust osc. level to obtain 577mV at the points, No. 22, 15 on the DOLBY PC board, while bargraph shows 0 position.
- Both LINE VOL and MIC VOL are turned to min. position, and Dolby is on.

COUNTER

a) When a regular tape is loaded:
1) Confirm that the segments are reset to "0000", and that LED dot lamp is turned off just after loading tape into compartment.



2) At whichever position the mode may be, i.e., PLAY, Rec, FF or CUE, confirm that the counter counts upward under decimal system.
3) At REW, REVIEW modes, confirm that the counter counts downward under decimal system.

4) In case Memory Sw. is on, confirm that Memory LED lamp comes on, and when changed to REW mode, confirm that deck will be automatically changed to STOP mode, when counter shows 9999-9997 after passing over 0000. However, confirm that mode is never changed to STOP while keeping depressing REW KEY.

5) Load a C60 tape, and operate FF mode from the beginning of take-up until AUTO STOP functions at the end of tape. Then confirm that the counter shows "0000"±10 when AUTO STOP is realized after rewinding of tape. Also check that the time required both for FF/REW for entire single side of C60 is 55±5 sec.

b) In case the Lux exclusive tape is loaded:

1) Confirm the LED dot is turned off just after the tape is put into the compartment. Next, confirm that the same lamp comes on at any mode of PLAY, FF, REW, CUE, REVIEW.

2) Connect DC synchroscope to the pin No. 40 on DISPLAY PC board, and confirm that the following neat, trim waveform exceeding 1V(peak to peak) can be obtained under PLAY mode. Take the same measurements under FF, REW modes, as well.

In case output is below 1V with trim waveform, add either of resistors, 470, 220, 120 ohms in parallel with R011(100 ohms) to obtain 1V peak to peak.

3) Under PLAY mode, confirm that the counter counts up in terms of minutes and seconds. Also, check that counting is made with an interval of one second.

4) Under FF, CUE modes, confirm that the counter counts up in terms of minutes and seconds.

5) Under REW, REVIEW modes, confirm that the counter counts down in terms of minutes and seconds.

6) When the MEMORY is switched on, confirm that mode is changed from REW to 'STOP' at display of 9959-9956 after passing over 0000. Confirm, however, that mode is never changed to STOP while REW KEY is kept depressed.

7) With MEMORY off, fast forward the C60 tape from the beginning of take-up. Then rewind it after AUTO STOP, and check that the counter shows 0010-9950 when AUTO STOP functions. Also check that the time required both for FF/REW for the entire single side of C60 is 55±5 sec.

PEAK BIAS

Set TEST TONE SW to BIAS & DOLBY CAL position, adjust EQSW according to the type of tape used. BIAS SW is at Normal position. Output terminals(pin jacks) are connected to VTVM/Oscilloscope.

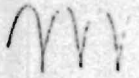
1) At REC MODE, set MON. SW to Tape position, and turn BIAS VOL. to check that PEAK BIAS LED lamp comes on when max. output is obtained.

2) Turn BIAS VOL clockwise, to obtain the output level lower by 0.25dB as compared to the peak point, and at this point adjust the semifixed resistor RT-001 to put off the LED lamp.

3) Turn back BIAS VOL counter-clockwise, and confirm that LED comes on again, and is turned off at the point where the output is lower by 0.25dB on another side.

CHECK POINTS

1) DISPLAY PCB - The deck is regarded as normal when the output of about 5V can be obtained at the pin No. 1 on IC033(4558) on the Display PCB. When REC MUT is in operation, the output varies between 0-5 volts.
2) Following all-wave rectifying waveform must be observed at the pin No. 1 on IC032(4558).



AZIMUTH

Set TEST TONE SW to AZIMUTH position, under REC mode. VTVM and oscilloscope should be connected to output terminals (Pin Jacks).

1) Monitoring VTVM/Oscilloscope, check that AZIMUTH LED lamps(2 pcs.) come on when the waveforms of L ch & R ch are in phase.
2) When out of phase, turn the screw for Azimuth Adjustment in the head housing, and confirm that by rotation in the direction of the unlighted lamp, this lamp comes on.

TIMER SW.

1) Load a tape, and set TIMER SW to REC position. Check that the REC mode is obtained in about 2 seconds after the power is switched on. Also check that the TIMER REC LED lights up.
2) Set TIMER SW to PLAY position, check that the deck is put into the PLAY mode when power is turned on.

PEAK HOLD SW

When the Peak Hold Switch is turned on, check that the display dot exceeding -6dB is kept held in the bar-graph. In case of the meter employing Microprocessor(available later), in about 2-3 seconds after the PEAK SW is on, PEAK HOLDING will be automatically cleared.

GENERAL OPERATION CHECK

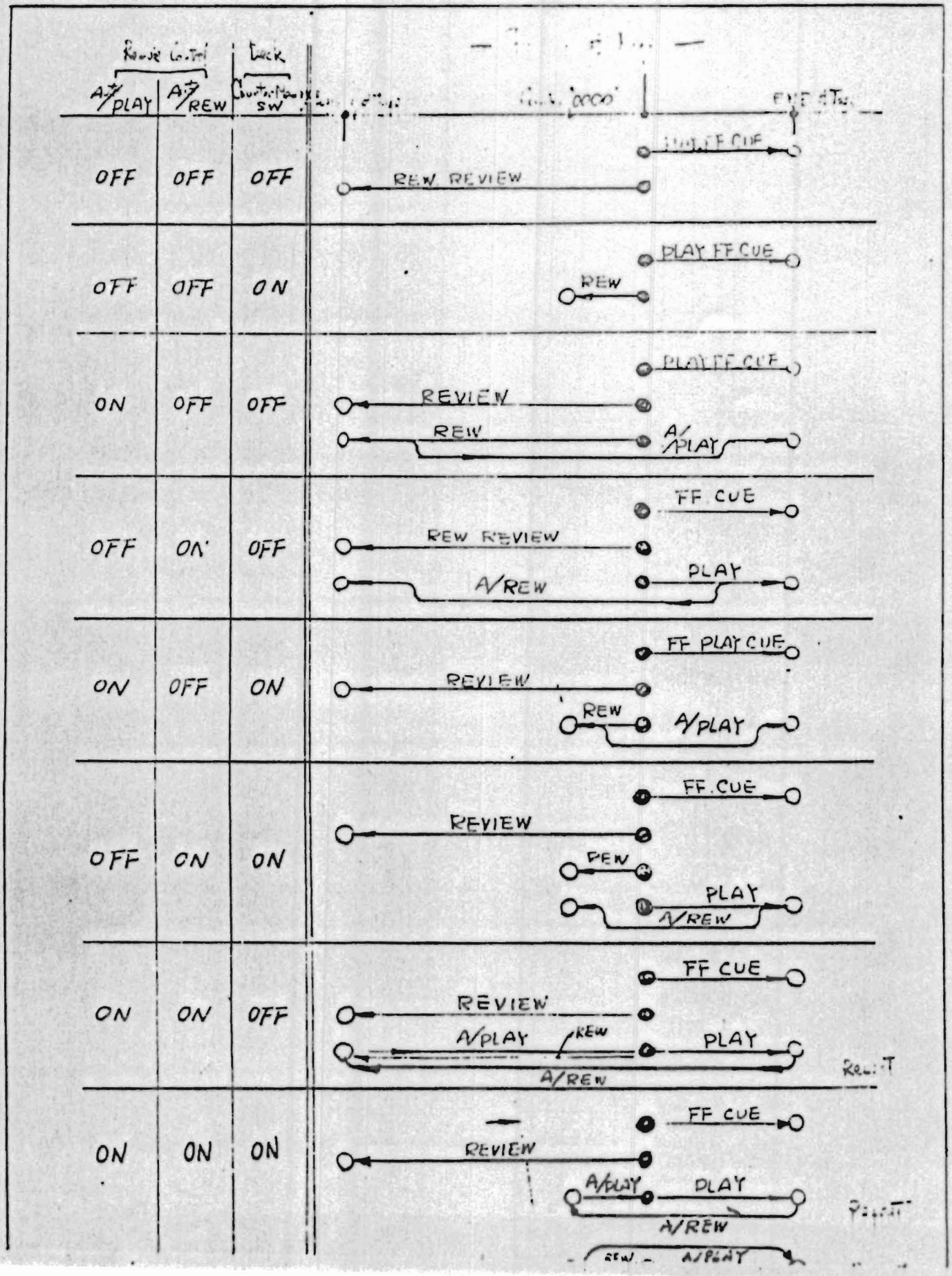
1) POWER SW ON
   a) In case of no tape in the compartment, solenoid and motors don't work at all, and POWER MUTE relay is actuated after 3-4 seconds.
   b) In case of tape in compartment, it is taken up for about 2 seconds in order to get rid of slack of tape within tape transport mechanism.
   c) In case the Timer is switched on, the PLAY or REC mode functions after momentary stop for about 0.3 seconds subsequent to the above-mentioned take-up of tape.
   d) No operation can be made during take-up of tape for about 2 seconds just after switched-on.

2) EJECT OPERATION
   a) When a tape is loaded in compartment, it is wound for about 2 seconds.
   b) When the Lux exclusive tape is loaded, LED dot lamp comes on momentarily. Then it re-lights as operation commences, and continues to light until the lid is ejected.

c) When a regular tape is loaded, LED dot lamp comes on momentarily only, and doesn't re-light.
d) No operation can be made during winding a tape for about 2 seconds just after switched-on.

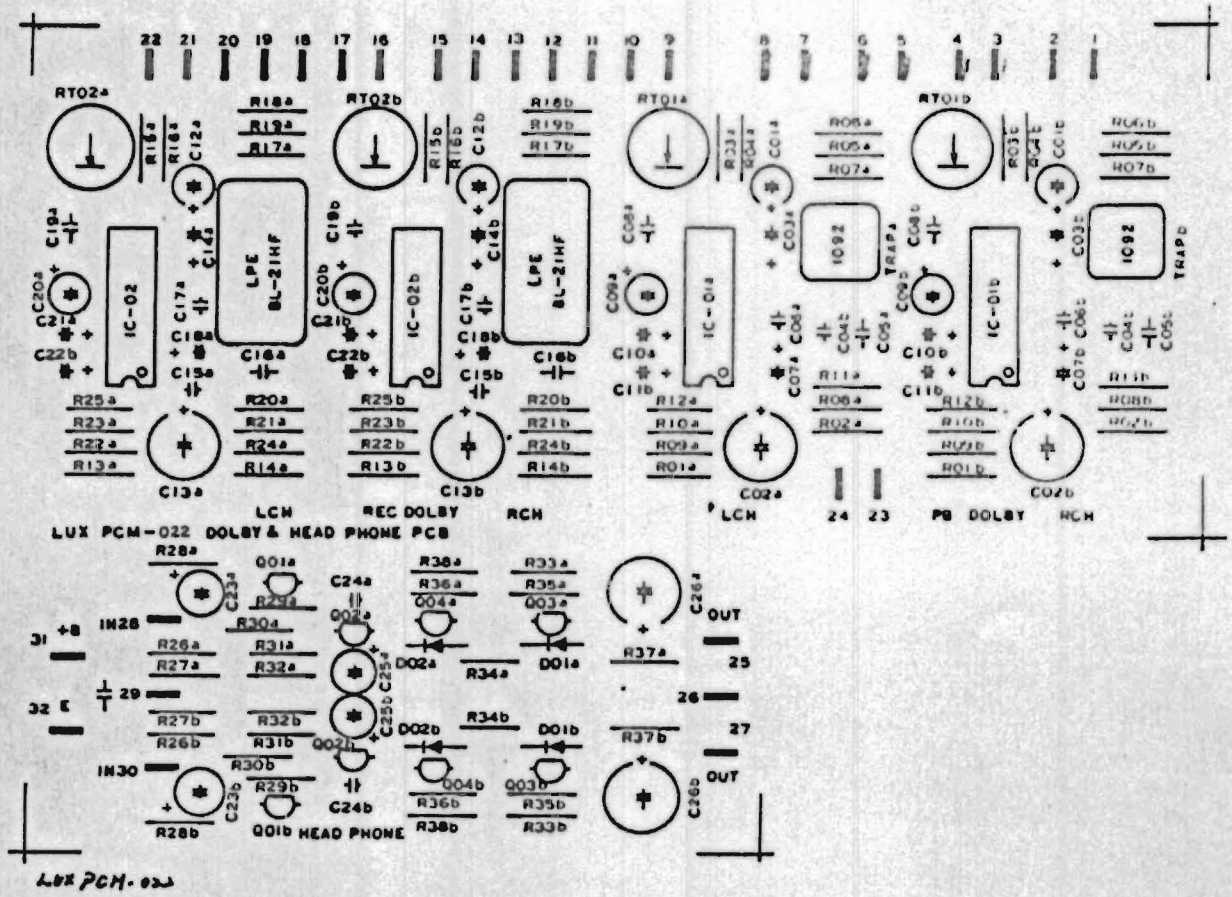
3) KEY OPERATION
a) PLAY, FF, REW, REC/PLAY modes can be operated after momentary STOP (0.3 seconds).
b) PAUSE is effective for STOP, PLAY, REC/PLAY modes.
c) SEARCH is effective only for PLAY mode. When it is turned on and off, the deck is returned into PLAY after temporary stop at PAUSE (0.5 sec.). If CUE and REV are repeated, within an interval o.5 sec., the deck is kept at temporary STOP.

4) AUTO STOP & REMOTE CONTROL REPEAT OPERATION BY REMOTE CONTROL
a) In case of AUTO/PLAY-OFF and AUTO/REW-OFF, or when REMOTE CONTROL is not connected, AUTO STOP functions in 2-3 seconds after the tape comes to the end.
b) In case the REMOTE CONTROL is connected to the deck, refer to the attached sheet for detailed operations.

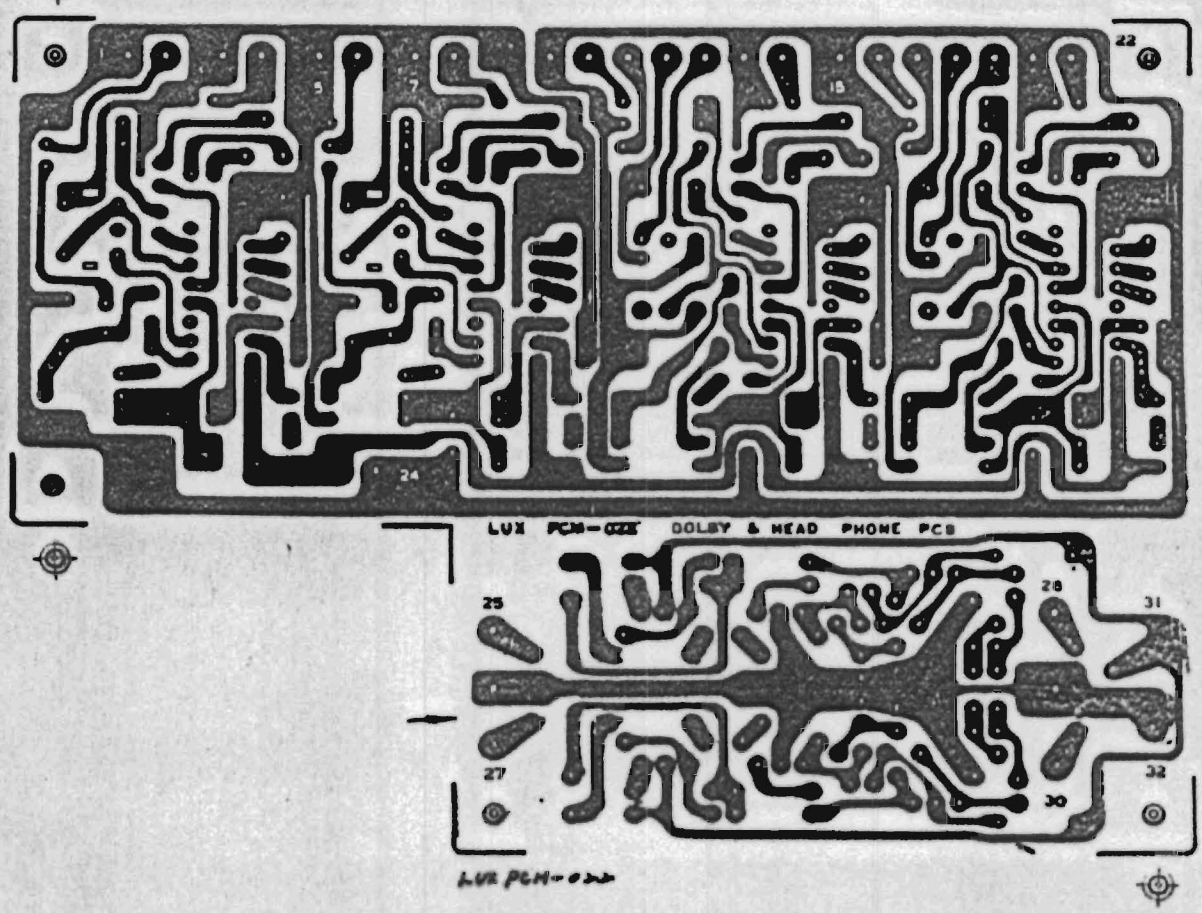

Review Control
Lock
A/PLAY
A/REW
Counter Interlock SW
OFF OFF OFF
REW REVIEW
FF CUE
OFF OFF ON
REW
PLAY FF CUE
ON OFF OFF
REVIEW
REW
A/PLAY
PLAY FF CUE
OFF ON OFF
REW REVIEW
A/REW
FF CUE
PLAY
ON OFF ON
REVIEW
REW
A/PLAY
FF PLAY CUE
OFF ON ON
REVIEW
REW
PLAY
A/REW
FF CUE
ON ON OFF
REVIEW
A/PLAY
REW
PLAY
A/REW
FF CUE
ON ON ON
REVIEW
A/PLAY
PLAY
A/REW
REW - A/PLAY
FF CUE

LUX PCM-009
PB AMP PCB
UL NO

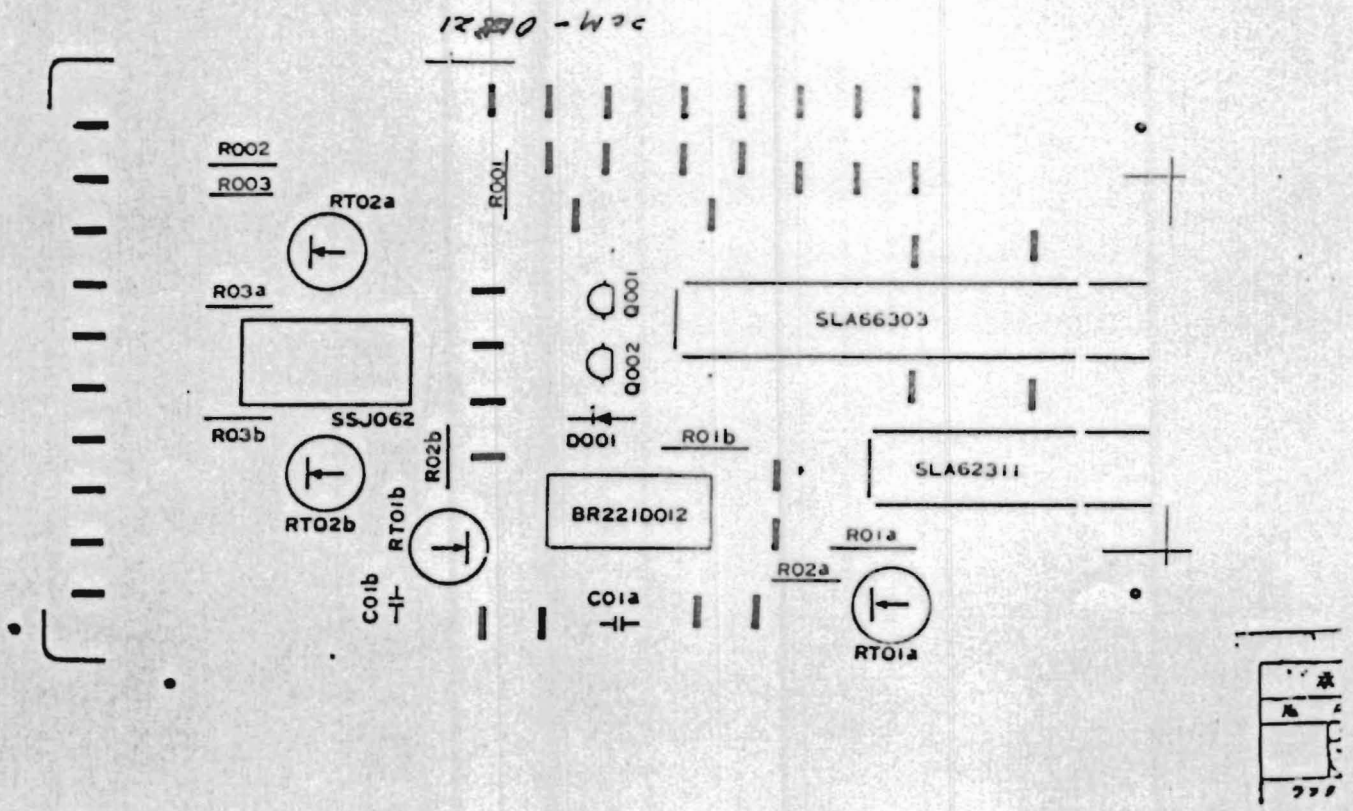

RCh
LCh
LUX PCM-009
PBAMP PCB




LUX PCM-022




LUX PCM-022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RT02a
R001
R03a
Q001
Q002
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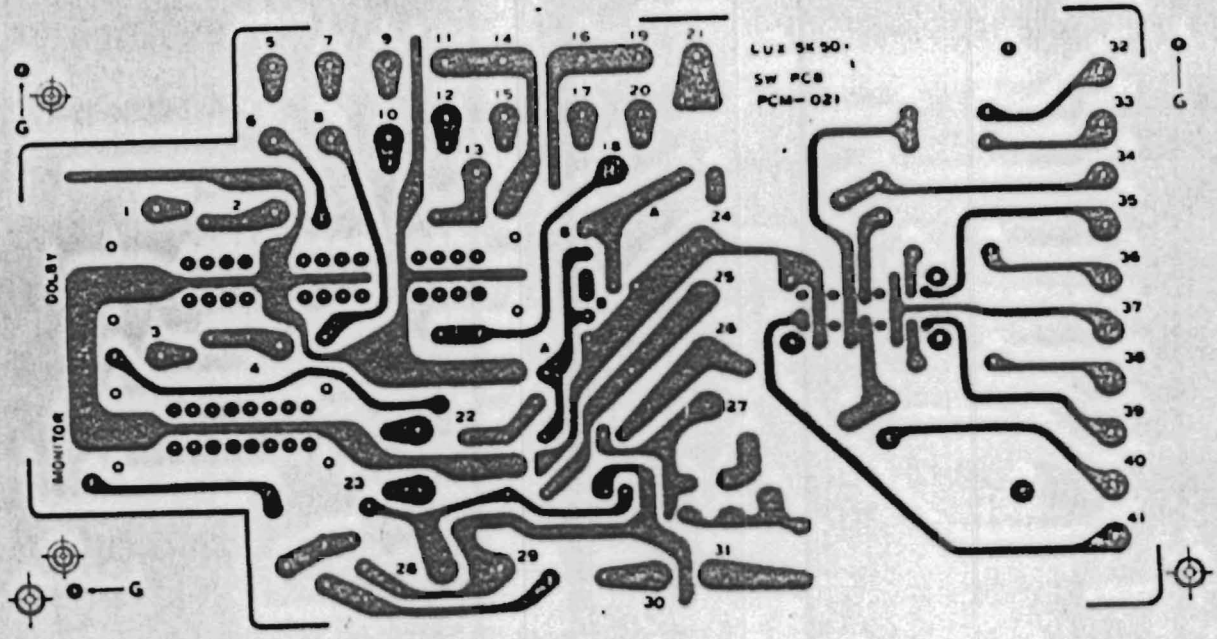
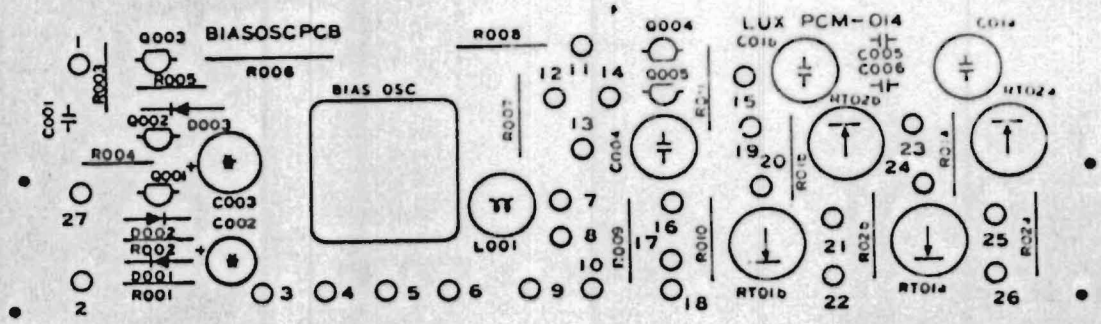
RT01a


LUX SX50
SW PCB
PCM-021
DOLBY
MONITOR
G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LUX PCM-014
BIAS OSC
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Q004
Q005
R005
R006
R008
C001
C002
C003
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C006
C016
D001
D002
D003
R001
R002
R004
L001
RT01b
RT01d
RT02b
RT02d
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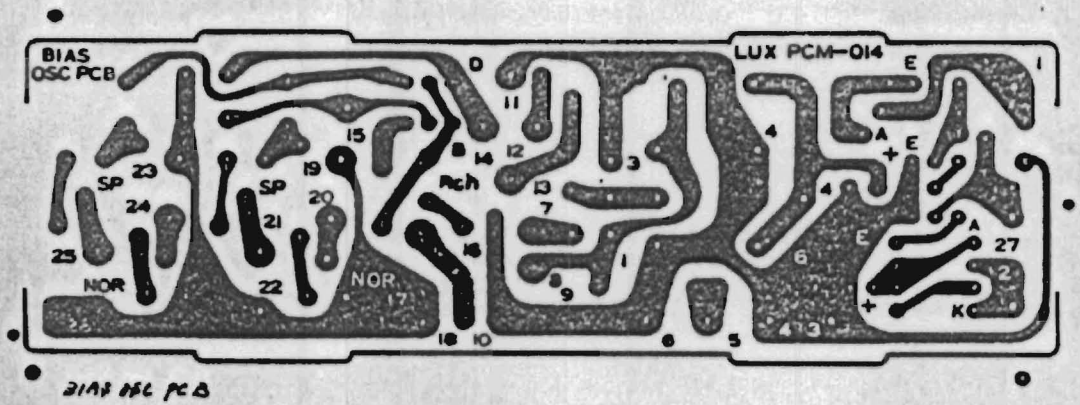
BIAS
OSC PCB
LUX PCM-014
SP
NOR
Pch
A
K
E
B
C

BIAS OSC PCB

C004
C006
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R021
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D010
R016
C010
R020
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D006
RT001
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R013
R012
R011
R010
R014
C003
Q007
Q003
C002
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R009
Q006
Q005
R007
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BR221 D012
TEST TONE
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Q003
R002
D002
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R037b
R040b
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C012b
C013b
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RT03b
C03b
R06b
C001
R004
R003
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SR2V 04N
TESTTONE
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R040a
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C013a
C014a
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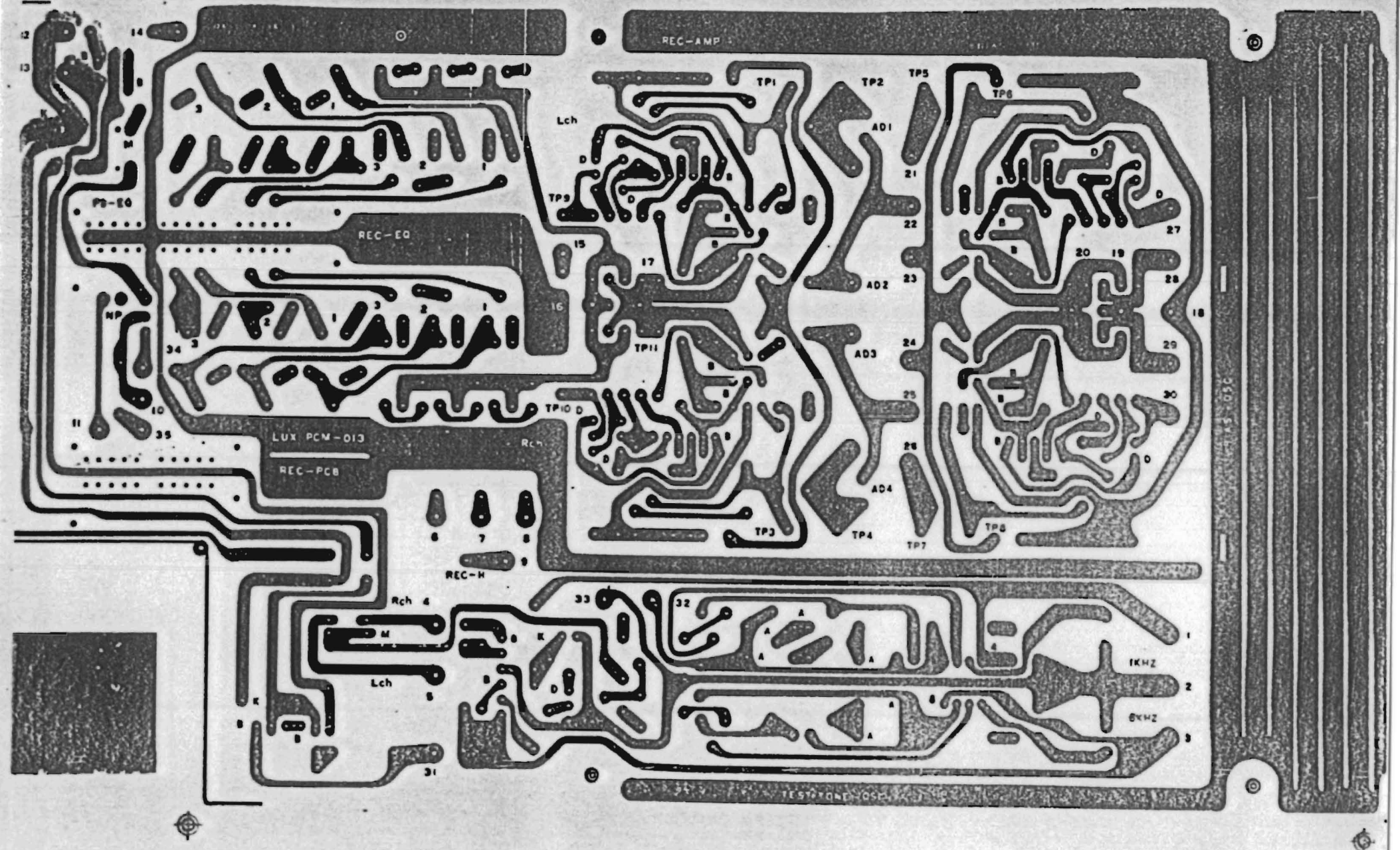
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REC-EQ
LUX PCM-013
REC-PCB
REC-H
Lch
Rch
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TP2
TP3
TP4
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TP8
TP9
TP10
TP11
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AD2
AD3
AD4
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6KHZ
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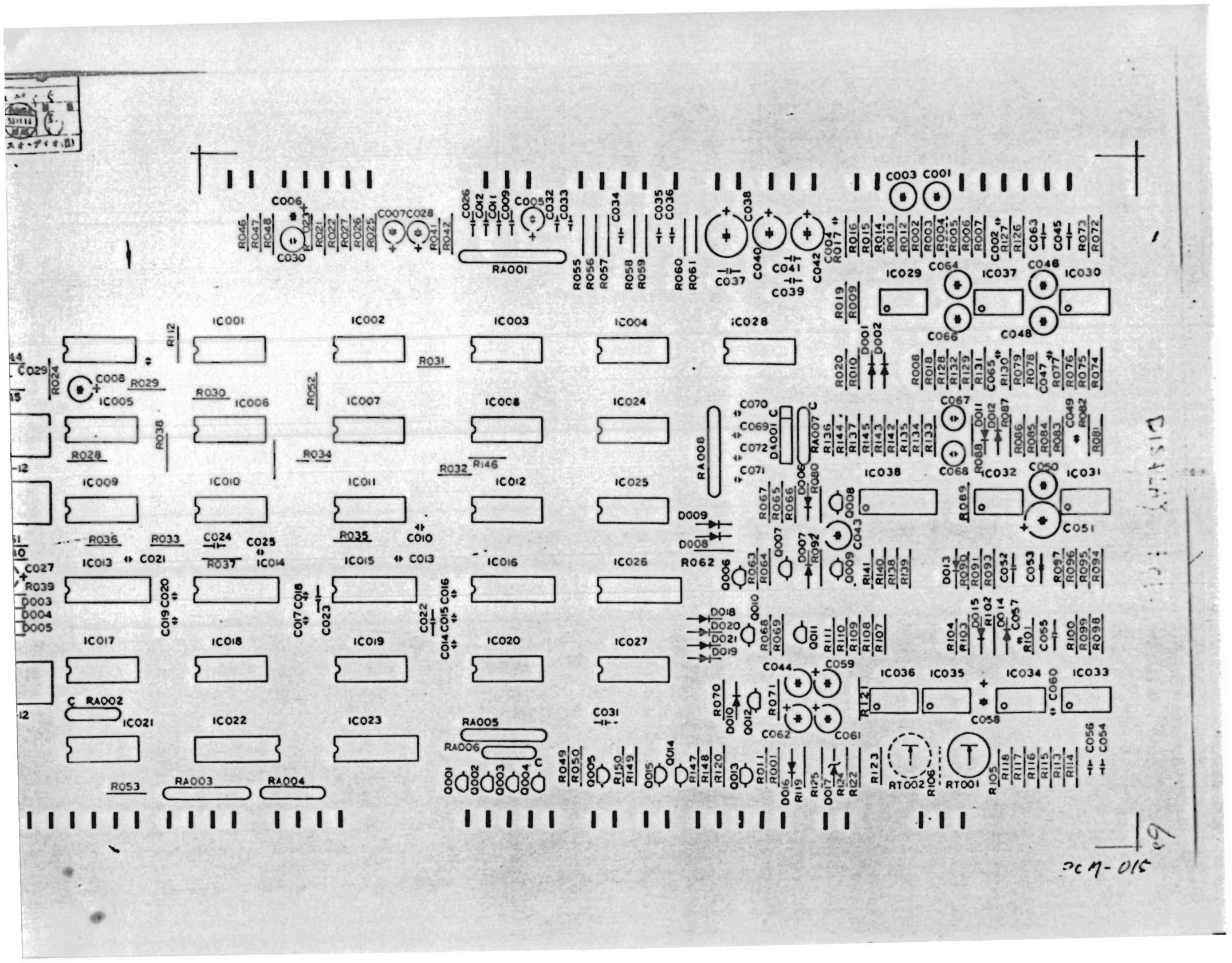
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RA001
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C008
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R029
R030
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IC007
IC008
IC024
R028
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R032
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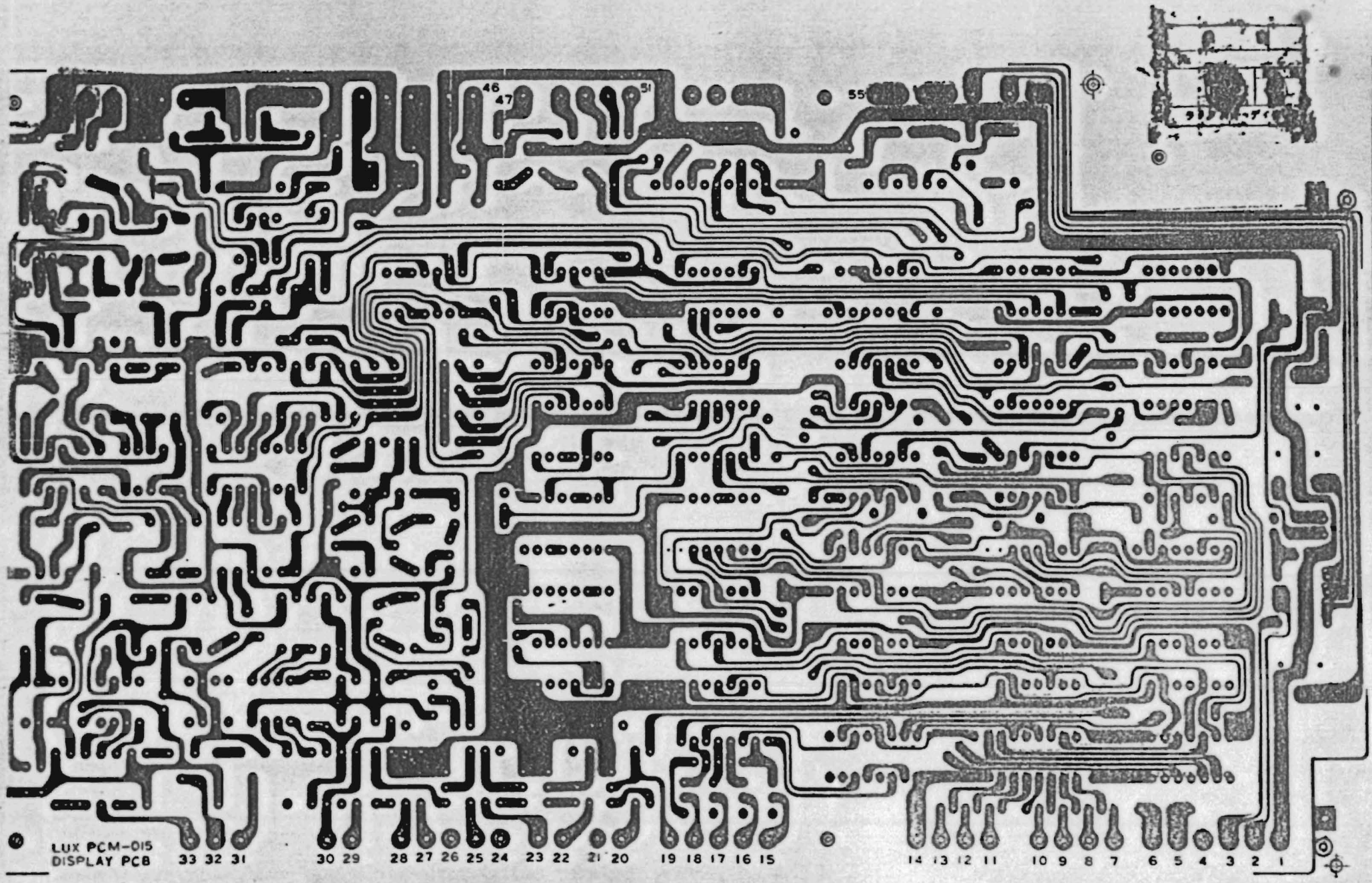
C072
C071
D4001 C
RA007 C
RA008
C067
C068
IC032
C050
IC031
IC038
C051
IC009
IC010
IC011
IC012
IC025
R036
R033
C024
C025
R035
C010
D009
D008
R062
C043
IC013
C021
R037
IC014
IC015
C013
IC016
IC026
C027
R039
D003
D004
D005
C019 C020
C017 C018
C023
C022
C014 C015 C016
D018
D020
D021
D019
IC017
IC018
IC019
IC020
IC027
C044
C059
C062
C061
IC036
IC035
IC034
IC033
C060
C058
RA002
IC021
IC022
IC023
C031
RA005
RA006
C056
C054
R053
RA003
RA004
Q001 Q002 Q003 Q004
Q005
Q014
Q015
Q013
D016
D017
RT002
RT001
R123
R106
R105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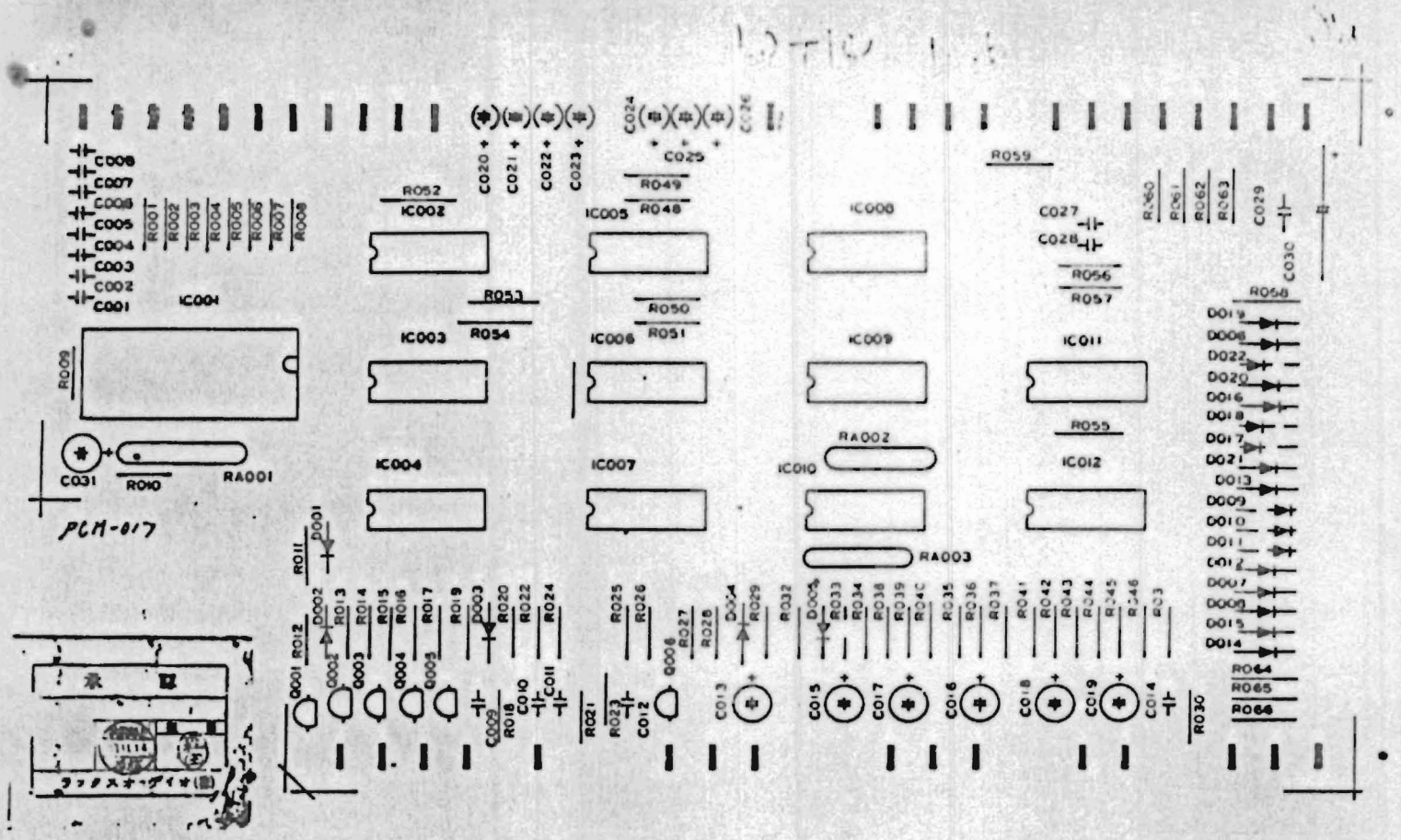
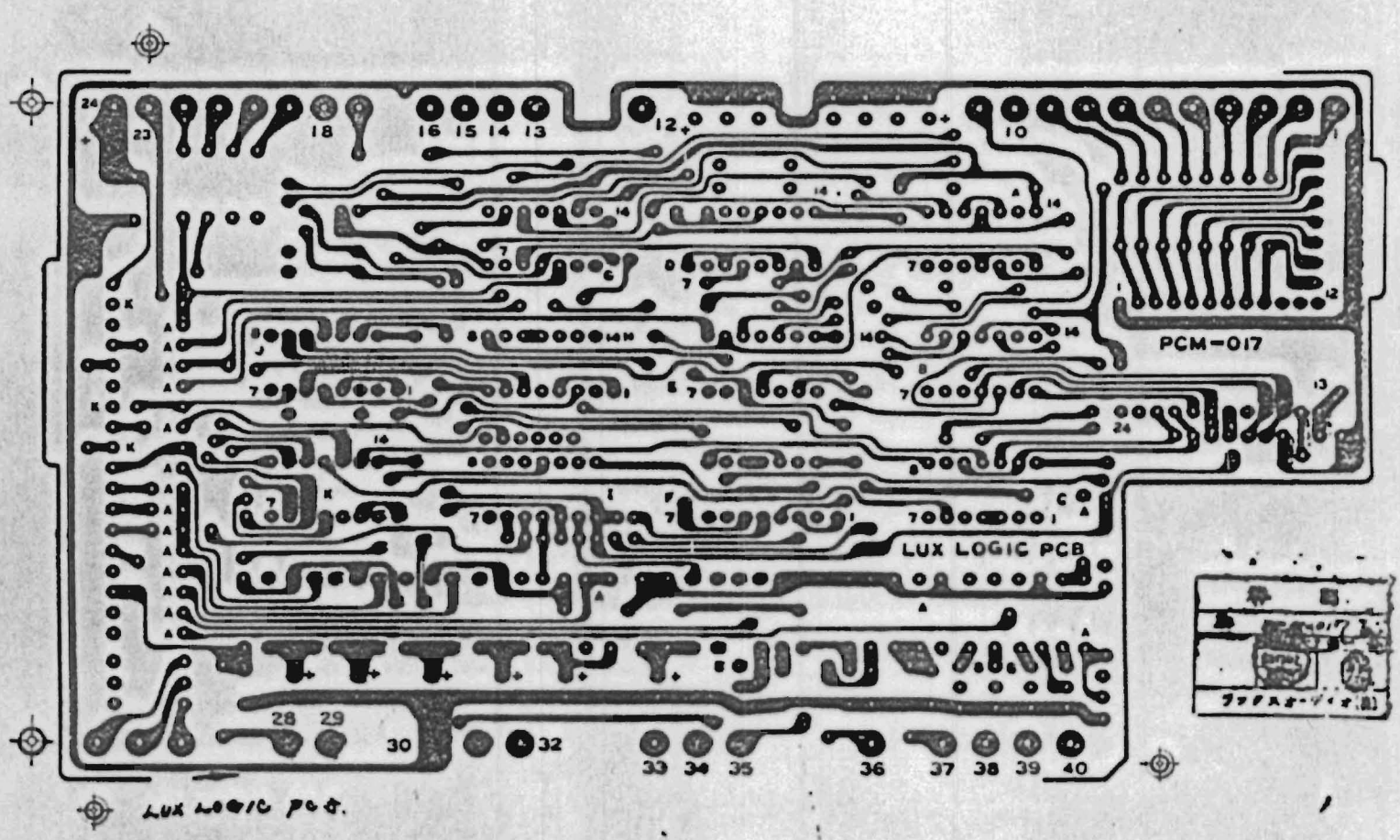
47
31
55
LUX PCM-015
DISPLAY PCB
33 32 31
30 29
28 27 26 25 24
23 22
21 20
19 18 17 16 15
14 13 12 11
10 9 8 7
6 5 4 3 2 1

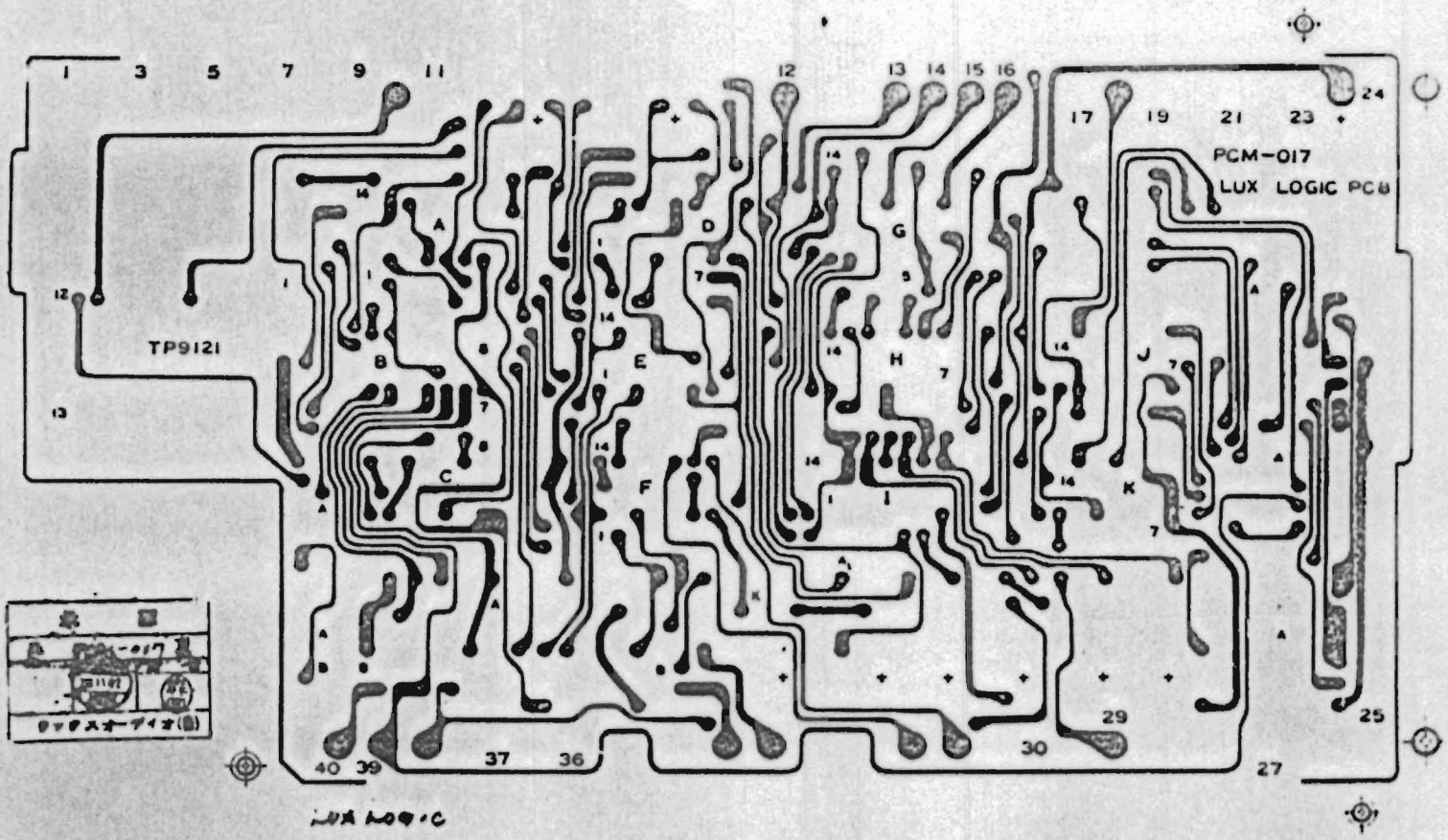
LINE AMP-R
MIC AMP-R
LINE AMPL
MIC AMP-L
LUX PCM-008
IN PUT PCB

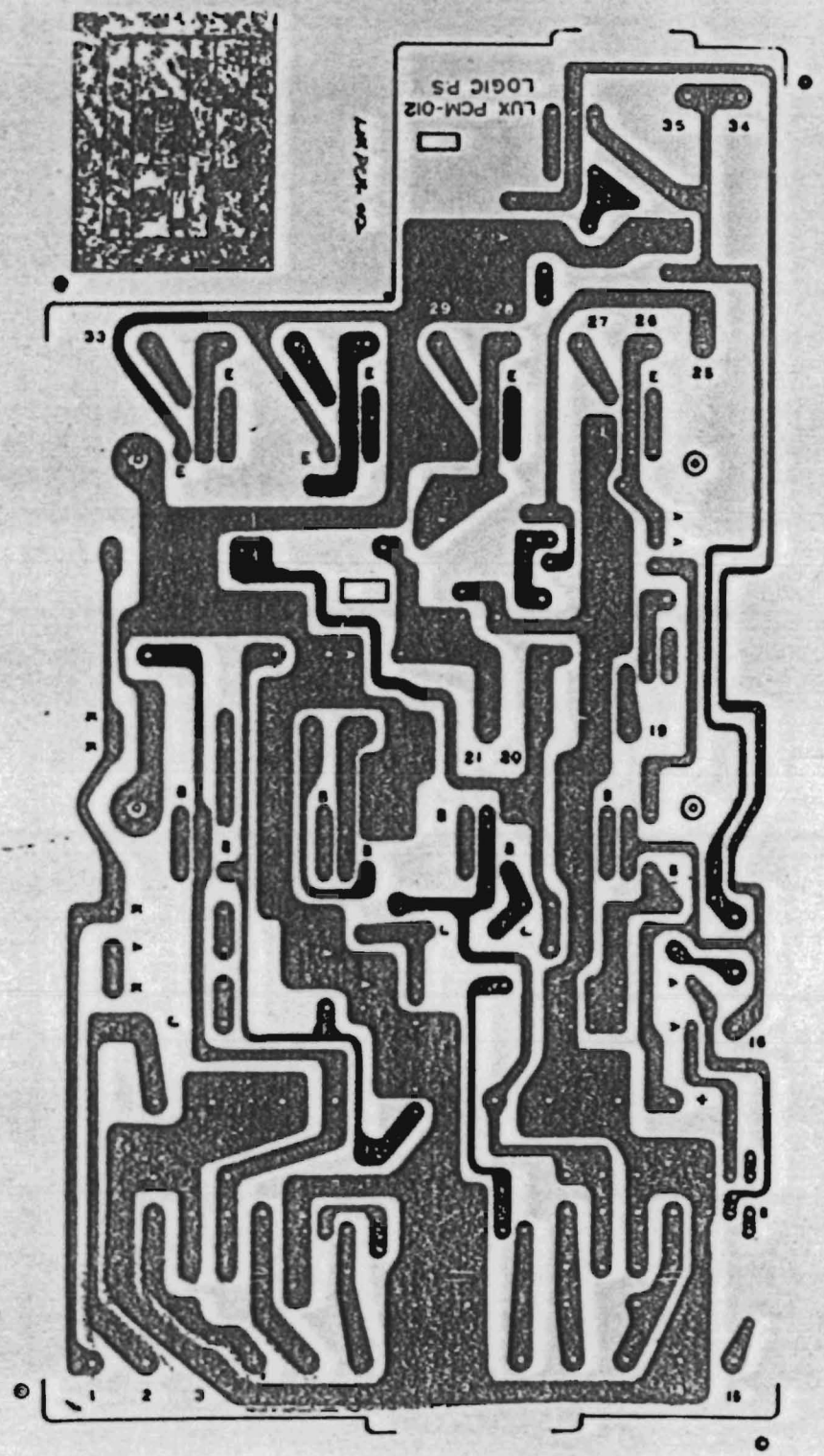
LUX PCM-008

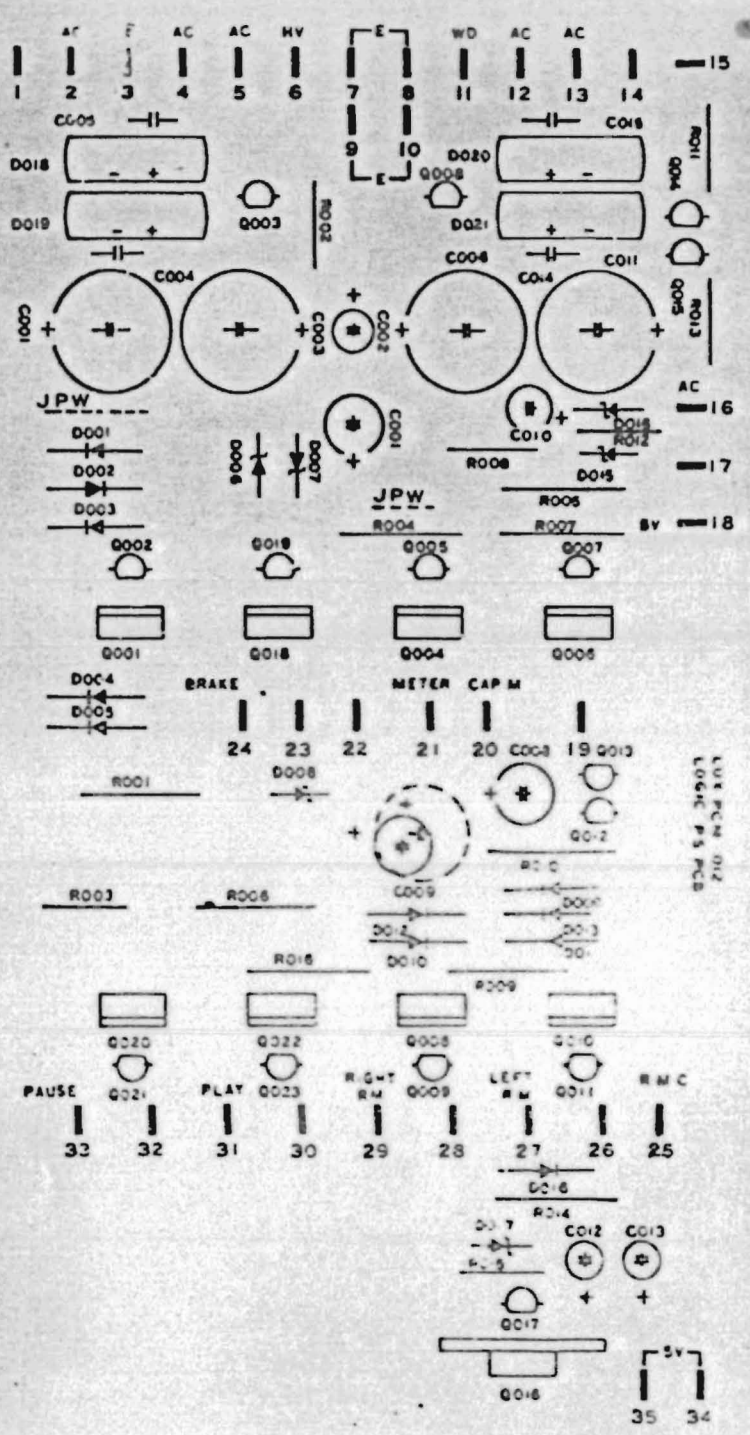

LUX PCM-008
INPUT PCB

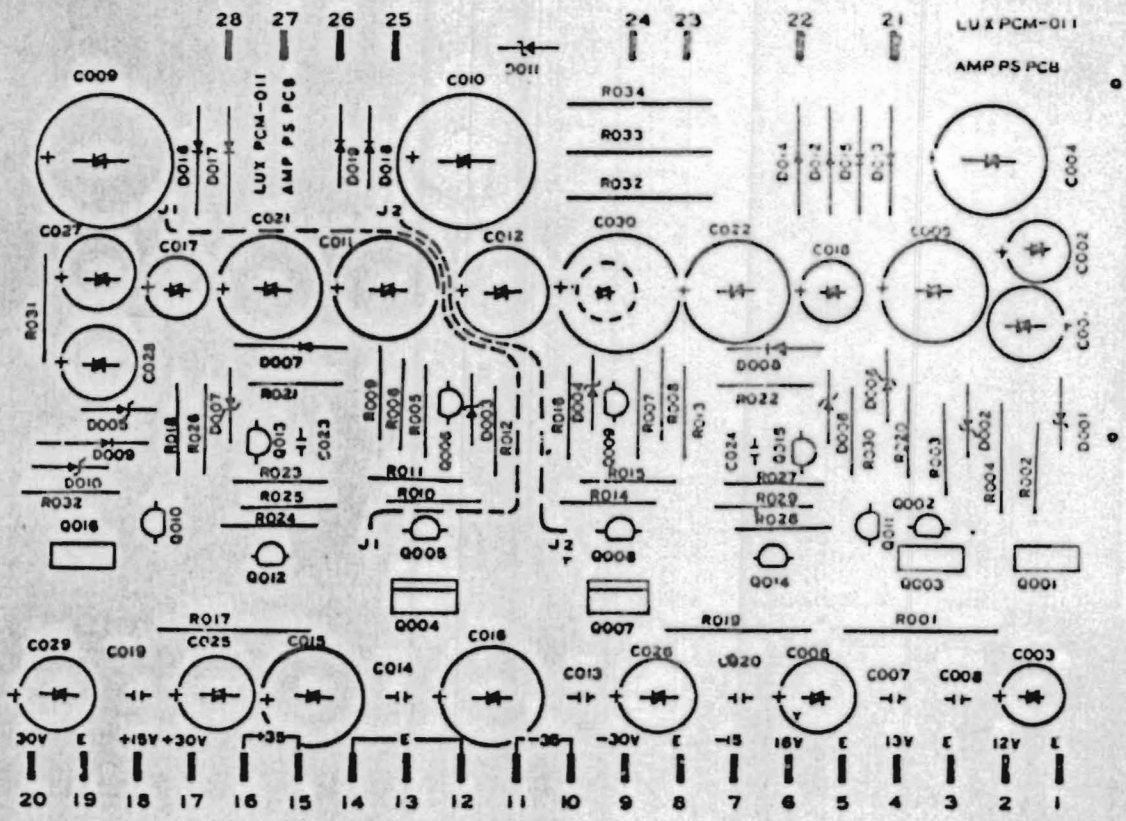

PCM-017


PCM-017
LUX LOGIC PCB
LUX LOGIC PCB.

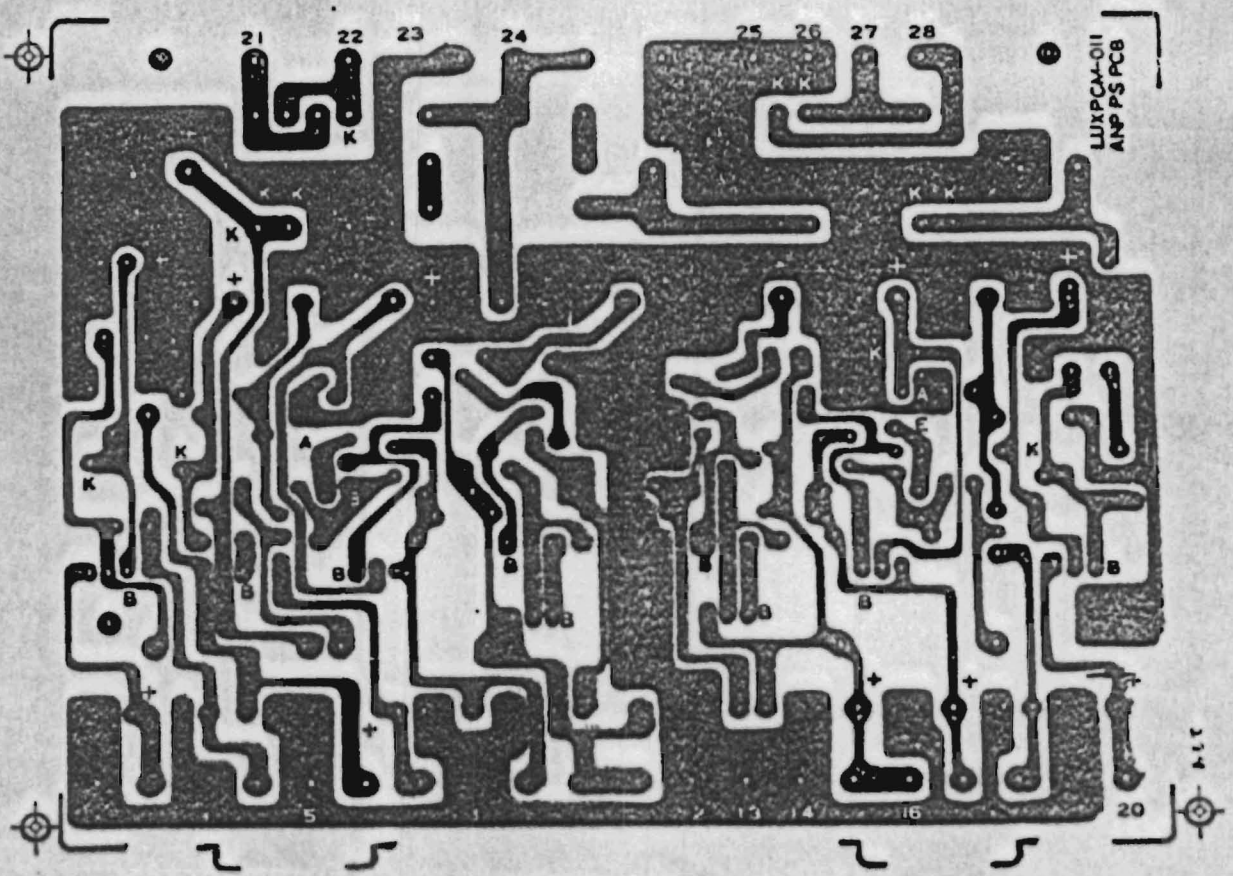

PCM-017
LUX LOGIC PCB
TP9121


LUX PCM-012
LOGIC PS


AC
AC
AC
HV
WD
AC
AC
JPW
JPW
BRAKE
METER
CAP M
PAUSE
PLAY
RIGHT RM
LEFT RM
RMC
8V
5V
LUX PCM 012 LOGIC PS PCB


LUX PCM-011
AMP PS PCB
28 27 26 25 24 23 22 21
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
30V +18V +30V +35 -35 -30V -15 18V 13V 12V
C009 C010 C027 C021 C017 C011 C012 C030 C022 C018 C029 C019 C025 C015 C014 C016 C013 C020 C006 C007 C008 C003 C004 C002 C001
R034 R033 R032 R031 R017 R019 R001
D011 D007 D008 D005 D009 D010 D006 D004 D003 D002 D001
Q016 Q010 Q012 Q005 Q004 Q008 Q007 Q014 Q011 Q003 Q001
J1 J2

B


LUX PCM-011
AMP PS PCB
21 22 23 24 25 26 27 28
5 13 14 16 20