VOCODER SERVICE MANUAL VC-10

CONTENTS

KEIO ELECTRONIC LABORATORY CORPORATION
TOKYO/JAPAN

1. SPECIFICATIONS

<Controls>

1. Keyboard	32 keys F ~ C
	Octave range: normal 16′
	up 8′
	Tuning ±100 cents
	Accent bend
	Vibrato speed (1 Hz ~ 10 Hz)
	Vibrato depth (0 ~ 100 cent P-P)
	External pitch control
	Pitch control wheel (±½ octave)
2. Signal mixers	Input signal balance (keyboard/noise)
	External signal level
3. Frequency response simulator	Microphone level
4. Meter	VU meter
5. Final controls	Ensemble
	Power switch/final volume
	Output balance (simulator/mike)
	Headphone level

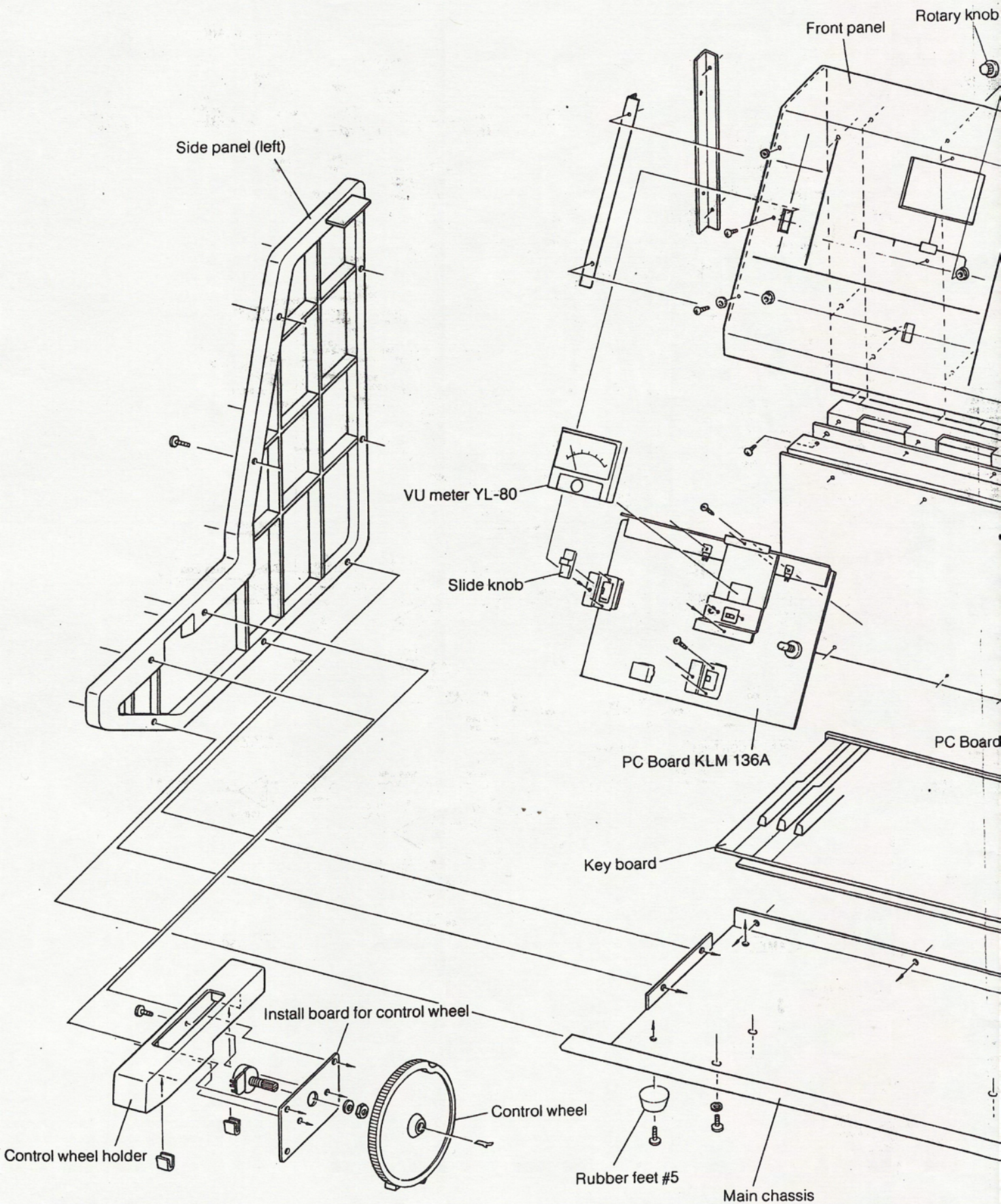
<Inputs>

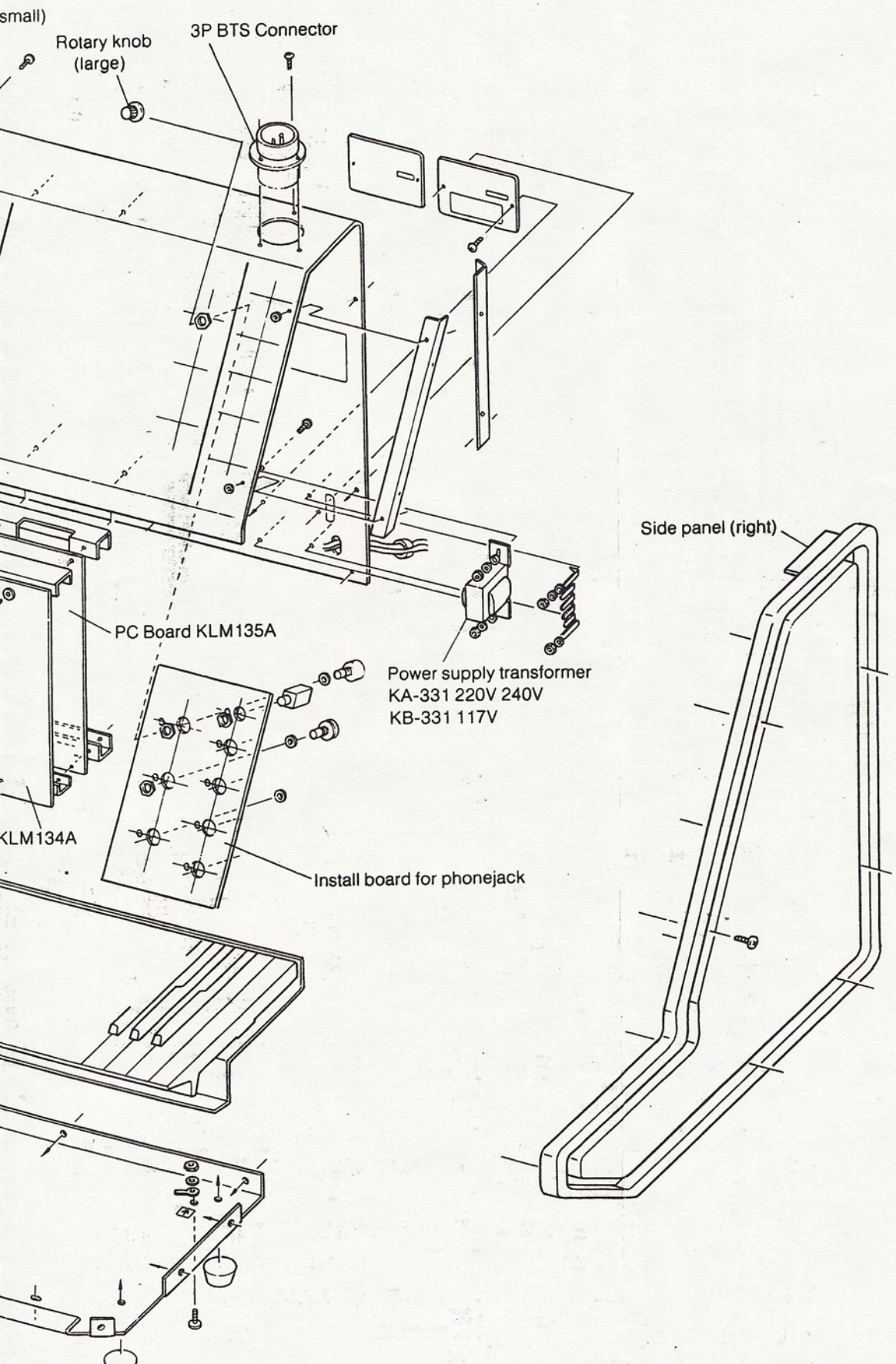
1. Mike inputs	BTS connector input 2P phone jack input } 50 ~
2. Signal inputs	Signal input 3V p-p MAX
	Pitch control input (1/3-oct/volt
	−3V ~ 3V

<Outputs>

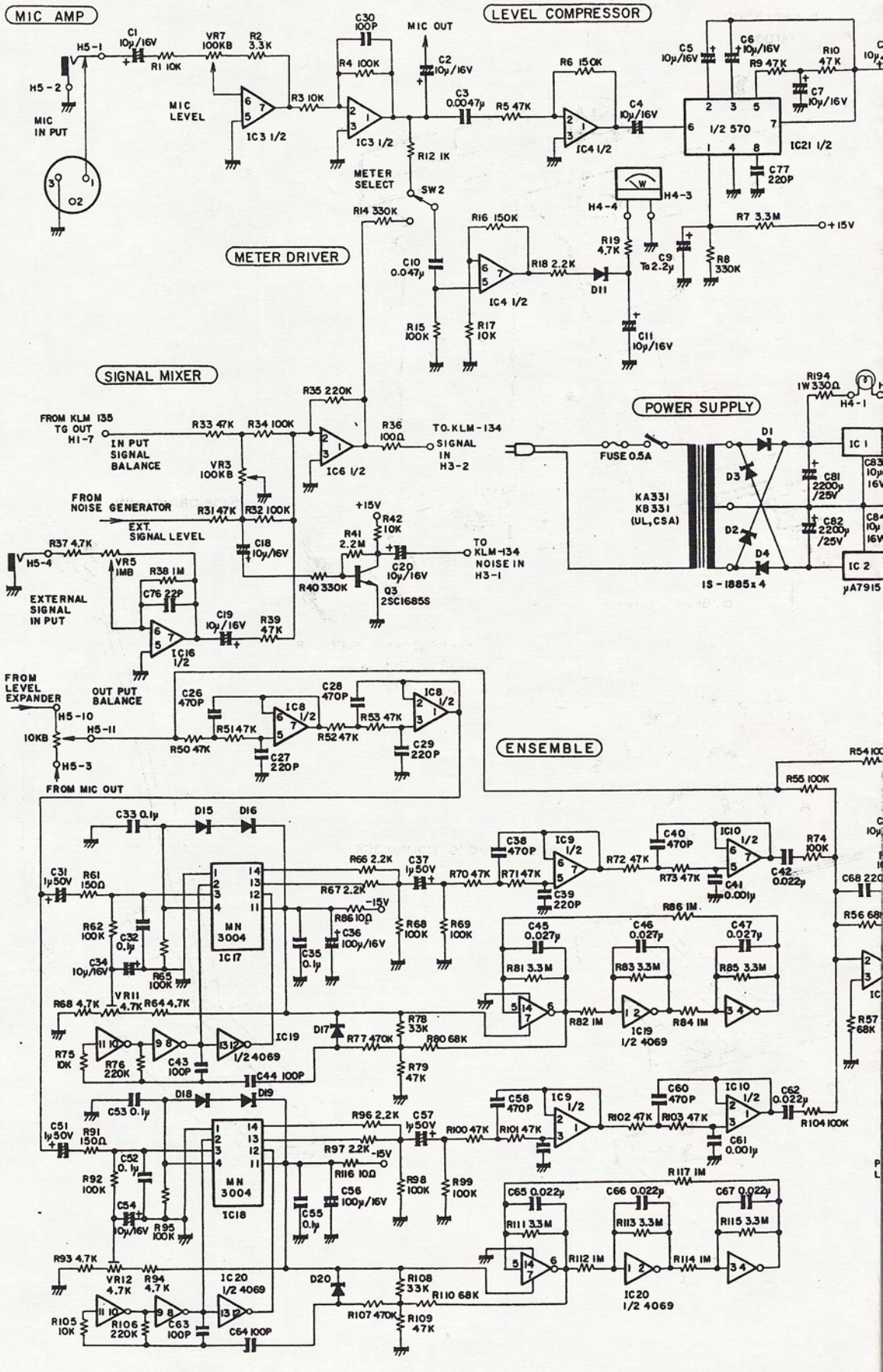
1. Final	Final out −10dB (output impedance 3KΩ)
2. Headphone	Headphone out 8Ω 120mW
Power consumption	25W
Dimensions	499(W) x 309(D) x 249(H) mm
Weight	7kg

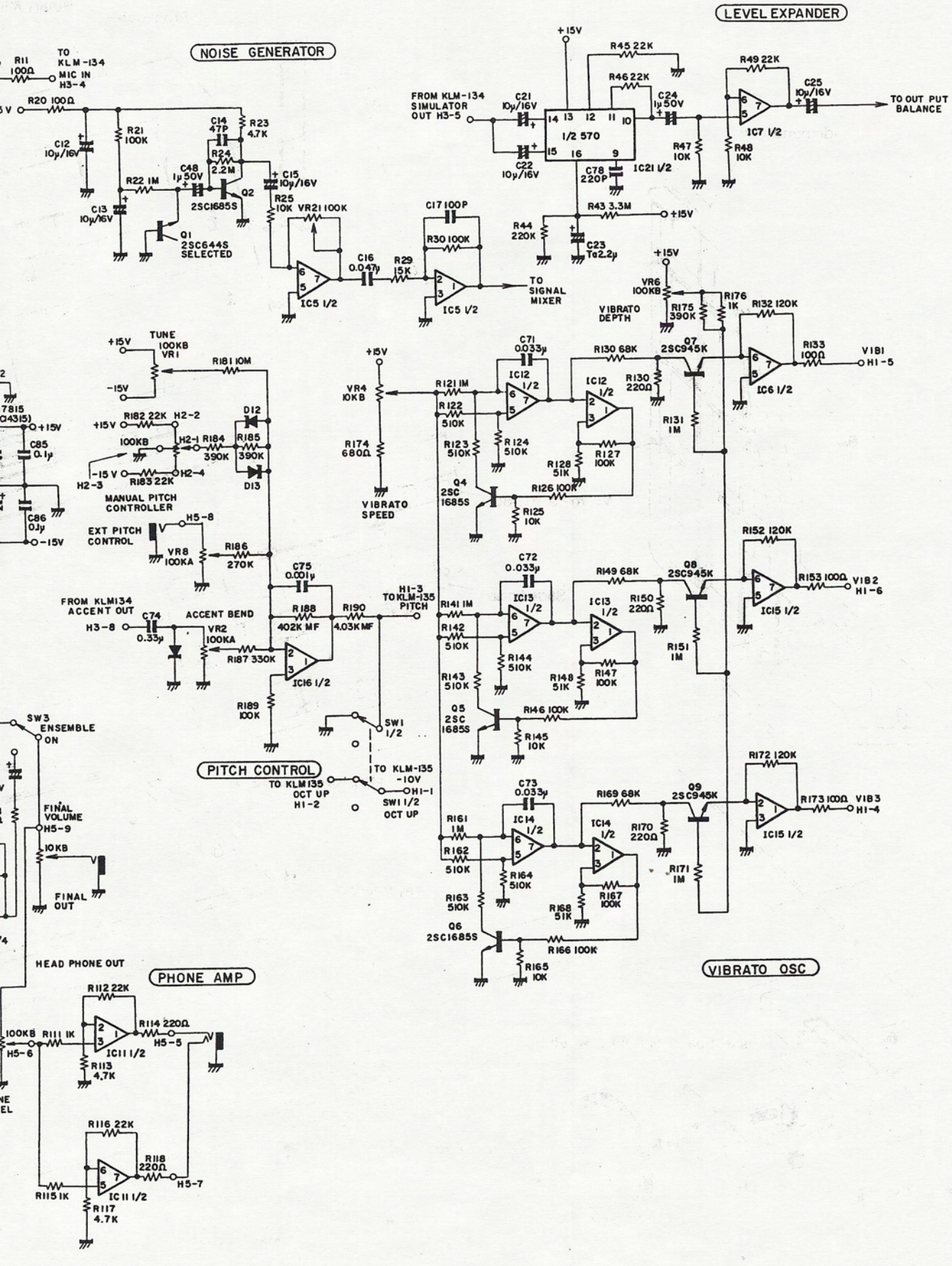
2. STRUCTURAL DIAGRAM



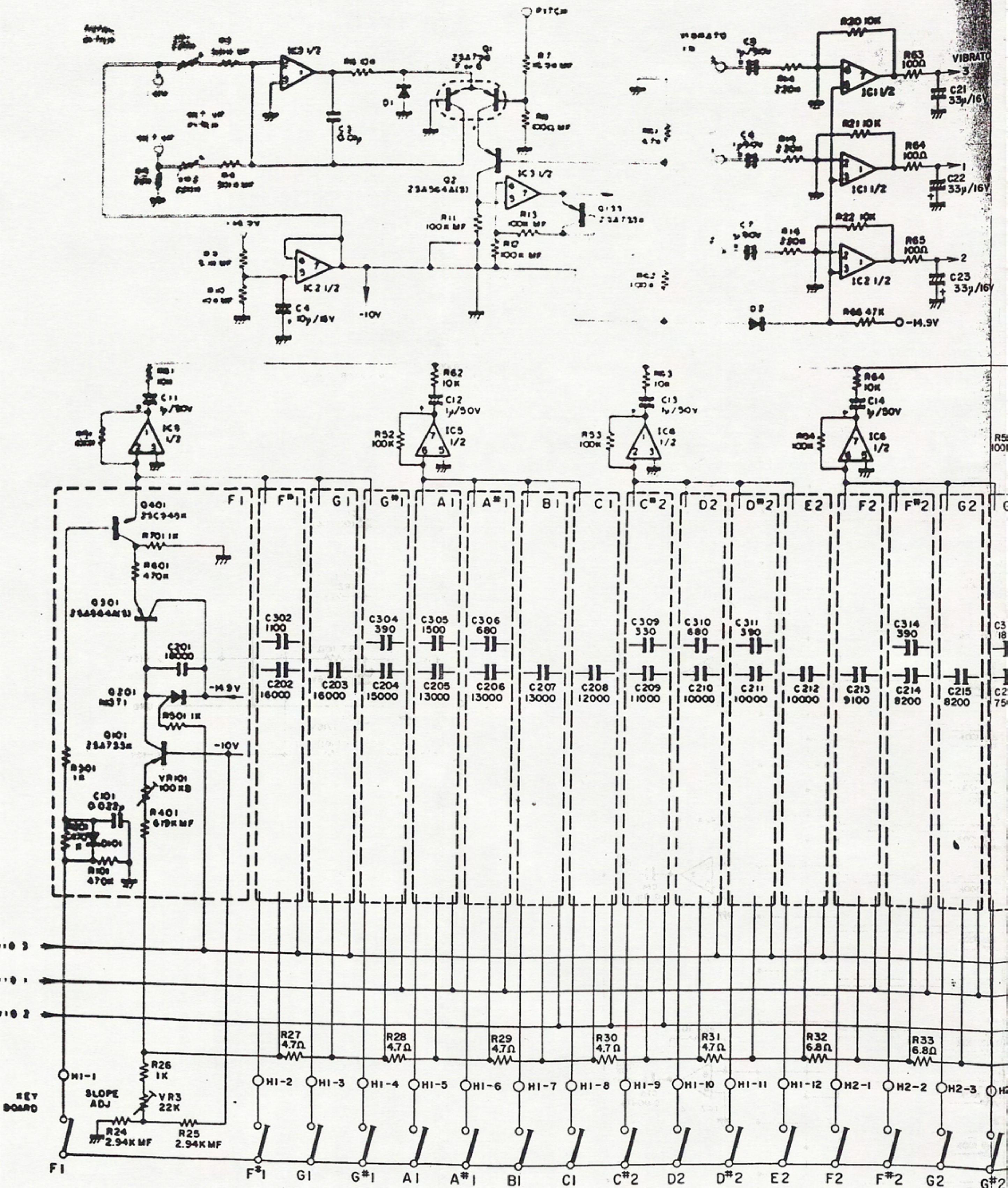

small)
Rotary knob
(large)
3P BTS Connector
PC Board KLM135A
Power supply transformer
KA-331 220V 240V
KB-331 117V
KLM134A
Install board for phonejack
Side panel (right)

3. CIRCUIT DIAGRAM KLM-136

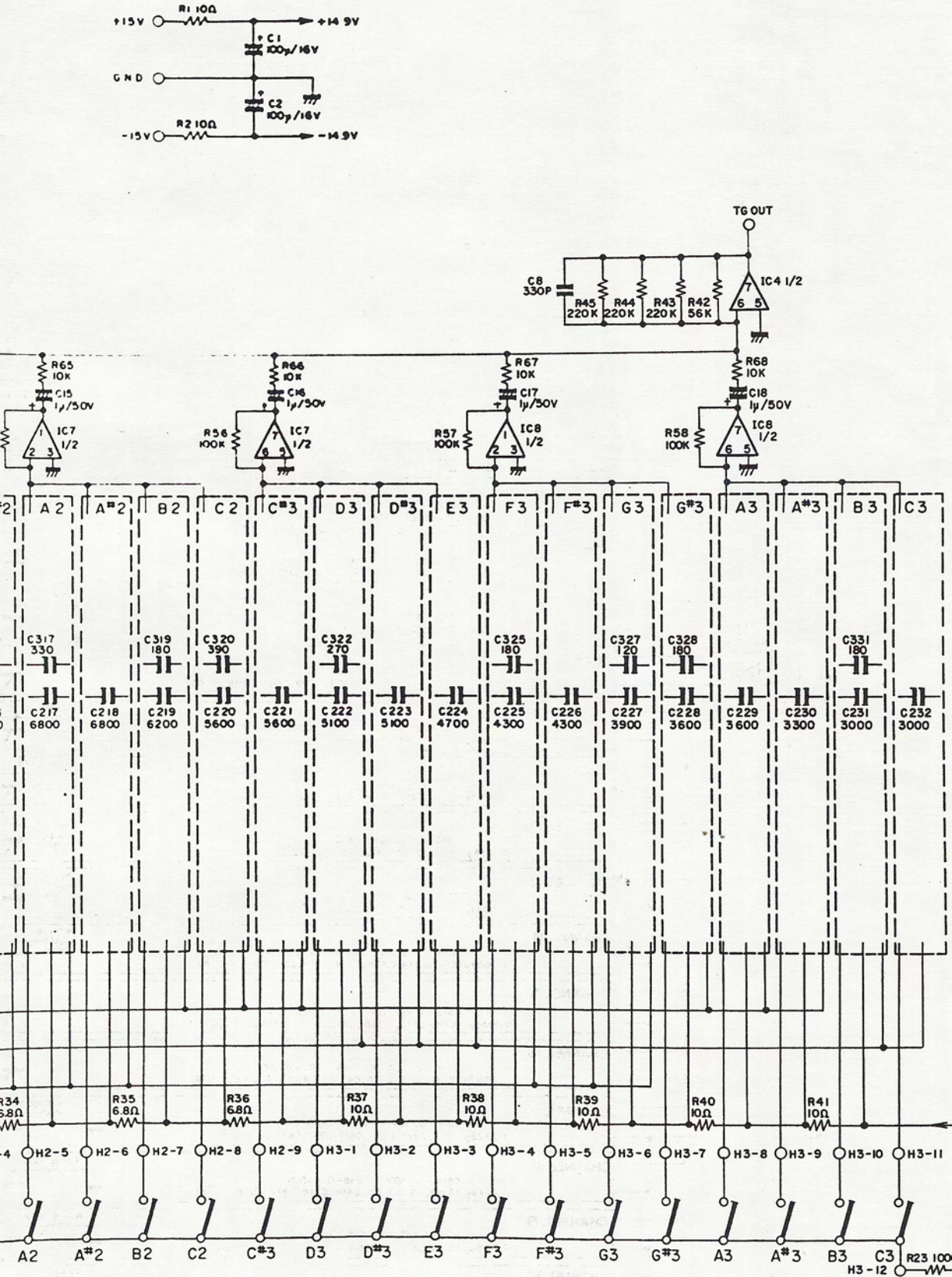



LEVEL EXPANDER
NOISE GENERATOR
PITCH CONTROL
PHONE AMP
VIBRATO OSC
MANUAL PITCH CONTROLLER
TO KLM-134 MIC IN H3-4
FROM KLM-134 SIMULATOR OUT H3-5
TO OUT PUT BALANCE
TO SIGNAL MIXER
VIBRATO DEPTH
VIBRATO SPEED
EXT PITCH CONTROL
FROM KLM134 ACCENT OUT H3-8
ACCENT BEND
TO KLM-135 PITCH
TO KLM135 OCT UP H1-2
TO KLM-135 -1OV H1-1 OCT UP
SW3 ENSEMBLE ON
FINAL VOLUME H5-9
FINAL OUT
HEAD PHONE OUT
TUNE 100KB VR1
+15V
-15V
1/2 570
IC5 1/2
IC6 1/2
IC7 1/2
IC11 1/2
IC12 1/2
IC13 1/2
IC14 1/2
IC15 1/2
IC16 1/2
IC21 1/2
2SC1685S
2SC945K
VIB1 H1-5
VIB2 H1-6
VIB3 H1-4

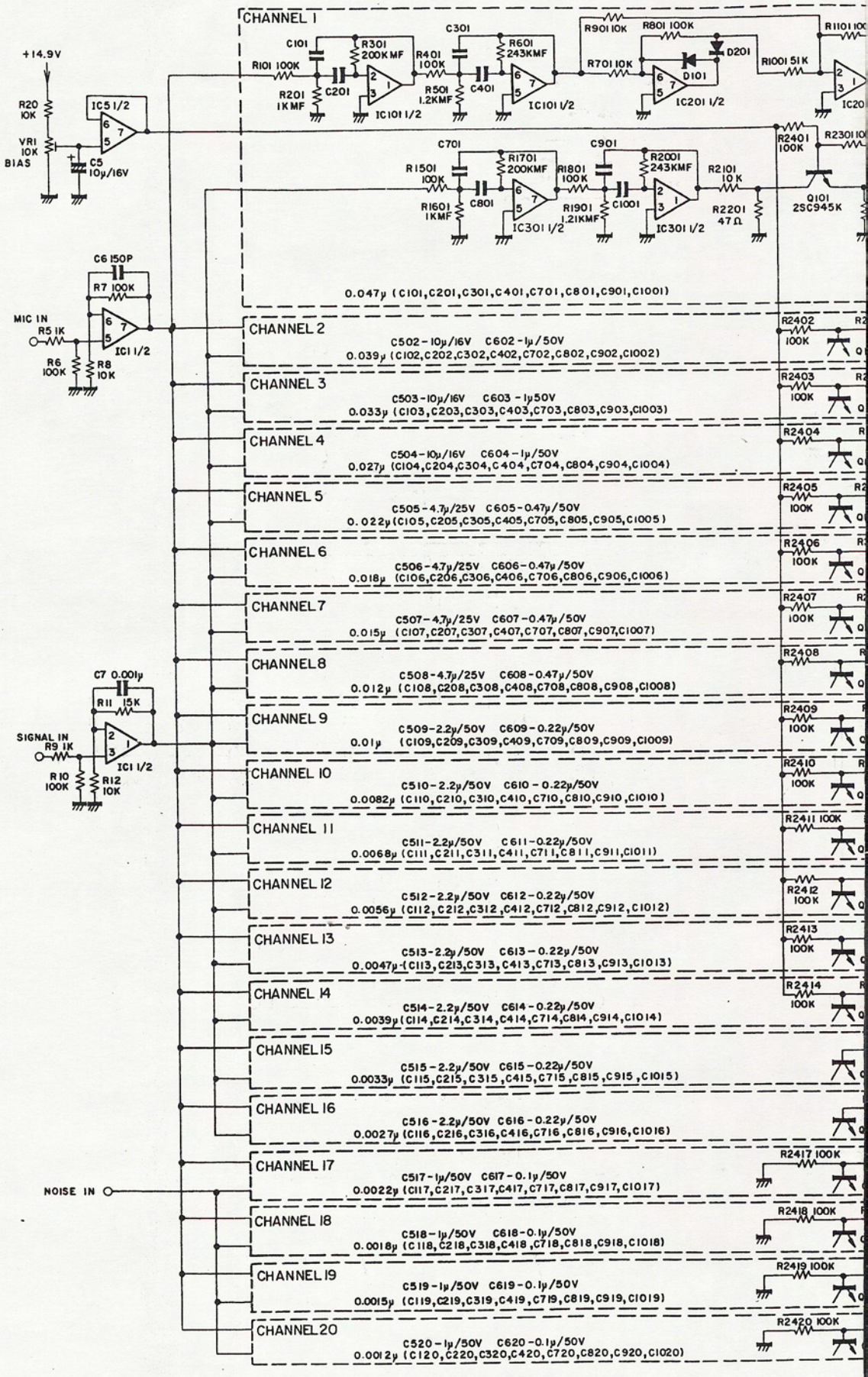
KLM-135

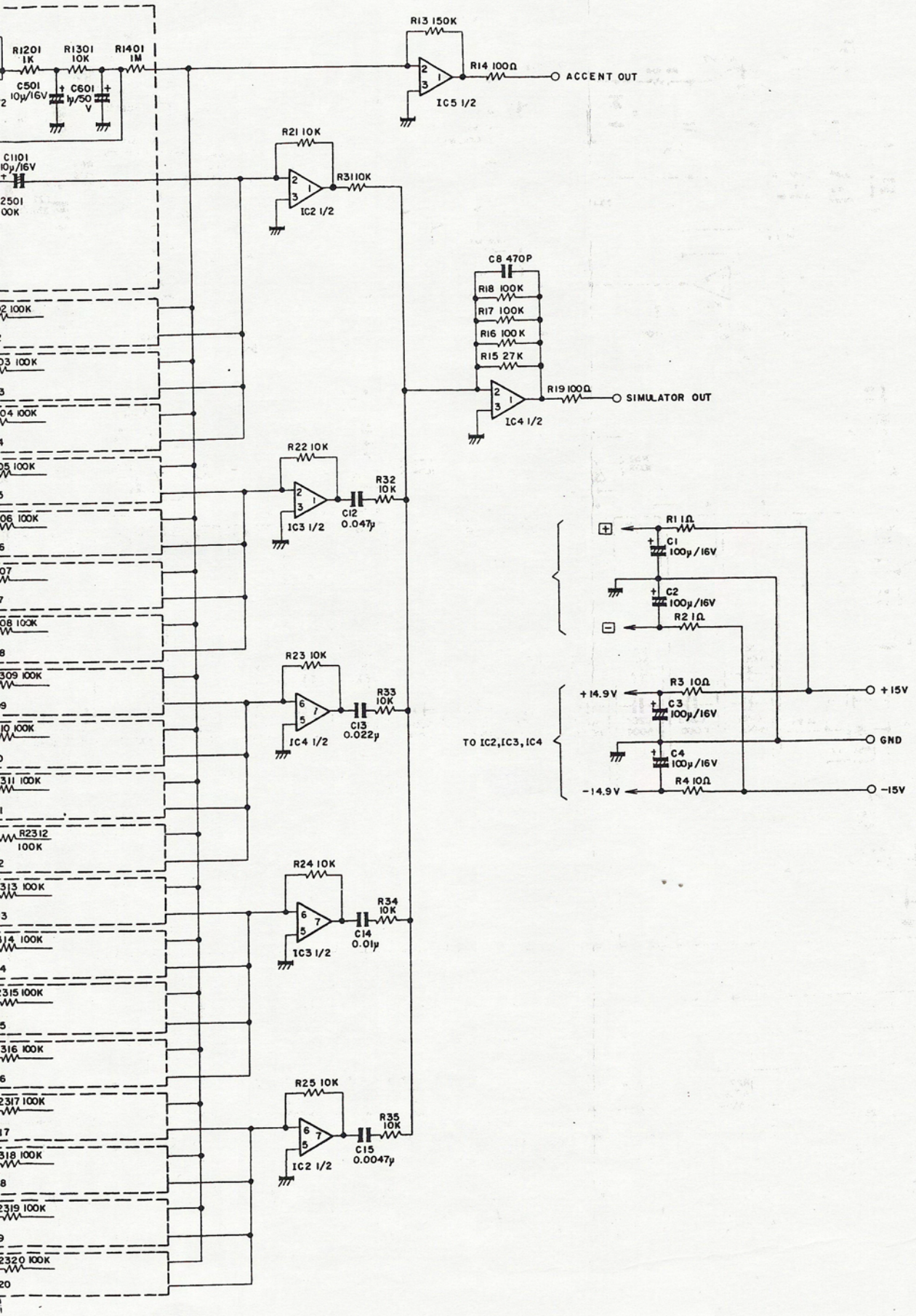


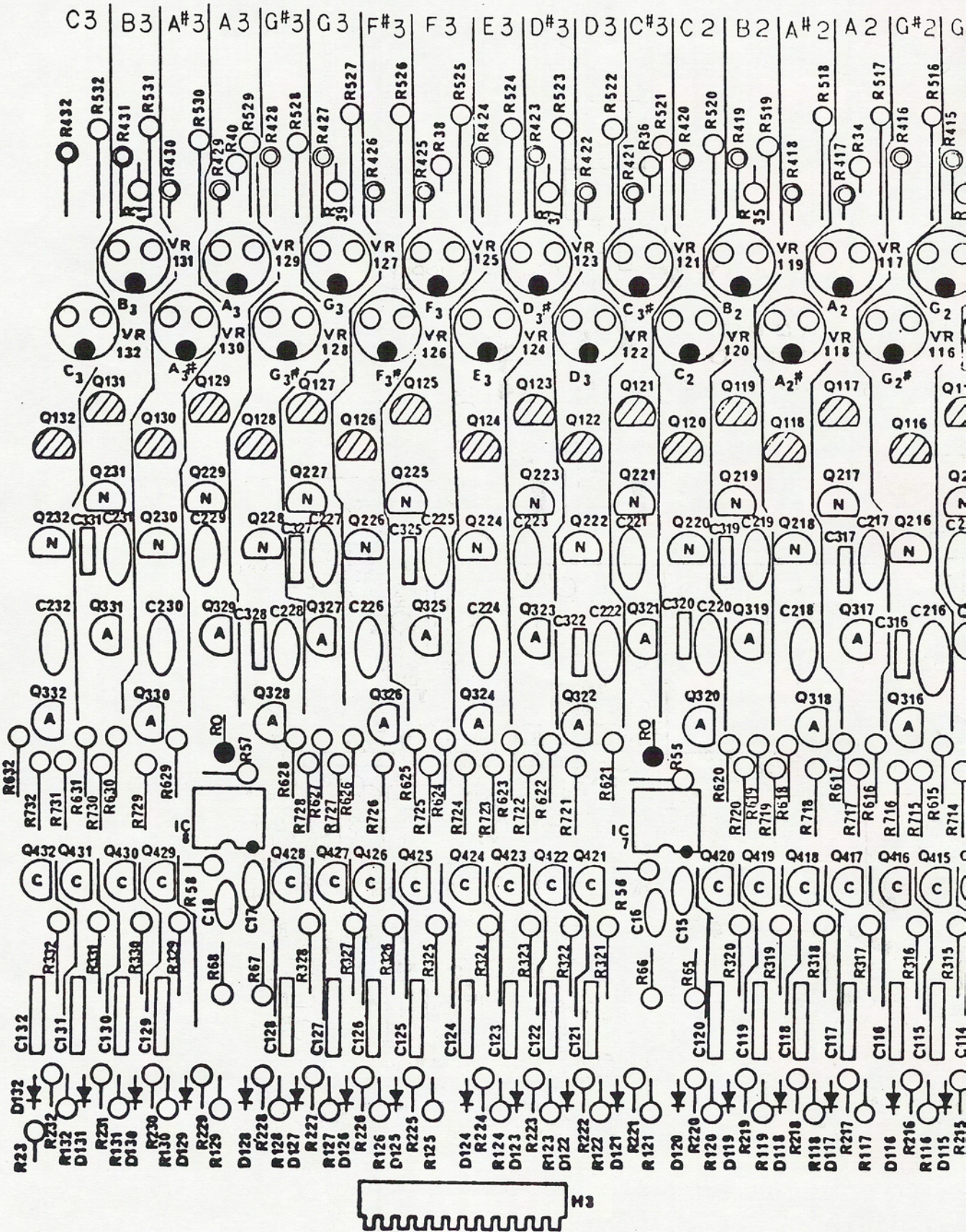
VIBRATO
R20 10K
R21 10K
R22 10K
R63 100Ω
R64 100Ω
R65 100Ω
C21 33μ/16V
C22 33μ/16V
C23 33μ/16V
IC1 1/2
IC2 1/2
IC3 1/2
R66 47K
-14.9V
-10V
C4 10μ/16V
R11 100K MF
R12 100K MF
R13 100K MF
Q2 2SA564A(S)
R62 10K
C12 1μ/50V
R52 100K
IC5 1/2
C13 1μ/50V
R53 100K
IC6 1/2
R64 10K
C14 1μ/50V
F1
F#1
G1
G#1
A1
A#1
B1
C1
C#2
D2
D#2
E2
F2
F#2
G2
Q401 2SC945K
R701 1K
R601 470K
Q301 2SA564A(S)
C201 18000
Q201 1S371
R501 1K
Q101 2SA733K
R301 1K
VR101 100KB
C101 0.022μ
R401 619K MF
R101 470K
C302 1100
C304 390
C305 1500
C306 680
C309 330
C310 680
C311 390
C314 390
C202 16000
C203 16000
C204 15000
C205 13000
C206 13000
C207 13000
C208 12000
C209 11000
C210 10000
C211 10000
C212 10000
C213 9100
C214 8200
C215 8200
R27 4.7Ω
R28 4.7Ω
R29 4.7Ω
R30 4.7Ω
R31 4.7Ω
R32 6.8Ω
R33 6.8Ω
R26 1K
SLOPE ADJ
VR3 22K
R24 2.94K MF
R25 2.94K MF
KEY BOARD
H1-1
H1-2
H1-3
H1-4
H1-5
H1-6
H1-7
H1-8
H1-9
H1-10
H1-11
H1-12
H2-1
H2-2
H2-3


+15V
R1 10Ω
+14.9V
C1 100μ/16V
GND
C2 100μ/16V
-15V
R2 10Ω
-14.9V
TG OUT
C8 330P
R45 220K
R44 220K
R43 220K
R42 56K
IC4 1/2
R65 10K
C15 1μ/50V
IC7 1/2
R66 10K
C16 1μ/50V
R56 100K
IC7 1/2
R67 10K
C17 1μ/50V
R57 100K
IC8 1/2
R68 10K
C18 1μ/50V
R58 100K
IC8 1/2
A2
A#2
B2
C2
C#3
D3
D#3
E3
F3
F#3
G3
G#3
A3
A#3
B3
C3
C317 330
C319 180
C320 390
C322 270
C325 180
C327 120
C328 180
C331 180
C217 6800
C218 6800
C219 6200
C220 5600
C221 5600
C222 5100
C223 5100
C224 4700
C225 4300
C226 4300
C227 3900
C228 3600
C229 3600
C230 3300
C231 3000
C232 3000
R35 6.8Ω
R36 6.8Ω
R37 10Ω
R38 10Ω
R39 10Ω
R40 10Ω
R41 10Ω
H2-5
H2-6
H2-7
H2-8
H2-9
H3-1
H3-2
H3-3
H3-4
H3-5
H3-6
H3-7
H3-8
H3-9
H3-10
H3-11
H3-12
R23 100

KLM-134

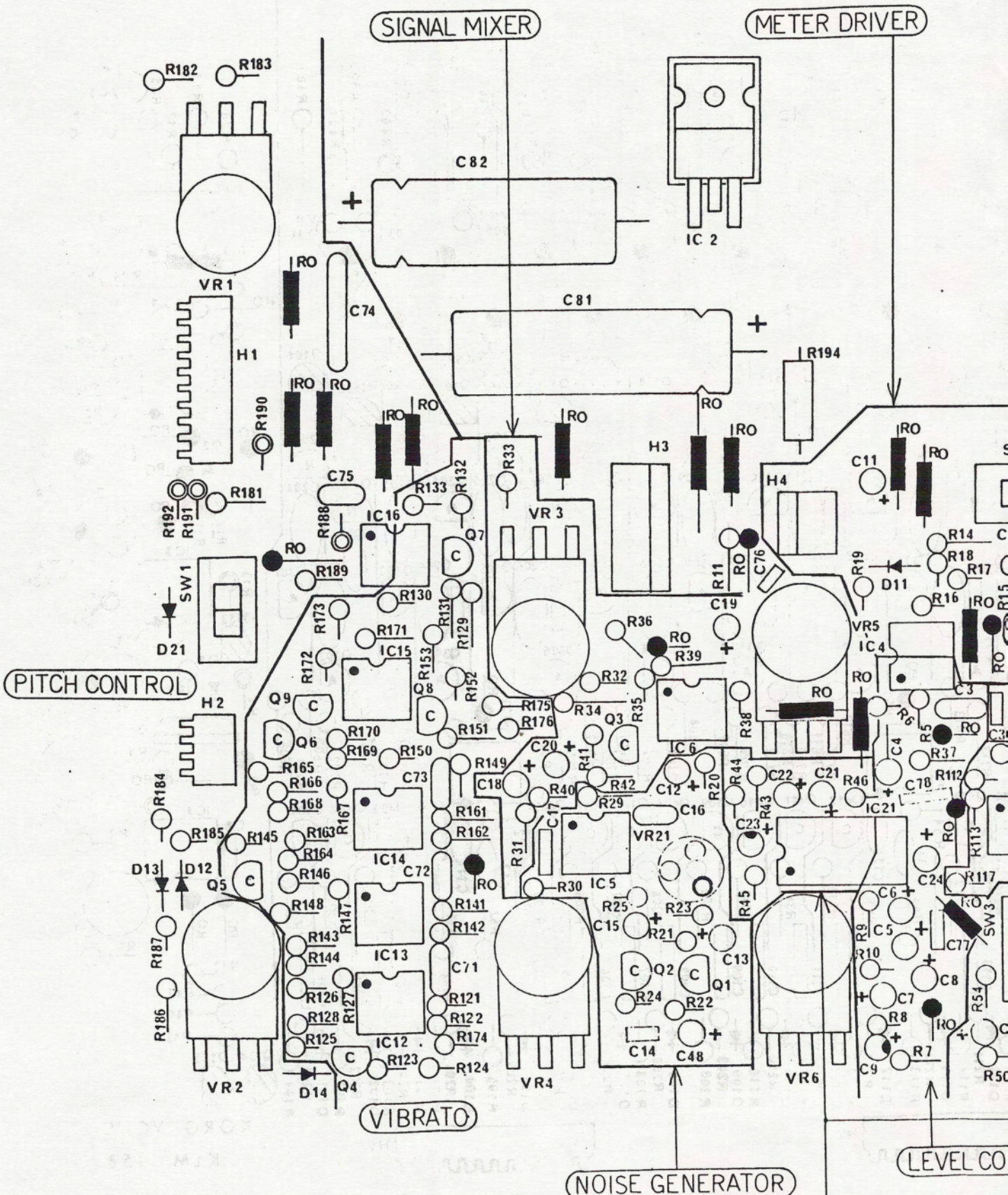

CHANNEL 1
+14.9V
R20 10K
VR1 10K BIAS
IC5 1/2
C5 10μ/16V
C101
R301 200KMF
R101 100K
C201
R201 1KMF
IC101 1/2
R401 100K
C301
R501 1.2KMF
R601 243KMF
C401
IC101 1/2
R901 10K
R801 100K
D201
R701 10K
D101
IC201 1/2
R1001 51K
R1101 10K
IC201
C701
R1501 100K
R1701 200KMF
R1601 1KMF
C801
IC301 1/2
C901
R1801 100K
R2001 243KMF
R1901 1.21KMF
C1001
IC301 1/2
R2101 10K
R2201 47Ω
R2401 100K
R2301 10K
Q101 2SC945K
0.047μ (C101,C201,C301,C401,C701,C801,C901,C1001)
C6 150P
R7 100K
MIC IN
R5 1K
R6 100K
R8 10K
IC1 1/2
CHANNEL 2
C502-10μ/16V C602-1μ/50V
0.039μ (C102,C202,C302,C402,C702,C802,C902,C1002)
R2402 100K
CHANNEL 3
C503-10μ/16V C603-1μ50V
0.033μ (C103,C203,C303,C403,C703,C803,C903,C1003)
R2403 100K
CHANNEL 4
C504-10μ/16V C604-1μ/50V
0.027μ (C104,C204,C304,C404,C704,C804,C904,C1004)
R2404
CHANNEL 5
C505-4.7μ/25V C605-0.47μ/50V
0.022μ (C105,C205,C305,C405,C705,C805,C905,C1005)
R2405 100K
CHANNEL 6
C506-4.7μ/25V C606-0.47μ/50V
0.018μ (C106,C206,C306,C406,C706,C806,C906,C1006)
R2406 100K
CHANNEL 7
C507-4.7μ/25V C607-0.47μ/50V
0.015μ (C107,C207,C307,C407,C707,C807,C907,C1007)
R2407 100K
CHANNEL 8
C508-4.7μ/25V C608-0.47μ/50V
0.012μ (C108,C208,C308,C408,C708,C808,C908,C1008)
R2408
C7 0.001μ
R11 15K
SIGNAL IN
R9 1K
R10 100K
R12 10K
IC1 1/2
CHANNEL 9
C509-2.2μ/50V C609-0.22μ/50V
0.01μ (C109,C209,C309,C409,C709,C809,C909,C1009)
R2409 100K
CHANNEL 10
C510-2.2μ/50V C610-0.22μ/50V
0.0082μ (C110,C210,C310,C410,C710,C810,C910,C1010)
R2410 100K
CHANNEL 11
C511-2.2μ/50V C611-0.22μ/50V
0.0068μ (C111,C211,C311,C411,C711,C811,C911,C1011)
R2411 100K
CHANNEL 12
C512-2.2μ/50V C612-0.22μ/50V
0.0056μ (C112,C212,C312,C412,C712,C812,C912,C1012)
R2412 100K
CHANNEL 13
C513-2.2μ/50V C613-0.22μ/50V
0.0047μ (C113,C213,C313,C413,C713,C813,C913,C1013)
R2413 100K
CHANNEL 14
C514-2.2μ/50V C614-0.22μ/50V
0.0039μ (C114,C214,C314,C414,C714,C814,C914,C1014)
R2414 100K
CHANNEL 15
C515-2.2μ/50V C615-0.22μ/50V
0.0033μ (C115,C215,C315,C415,C715,C815,C915,C1015)
CHANNEL 16
C516-2.2μ/50V C616-0.22μ/50V
0.0027μ (C116,C216,C316,C416,C716,C816,C916,C1016)
CHANNEL 17
C517-1μ/50V C617-0.1μ/50V
0.0022μ (C117,C217,C317,C417,C717,C817,C917,C1017)
R2417 100K
NOISE IN
CHANNEL 18
C518-1μ/50V C618-0.1μ/50V
0.0018μ (C118,C218,C318,C418,C718,C818,C918,C1018)
R2418 100K
CHANNEL 19
C519-1μ/50V C619-0.1μ/50V
0.0015μ (C119,C219,C319,C419,C719,C819,C919,C1019)
R2419 100K
CHANNEL 20
C520-1μ/50V C620-0.1μ/50V
0.0012μ (C120,C220,C320,C420,C720,C820,C920,C1020)
R2420 100K

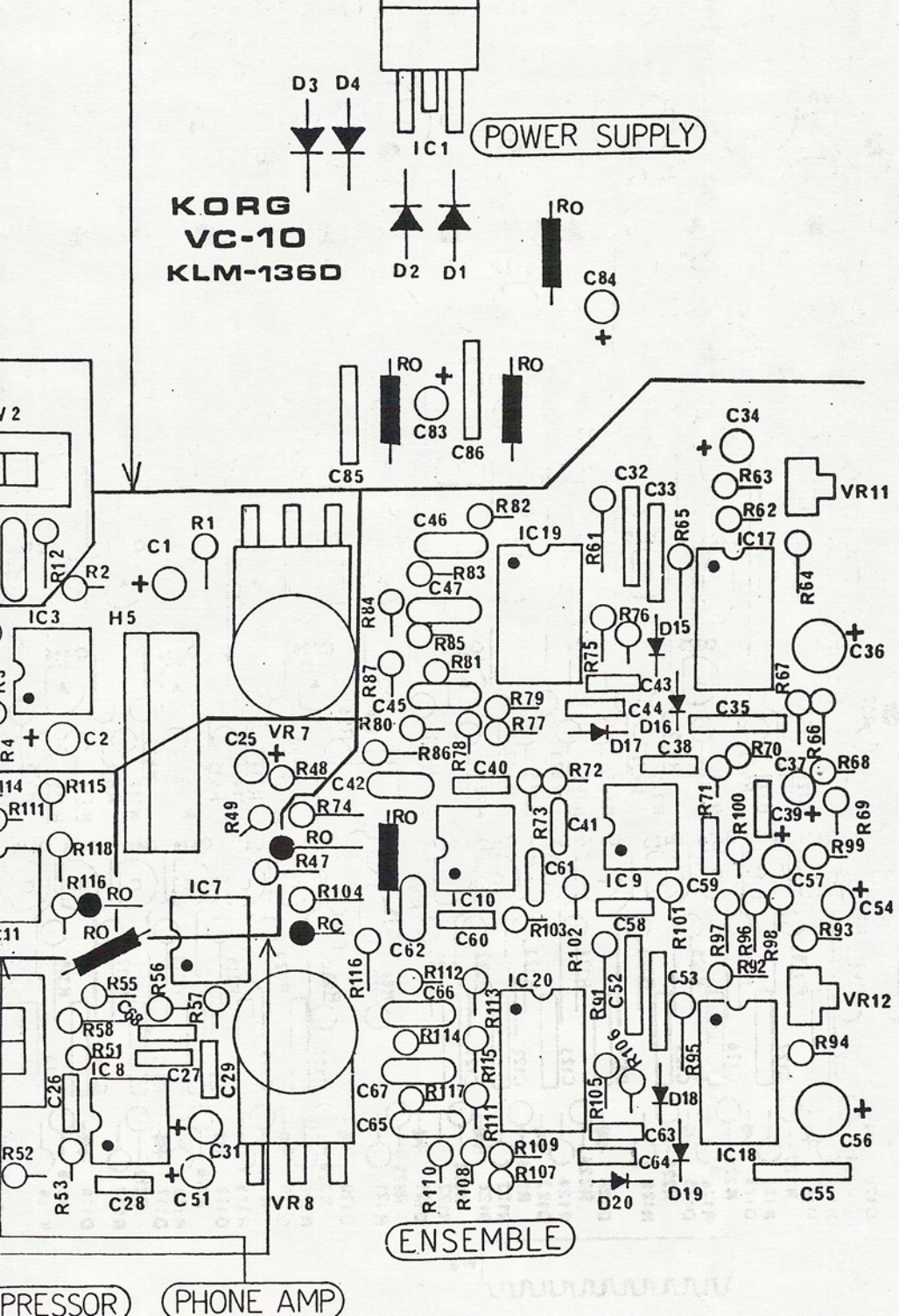

R1201 1K
R1301 10K
R1401 1M
C501 10μ/16V
C601 1μ/50 V
C1101 10μ/16V
2501 00K
R13 150K
R14 100Ω
ACCENT OUT
IC5 1/2
R21 10K
R31 10K
IC2 1/2
C8 470P
R18 100K
R17 100K
R16 100K
R15 27K
R19 100Ω
SIMULATOR OUT
IC4 1/2
R22 10K
R32 10K
C12 0.047μ
IC3 1/2
R23 10K
R33 10K
C13 0.022μ
IC4 1/2
R24 10K
R34 10K
C14 0.01μ
IC3 1/2
R25 10K
R35 10K
C15 0.0047μ
IC2 1/2
R1 1Ω
C1 100μ/16V
C2 100μ/16V
R2 1Ω
+14.9V
R3 10Ω
C3 100μ/16V
C4 100μ/16V
R4 10Ω
-14.9V
+15V
GND
-15V
TO IC2, IC3, IC4


C3
B3
A#3
A3
G#3
G3
F#3
F3
E3
D#3
D3
C#3
C2
B2
A#2
A2
G#2
G
M3

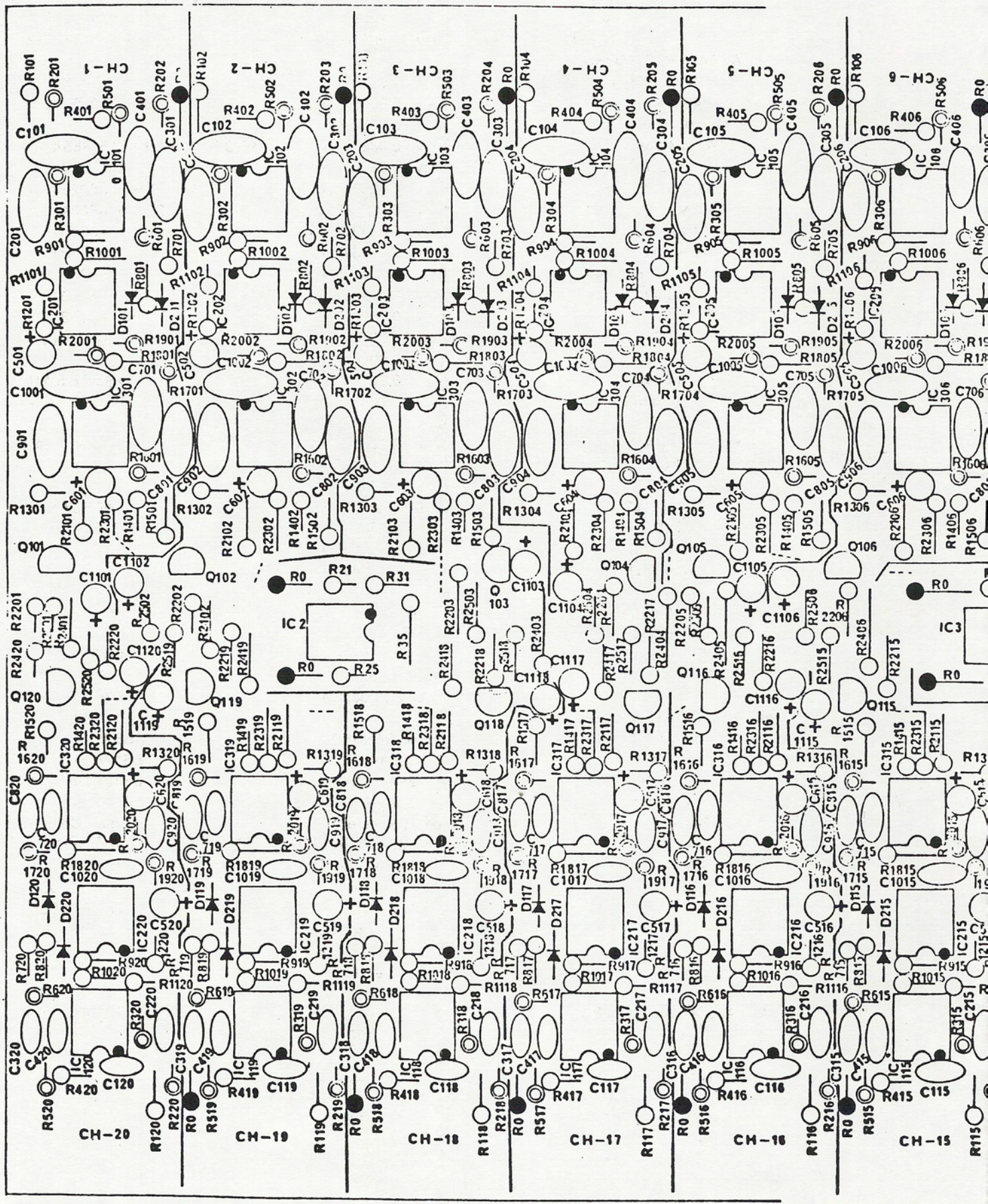
F#2
F2
E2
D#2
D2
C#2
C1
B1
A#1
A1
G#1
G1
F#1
F1
VR 115
VR 113
VR 111
VR 109
VR 107
VR 105
VR 103
VR 101
VR 114
VR 112
VR 110
VR 108
VR 106
VR 104
VR 102
IC 1
IC 2
IC 3
IC 4
IC 5
IC 6
SLOPE ADJ VR3
TOTAL PITCH
VR2 OCT UP PITCH
VR1
KORG VC-10
KLM-135B
H1
H2

4. PC BOARD KLM-136



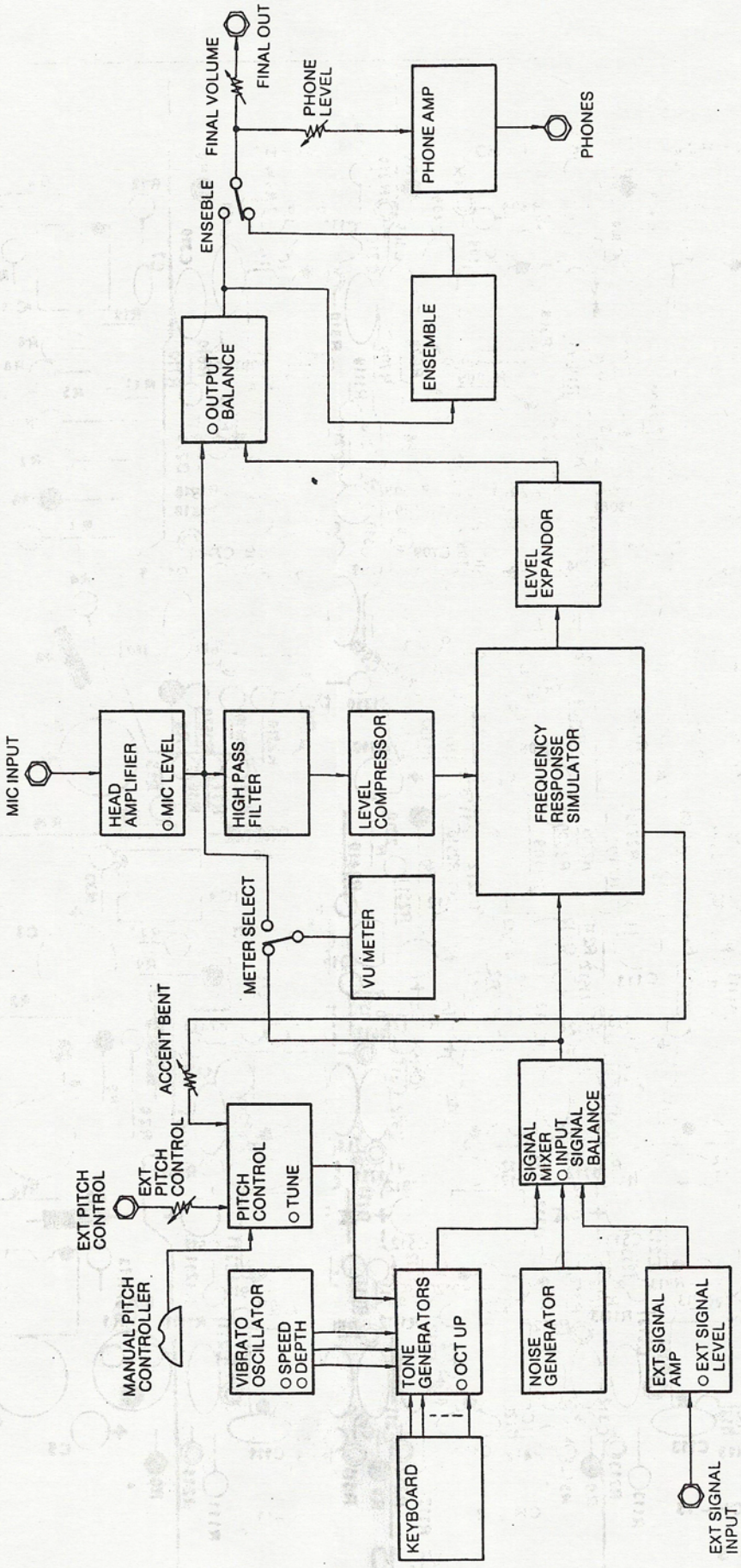

MIC AMP
POWER SUPPLY
KORG
VC-10
KLM-136D
D3 D4
IC1
D2 D1
RO
C84
C85
C83
C86
C34
C32
C33
R63
R62
VR11
R82
C46
IC19
IC17
R61
R65
R64
R1
C1
R2
R12
R83
C47
R84
R76
D15
C36
IC3
H5
R85
R81
R87
R75
C43
R67
C45
R79
C44
C35
C2
R80
R77
D16
R66
C25
VR 7
D17
C38
R70
C37
R68
R86
R78
C40
R72
R48
C42
R74
R73
R71
R100
C39
R69
R49
RO
C41
R99
R118
R47
C61
IC 9
C59
C57
R116
RO
IC7
R104
IC10
C54
RO
R103
R102
C58
R101
R97
R96
R98
R93
C62
C60
R116
R112
C66
IC 20
R91
C52
C53
R92
VR12
R56
R55
R113
R58
R57
R114
R94
R51
R115
R95
IC 8
C27
C29
C26
C67
R117
R105
D18
C65
R111
C63
C56
R52
C31
R109
IC18
R110
R108
R107
C64
C28
C51
VR 8
D20
D19
C55
R53
ENSEMBLE
PRESSOR
PHONE AMP

KLM-134



CH-7
CH-8
CH-9
CH-10
CH-14
CH-13
CH-12
CH-11
IC 1
IC4
IC5
BIAS
VR1
KORG
KLM-134B
VC-10

5. BLOCK DIAGRAM



6. PARTS LIST

(Mechanical parts not listed)

●CARBON RESISTORS
not listed

●METAL FILM RESISTORS
1/4W 1% 100Ω x 1
1/4W 1% 1kΩ x 40
1/4W 1% 1.21K% x 40
1/4W 1% 4.03KΩ x 1
1/4W 1% 5.1KΩ x 1
1/4W 1% 10KΩ x 1
1/4W 1% 16.9KΩ x 1
1/4W 1% 29.4KΩ x 11
1/4W 1% 100KΩ x 3
1/4W 1% 162KΩ x 1
1/4W 1% 200KΩ x 40
1/4W 1% 243KΩ x 40
1/4W 1% 301KΩ x 1
1/4W 1% 402KΩ x 2
1/4W 1% 619KΩ x 32
1W 1% 330Ω x 32

●MYLAR CAPACITORS
50V - 0.001μF x 4
50V - 0.0022μF x 1
50V - 0.01μF x 1
50V - 0.022μF x 6
50V - 0.27μF x 4
50V - 0.33μF x 4
50V - 0.39μF x 1
50V - 0.47μF x 3
50V - 0.56μF x 1
50V - 0.68μF x 1
50V - 0.082μF x 1

●CERAMIC CAPACITORS
50V - 22pF x 1
50V - 47pF x 1
50V - 100pF x 6
50V - 120pF x 1
50V - 150pF x 1
50V - 180pF x 5
50V - 220pF x 7
50V - 270pF x 1
50V - 330pF x 3
50V - 390pf x 4
50V - 470pF x 7
50V - 680pF x 2

●TANTALUM CAPACITORS
16V 2.2μF x 2

●ELECTROLYTIC CAPACITORS
16V - 10μF x 64
16V - 100μF x 8
50V - 1.0μF x 29
25V -2200μF x 2

●POLYPROPYLENE CAPACITORS
100V - 0.0011μF x 1
100V - 0.0012μF x 8
100V - 0.0015μF x 9
100V - 0.0018μF x 8
100V - 0.0022μF x 8
100V - 0.0027μF x 8
100V - 0.0030μF x 2
100V - 0.0033μF x 9
100V - 0.0036μF x 2
100V - 0.0039μF x 9
100V - 0.0043μF x 2
100V - 0.0047μF x 9
100V - 0.0051μF x 2
100V - 0.0056μF x 10
100V - 0.0062μF x 1
100V - 0.0068μF x 10
100V - 0.0075μF x 1
100V - 0.0082μF x 10
100V - 0.0091μF x 1
100V - 0.0001μF x 11
100V - 0.0011μF x 1
100V - 0.012μF x 9
100V - 0.013μF x 3
100V - 0.015μF x 9
100V - 0.016μF x 2
100V - 0.018μF x 9
100V - 0.022μF x 8
100V - 0.027μF x 8
100V - 0.033μF x 8
100V - 0.039μF x 8
100V - 0.047μF x 8
100V - 0.33μF x 1

●TRANSISTORS
2SA-798G x 1
2SA-564AS x 32
2SC-1685S x 5
(special selected)
2SA-733K x 35
2SC-945LK x 55
2SC-644R x 1

●DIODES
1S-1555 x 85
1S-1885 x 4

●IC
N13T-1 x 32
MN-3004 x 2
μPC-4558 x 87
μPC-14315 x 1
μA-7915 x 1
MC-14069 x 2
NE-570 x 1

●SEMI-FIXED RESISTORS
SR29R 4.7KΩB x 2
SR19R 100KΩB x 33
SR19R 100KΩB x 1
SR19R 47KΩB x 1
SR19R 220KΩB x 2

●ROTARY VARIABLE RESISTORS
EVH-5LA802B15 x 4
EVH-5LA802B14 x 1
EVH-5LA802A15 x 2
EVH-5LA802B16 x 1
EVC-BQ5P18B14 x 1
EVH-OFA-803B14 x 1
EVH-OFA-803B15 x 1
EVH-RTAP20B15 x 1
(Center click-stop)

●SLIDE SWITCH
SSB-12208 x 3

●KEY
F-c 32 key

●PHONE JACK
2P (RC-707) x 3
3P (ST) x 1

●FUSE
250V-0.1A x 1

●CONNECTORS
BE4P-SHF-1 x 1
BE8P-SHF-1 x 1
BE11P-SHF-1 x 1
BS9P-SHF-1 x 1
BS12P-SHF-1 x 2
BS10P-SHF-1 x 1
BS4P-SHF-1 x 1
Female Connectors
MLR-3 RRC-1 x 1
4PVC-1001 x 1
4PVC-1002 x 1
8PVC-1003 x 1
9P x 1
10P x 1
11P x 1
12P x 1
MLP-03 TRC-220 x 1

7. CHECK AND ADJUSTMENT

(refer to figures 1 and 2)

*Setup for testing.

a. Connect VC-10 FINAL OUT to WT-10 (Korg Tuning Standard) input jack.
b. Connect microphone (audio signal) to VC-10 MIC INPUT.

7-1 TOTAL PITCH Adjustment.

a. Set TUNE knob to center.
b. Set OCTAVE switch to down position.
c. Play A-2 (on keyboard) and adjust VR1 so that the WT-10A indicates the correct pitch.
d. Adjust each of the trimmer screws from F-1 to C-3 to the correct pitch as indicated on the WT-10 A meter.

7-2 OCT UP PITCH Adjustment.

a. Set OCTAVE switch to UP position.
b. Play F-3 (on keyboard) and adjust trimmer screw VR-2 as necessary, so that the pitch is one octave higher than before.

7-3 SLOPE ADJUST Adjustment.

a. Play F-1 and adjust VR-3 so that the pitch is one octave higher than before.

(Repeat adjustments 7-2 and 7-3 as many times as needed, so that all keys stay in tune at both OCTAVE switch positions.)

7-4 BIAS Adjustment.

a. Disconnect microphone from MIC INPUT.
b. Disconnect WT-10A, and connect FINAL OUT to amplifier.
c. Play each of the keys on the keyboard and adjust VR-4 just as much as necessary so that no sound will be produced. Do not turn VR-4 further (clockwise) than the point where the sound first stops. If turned too far, sensitivity to a microphone input signal will be too low.

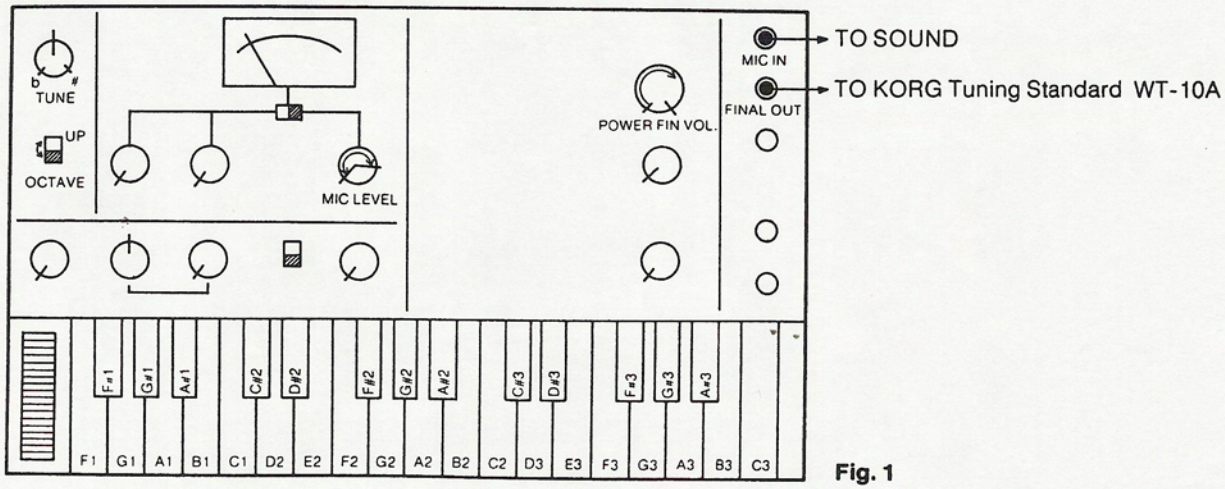


Fig. 1

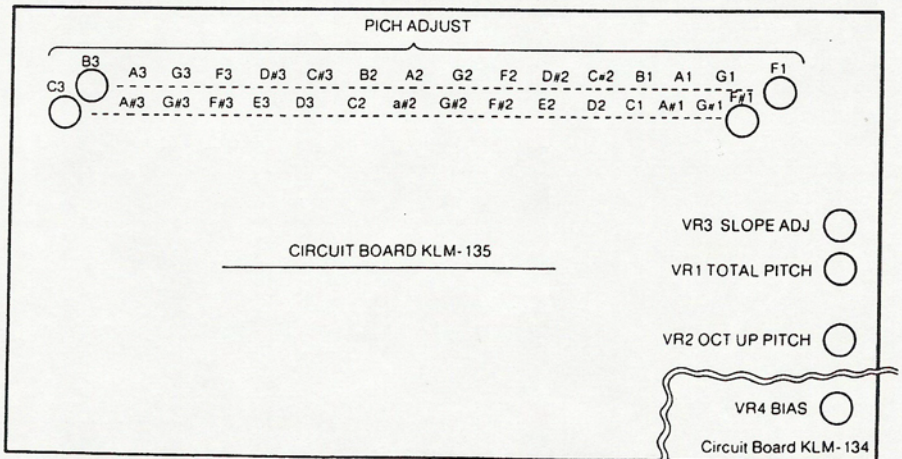


Fig. 2