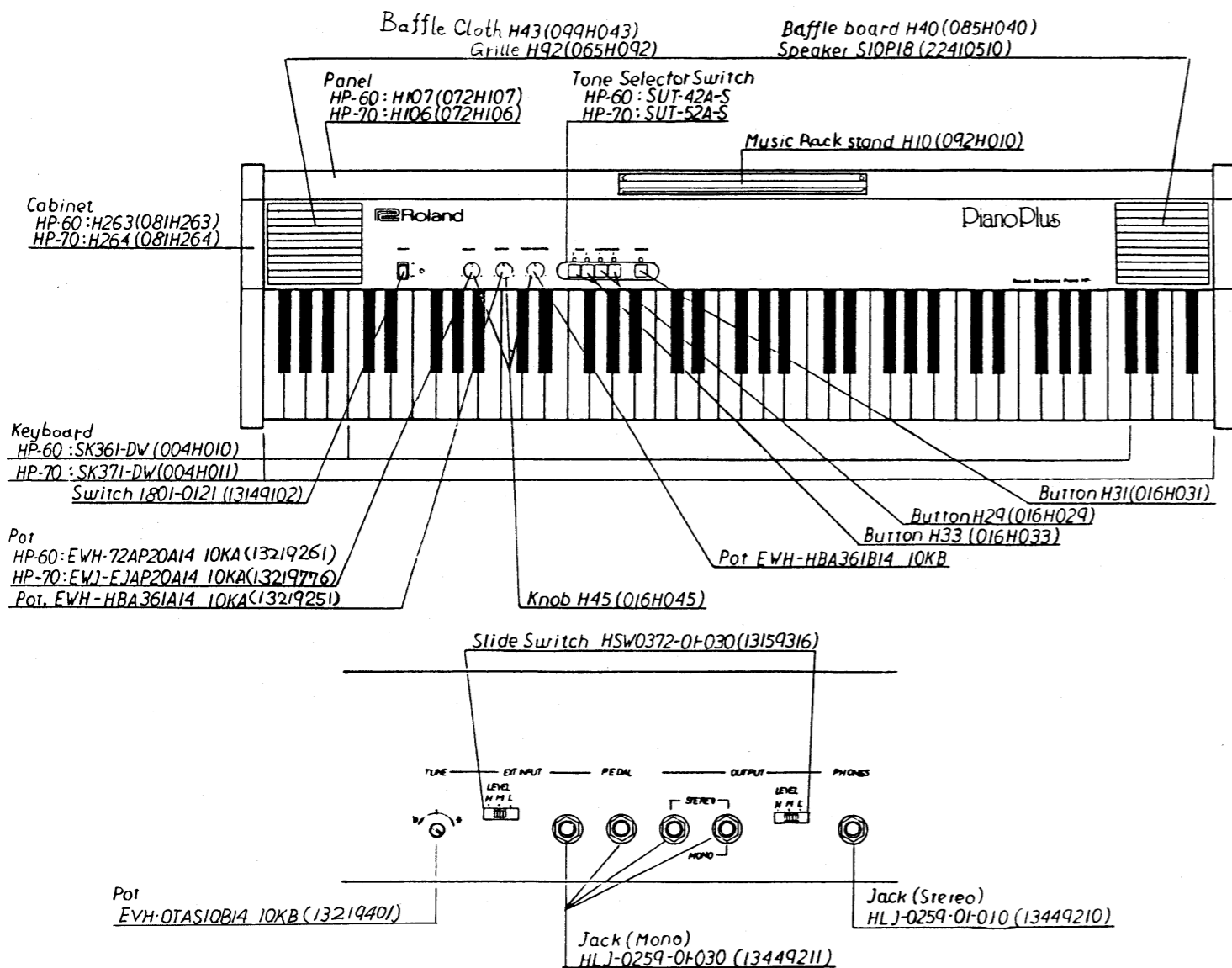


# HP-60/70 SERVICE NOTES

First Edition

## SPECIFICATIONS

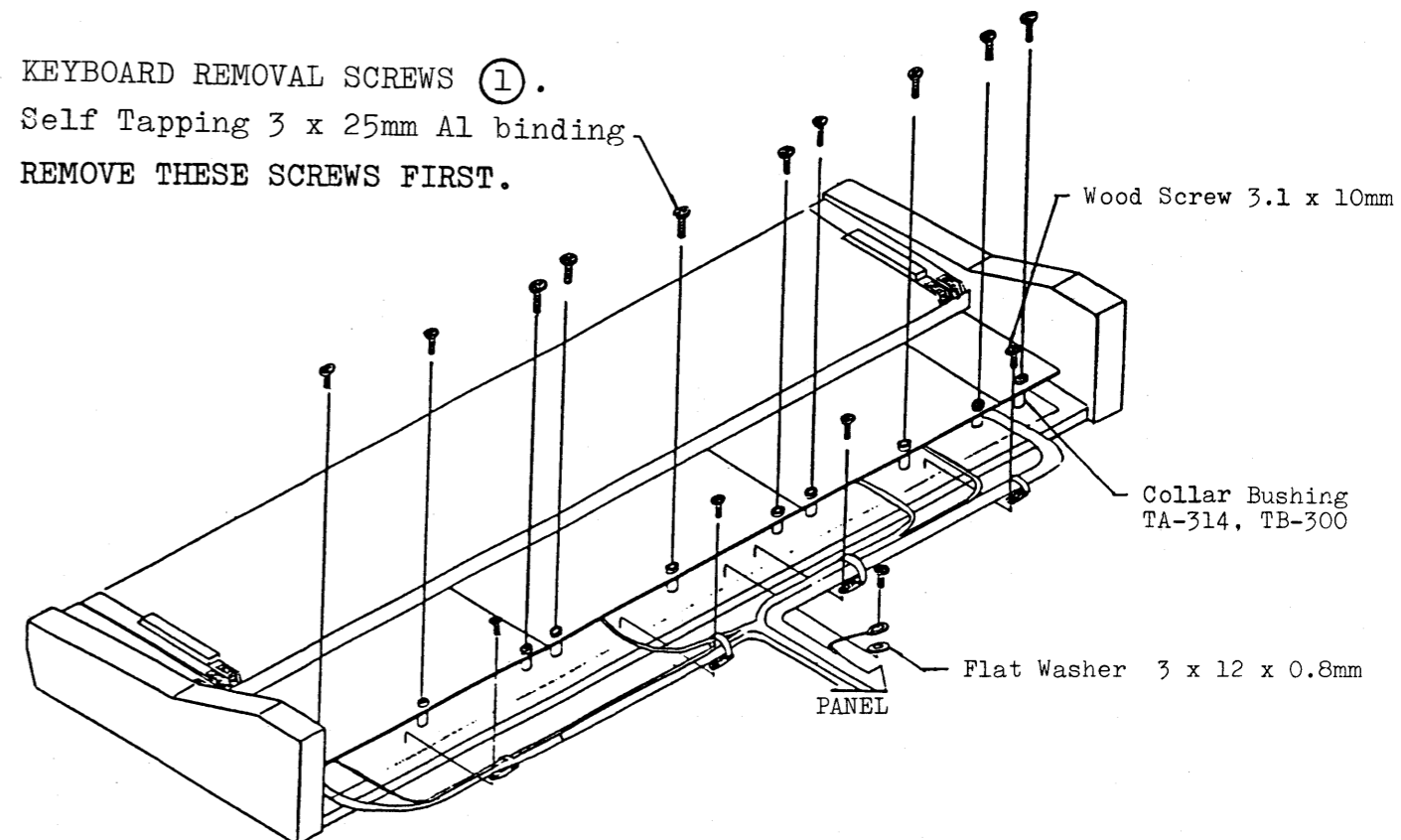
Keyboard ..... HP-60: 61 keys C1-C6/HP-70: 75 keys F1-G7  
 Tunable range ..... HP-60: +39 cents, -50 cents  
 HP-70: +30 cents, -55 cents  
 Output level ..... H: 0dB/M: -10dB/L: -20dB  
 (0dB = 7V p-p @ mid. C, ff)  
 Input level ..... H: +6dBm/M: -9dBm/L: -24dBm  
 Speaker ..... 10cm x 2  
 Output power ..... 2W x 2 (rms)  
 Power consumption ... HP-60: 23W/HP-70: 26W  
 Dimensions ..... HP-60: 915(W) x 300(D) x 130(H)mm 10.1 kg  
 HP-70: 1105(W) x 300(D) x 130(H)mm 12 kg



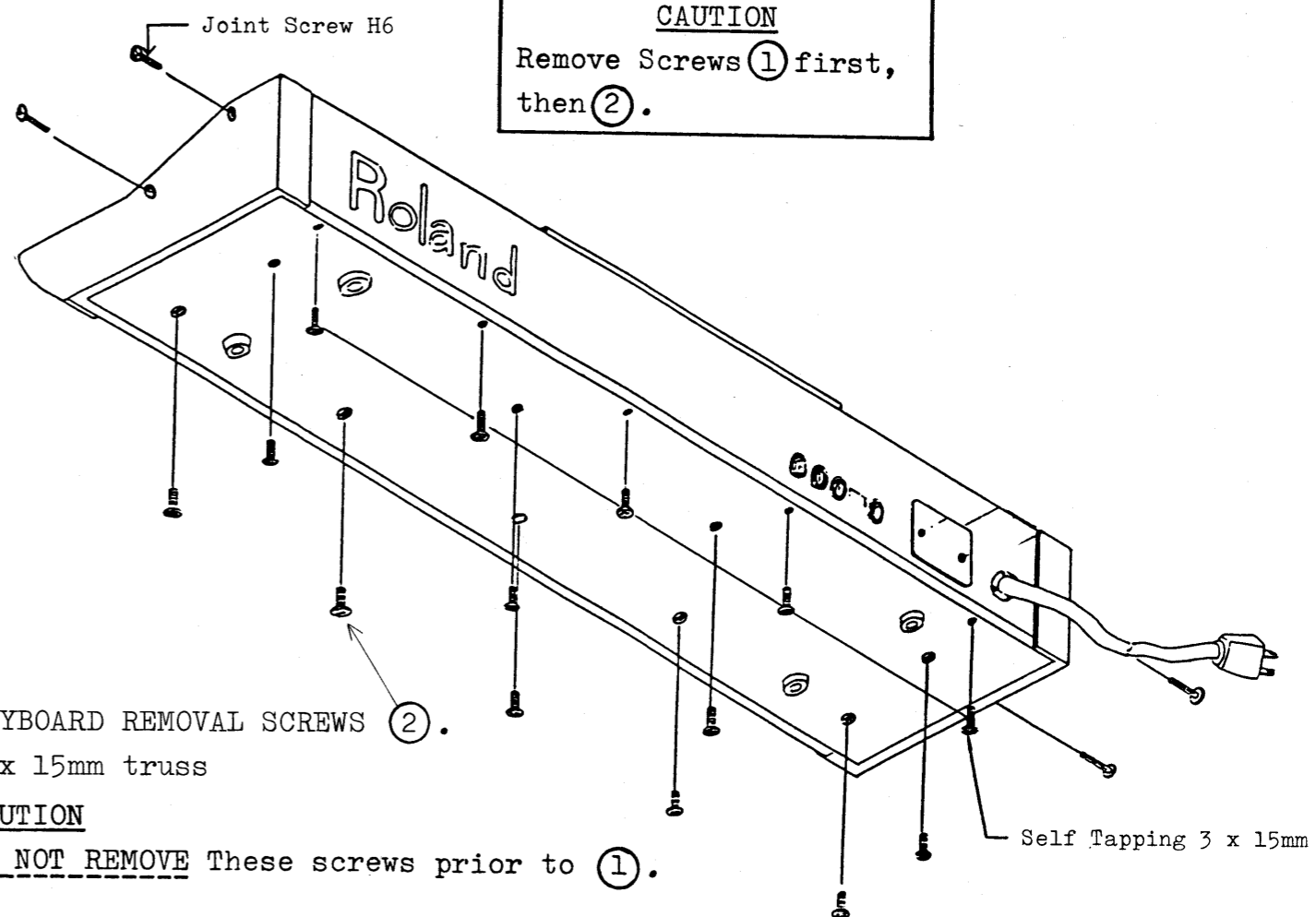
KEYBOARD REMOVAL SCREWS ①.

Self Tapping 3 x 25mm Al binding

REMOVE THESE SCREWS FIRST.



KEYBOARD REMOVAL SCREWS  
**CAUTION**  
 Remove Screws ① first,  
 then ②.



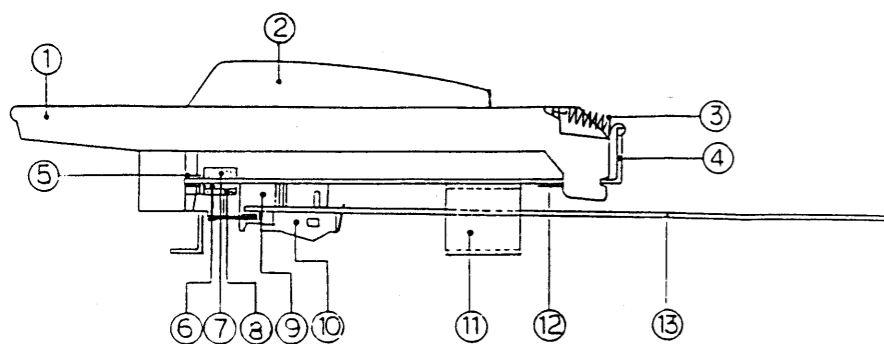
KEYBOARD REMOVAL SCREWS ②.

4 x 15mm truss

**CAUTION**

DO NOT REMOVE These screws prior to ①.

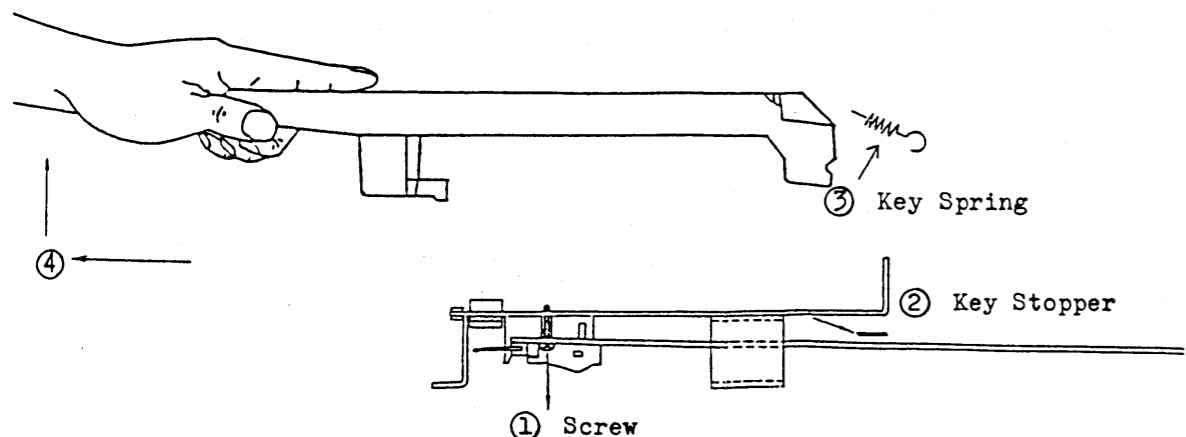
SK-361Dw (HP-60)  
SK-371Aw (HP-70) Parts List



1	106 H 026	Natural Key (With Weight)	C F
1	027	"	D
1	028	"	E B
1	029	"	G
1	030	"	A
1	031	"	C' F'
1	035	"	G'
2	032	Sharp Key (With Weight)	
3	070H029	Sharp Key Spring H29	
3	034	Natural Key Spring H34	
4	061H135	Chassis H135 (61 Notes) HP-60	
4	061H123	" H123 (75 Notes) HP-70	
5	068H004	Guide Bush	
6	107H064	Cushion H64	
7	071H143	Stop Felt H143 (61 Notes) HP-60	
7	167	" H167 (75 Notes) HP-70	
8	071H168	Level Felt H168 (61 Notes) HP-60	
8	169	" H169 (75 Notes) HP-70	
9	104H037	Holder H37	
10	004H009	Switch H9	
11	062H027	Chassis Stand H27	
11	028	" H28	
12	098H006	Key Stopper H6	
13	GTH 48 .49 .50.	(61 Notes) HP-60	
13	GTH 51 .52 .53 .54.	(75 Notes) HP-70	

Key Removal

1. Remove Screw ①.
  2. Remove Key Stopper ②.
  3. Remove Key Spring ③.  
Identify Key Spring if White and Black Keys are removed, they are different in tention.
  4. Pull out and up on front end of Key ④.
- This will disengage the Key from its mounting.



Key Installation  
Reverse the order for Key Removal.

PARTS LIST

☆ : HP-60 ★ : HP-70

CASE

- ☆ 081H263 Cabinet H263
- ★ 081H264 Cabinet H264
- ☆ 072H107 Panel H107
- ★ 072H106 Panel H106
- 092H010 Music Rack Stand H10
- 065H092 Grille H92
- 099H043 Baffle Cloth H43
- 085H040 Baffle Board H40
- 092H011 Music Rack H11 (option)
- ★ 131H059 Dust Cover H59
- ☆ 131H060 Dust Cover H60

KEYBOARD

- ☆ 004H010 SK-361-DW C-C 61 notes
- ★ 004H011 SK-371-DW F-G 75 notes

KNOB, BUTTON

- 016H045 Knob H45
- 016H033 Button H33 ivory
- 016H029 Button H29 orange
- ★ 016H031 Button H31 lime

SWITCH, JACK

- 13149102 Switch 1801-0121 Power
- ☆ 13129533 Switch SUT-42A-S
- ★ 13129534 Switch SUT-52A-S
- 13159316 Slide Switch HSW-0372-01-030
- 13449210 Jack (Stereo) HLJ-0259-01-010
- 13449211 Jack (Mono) HLJ-0259-01-030
- 2215070400 Jack Nut N-704

COIL, TRANSFORMER

- 12449222 Coil P-75 101 100μH
- 022H047J PT-H47J 100V
- 022H047C PT-H47C 117V
- 022H047D PT-H47D 220/240V

PCB ASSEMBLY

- ☆ 149H152 Switch Board OPH152 (pcb 052H320A)
- ★ 149H153 Switch Board OPH153 (pcb 052H320A)
- ☆ 141H035 Amp Board APH035 (pcb 052H319A)
- ★ 147H036 Amp Board APH036 (pcb 052H319A)
- ☆ 147H048 Gate Board GTH048 (pcb 052H317B)
- ☆ 147H049 Gate Board GTH049 (pcb 052H316B)
- ☆ 147H050 Gate Board GTH050 (pcb 052H316B)
- ★ 147H051 Gate Board GTH051 (pcb 052H318C)
- ★ 147H052 Gate Board GTH052 (pcb 052H316B)
- ★ 147H053 Gate Board GTH053 (pcb 052H316B)
- ★ 147H054 Gate Board GTH054 (pcb 052H316B)

IC

- 15179129 TMS3615-25NS  
HP-60/70 design requires relatively uniform threshold of the TMS-3615's in a unit to sound notes having similar contour (lengths of decay and release).  
To meet this the Roland selects the devices to grades as follows:  
0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 2.0 — marked on face.  
When replacing, use the same number as on existing.
- 15189105 μPC4558
- 15229802 BA662A
- 15199510 LA4440 stereo power amp 6W
- 15199105N0 μPC14315H or μA7815UC (15199105F0) regulator
- 15169504 MN3101 BBD driver
- 15219213 MN3009 BBD 256-stage

TRANSISTOR

- 15119113 2SA1015-GR
- 15129114 2SC1815-GR
- 15129121 2SC2021-R
- 15119806 2SB596-O
- 15139101 2SK30A-GR

DIODE

- 15019518 RD4.7EB zener
- 15019252 1SS84
- 15019101 1S1555
- 15019236 W02 rectifier stack
- 15029103 TLR-124 LED

POTENTIOMETER

- ☆ 13219261 EWH-72AP20A14 10kA
- ★ 13219776 EWJ-EJAP20A14 10kA x 2
- 13219251 EWH-HBA361A14 10kA center click
- 13219252 EWH-HBA361B14 10kA center click
- 13219401 EVH-OTAS10B14 10kA
- 13299106 EVT-R4SA00B53 5kA trimmer
- 13299101 EVT-R4SA00B14 10kA trimmer
- 13299102 EVT-R4SA00B15 100kA trimmer

FUSE

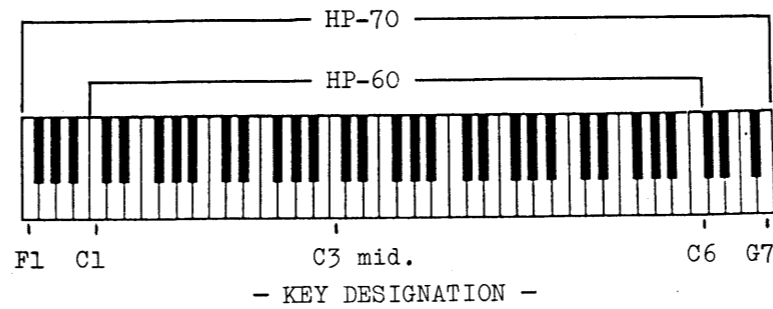
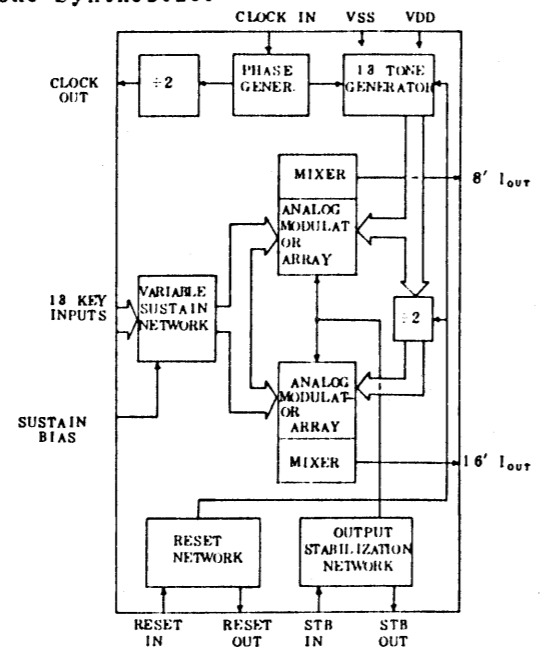
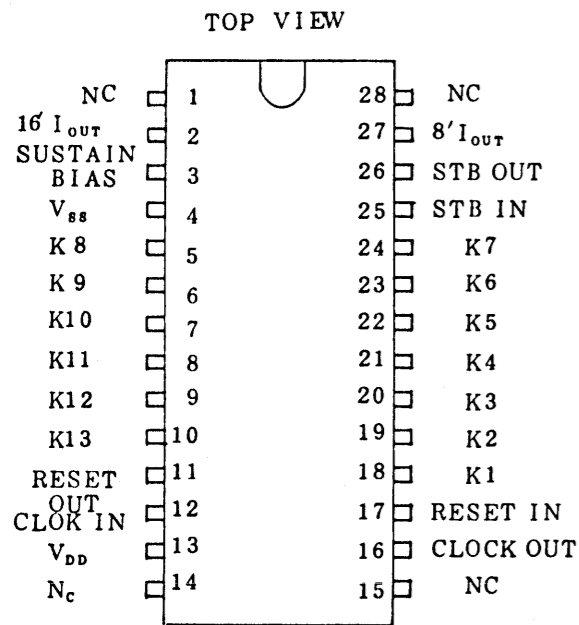
- 12559138 MGP 0.75A pri. 100V
- 12559313 MGP 0.75A CSA pri. 117V
- 12559507 CEE T200mA pri. 220/240V
- 12559521 CEE T1.6A sec. 220/240V
- 12559514 CEE T2.0A sec. 220/240V

OTHERS

- 22410510 Speaker S10P18
- 048H028 Heat Sink H28

TMS 3615

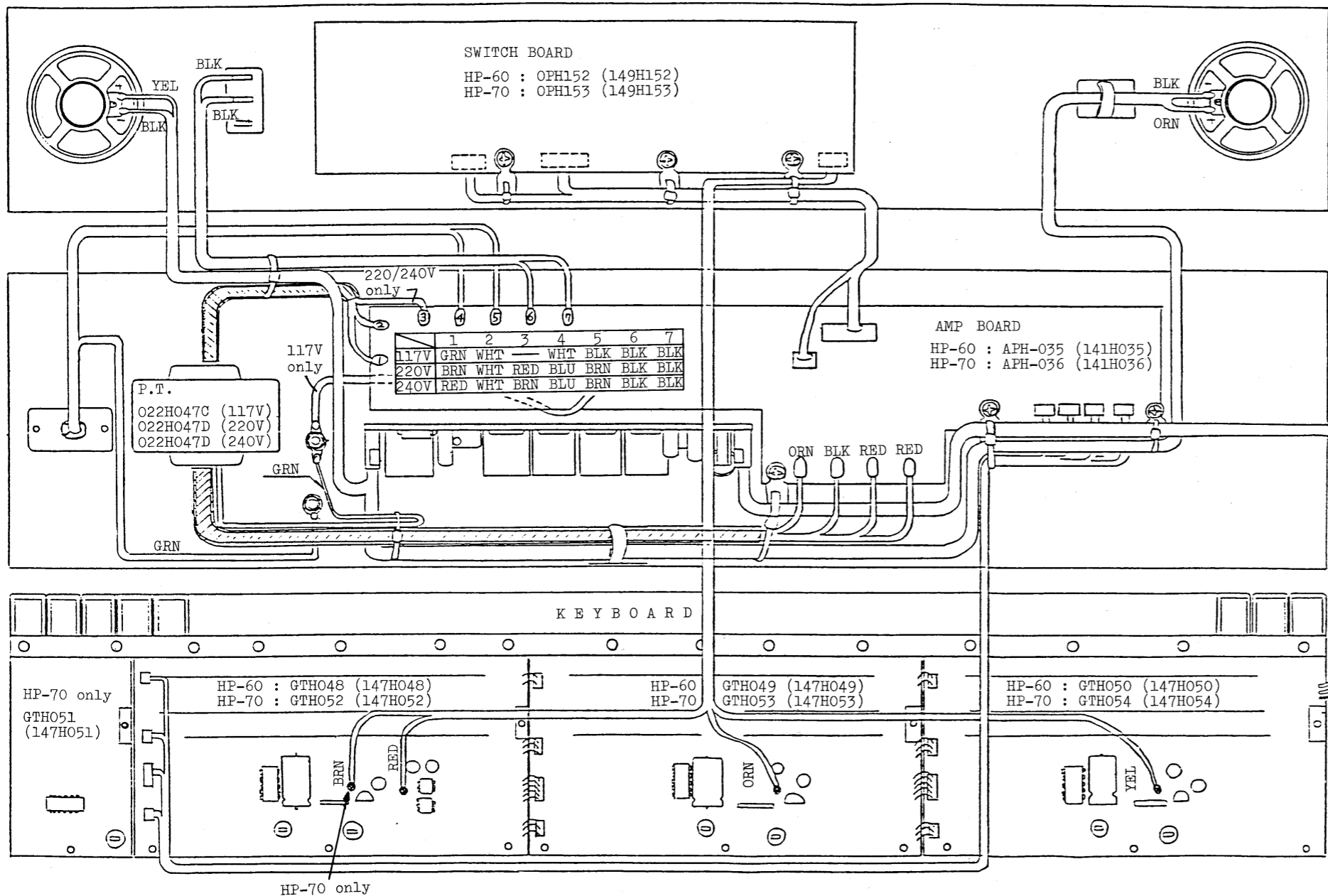
Octave Multipule Tone Synthesizer



ADJUSTMENTS

HP-70	Gate	GTH051	GTH052	GTH053	GTH054		
	Key	G1	G2	G3	G4	G5	G6
Trimmer	VR1	VR1	VR4	VR1	VR4	VR1	VR4
Check point	CP1	CP1	CP2	CP1	CP2	CP1	CP2

HP-60	Gate	GTH048	GTH049	GTH050	
	Key	C2	C3	C4	C5
Trimmer	VR1	VR1	VR4	VR1	VR4
Check point	CP1	CP1	CP2	CP1	CP2



GTH

P-P LEVEL

Set TOUCH CONTROL VR3 at center click.

With the combination shown above.  
Play the key gently and adjust the VR for.  
1.2V p-p waveform.

(VCF)

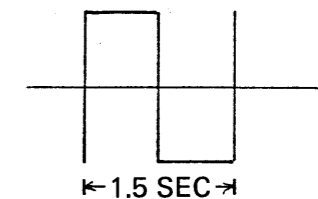
VR2 and VR3 are for factory set only.  
Do not touch them.

APH036 (HP-70 only)

CHORUS SPEED

Connect oscilloscope to CP3.

Adjust VR2 for:

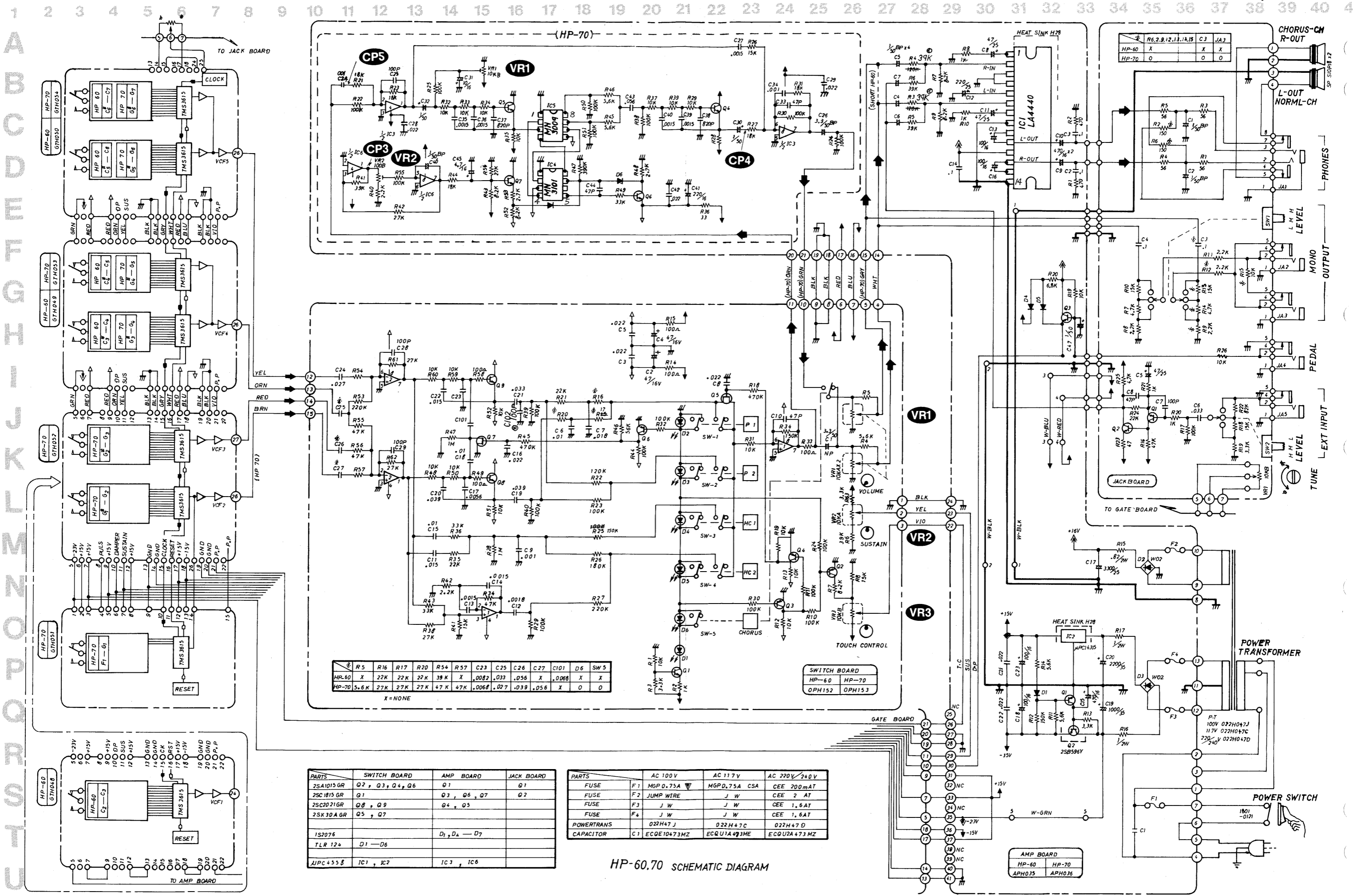


BBD BIAS

Scope to CP4.

Feed sine wave to CP5 with its level adjusted  
for 4V p-p at CP4.

Adjust VR1 for symmetrically flattened peaks.



PARTS	SWITCH BOARD	AMP BOARD	JACK BOARD
2SA1015 GR	Q2, Q3, Q4, Q6	Q1	Q1
2SC1015 GR	Q1	Q3, Q6, Q7	Q2
2SC2021GR	Q8, Q9	Q4, Q5	
2SK30A GR	Q5, Q7		
1S2076		D1, D4 - D7	
TLR 124	D1 - D6		
μPC4558	IC1, IC2	IC3, IC6	

PARTS	AC 100V	AC 117V	AC 220V/240V
FUSE F1	MGP 0.75A	MGP 0.75A	CSA CEE 200mA T
FUSE F2	JUMP WIRE	J W	CEE 2 AT
FUSE F3	J W	J W	CEE 1.6AT
FUSE F4	J W	J W	CEE 1.6AT
POWERTRANS	022H47 J	022H47 C	022H47 D
CAPACITOR C1	ECQE10473MZ	ECQ1A473ME	ECQ2A473MZ

HP-60,70 SCHEMATIC DIAGRAM

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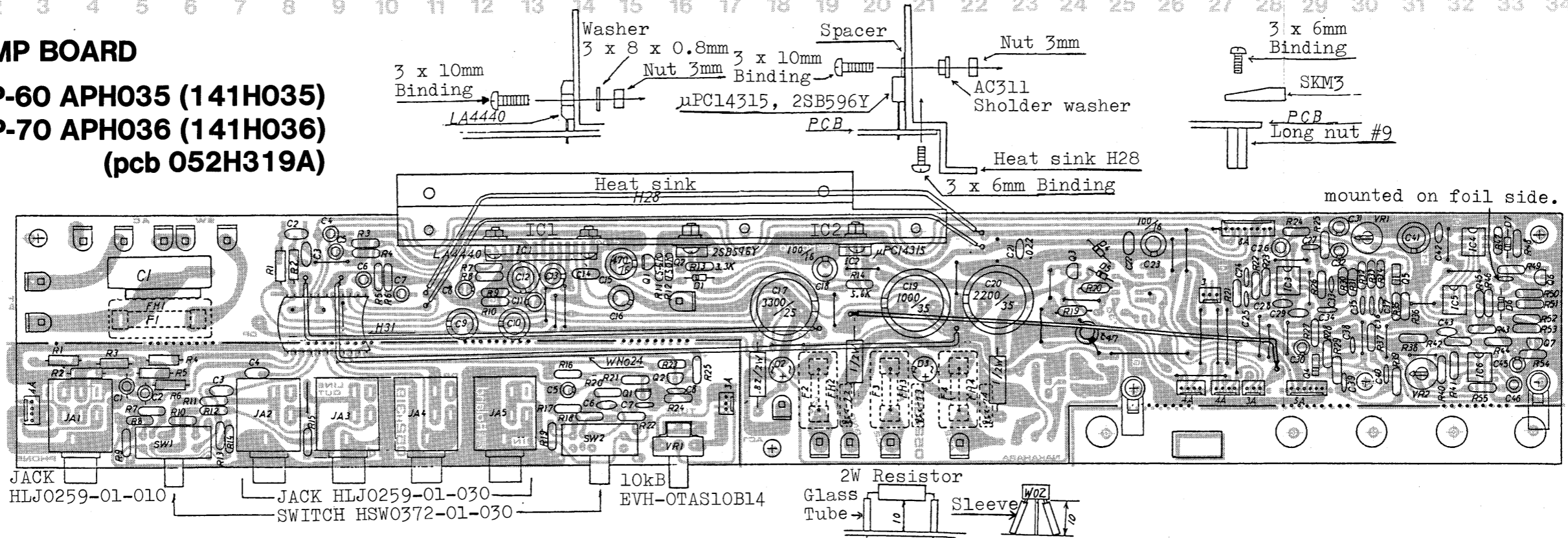
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

**AMP BOARD**

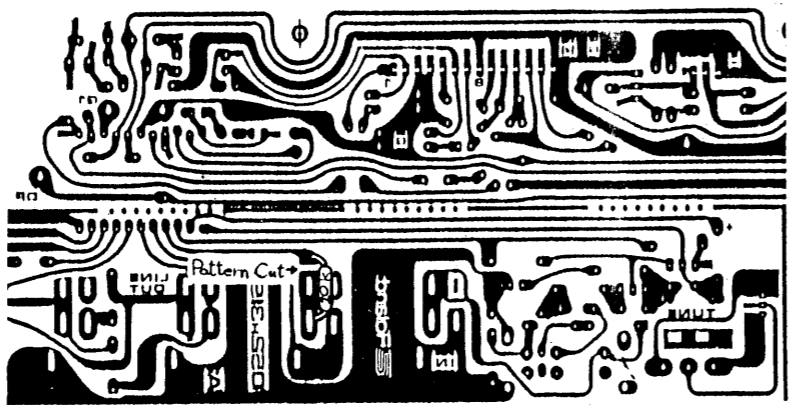
**HP-60 APH035 (141H035)**

**HP-70 APH036 (141H036)**

**(pcb 052H319A)**

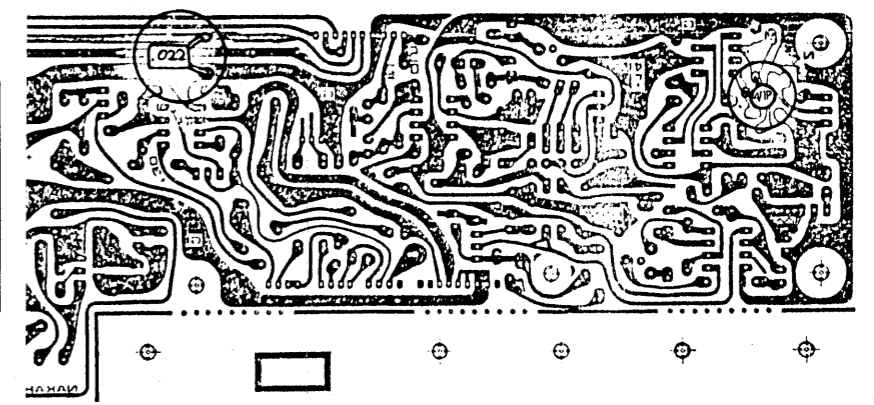


- — 2SC2021R
- — 2SC1815GR
- ◐ — 2SA1015GR
- — IS2076 (IS1555)
- — TL4558 (μPC4558)
- ⊙ — 2SK30GR



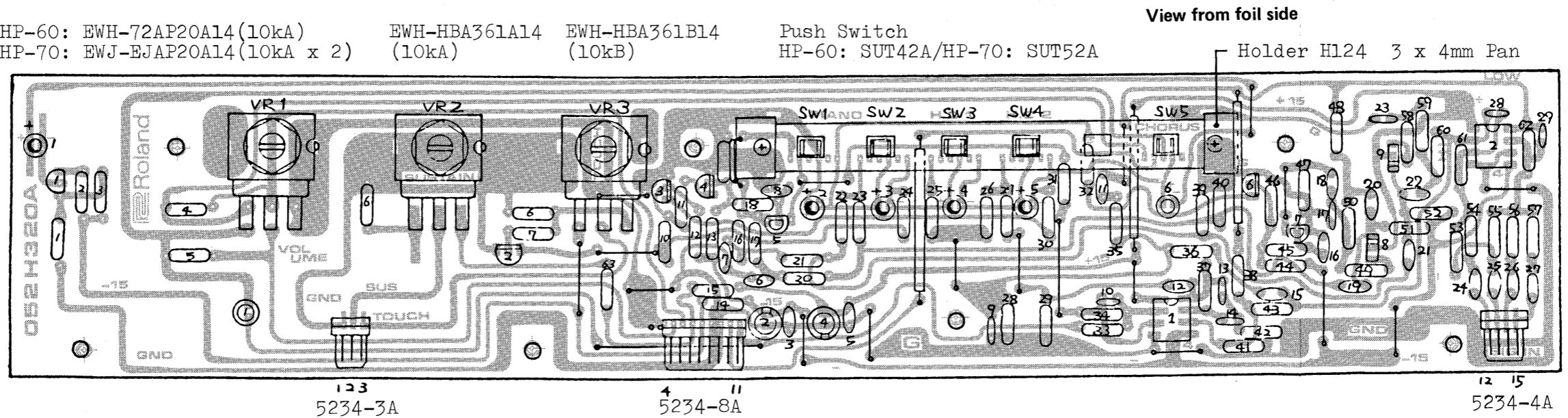
FUSE, FUSE HOLDER (— jumper)

	100V	117V	220/240V
F1	MGP 0.75A	MGP 0.75A	CSA CEE T200mA
F2			CEE T2A
F3			CEE T1.6A
F4			CEE T1.6A
FH1			
FH2	NONE	NONE	TF758
FH3			
FH4			
C1	ECQU1A473MC	ECQU1A473ME	ECQU2A473MF



**SWITCH BOARD HP-60 OPH152 (149H152)/HP-70 OPH153 (149H153) (pcb 052H320A)**

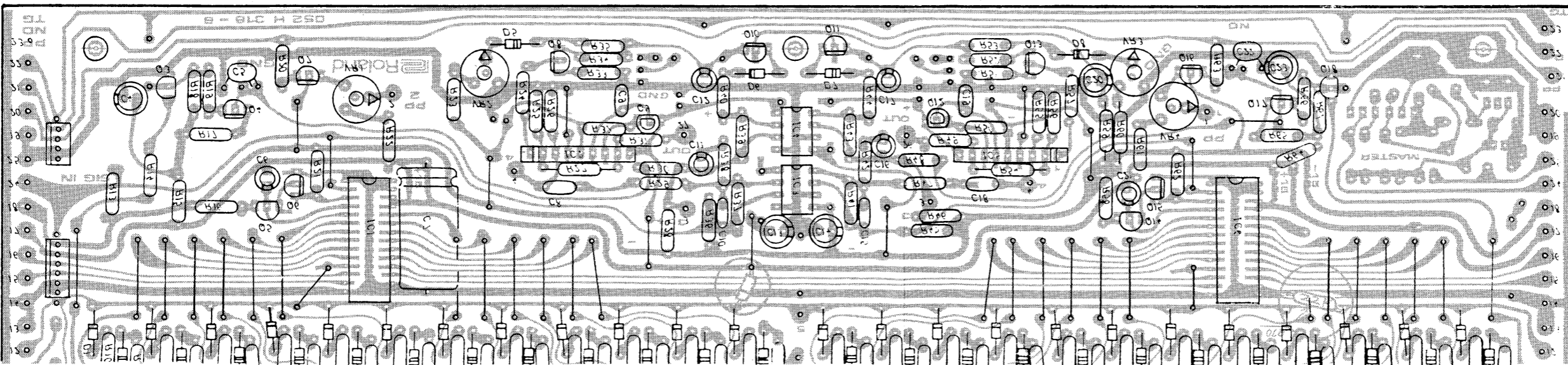
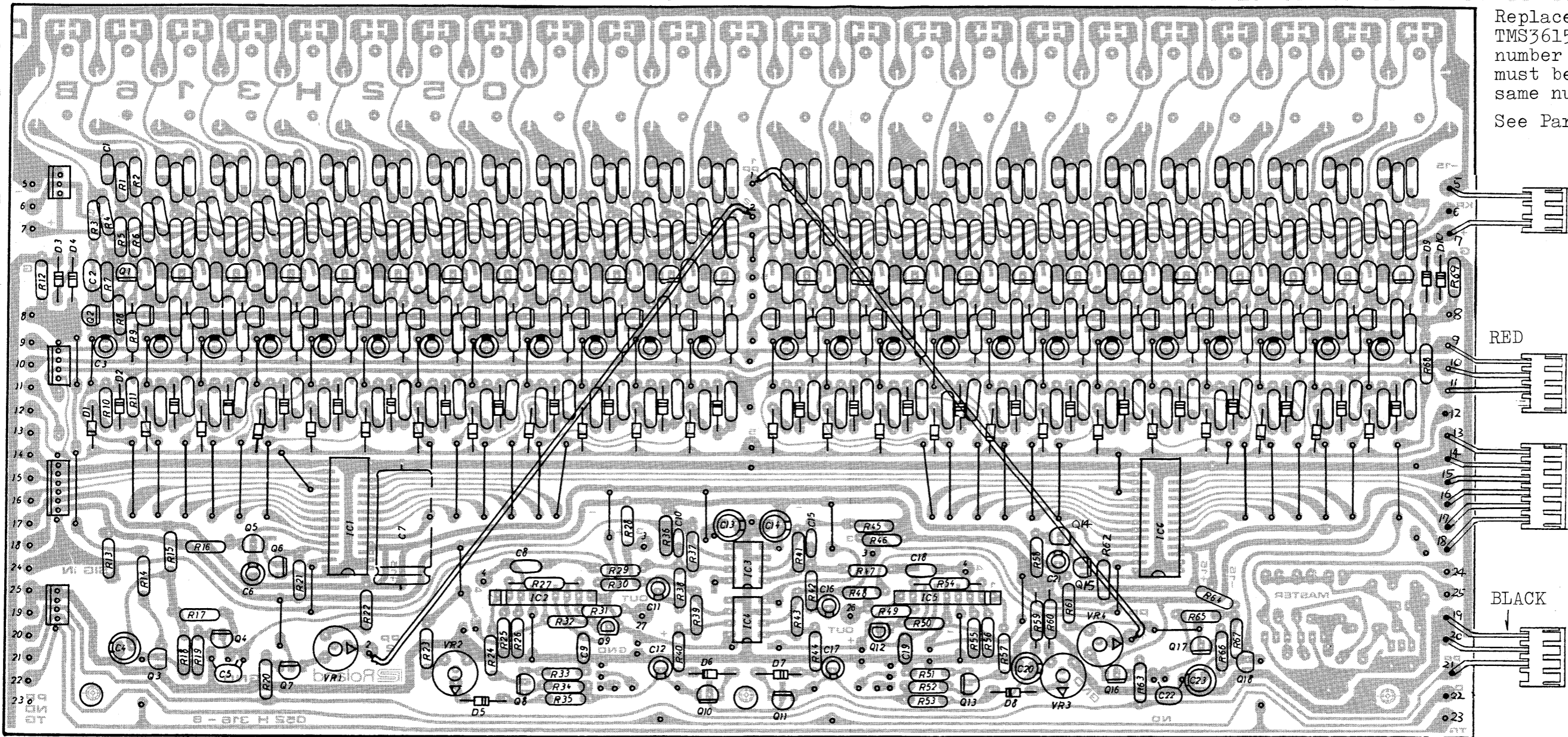
HP-60: EWH-72AP20A14 (10kA) EWH-HBA361A14 EWH-HBA361B14 Push Switch  
 HP-70: EWJ-EJAP20A14 (10kA x 2) (10kA) (10kB) HP-60: SUT42A/HP-70: SUT52A



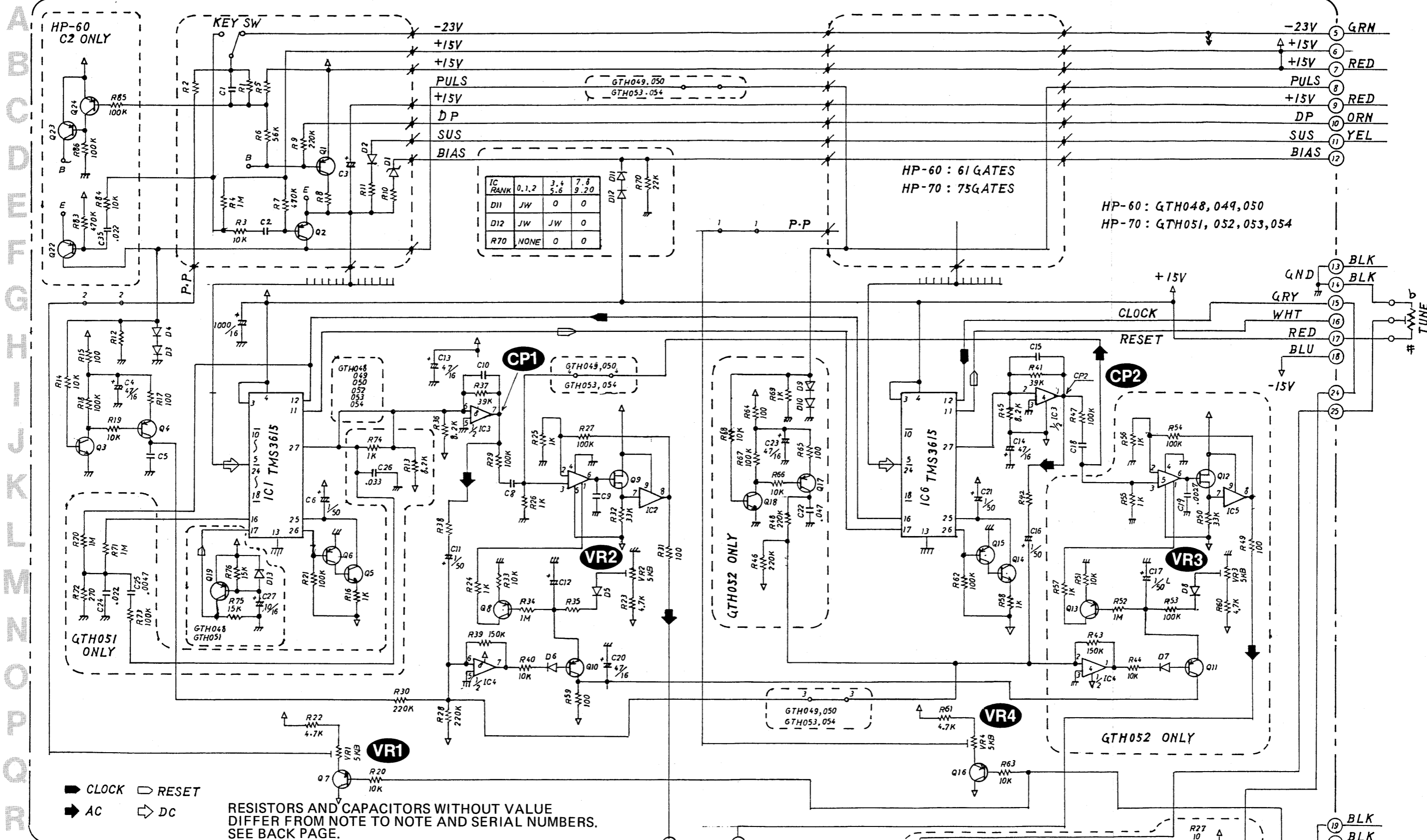
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P  
Q  
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S  
T  
U  
V



Replacement for TMS3615 with number label must be of the same number. See Parts List.



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 40



IC RANK	0.1,2	3.4	5.6	7.8	9.10
D11	JW	0	0		
D12	JW	JW	0		
R70	NONE	0	0		

HP-60 : GTH048, 049, 050  
HP-70 : GTH051, 052, 053, 054

➡ CLOCK    ◻ RESET  
➡ AC        ◻ DC

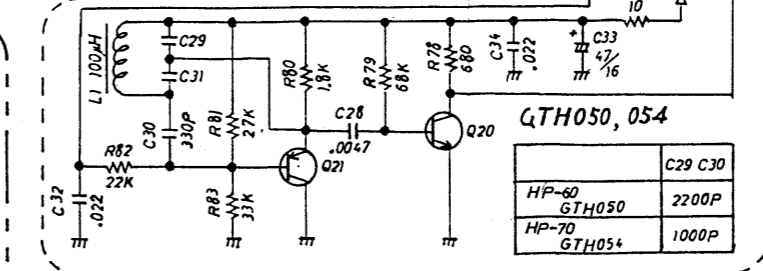
RESISTORS AND CAPACITORS WITHOUT VALUE DIFFER FROM NOTE TO NOTE AND SERIAL NUMBERS. SEE BACK PAGE.

ICs  
IC2, IC5 : BA662  
IC3, IC4 : PC4558N or TL4558

Transistors  
All PNP : 2SA1015GR  
All NPN : 2SC1815GR  
All FET : 2SK30GR

Diodes  
D1 : RD4.7EB2  
D2 : ISS84  
D3~D13 : IS2076  
OR  
ISI555

TMS3615 WITH NUMBER LABEL  
The IC is a selected one and must be replaced only by the same number. SEE PARTS LIST FOR DETAIL.



19 BLK  
20 BLK  
21 V10  
22  
23



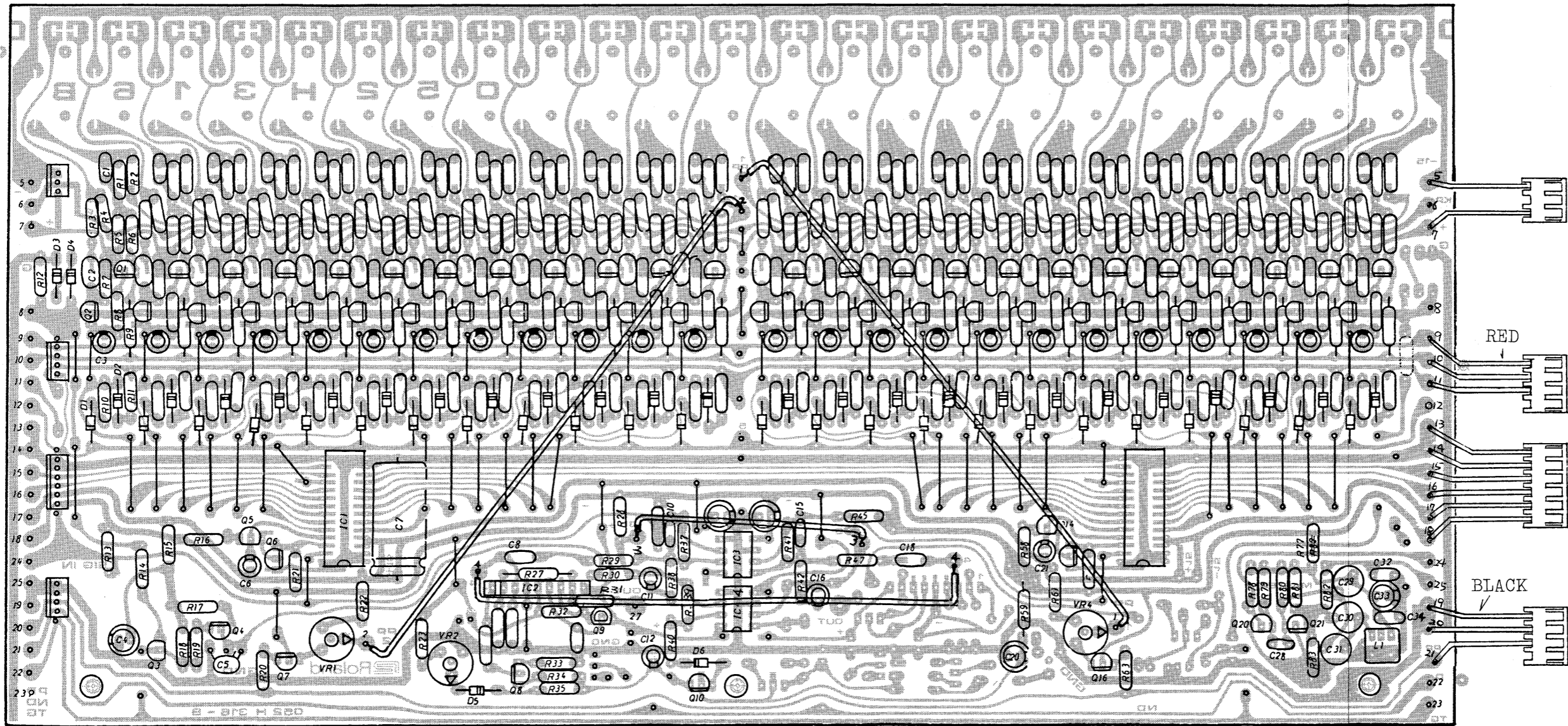


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

**GATE BOARD**

**HP-60 GTH049 (147H049) GTH050 (147H050)**

**HP-70 GTH053 (147H053) GTH054 (147H054) (pcb 052H316B)**

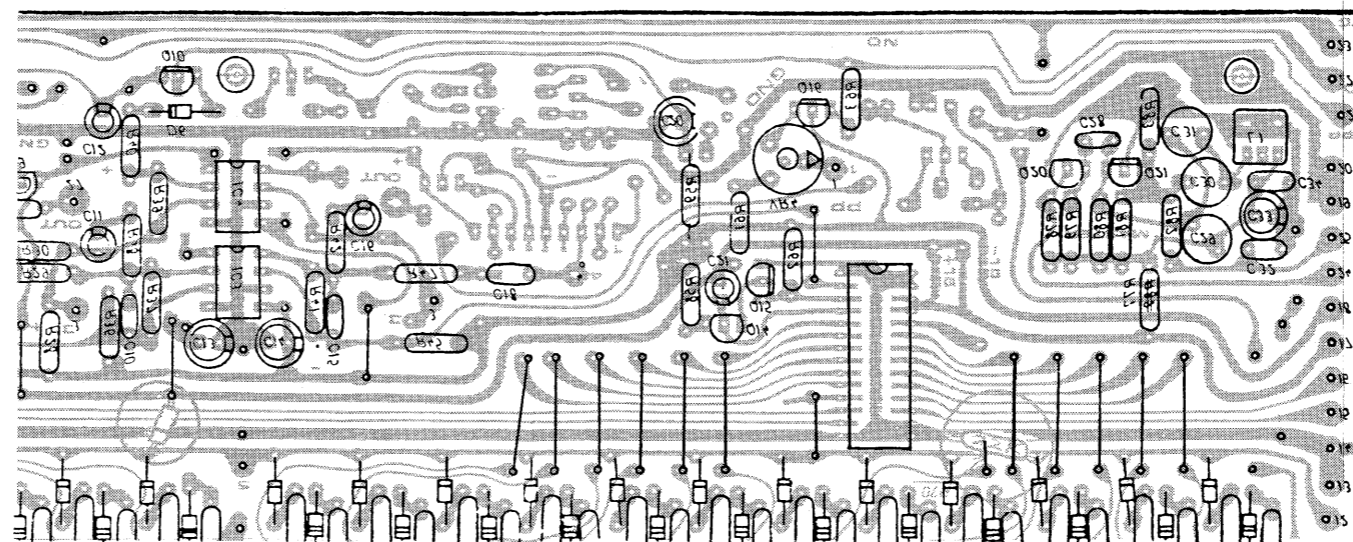


**GTH049  
GTH053**

RED

BLACK

View from foil side



**GTH050  
GTH054**

BLACK

WHITE

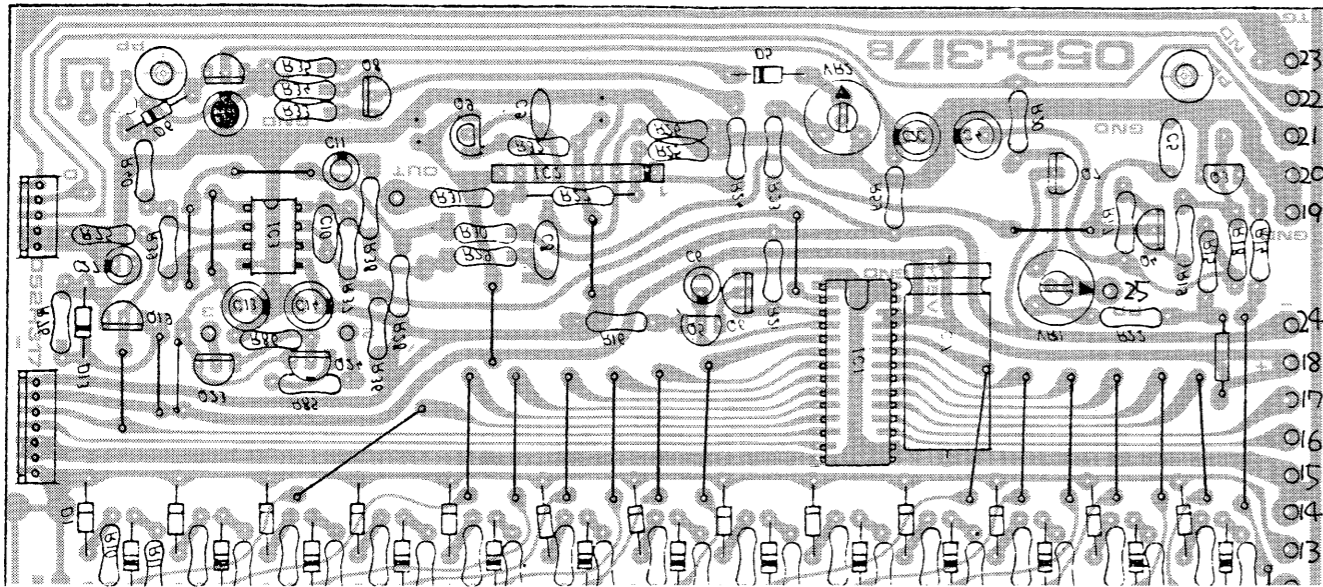
- TMS3615 NS-R1
- TL4558 (PC4558)
- BA662A RED
- 2SA1015GR
- 2SC1815GR
- 2SK30GR

- RD4.7E B2
- ISS84 (low leakage)
- IS2076 (IS1555)
- CE04 W MD (low leakage)

TMS3615 with number label needs replacement to be the same number. See Parts List for detail.

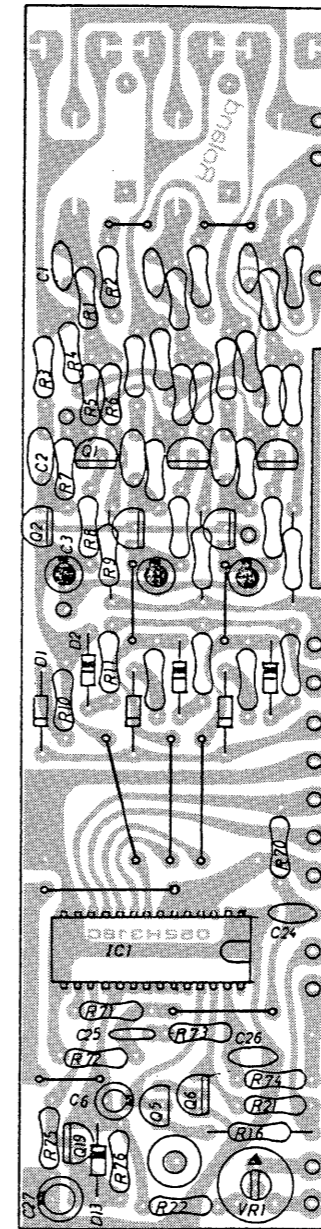
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41

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



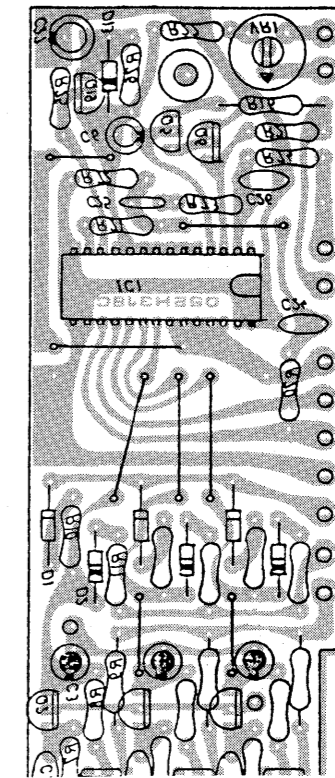
**GATE BOARD**  
**HP-60 GTH048**  
**(147H048)**  
**(pcb 052H317B)**

View from foil side

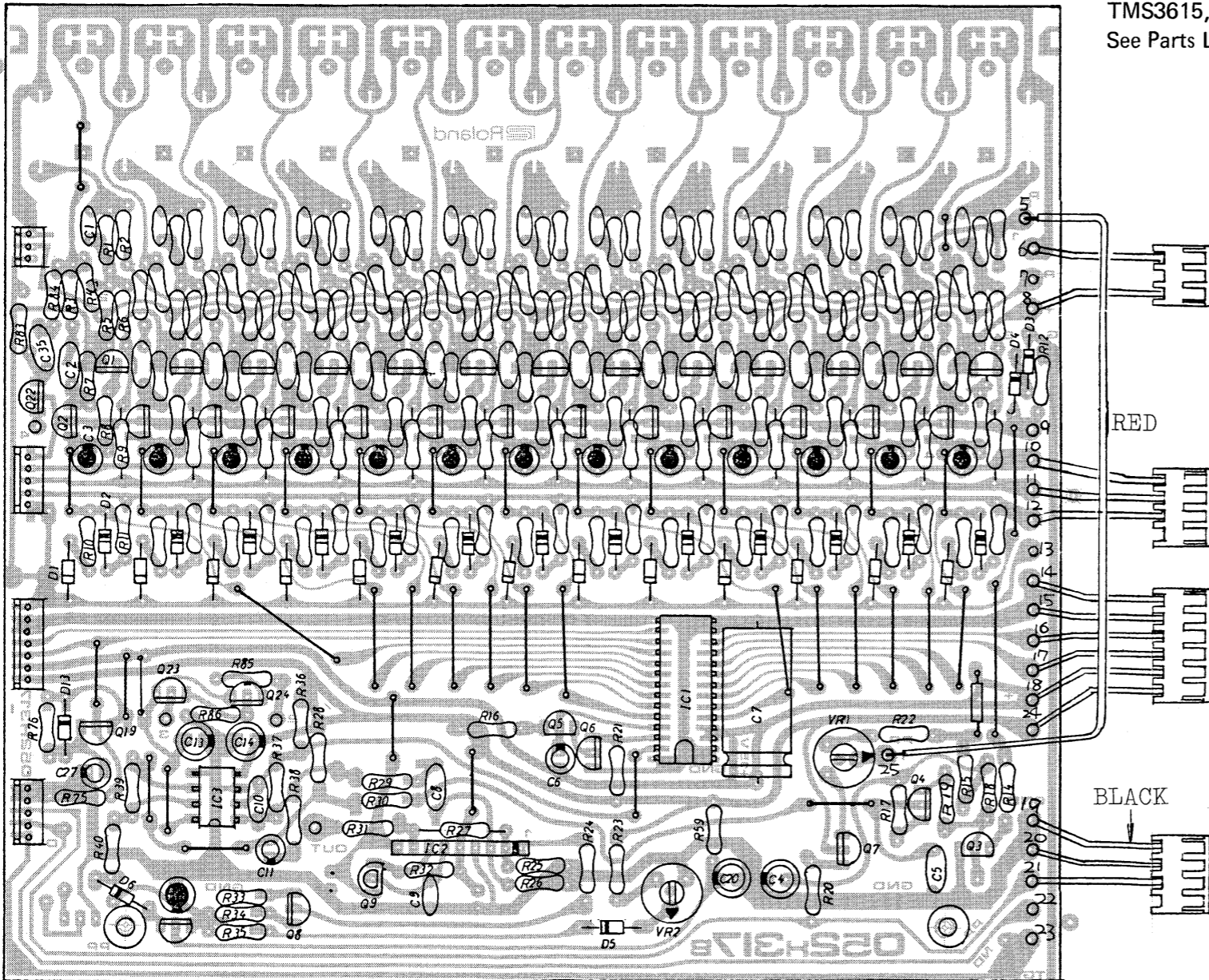


**GATE BOARD**  
**HP-70 GTH-051**  
**(147H051)**  
**(pcb 052H318C)**

View from foil side



When replacing number labeled TMS3615, use the same no. only. See Parts List for detail.



● — low leakage

