

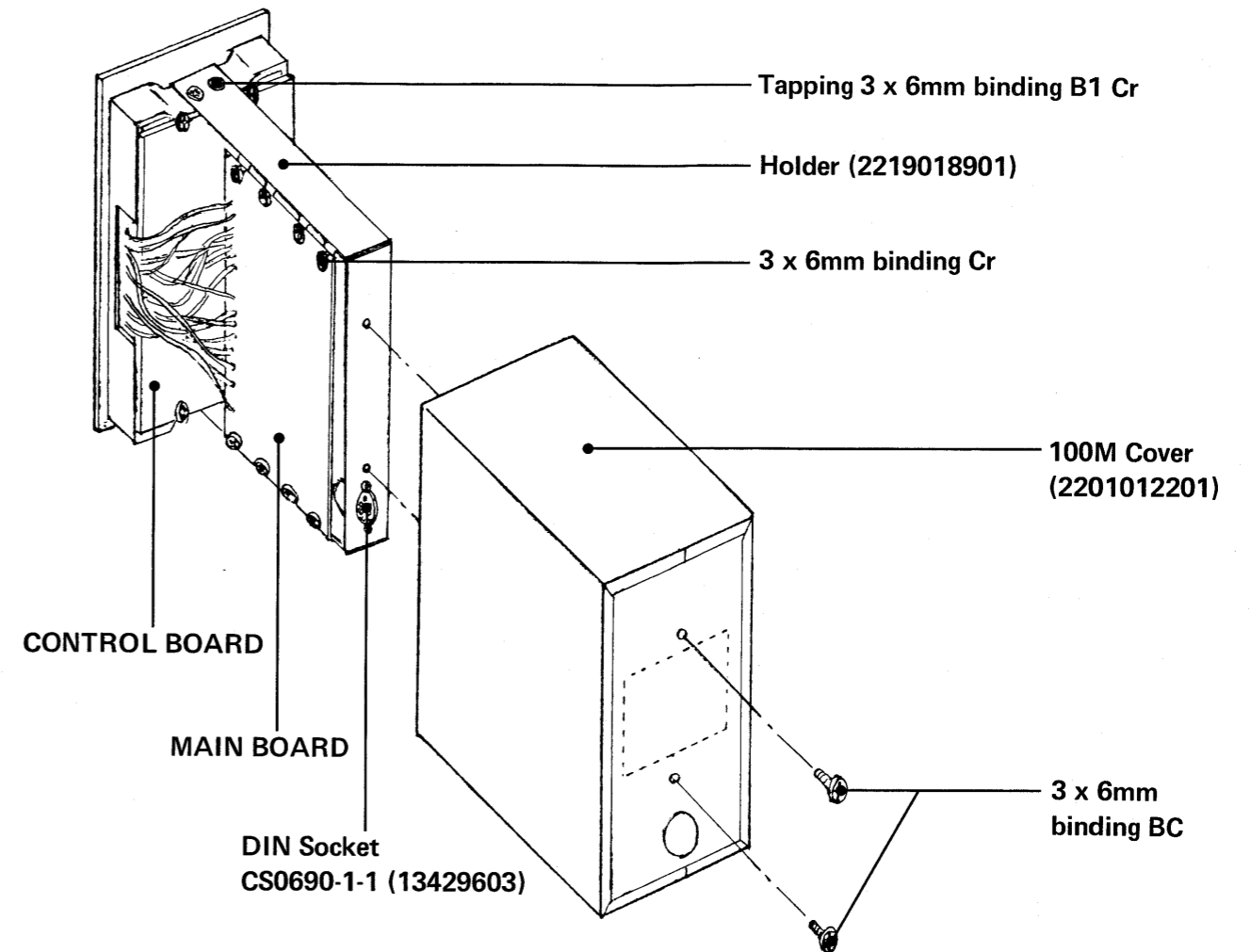
SYSTEM-100M 165/173/174

SERVICE NOTES *First Edition*

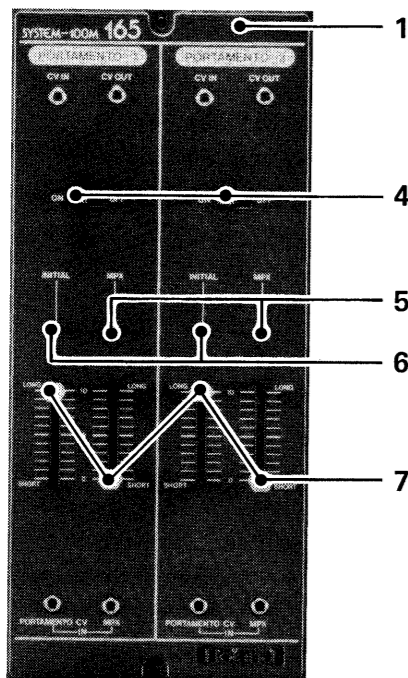
SPECIFICATIONS

	165	173	174
	Portamento Time: 2 msec to 5 sec	SIGNAL GATE Frequency Response: DC to 20kHz S/N Ratio: better than 100dBm (IHF-A)	Gain: unity S/N Ratio: better than 90dBm (IHF-A)
Input	CV IN, PORTAMENTO CV IN ... 10V max Imp: more than 50kΩ MPX IN ... ON: 3.5-12V OFF: 0V	┐ GATE IN ... more than 3.5V Imp: more than 50kΩ ┘ GATE IN ... less than 3.5V Imp: more than 50kΩ SIGNAL IN ... 10Vp-p max Imp: more than 50kΩ	IN ... 12Vp-p max Imp: more than 100kΩ
Output	CV OUT ... 10V max Imp: more than 1kΩ	SIGNAL OUT ... 10Vp-p max Imp: less than 1kΩ	OUT 1, OUT 2 ... Imp: less than 1kΩ
Power Requirement	+15V @ 55mA -15V @ 40mA	+15V @ 40mA -15V @ 20mA	+15V @ 50mA -15V @ 50mA -23V @ 15mA (LED)
Dimensions	104(W) x 230(H) x 199(D) mm, 4-1/16(W) x 9-1/16(H) x 7-13/16(D) in		
Weight	1.2kg, 2 lb. 10 oz.	1.15kg, 2 lb. 9 oz.	1.2kg, 2 lb. 10 oz.

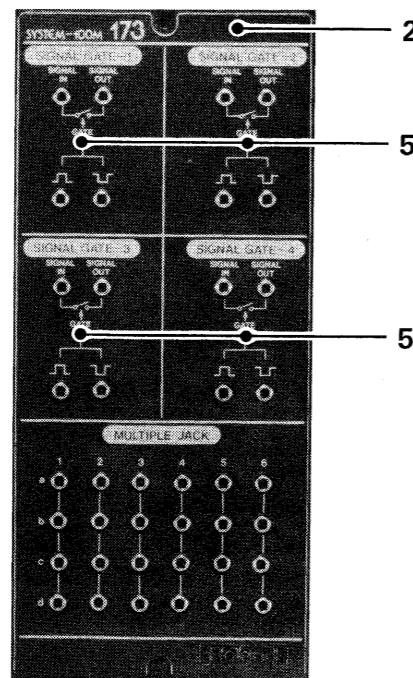
COMMON PARTS



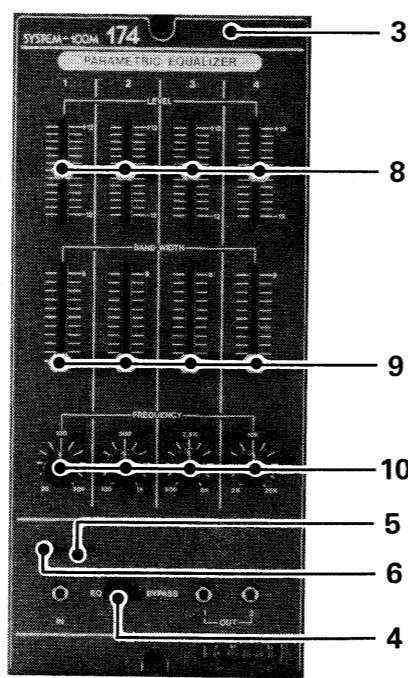
165



173



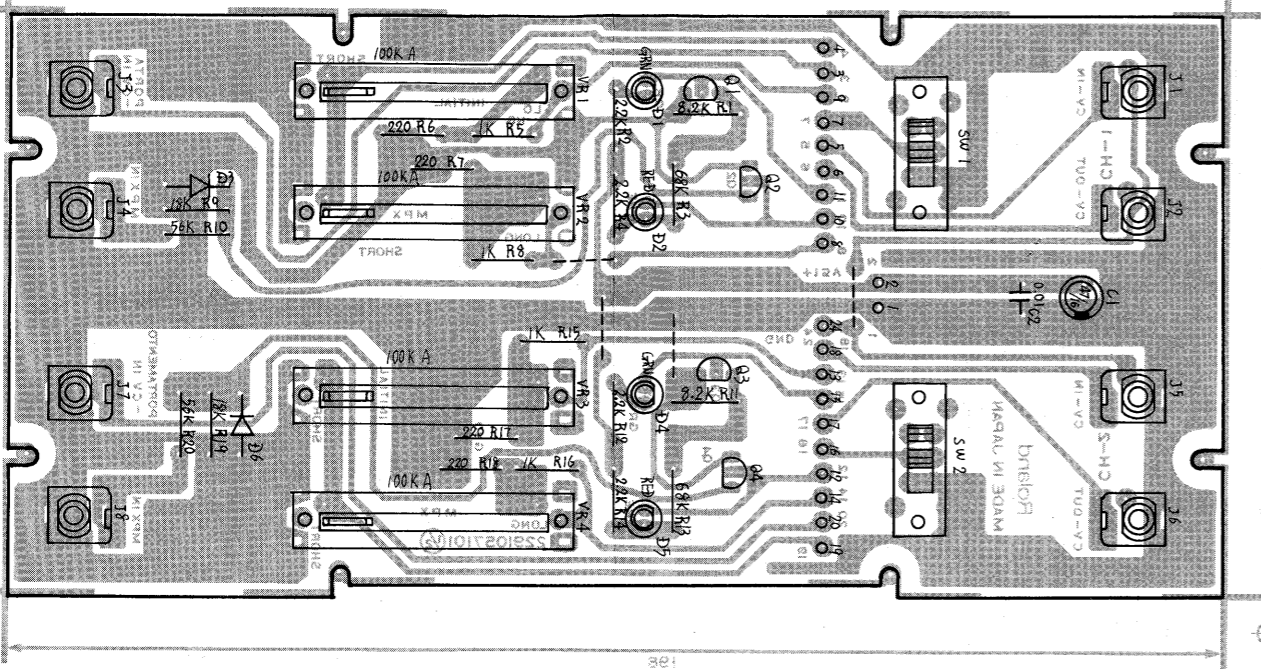
174



No	Part Name	Part Number
1	M-165 Front Panel	(2221030800)
2	M-173 Front Panel	(2221030900)
3	M-174 Front Panel	(2221031000)
4	Slide Switch SSB-02242	(13159103)
5	LED (red) GL-3AR-2	(15029109)
6	LED (green) GL-3PG-2	(15029112)
7	Slide Pot EVA-TOA-C15A15 100kA	(13339401)
8	Slide Pot EVA-T5K-C15B15 100kB	(13339862)
9	Slide Pot EVA-TOA-C15B15 100kB	(13339402)
10	Rotary Pot EWK-77A320-15D 100kRD	(13219780)
All Jacks SJ-409-1-2 (13449402)		
All Slide Knobs (2247012900)		
All Rotary Knobs (2247012700)		

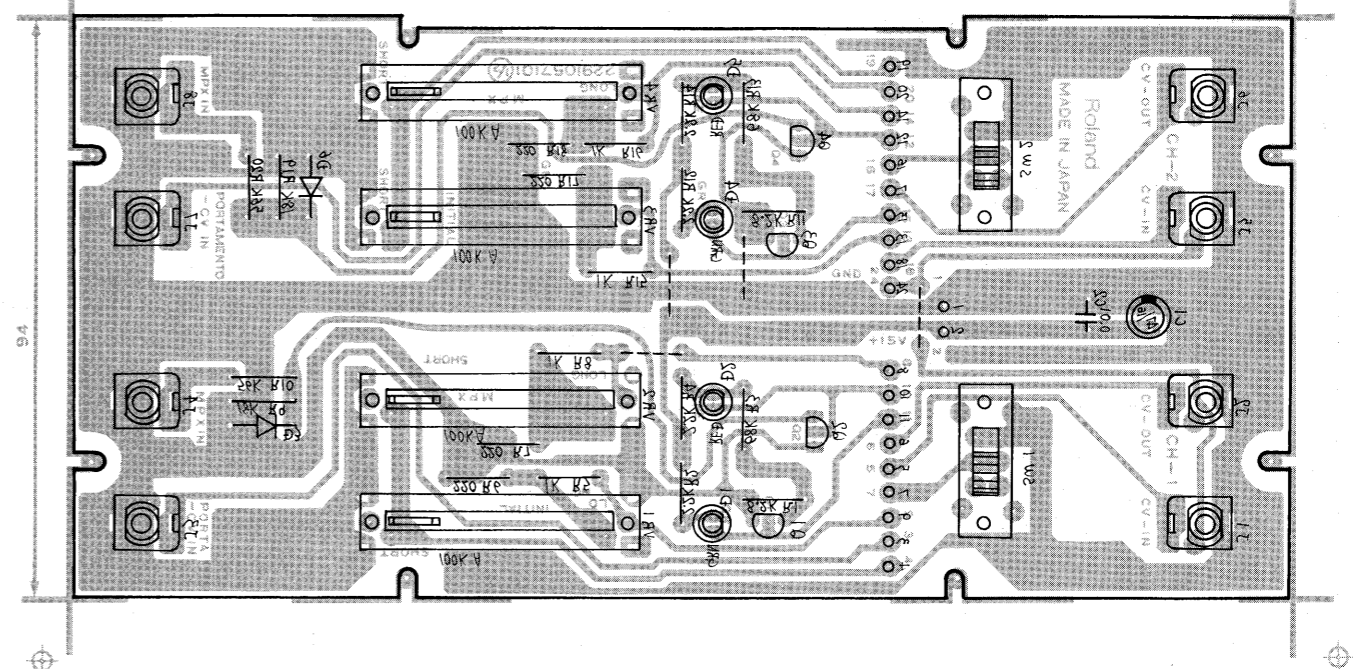
165

165 CONTROL BOARD (7912003001) (pcb 2291057101-1/2)

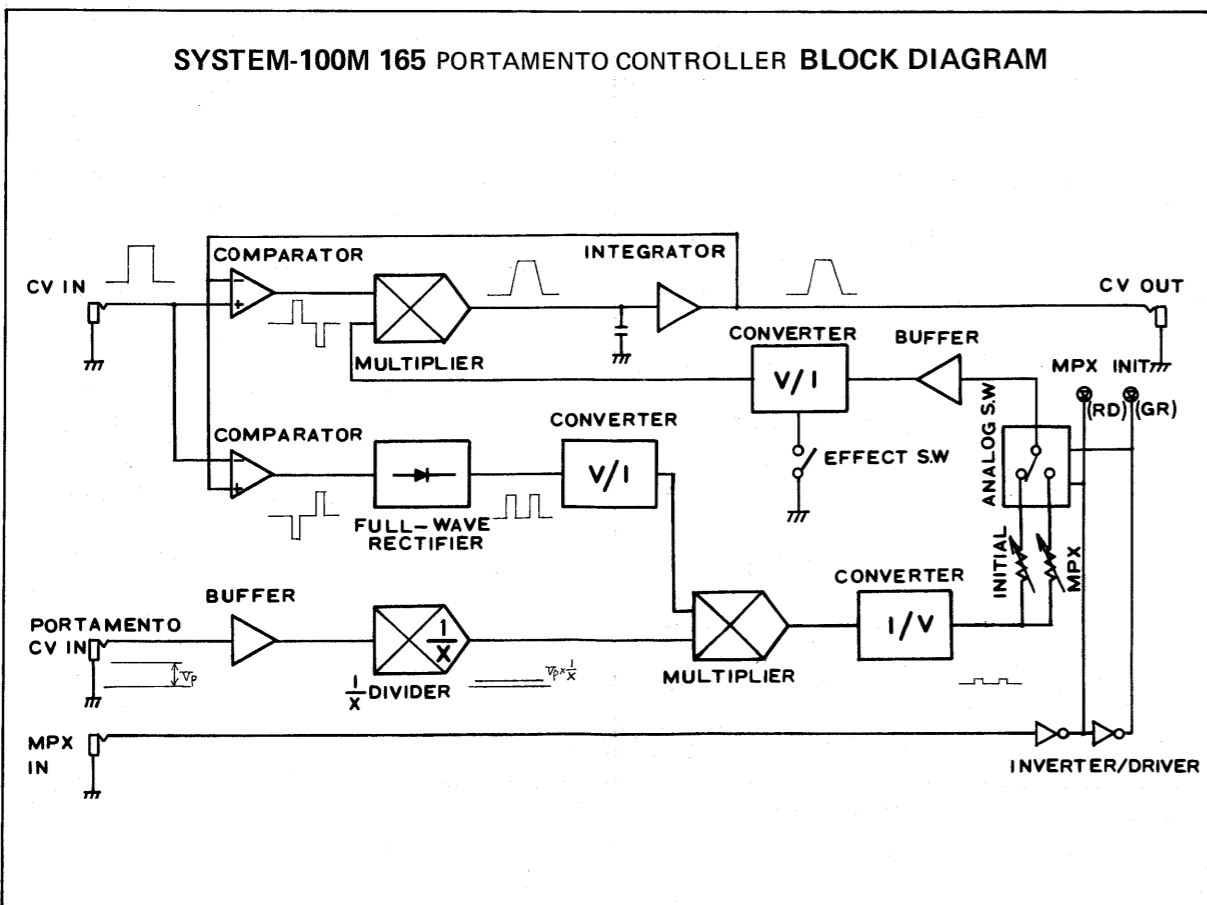


165 CONTROL BOARD

View from foil side

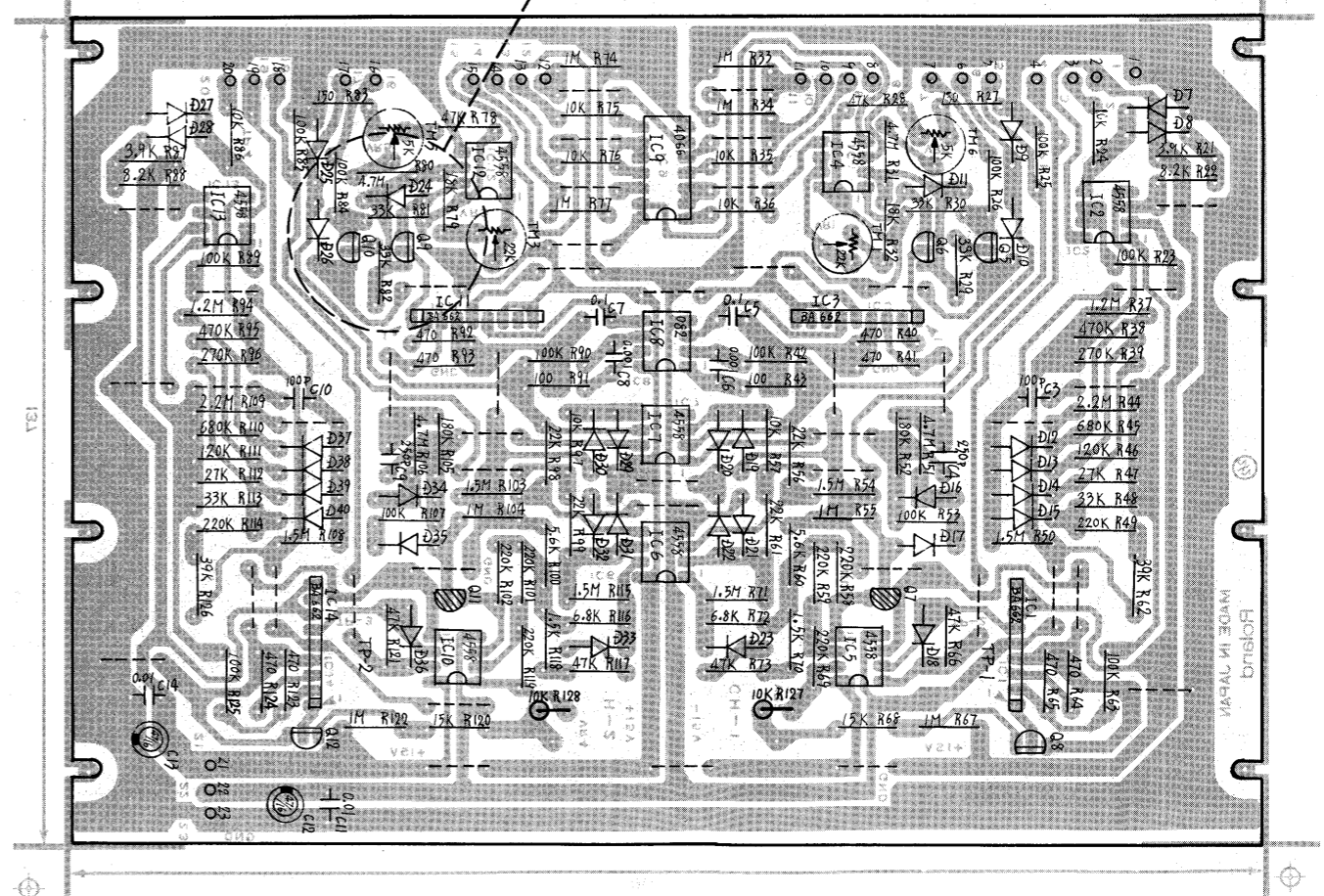


SYSTEM-100M 165 PORTAMENTO CONTROLLER BLOCK DIAGRAM



165 MAIN BOARD (7912004001) (pcb 2291057101-2/2)

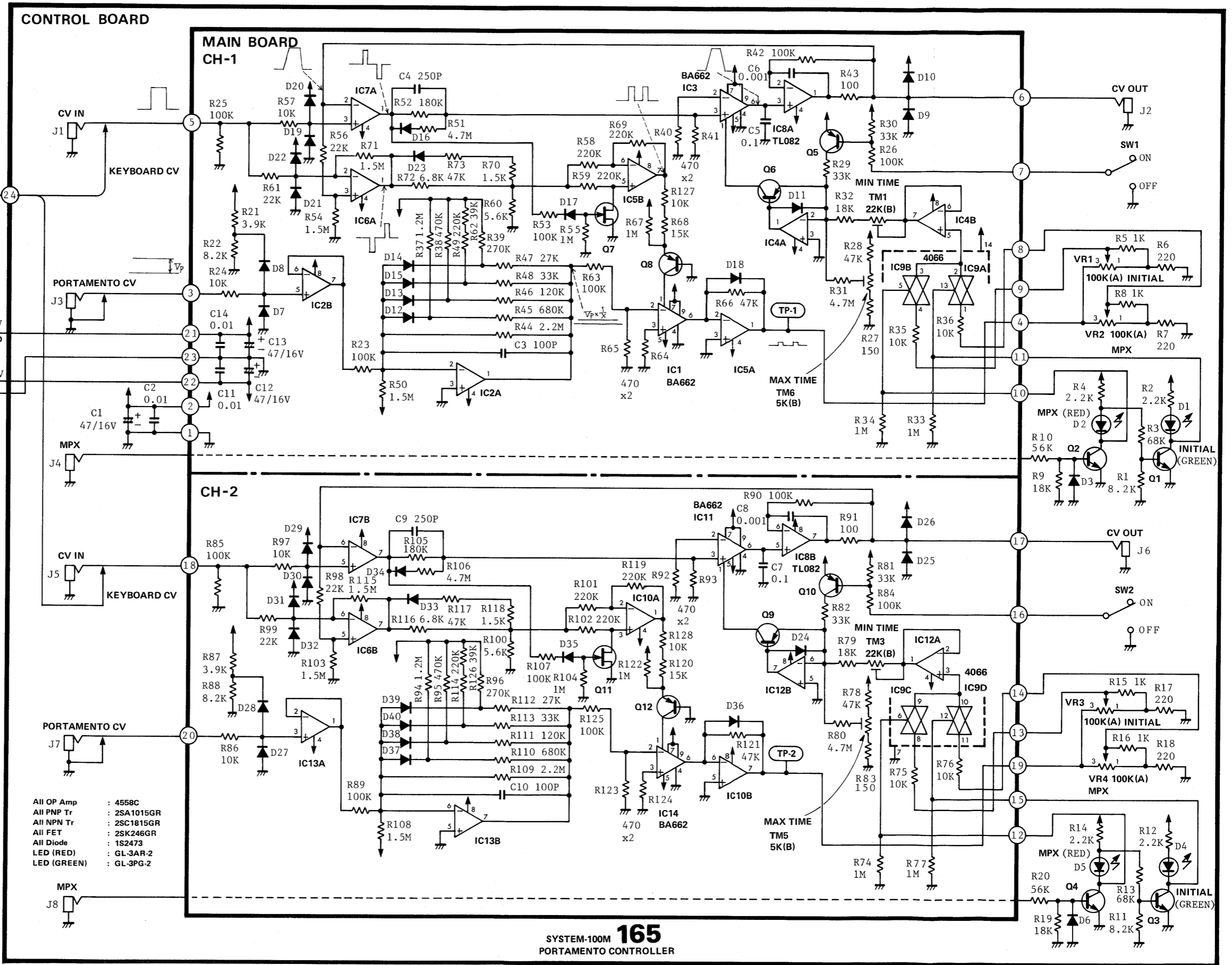
SN270100-280299



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

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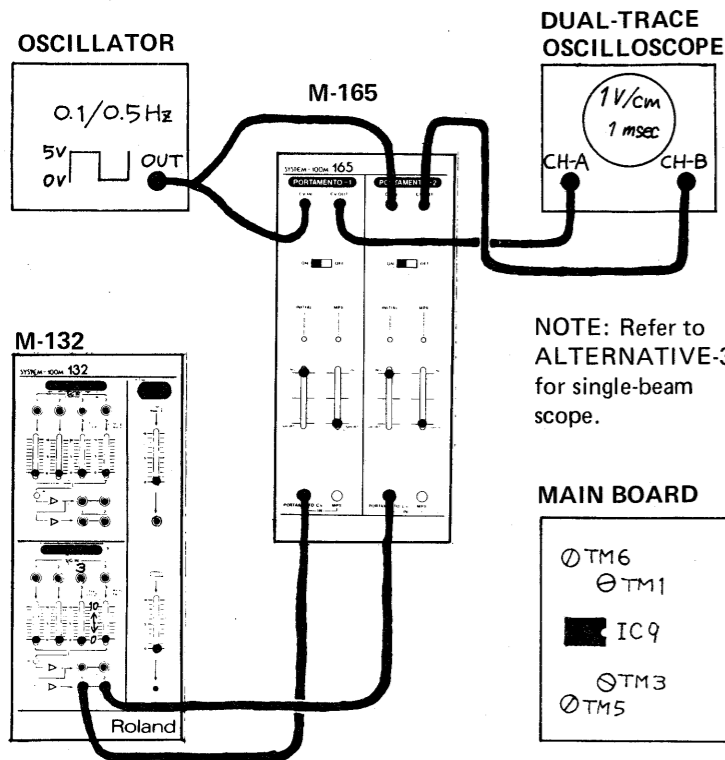
165



- All OP Amp : 4558C
- All PNP Tr : 2SA1015GR
- All NPN Tr : 2SC1815GR
- All FET : 2SK246GR
- All Diode : 1S2473
- LED (RED) : GL-3AR-2
- LED (GREEN) : GL-3PG-2

SYSTEM-100M 165
PORTAMENTO CONTROLLER

165 ADJUSTMENT



NOTE: Refer to ALTERNATIVE-3 for single-beam scope.

This adjustment needs ultra low frequency (0.1-0.5Hz) square waveforms of TTL level (0V and 5V), which may not be available from ordinary test oscillators and dual-trace oscilloscope. Consequently, some possible alternatives are illustrated.

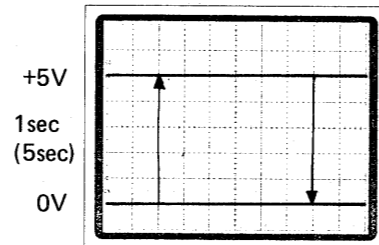
PORTAMENTO TIME

The same procedures are applicable to both CH-1 and CH-2. First, adjust CH-1, then CH-2 looking CH-1 waveforms as standard. More to the point, synchronize all phases of CH-1 and CH-2 overlapped on the screen.

• ONE SECOND

Patch Instruments and set M-132 and M-165 as shown. M-132 MIXER-2 SIG IN 3 to 0 (0V). Set test oscillator to 0.5Hz.

Adjust TM-1 (TM-3) on MAIN BOARD so that the times required for horizontal line on the scope to reach from 0V to +5V and from +5V to 0V are one second each. (see below)



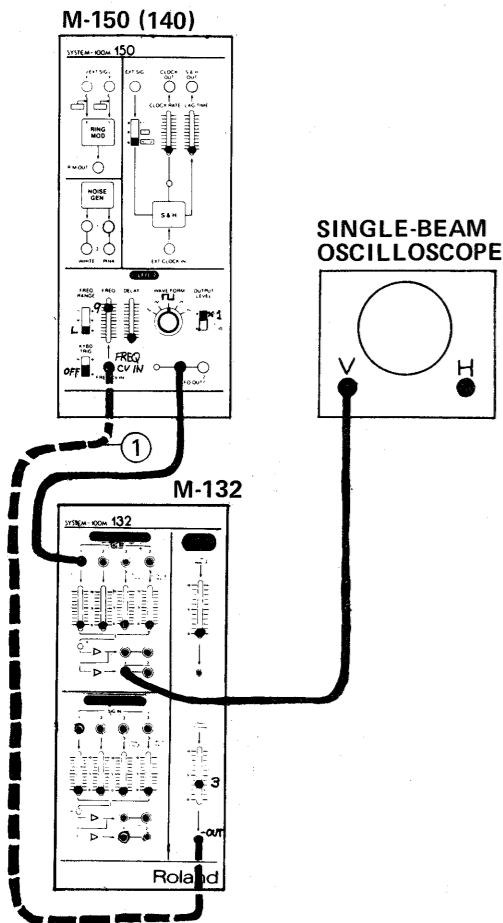
• FIVE SECOND

Set oscillator to 0.1Hz.

Set M-132 MIXER-2 SIG IN 3 to 10 (10V).

Adjust TM-6 (TM-5) on MAIN BOARD so that the time required for horizontal line to reach +5V or to return to 0V is five seconds.

TM-1 (TM-3) and TM-6 (TM-5) interact. Repeat the adjustments, maybe 3-5 times.



ALTERNATIVE-1 TEST OSCILLATOR

If the MC-4 is available, use its CV output.

CV DATA: 0 = 0V STEP TIME: 2000 = 0.1Hz
 60 = 5V 400 = 0.5Hz
 120 = 10V Other parameters: Initial setting

ALTERNATIVE-2 TEST OSCILLATOR

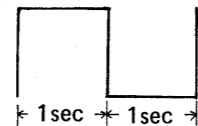
This setup makes SYSTEM-100M 150 and 132 a test oscillator.

1. (Do not connect Patch ① yet)

Adjust M-132 MIXER-1 out for 5Vp-p.

2. (scope time base 0.2s/cm)

Adjust M-150 FREQ (approx. at 9) for 0.5Hz.



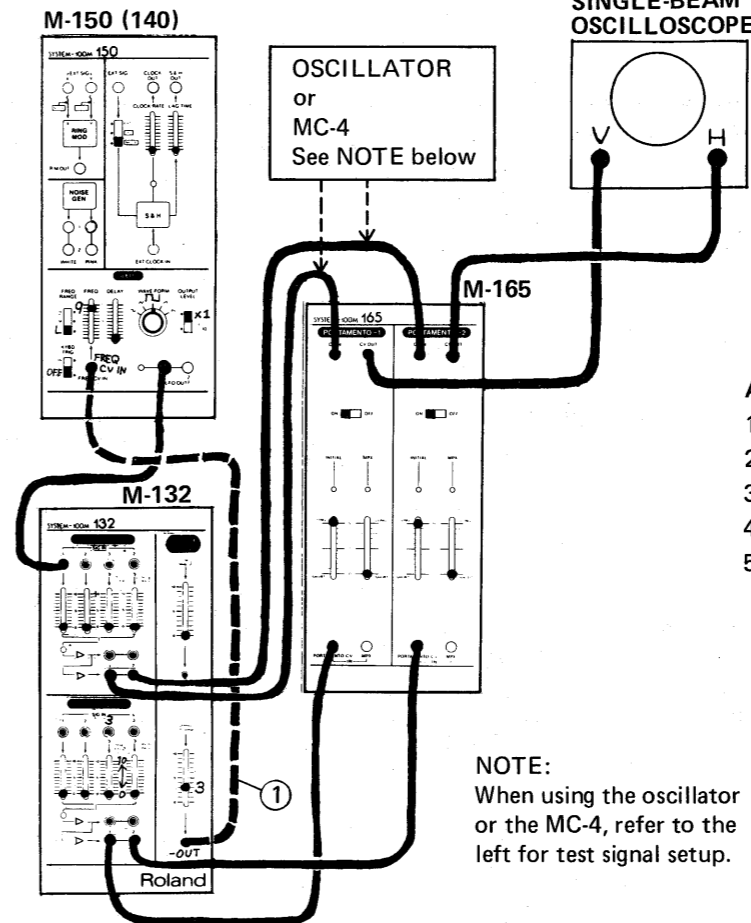
3. Add Patch ①.

(scope time base 0.5s/cm)

4. Adjust M-132 -OUT (approx. at 3) for 0.1Hz.

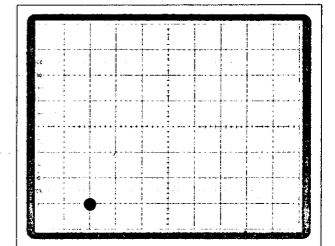


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ALTERNATIVE-3 USING SINGLE-BEAM SCOPE

1. Do not connect H IN yet.
2. Set scope V IN to GND and RANGE to 1V/cm.
3. Position scope spot as shown below.
4. Connect scope H IN to M-165 PORTA-2 CV OUT.
5. Set scope V IN to DC.



NOTE: When using the oscillator or the MC-4, refer to the left for test signal setup.

PORTAMENTO-1

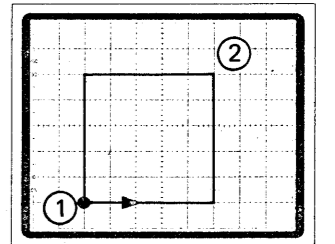
• ONE SECOND

1. Disconnect Patch ① (dotted line).

2. Set M-132 MIXER-2 SIG IN 3 knob to 0 (0V).

3. Set M-165 changeover switches: PORTAMENTO-1 to ON and PORTAMENTO-2 to OFF

4. Turn TM-1 CW until display stops (foldover) for a period at points ① and ②, then reverse TM-1 slightly just enough for smooth beam running without reducing displayed V amplitude (5Vp-p).



• FIVE SECOND

1. Connect Patch ① (dotted line).

2. Set M-132 MIXER-2 SIG IN 3 to 10 (10V).

3. Similarly, adjust TM-6 for smooth sweep running without reducing vertical amplitude.

4. TM-1 and TM-6 will interact. Repeat these adjustments until no improvement is noted.

PORTAMENTO-2

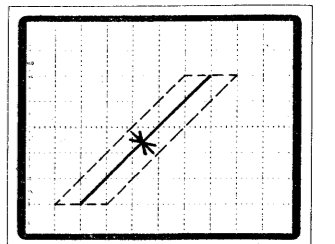
• ONE SECOND

1. Disconnect Patch ① (dotted line).

2. Set M-165 PORTAMENTO-2 to ON.

3. Set M-132 MIXER-2 SIG IN 3 to 0.

4. Adjust TM-3 so that Lissajous is single line as possible.



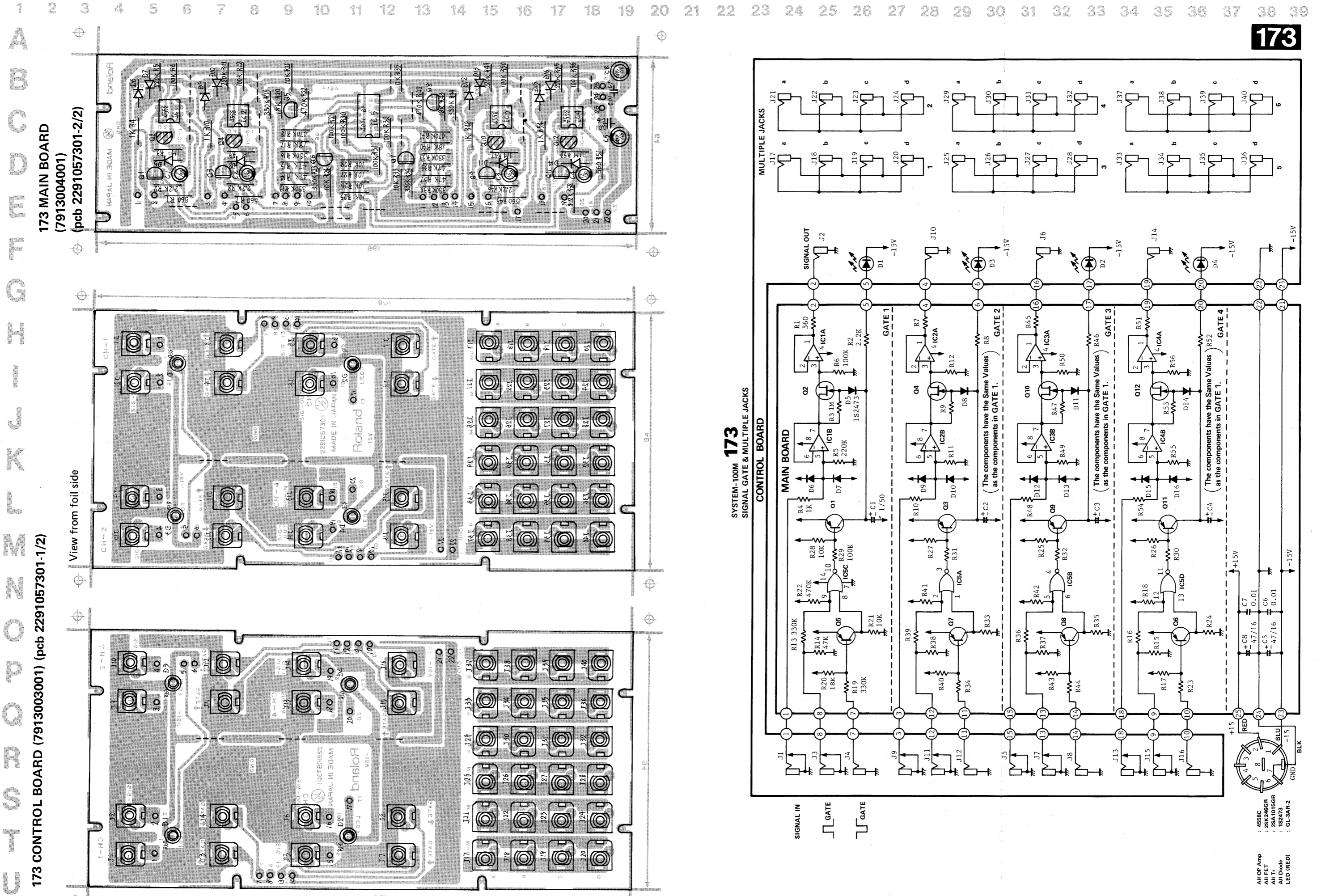
• FIVE SECOND

1. Connect Patch ① (dotted line).

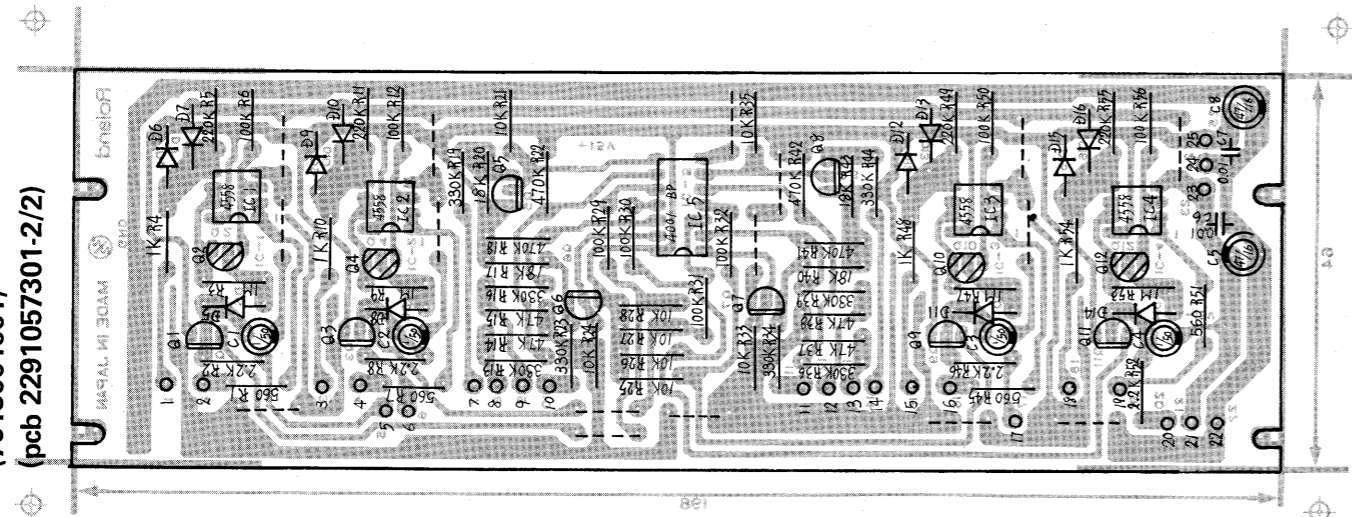
2. Set M-132 MIXER-2 SIG IN 3 to 10.

3. Similarly, adjust TM-5 for single line trace.

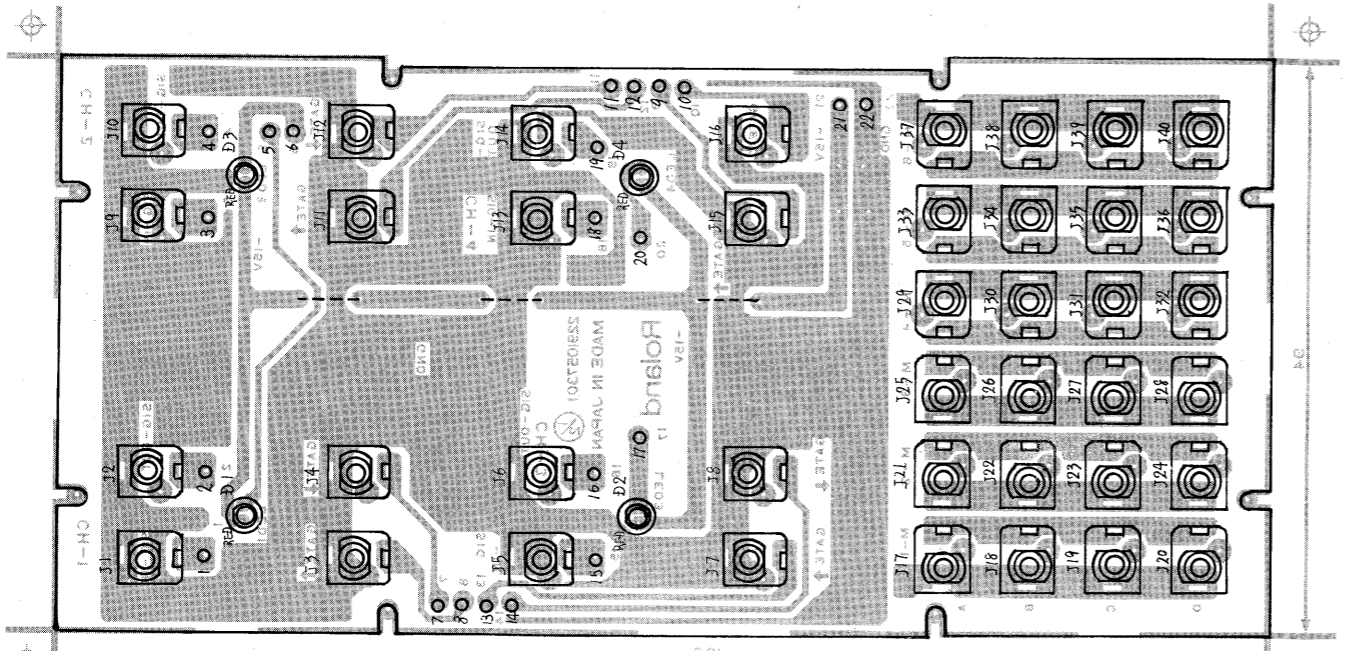
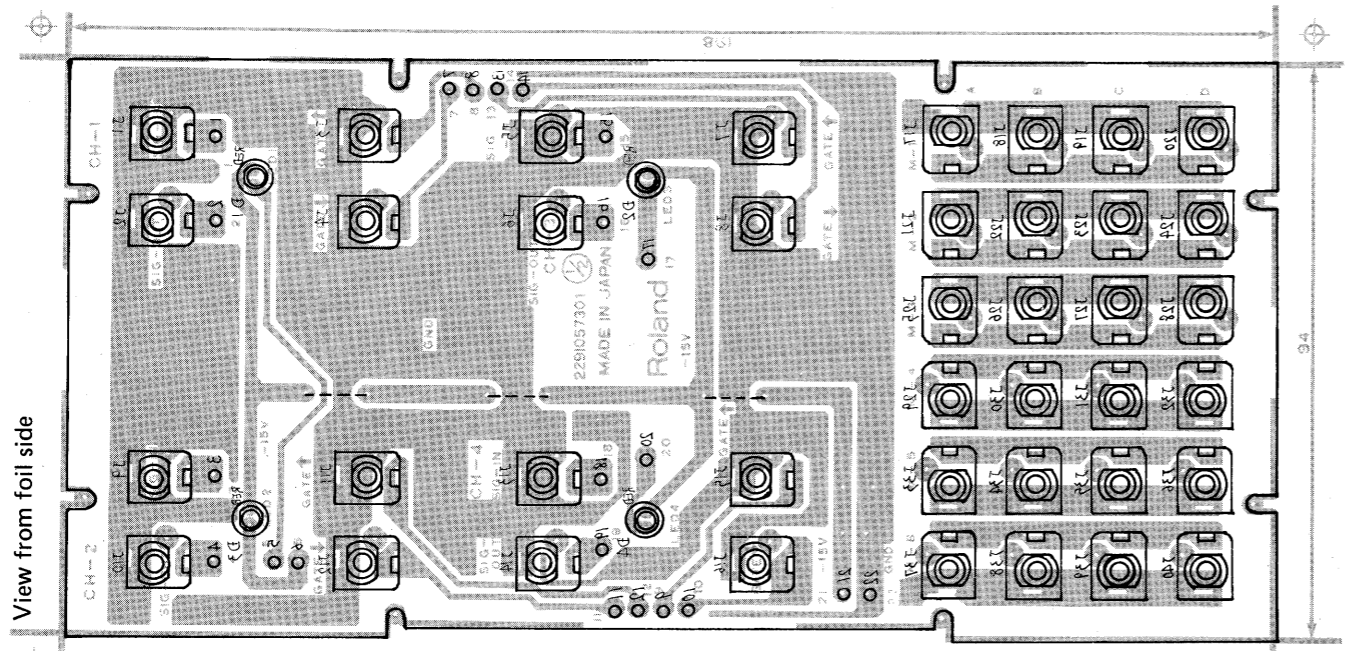
4. TM-3 and TM-5 will interact. Repeat these adjustments until no improvement is noted.



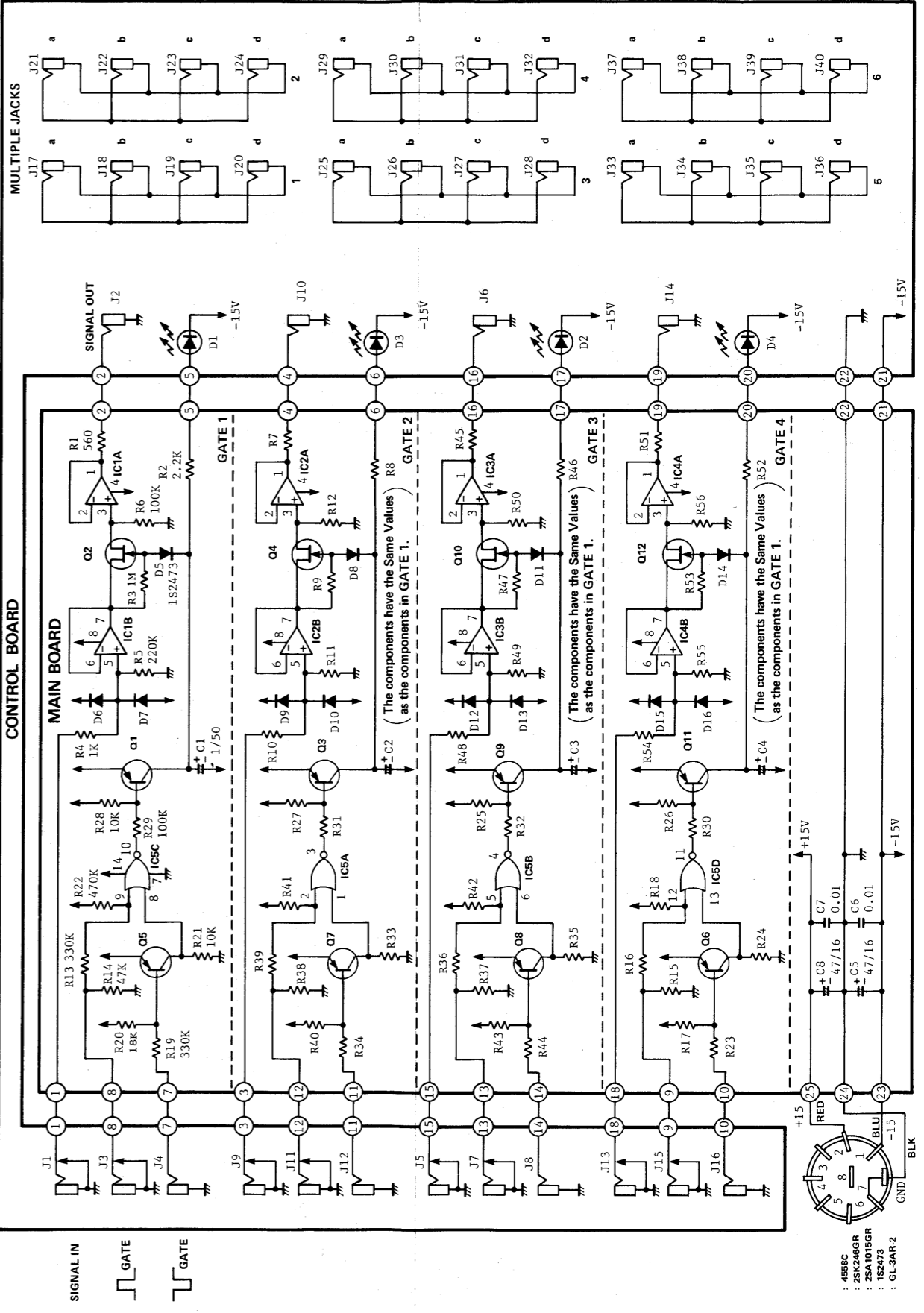
173 MAIN BOARD
(7913004001)
(pcb 2291057301-2/2)



173 CONTROL BOARD (7913003001) (pcb 2291057301-1/2)



173
SYSTEM-100M
SIGNAL GATE & MULTIPLE JACKS
CONTROL BOARD

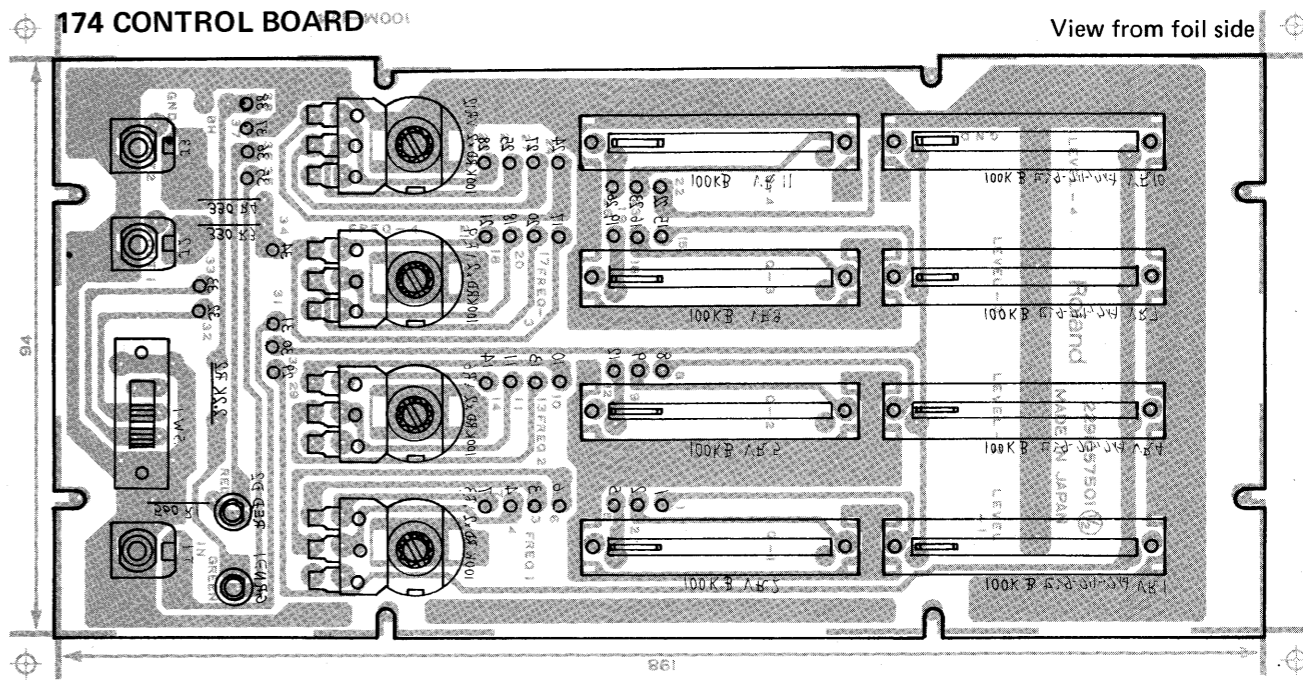
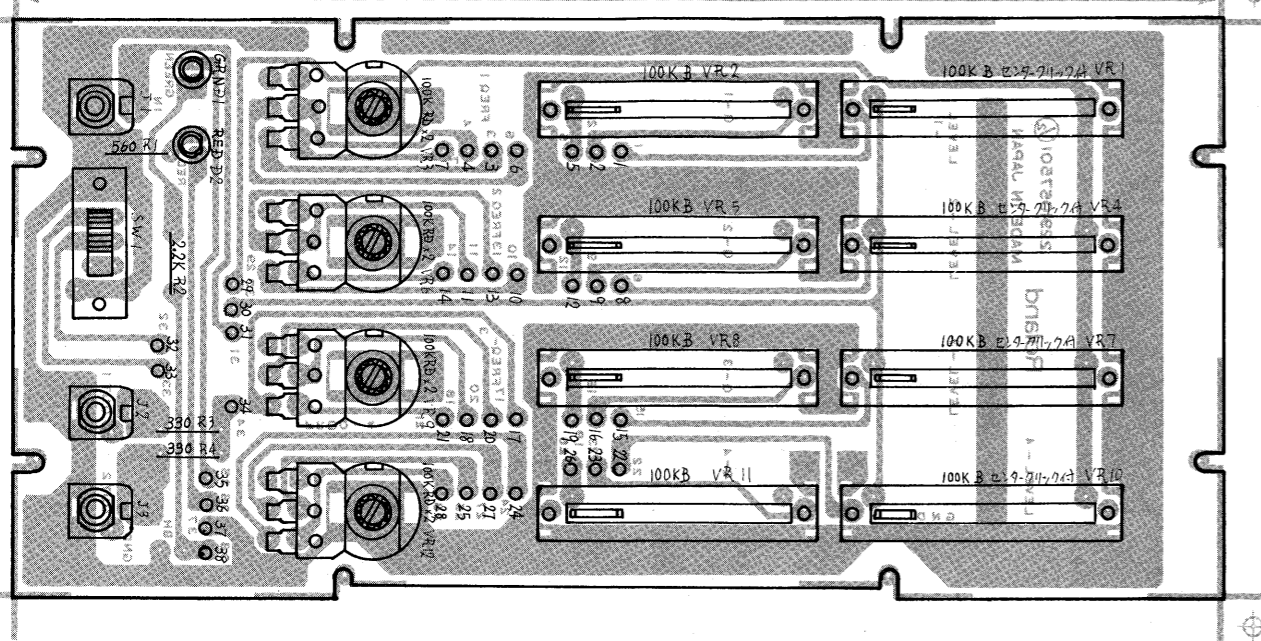


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

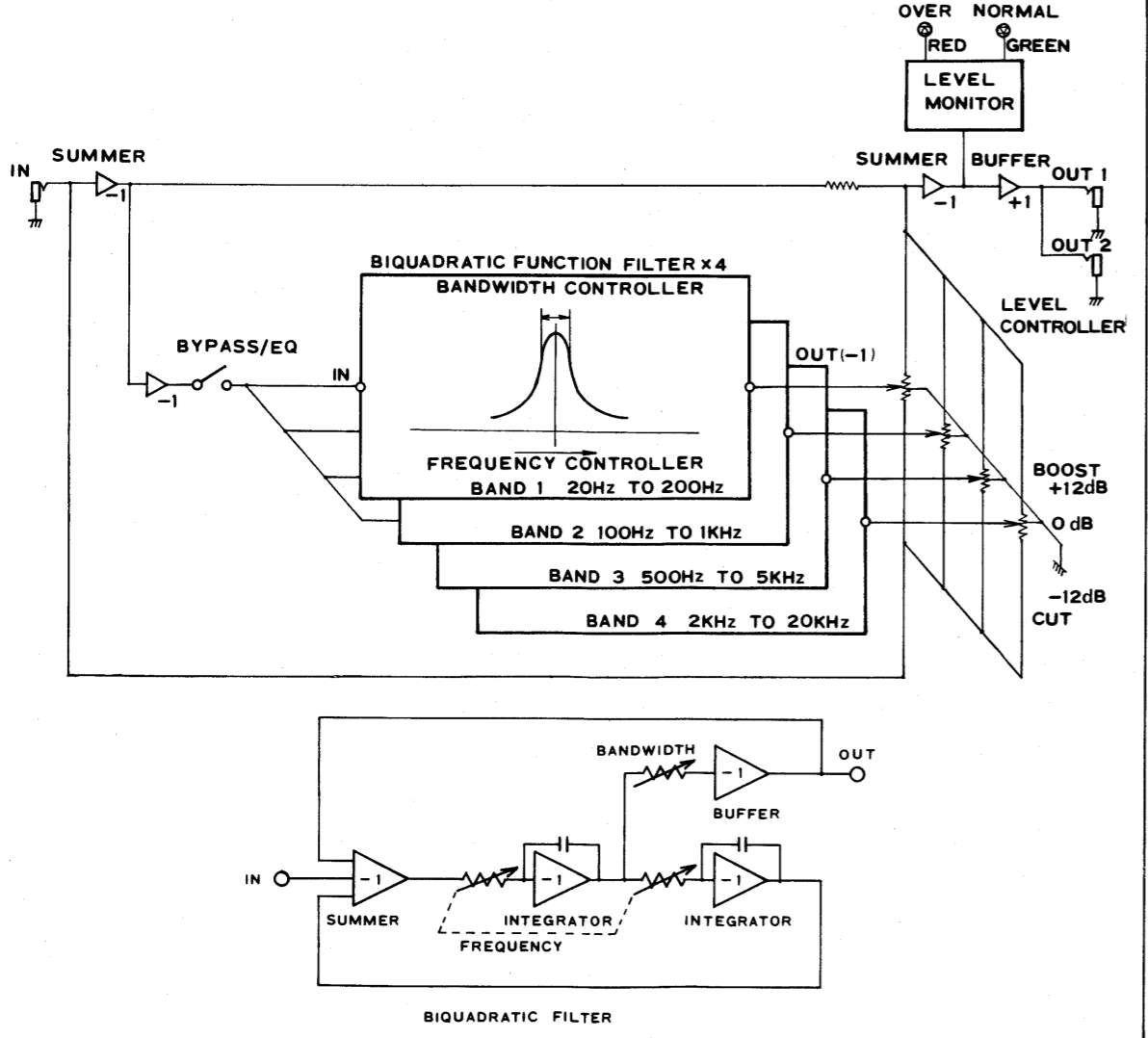
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

174

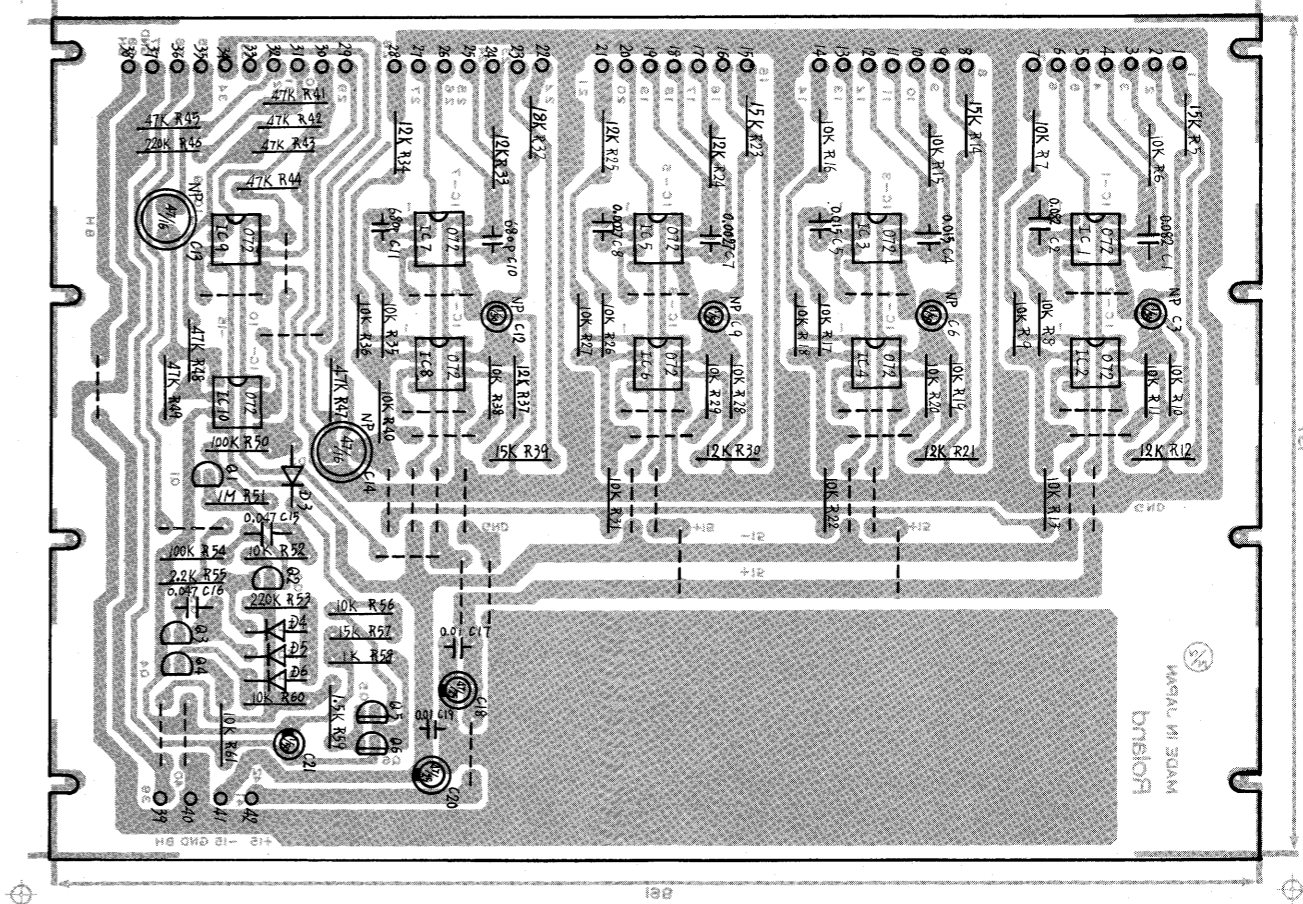
174 CONTROL BOARD (7914003002) (pcb 2291057501-1/2)



SYSTEM-100M 174 PARAMETRIC EQUALIZER BLOCK DIAGRAM

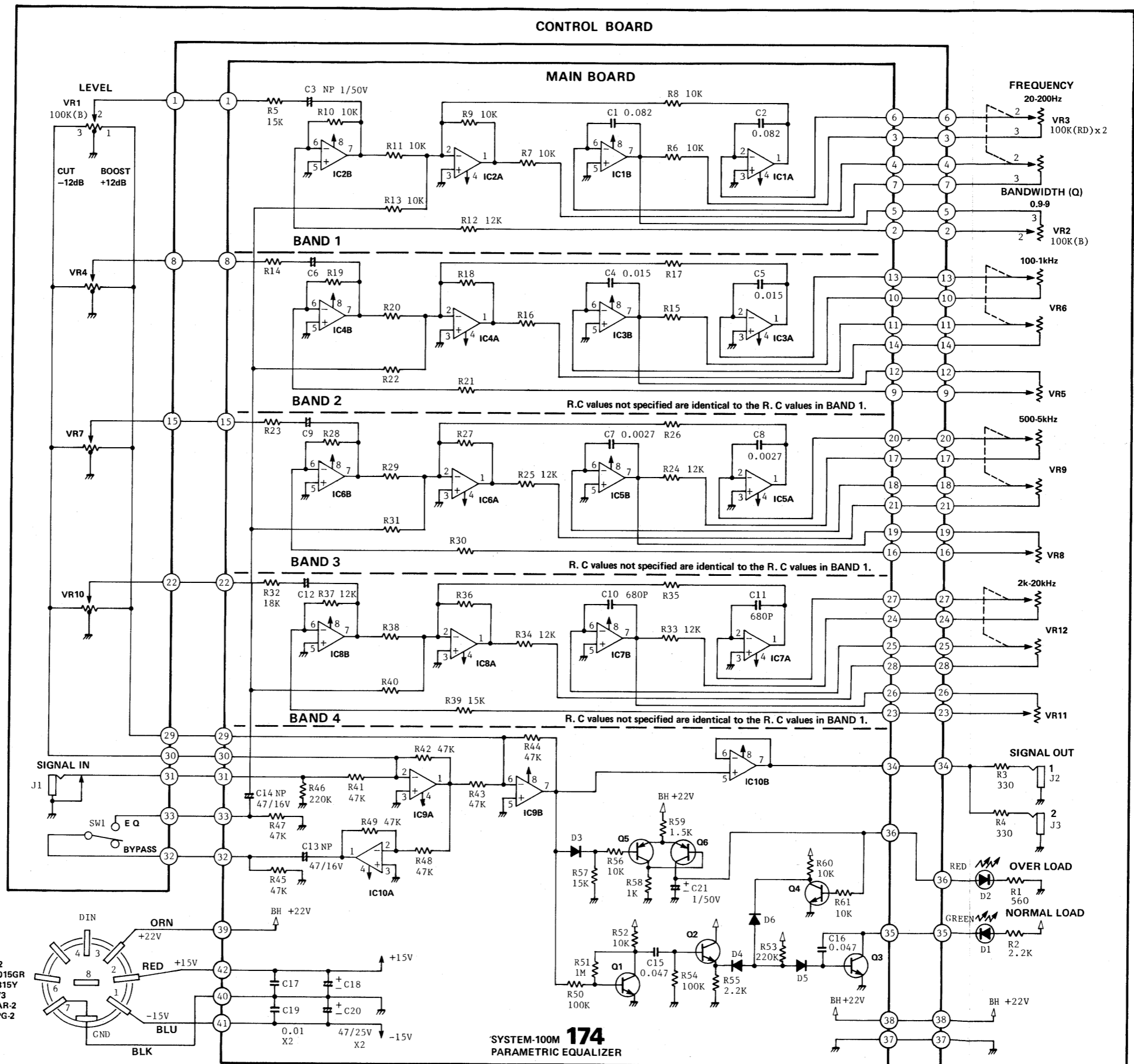


174 MAIN BOARD (7914004002) (pcb 2291057501-2/2)



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

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- All OP Amp : TL072
- All PNP Tr : 2SA1015GR
- All NPN Tr : 2SC1815Y
- All Diode : 1S2473
- LED (RED) : GL-3AR-2
- LED (GREEN) : GL-3PG-2

PARTS LIST

2221030800 M-165 Front panel 165
 2221030900 M-173 Front panel 173
 2221031000 M-174 Front panel 174
 2201012201 100M Cover
 2219018901 Holder
 2247012900 Knob (slide pot) 165/174
 2247012700 Knob (rotary pot) 174

DIN SOCKET

13429603 CS0690-1-1 8P

JACK

13449402 SJ-409-1-2

SWITCH

13159103 SSB-02242 (slide) 165/174

PCB

7912003001 165 CONTROL BOARD
(pcb 2291057101-1/2)
 7912004001 165 MAIN BOARD
(pcb 2291057101-2/2)
 7913003001 173 CONTROL BOARD
(pcb 2291057301-1/2)
 7913004001 173 MAIN BOARD
(pcb 2291057301-2/2)
 7914003002 174 CONTROL BOARD
(pcb 2291057501-1/2)
 7914004002 174 MAIN BOARD
(pcb 2291057501-2/2)

POTENTIOMETER (slide)

13339401 EVA-TOA-C15A15 100kA 165
 13339402 EVA-TOA-C15B15 100kB 174
 13339862 EVA-T5K-C15B15 100kB 174

POTENTIOMETER (rotary)

13219780 EWK-77A320-15D 100kRD 174

POTENTIOMETER (trimmer)

13299544 H1021A015-22kB 165
 13299106 EVT-R4SA00B53 5kB 165

IC (CMOS)

15159115H0 HD14066BP 165
 Quad Bilateral Switch
 15159101H0 HD14001BP 173
 Quad 2-Input NOR Gate

IC (OP-AMP)

15189105 μ PC4558C 173
 15189118 TL082CP 165 Bi-FET
 15189147 NJM-072DP 174

IC (CUSTOM)

15229802 BA662 165 VCA

TRANSISTOR

15119113 2SA1015-GR
 15129114 2SC1815-GR 165
 15129115 2SC1815-Y 174

FET

15139103 2SK30ATM-GR 165/173
 15139112 2SK246-GR 165/173

DIODE

15019103 1S2473
 15019125 1SS133 165

LED

15029109 GL-3AR-2 (red)
 15029112 GL-3PG-2 (green) 165/174

CAPACITOR

13639933M0 ECEA1EN470S 47 μ F/25V 174
 (bi-polar)
 13639942M0 ECEA1HN010S 1 μ F/50V 174
 (bi-polar)

OTHERS

13429603 8p DIN cord (30cm)
 2224010900 Slide pot mask 165/174