KORG

PERFORMING KEYBOARD SERVICE MANUAL TRIDENT mk II

CONTENTS

KEIO ELECTRONIC LABORATORY CORPORATION
TOKYO/JAPAN

1. SPECIFICATIONS

KEYBOARD ..... • C–C, 61 Keys, 8 voices

SYNTHESIZER SECTION (Program and edit functions are possible for items marked *)

VCO-1* .....
- Octave (16', 8', 4')
- Waveform (∧, PW, PWM)
- PW/PWM Intensity
- PWM Speed

VCO-2* .....
- Scale (Off, 16', 8', 4')
- Waveform (∧)
- Detune

VCF* .....
- Cut-off Frequency
- Resonance
- EG Intensity
- KBD Track (Off 0%, Quarter 25%, Half 50%, Full 100%, Over < 150%)

VCF EG* .....
- Attack
- Decay
- Sustain
- Release

VCA* ..... • Attenuator (–10dB ~ +10dB)

VCA EG* .....
- Attack
- Decay
- Sustain
- Release

VCA* ..... • Attenuator (–10dB ~ +10dB)

AUTO DAMP ..... • ON/OFF

PROGRAMMER (x32) .....
- Program Select (1–8)
- Bank Select (A, B, C, D)
- Manual
- Write

TAPE INTERFACE .....
- To Tape
- From Tape
- Verify
- Error/Cancel
- Write Enable (Enable/Disable)
- Tape Enable (Enable/Disable)
- Tape Indicator x2 (Found, Loading)

MIXER .....
- Output (On/Off)
- Volume

BRASS SECTION

OCTAVE (x2) ..... • 16', 8'

VCF .....
- Cut-off Frequency
- Resonance
- EG Intensity

ENVELOPE GENERATOR .....
- Attack
- Decay
- Sustain
- Release

TRIGGER .....
- Multiple Trigger (On/Off)
- Trigger Select (On/Off)
- Silence Note (2, 4, 6, 8)

MIXER .....
- Output (On/Off)
- Volume

STRINGS SECTION

OCTAVE (x3) ..... • 16', 8', 4'

ENVELOPE GENERATOR .....
- Attack
- Release

EQUALIZER .....
- High
- Low

EFFECT .....
- Bowing (On/Off, Level, Tone)
- Vibrato (On/Off, Delay Time, Intensity, Speed)
- Ensemble (On/Off)

FILTER ..... • KBD Balance

MIXER .....
- Output (On/Off)
- Volume

TOTAL CONTROL SECTION

KEY ASSIGNOR ..... • Assign Mode (1, 2)

KEYBOARD SPLIT .....
- Synthe (L, L+H, H)
- Brass (L, L+H, H)
- Strings (L, L+H, H)

PITCH CONTROL ..... • Tune (±100 Cents)

VIBRATO .....
- Delay Vibrato (On/Off)
- Intensity

JOY STICK .....
- Pitch Bend (X-Axis)
- Vibrato Depth/Trill Depth (Y-Axis)
- Intensity
- Speed

FLANGER .....
- Select (Synthe, Brass, Strings)
- Manual
- Intensity
- Feedback
- Speed

VOLUME CONTROL .....
- Total Volume
- Headphone Volume

POWER SWITCH ..... • Power (On/Off)

INPUTS & OUTPUTS

INPUTS .....
- Synthe VCF fcM In (–5V ~ +5V)
- Synthe Release (⊣GND)
- Brass VCF fcM In (–5V ~ +5V)
- Brass Trigger In (⊣GND)
- Separate Expression x3 (0 ~ +5V)
- Total Expression (0 ~ +5V)
- From Tape (With High/Low Switch)

OUTPUTS .....
- Mix Outputs (High, Low)
- Separate Outputs (Synthe, Brass, Strings)
- Headphone Output (Stereo)
- To Tape (With High/Low Switch)

DIMENSIONS ..... • 1012(W) x 542(D) x 173(H) mm

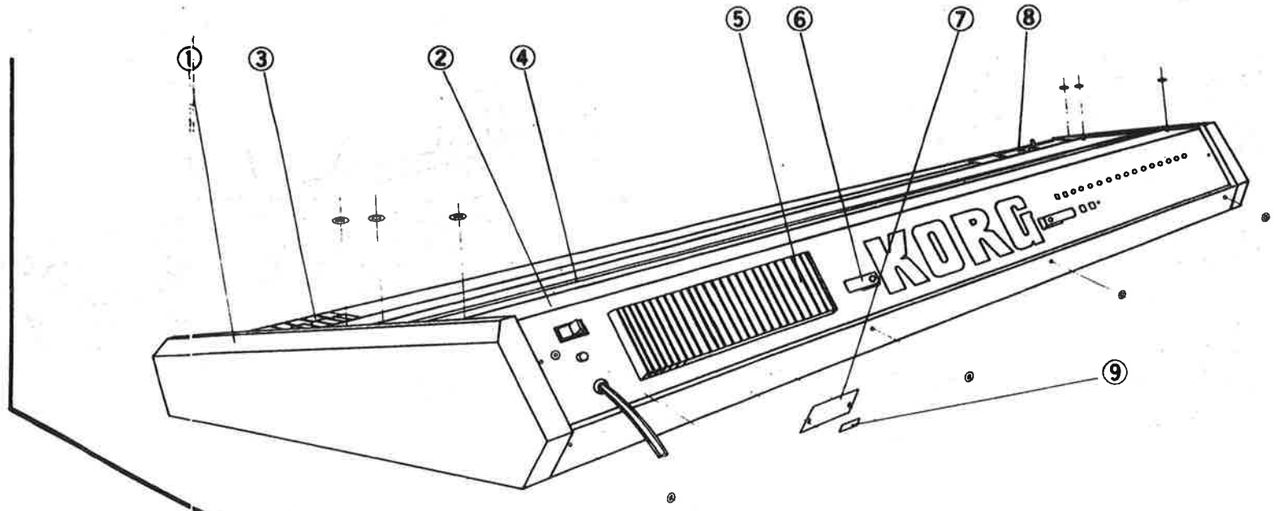
WEIGHT ..... • 23.5 kg

ACCESSORIES .....
- Connection Cord
- Dust Cover
- Foot Switch S-1
- Memory Cassette

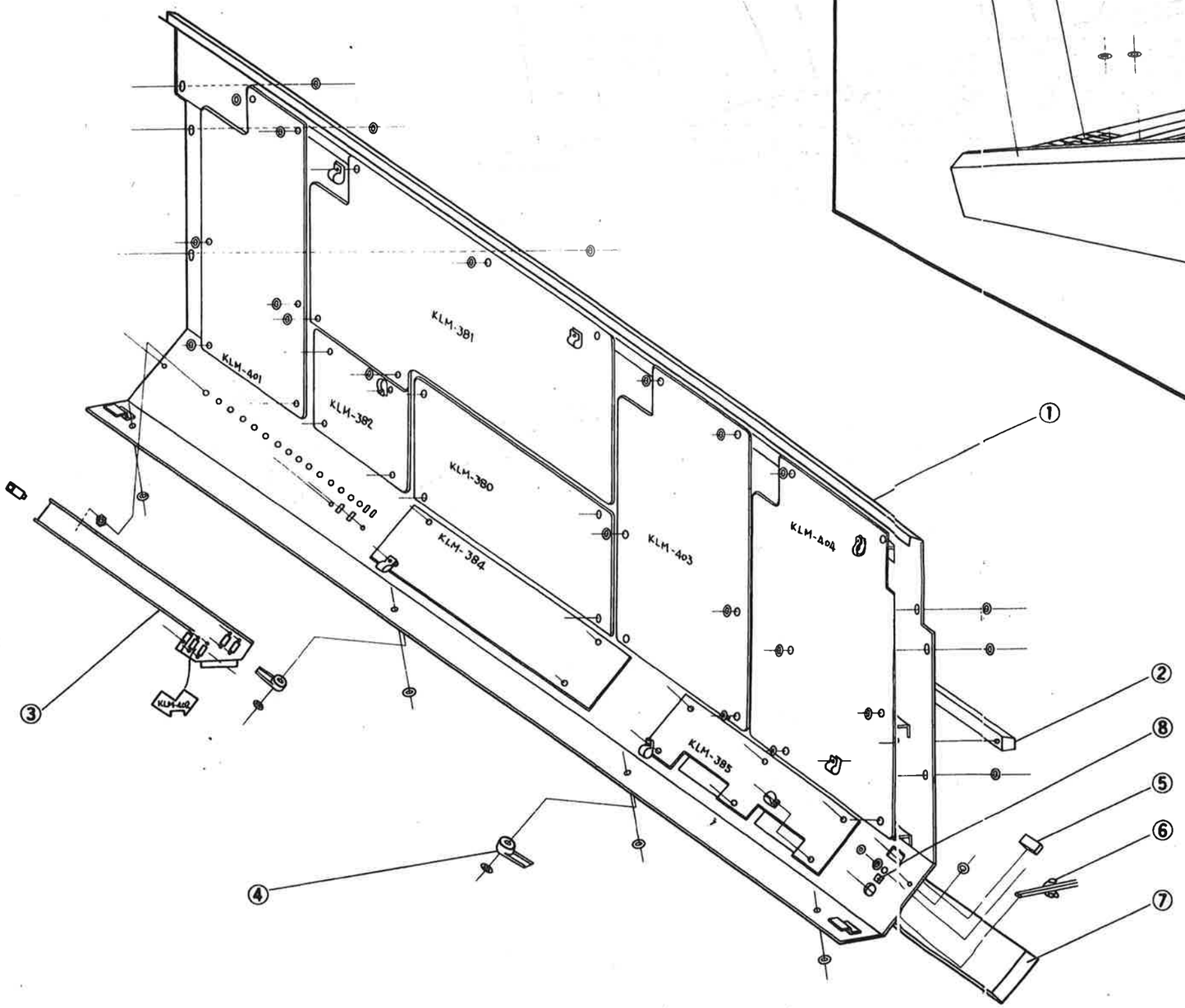
POWER CONSUMPTION .....
- Voltage (Local Voltage, 50/60 Hz)
- Wattage (53 W)

YOUR NOTES

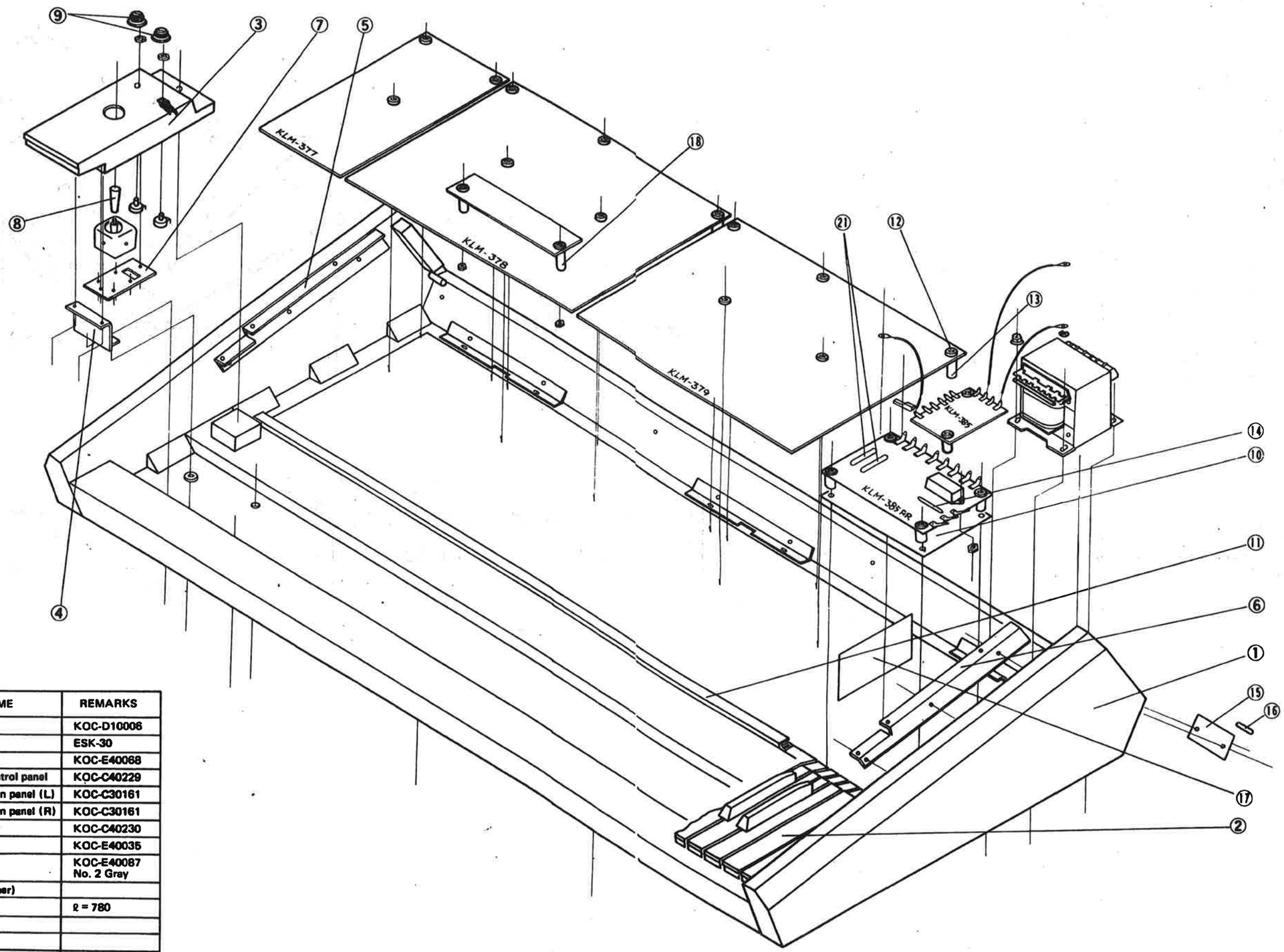
Page is intentionally Blank



PART NO.	PARTS NAME	REMARKS
1	Wooden case	KOC-D10006
2	Main panel	KOC-C10004
3	Keyboard	ESK-30
4	Music stand	KOC-C30162
5	Radiator	KOC-C30189
6	Cord Stopper	KOC-E40099
7	Model number plate	KOC-C40144
8	Control panel	KOC-E40068
9	Serial number seal	KOC-F40050

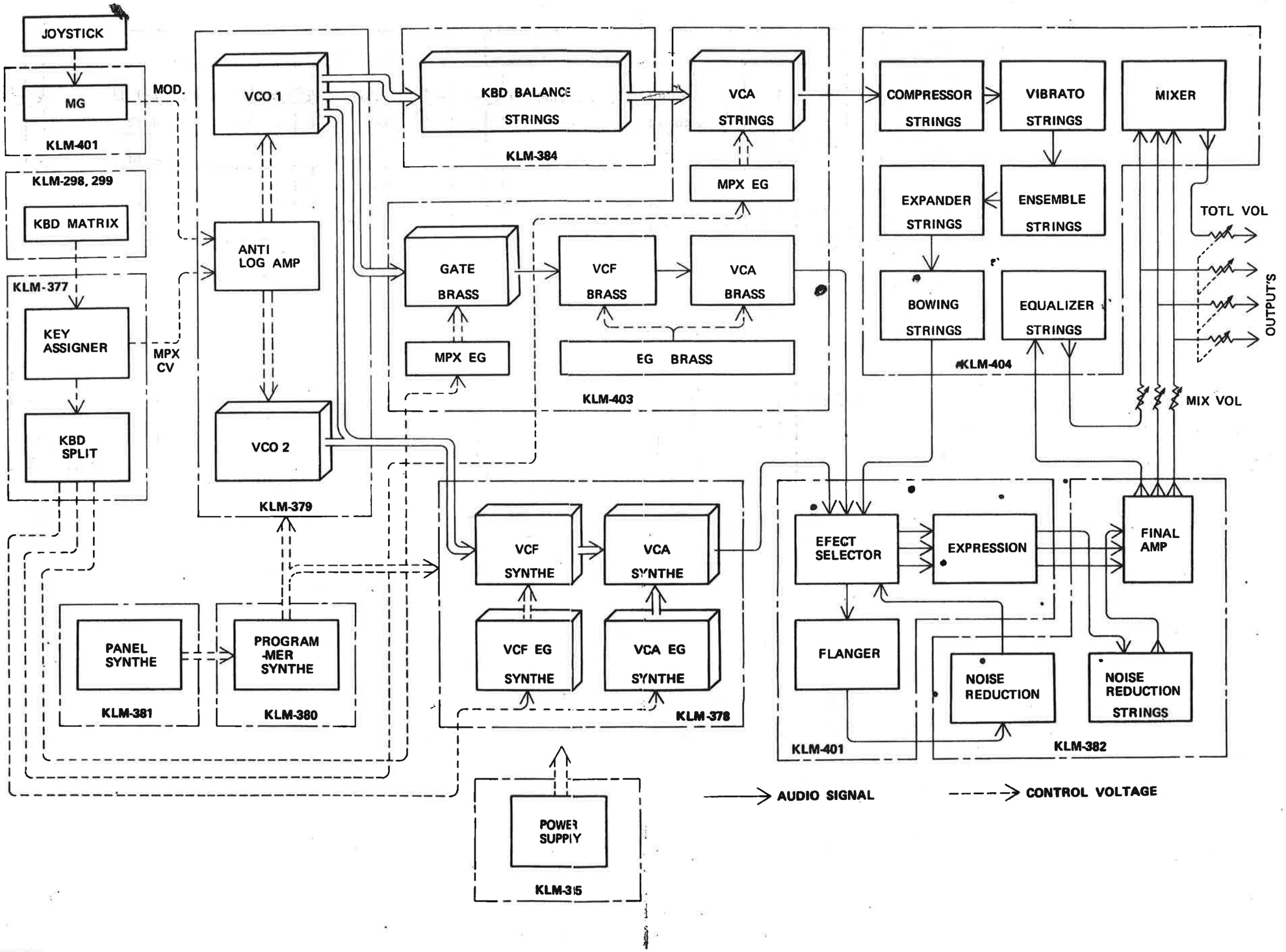


PART NO.	PARTS NAME	REMARKS
1	Main panel	KOC-C10004
2	Music stand	KOC-C30162
3	Phone jack plate	KOC-C20113
4	Cord stopper	KOC-E40099
5	Power SW	
6	Bushing	
7	Radiator	KOC-C30189
8	GND seal	

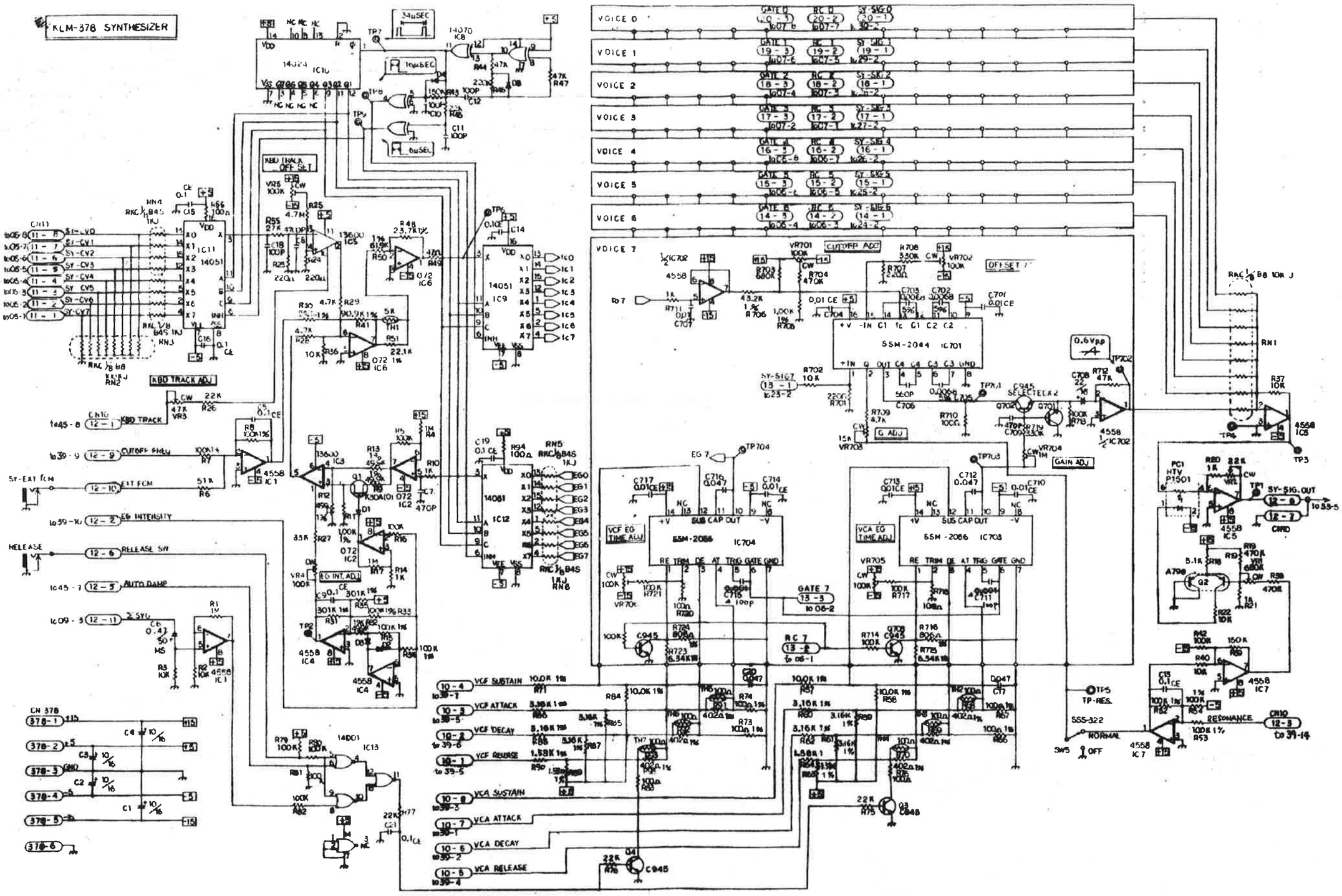


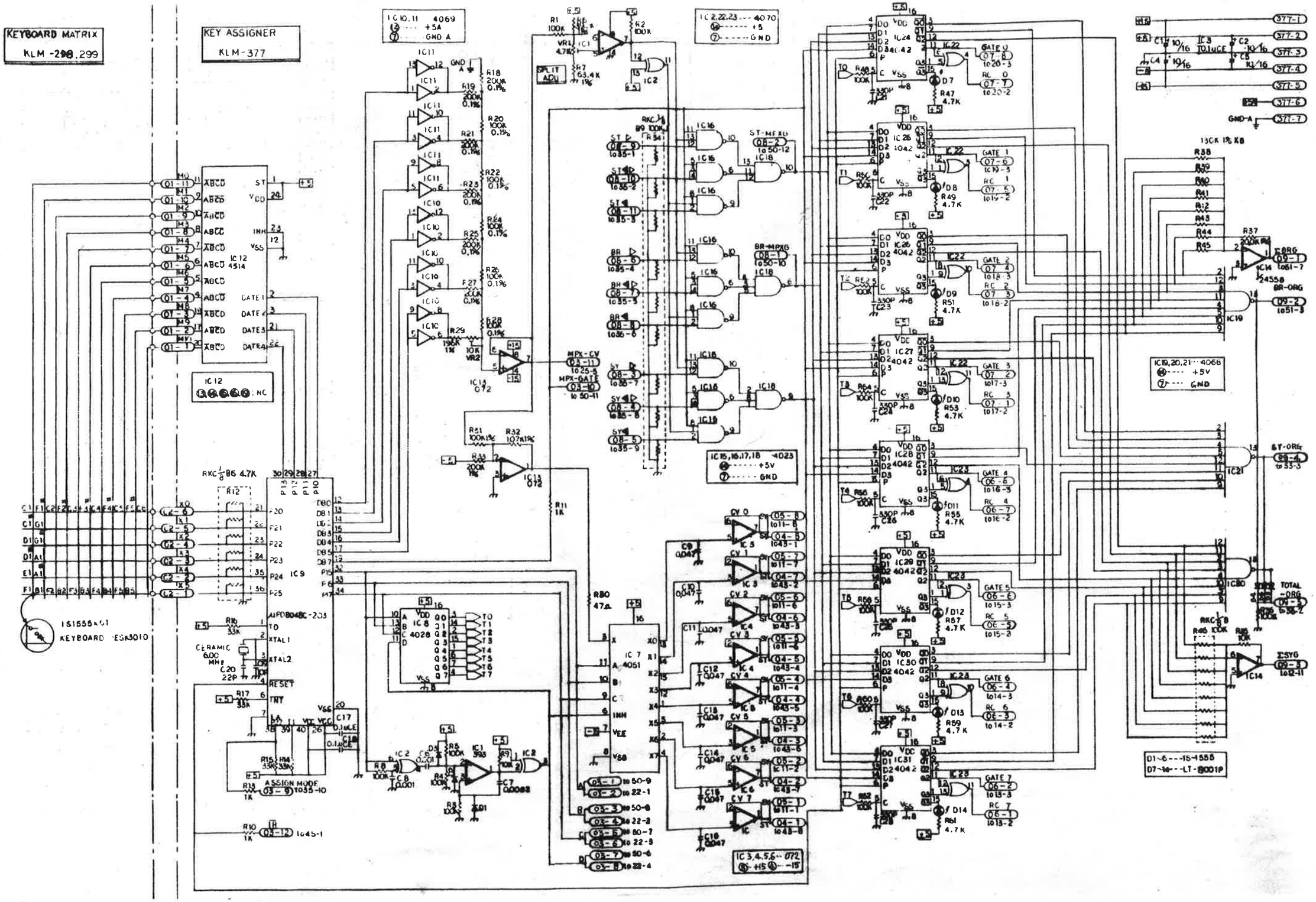
PART NO.	PARTS NAME	REMARKS
1	Wooden case	KOC-D10006
2	Key board	ESK-30
3	Control panel	KOC-E40068
4	Metal fitting of control panel	KOC-C40229
5	Metal fitting of main panel (L)	KOC-C30161
6	Metal fitting of main panel (R)	KOC-C30161
7	Joystic plate	KOC-C40230
8	Joystic VR knob	KOC-E40035
9	Rotary VR knob	KOC-E40087 No. 2 Gray
10	Shielding sheet (Fiber)	
11	PC board rail	ℓ = 780
12	Bushing (TB300)	
13	Bushing (TB301)	
14	Fuse seal	
15	Model number plate	KOC-C40144
16	Serial number seal	
17	Fuse caution seal	KOC-F30013
18	Bushing (TA320)	

3. BLOCK DIAGRAM



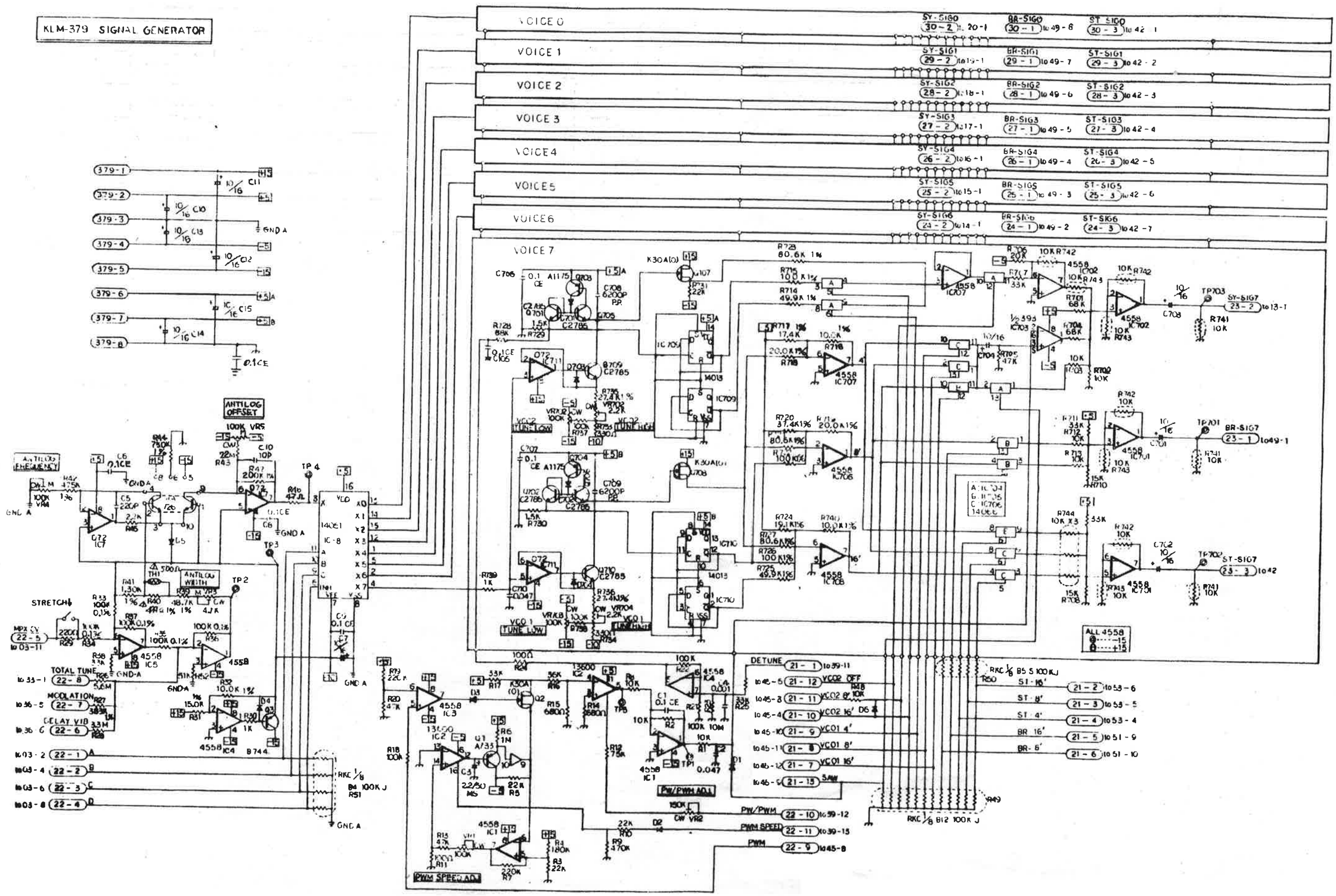
KLM-378 SYNTHESIZER



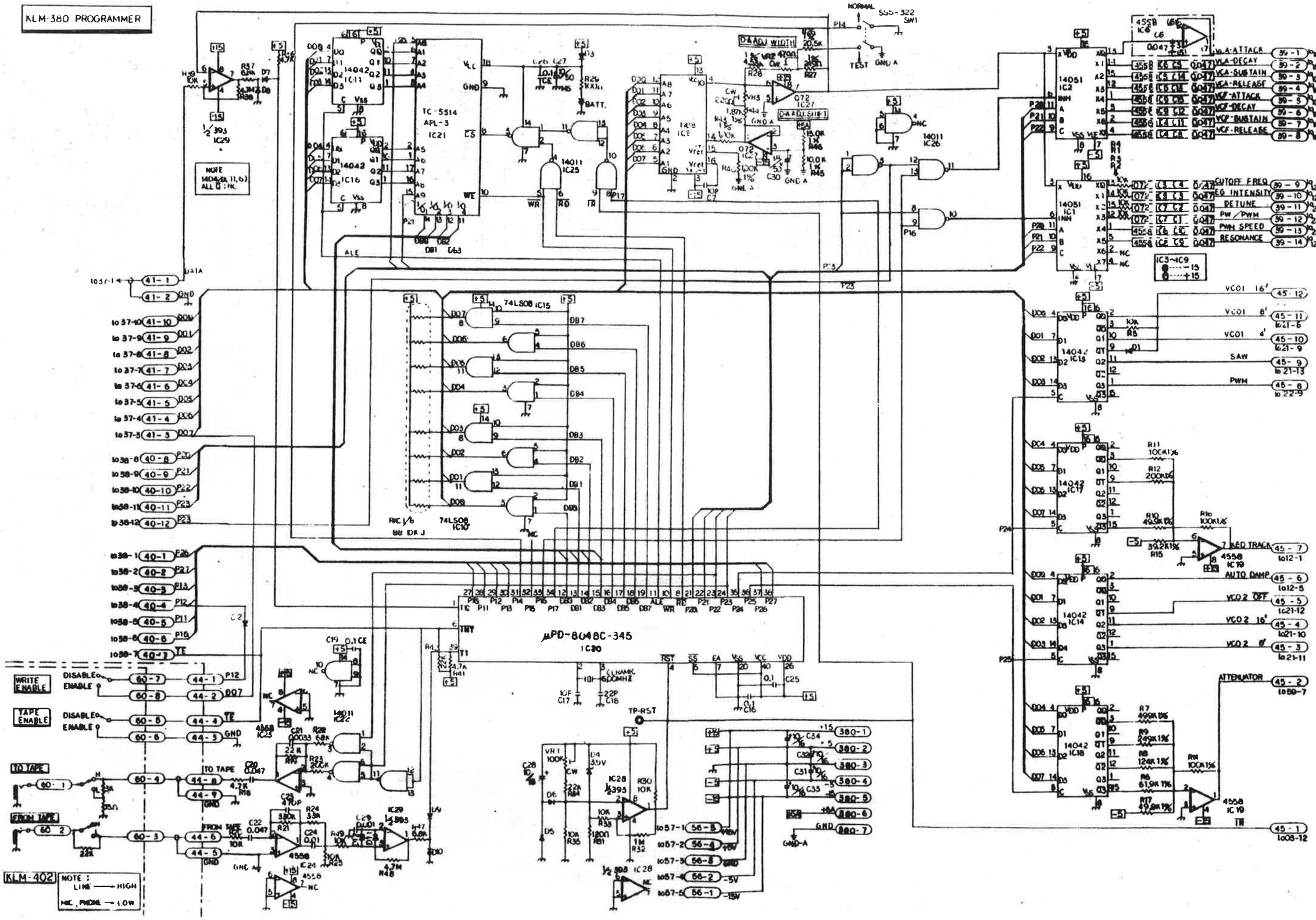

KEYBOARD MATRIX
KLM -298,299
KEY ASSIGNER
KLM-377
IC10,11 4069
+5A
GND A
IC2,22,23 4070
+5
GND
IC12
NC
IC9
KEYBOARD ESA3010
ASSIGN MODE
IC15,16,17,18 4023
+5V
GND
IC19,20,21 4068
+5V
GND
IC 3,4,5,6 072
+15 -15
D1-6 -15-1555
D7-14 -LT-8001P
TOTAL -ORG
Σ-ORG
ST-ORG
BR-ORG
MPX-GV
MPX-GATE
SPLIT ADJ
GND-A
130K 1% K8

KLM-379 SIGNAL GENERATOR

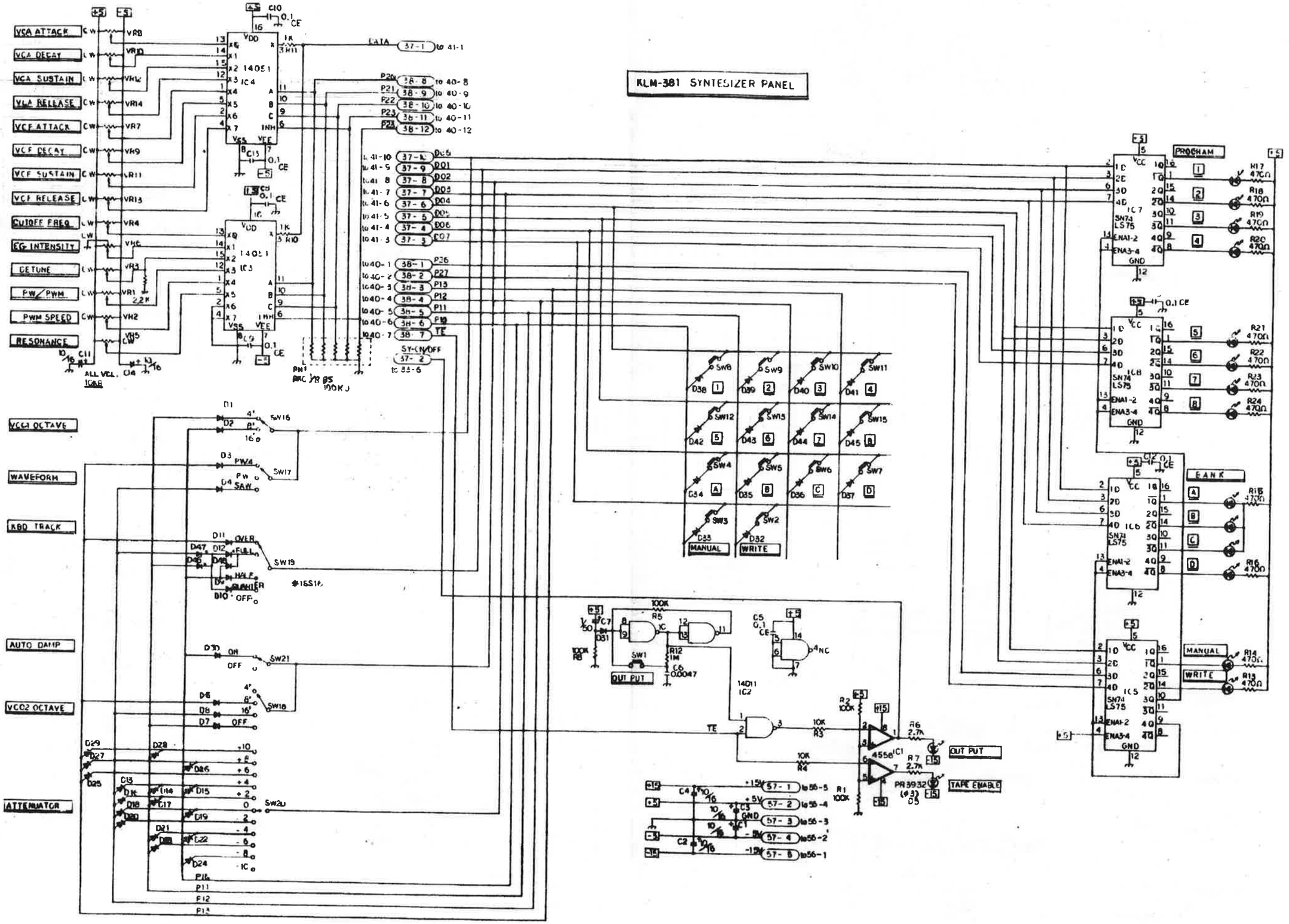
KLM-379 SIGNAL GENERATOR



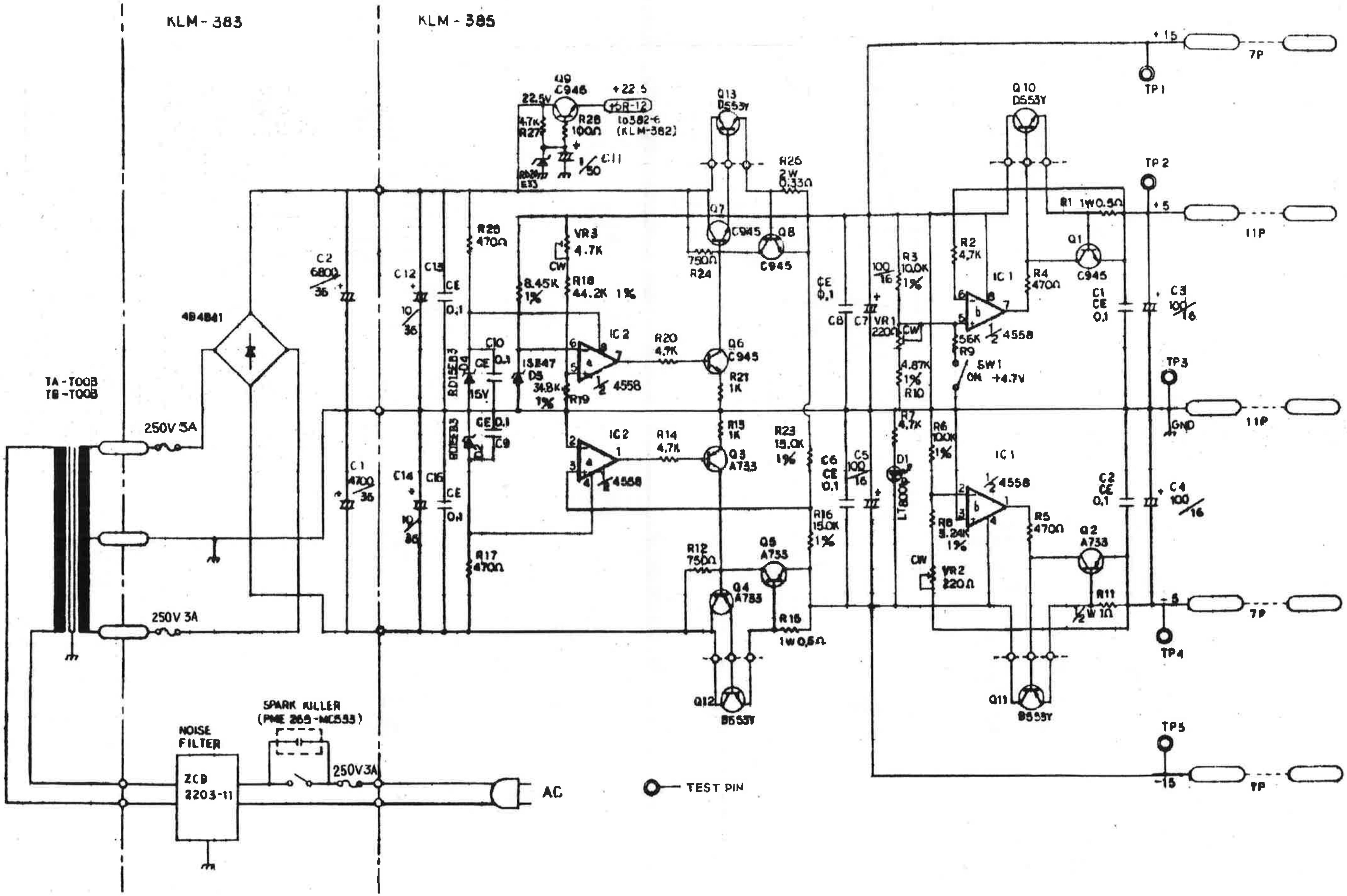
KLM-380 PROGRAMMER



KLM-381 SYNTHESIZER PANEL

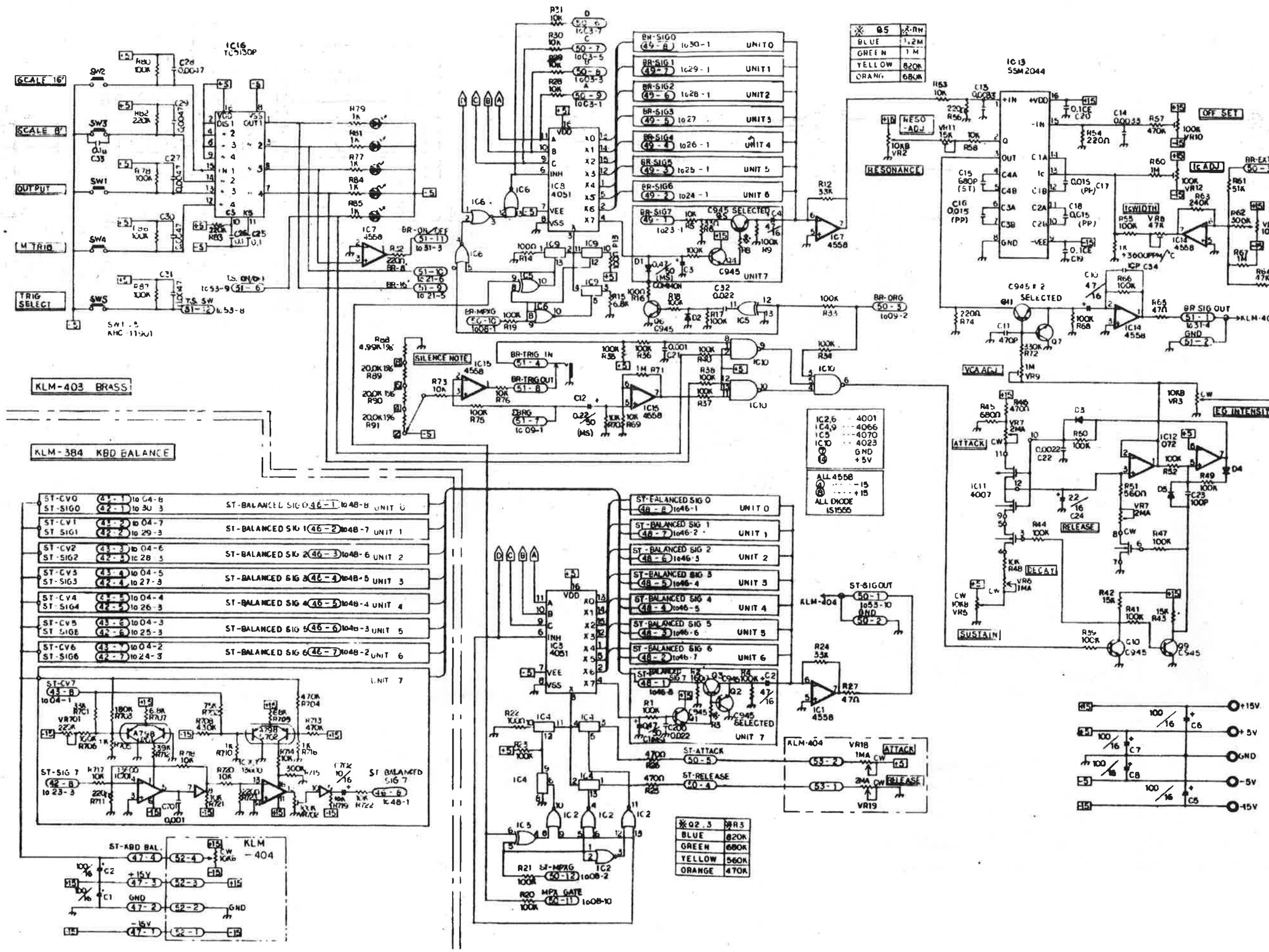


KLM-383, 385

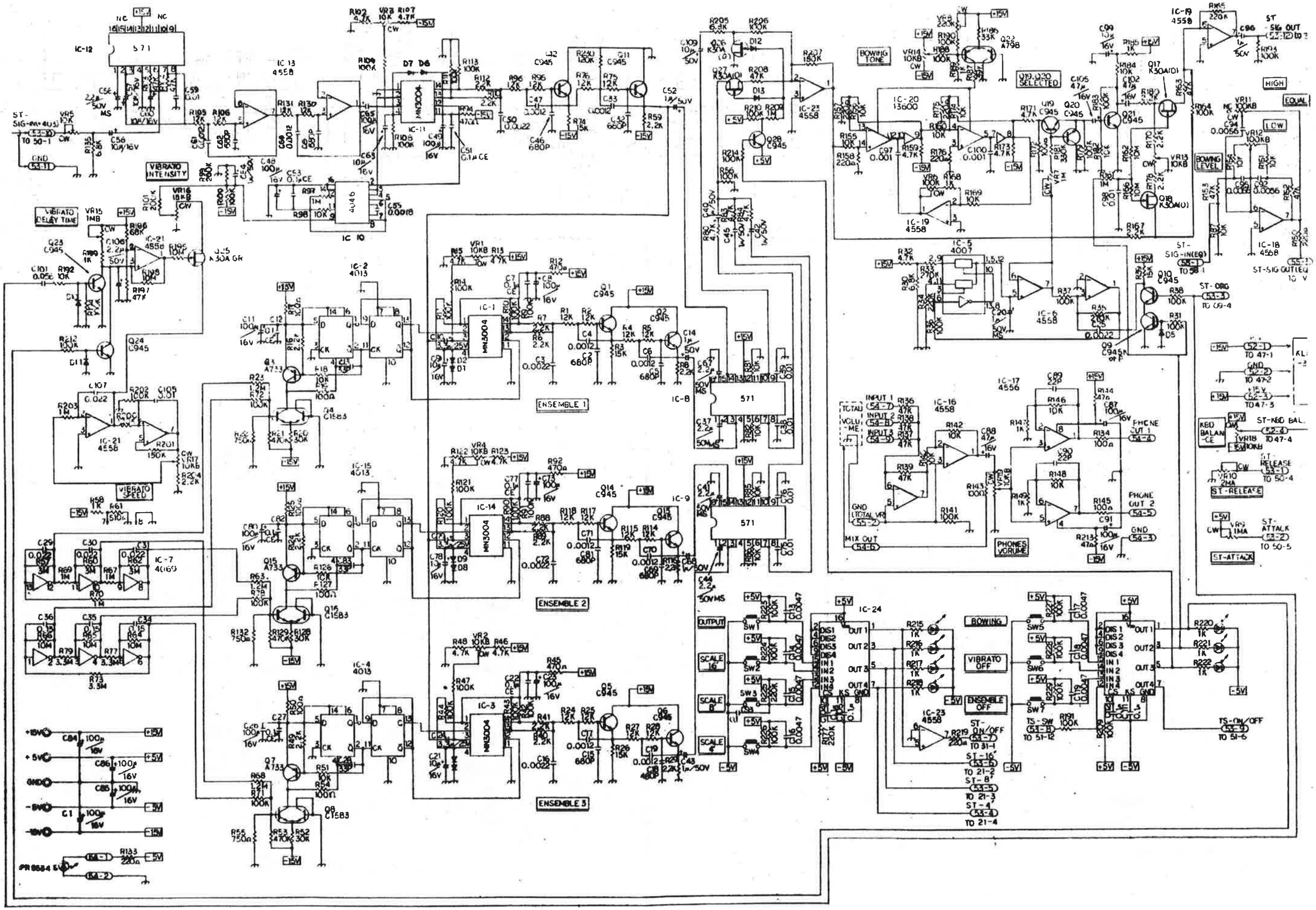


KLM - 383
KLM - 385
TA - T00B
TB - T00B
250V 3A
250V 3A
4B4B41
C2
6800
35
C1
4700
35
C12
10
35
C13
CE
0,1
C14
10
35
C16
CE
0,1
R25
470Ω
R17
470Ω
Q9
C945
22.5V
4.7K
R27
R28
100Ω
C11
1
50
+22.5
Q13
D553Y
R26
2W
0.33Ω
Q7
C945
Q8
C945
750Ω
R24
VR3
4.7K
CW
8.45K
1%
R18
44.2K 1%
C10
CE
0.1
15V
1S247
D5
34.8K
1%
R19
IC 2
4558
R20
4.7K
Q6
C945
R21
1K
R15
1K
R14
4.7K
Q3
A733
R23
15.0K
1%
R16
15.0K
1%
C6
CE
0.1
C5
100
16
C8
C7
CE
0.1
VR1
220Ω
R12
750Ω
Q5
A733
Q4
A733
R13
1W 0.5Ω
Q12
B553Y
Q10
D553Y
TP 1
TP 2
TP 3
TP 4
TP 5
+15
7P
+5
11P
GND
11P
-5
7P
-15
7P
R1 1W 0.5Ω
Q1
C945
R2
4.7K
IC 1
R4
470Ω
100
16
R3
10.0K
1%
56K
R9
4558
SW1
ON +4.7V
4.87K
1%
R10
C1
CE
0.1
C3
100
16
R7
4.7K
D1
LT800
R6
100K
1%
IC 1
4558
R8
3.24K
1%
CW
VR2
220Ω
R5
470Ω
Q2
A733
R11
1/2 W 1Ω
C2
CE
0.1
C4
100
16
Q11
B553Y
SPARK KILLER
NOISE FILTER
ZCB
2203-11
250V3A
AC
TEST PIN

KLM-384, 403

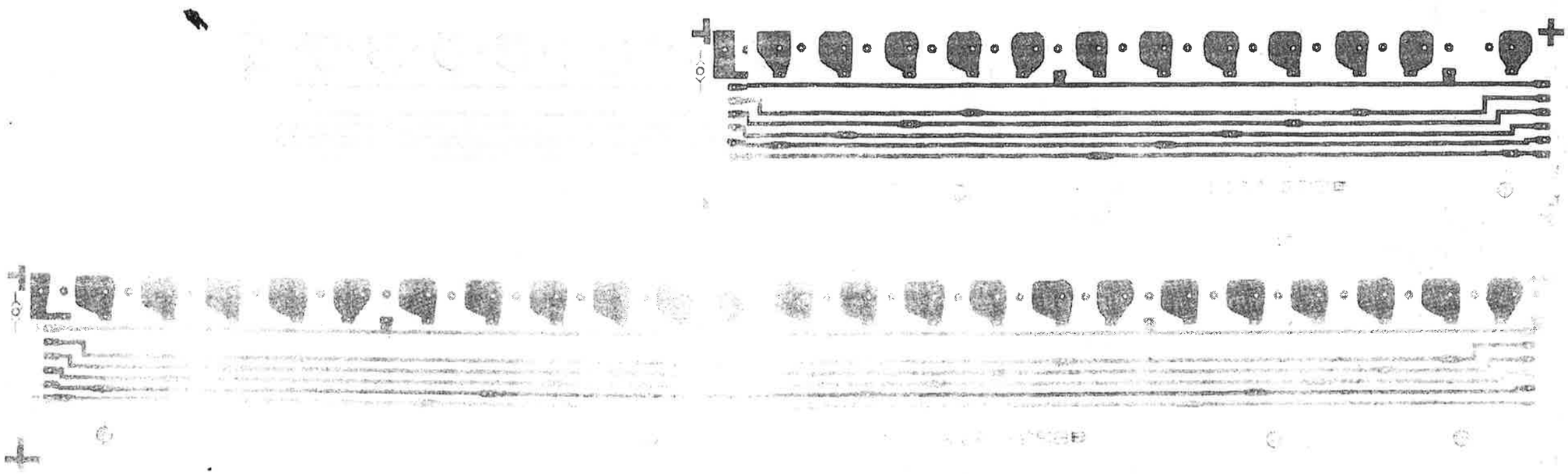

IC16 TC9130P
SCALE 16'
SCALE 8'
OUTPUT
M TRIG
TRIG SELECT
SW1 - 5 RHC 11901
KLM-403 BRASS
KLM-384 KBD BALANCE
IC7 4558
BR-ON/OFF
BR-MPXG
IC6 4051
IC8 4051
IC9
IC5
IC6
BR-SIG0 (49-8) to30-1 UNIT0
BR-SIG1 (49-7) to29-1 UNIT1
BR-SIG2 (49-6) to28-1 UNIT2
BR-SIG3 (49-5) to27 UNIT3
BR-SIG4 (49-4) to26-1 UNIT4
BR-SIG5 (49-3) to25-1 UNIT5
BR-SIG6 (49-2) to24-1 UNIT6
BR-SIG7 (49-1) to23-1 UNIT7
C945 SELECTED
SILENCE NOTE
IC15 4558
BR-TRIG IN
BR-TRIG OUT
BR-ORG
IC10
IC13 SSM2044
RESONANCE
OFF SET
20CT/1V
IC ADJ
IC WIDTH
CUT OFF FREQ
BR-EXTICM
BR SIG OUT
KLM-404
VCA ADJ
EG INTENSITY
ATTACK
DECAY
RELEASE
SUSTAIN
IC11 4007
IC12 072
ST-BALANCED SIG 0 (48-8) to46-1 UNIT 0
ST-BALANCED SIG 1 (48-7) to46-2 UNIT 1
ST-BALANCED SIG 2 (48-6) to46-3 UNIT 2
ST-BALANCED SIG 3 (48-5) to46-4 UNIT 3
ST-BALANCED SIG 4 (48-4) to46-5 UNIT 4
ST-BALANCED SIG 5 (48-3) to46-6 UNIT 5
ST-BALANCED SIG 6 (48-2) to46-7 UNIT 6
ST-BALANCED SIG 7 (48-1) to46-8 UNIT 7
ST-CV0 (43-1) to04-8
ST-SIG0 (42-1) to30-3
ST-CV1 (43-2) to04-7
ST-SIG1 (42-2) to29-3
ST-CV2 (43-3) to04-6
ST-SIG2 (42-3) to28-3
ST-CV3 (43-4) to04-5
ST-SIG3 (42-4) to27-3
ST-CV4 (43-5) to04-4
ST-SIG4 (42-5) to26-3
ST-CV5 (43-6) to04-3
ST-SIG5 (42-6) to25-3
ST-CV6 (43-7) to04-2
ST-SIG6 (42-7) to24-3
ST-CV7 (43-8) to04-1
ST-SIG 7 (42-8) to23-3
ST-BALANCED SIG 7 (48-8) to48-1
ST-SIGOUT
ST-ATTACK
ST-RELEASE
ST-MPXG
MPX GATE
ST-KBD BAL.
KLM -404
+15V
GND
-15V
+5V
-5V
IC2,6 4001
IC4,9 4066
IC5 4070
IC10 4023
ALL 4558 -15 +15
ALL DIODE 1S1555
Q1,2,3 R3
BLUE 820K
GREEN 680K
YELLOW 560K
ORANGE 470K
Q5 R4
BLUE 1.2M
GREEN 1M
YELLOW 820K
ORANG 680K

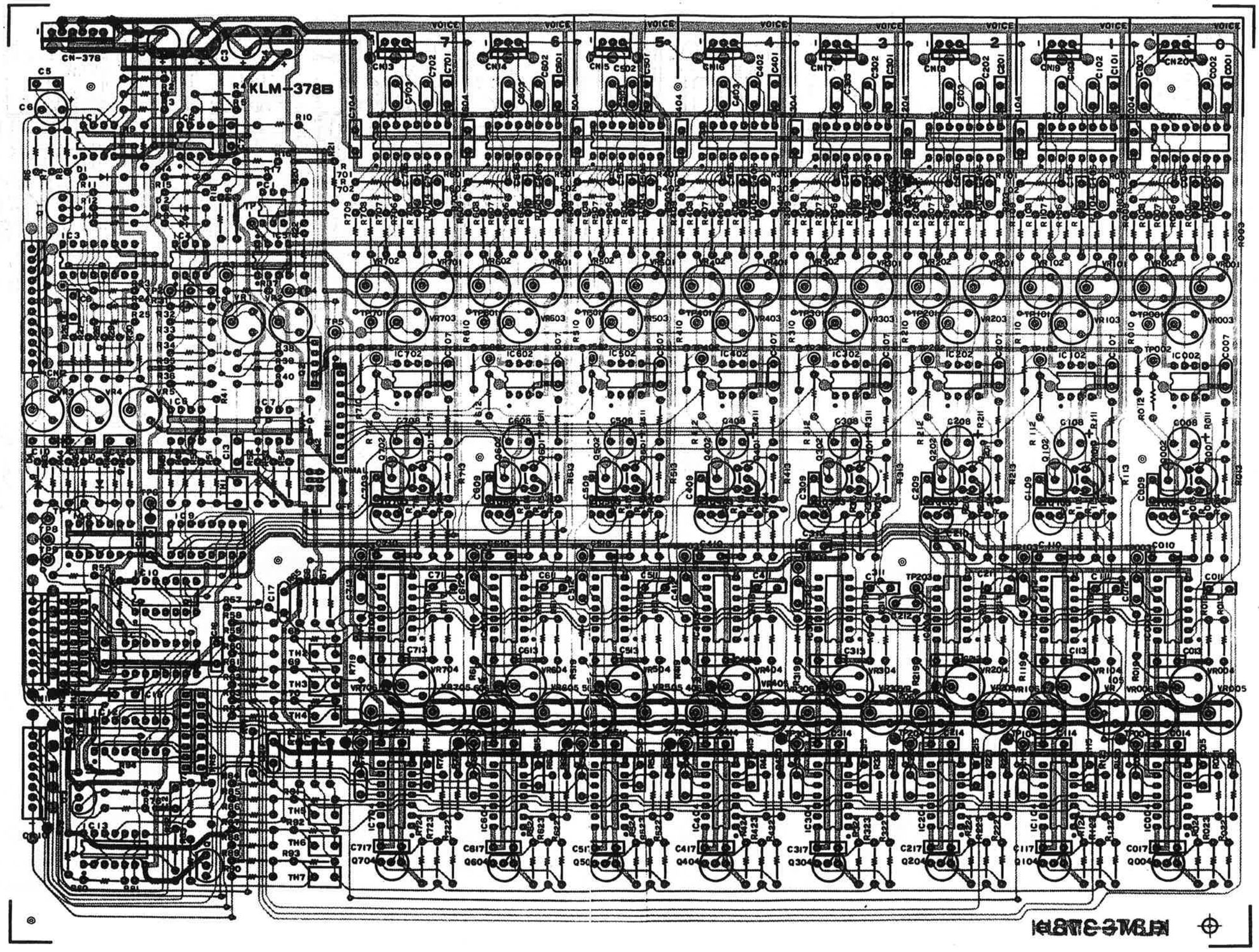
KLM-404

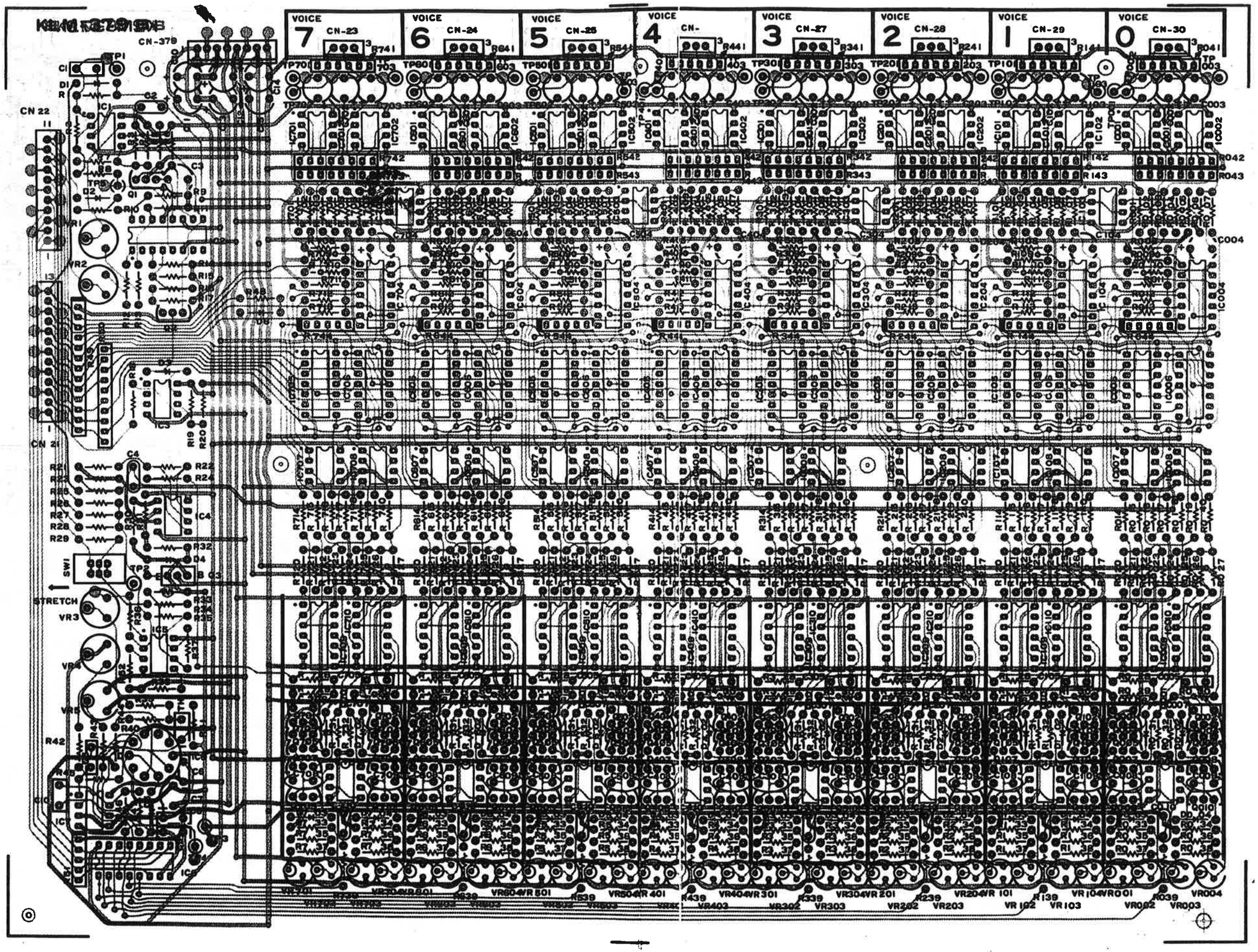

IC-12
IC 13
4558
IC 10
4046
VIBRATO INTENSITY
VIBRATO DELAY TIME
VIBRATO SPEED
IC-21
4558
IC-2
4013
IC-15
4013
IC-4
4013
IC-7
4069
IC-1
MN3004
IC-14
MN3004
IC-3
MN3004
ENSEMBLE 1
ENSEMBLE 2
ENSEMBLE 3
IC-8
571
IC-9
571
IC-11
MN3004
IC-20
13600
IC-19
4558
IC-5
4007
IC-6
4558
IC-18
4558
IC-17
4556
IC-16
4558
IC-24
IC-23
4558
BOWING TONE
Q20,Q30 SELECTED
HIGH
EQUAL
LOW
BOWING LEVEL
VIBRATO OFF
ENSEMBLE OFF
BOWING
OUTPUT
SCALE 16'
SCALE 8'
SCALE 4'
ST-SIG-IN(EQ)
ST-SIG OUT(EQ)
ST-ORG
KBD BALANCE
ST-KBD BAL.
ST-RELEASE
ST-ATTALK
PHONE OUT 1
PHONE OUT 2
PHONES VOLUME
TOTAL VOLUME
MIX OUT
TS-ON/OFF
TS-SW
ST-ON/OFF
ST-16'
ST-8'
ST-4'

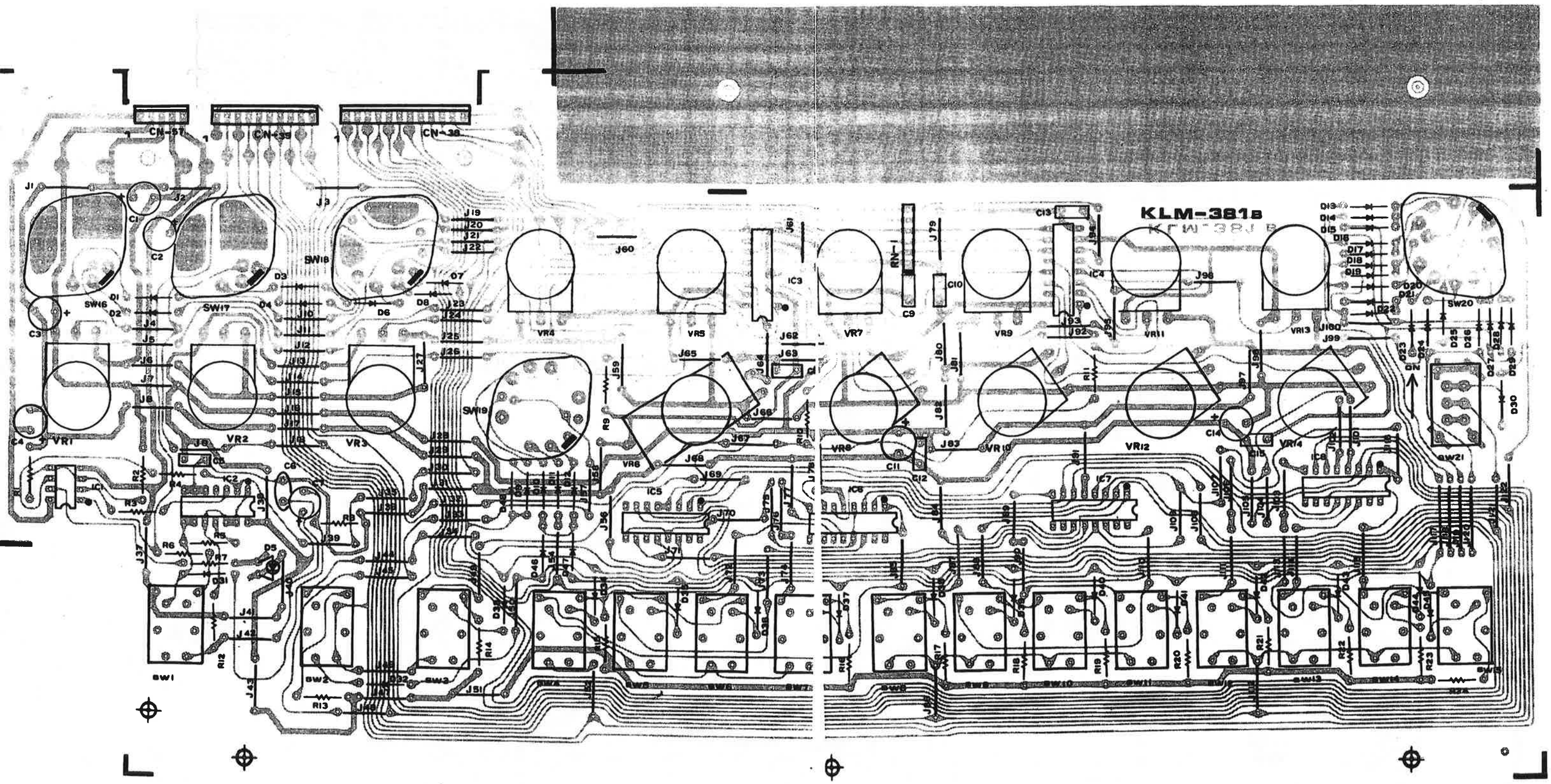
5. PC BOARD

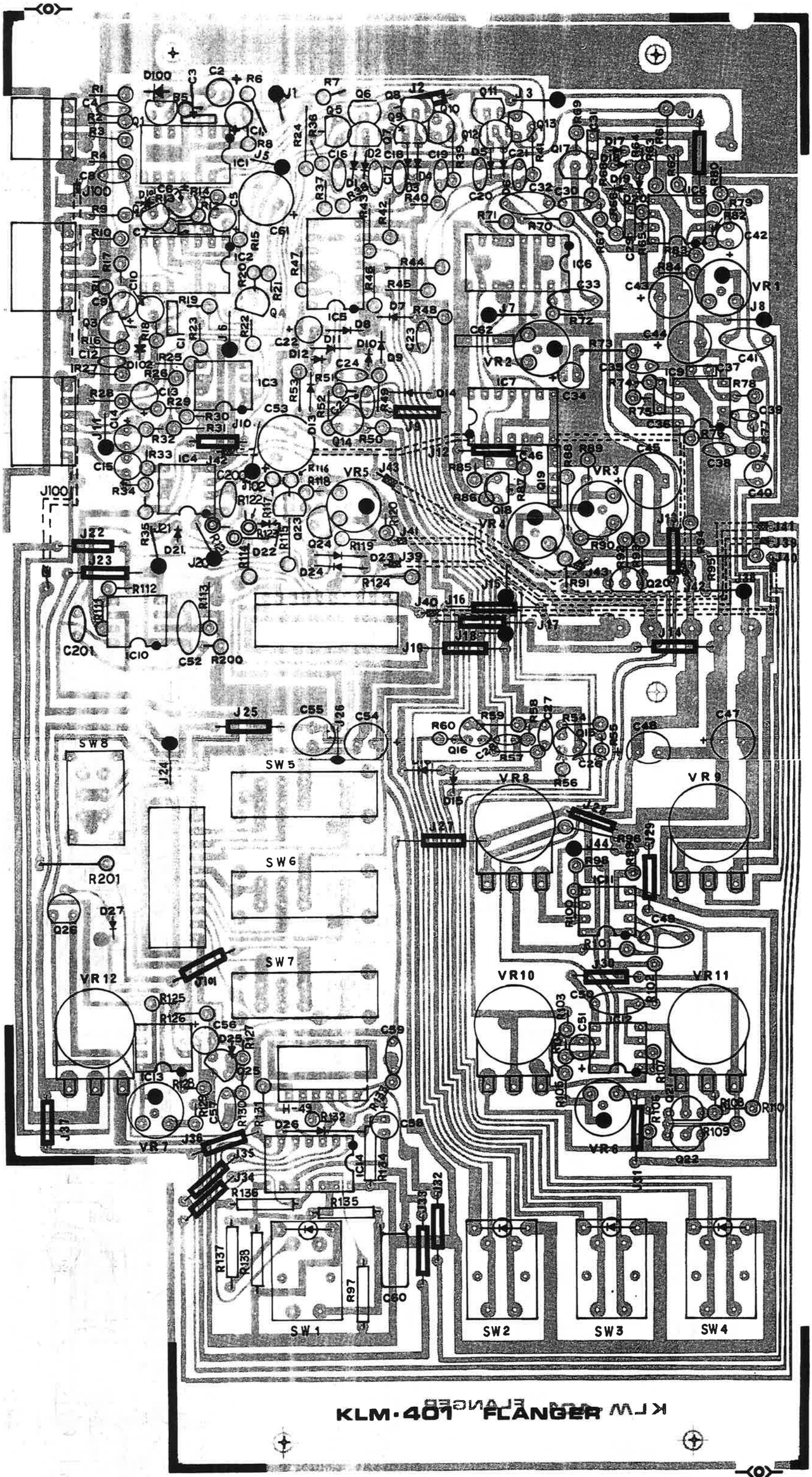
KLM-298, 299, 379




KLM-378B
CN-378
VOICE
VOICE
VOICE
VOICE
VOICE
VOICE
VOICE
VOICE
CN13
CN14
CN15
CN16
CN17
CN18
CN19
CN20
IC702
IC602
IC502
IC402
IC302
IC202
IC102
IC002
VR702
VR701
VR602
VR601
VR502
VR501
VR402
VR401
VR302
VR301
VR202
VR201
VR102
VR101
VR002
VR001
VR704
VR604
VR504
VR404
VR304
VR204
VR104
VR004
VR005
NORMAL

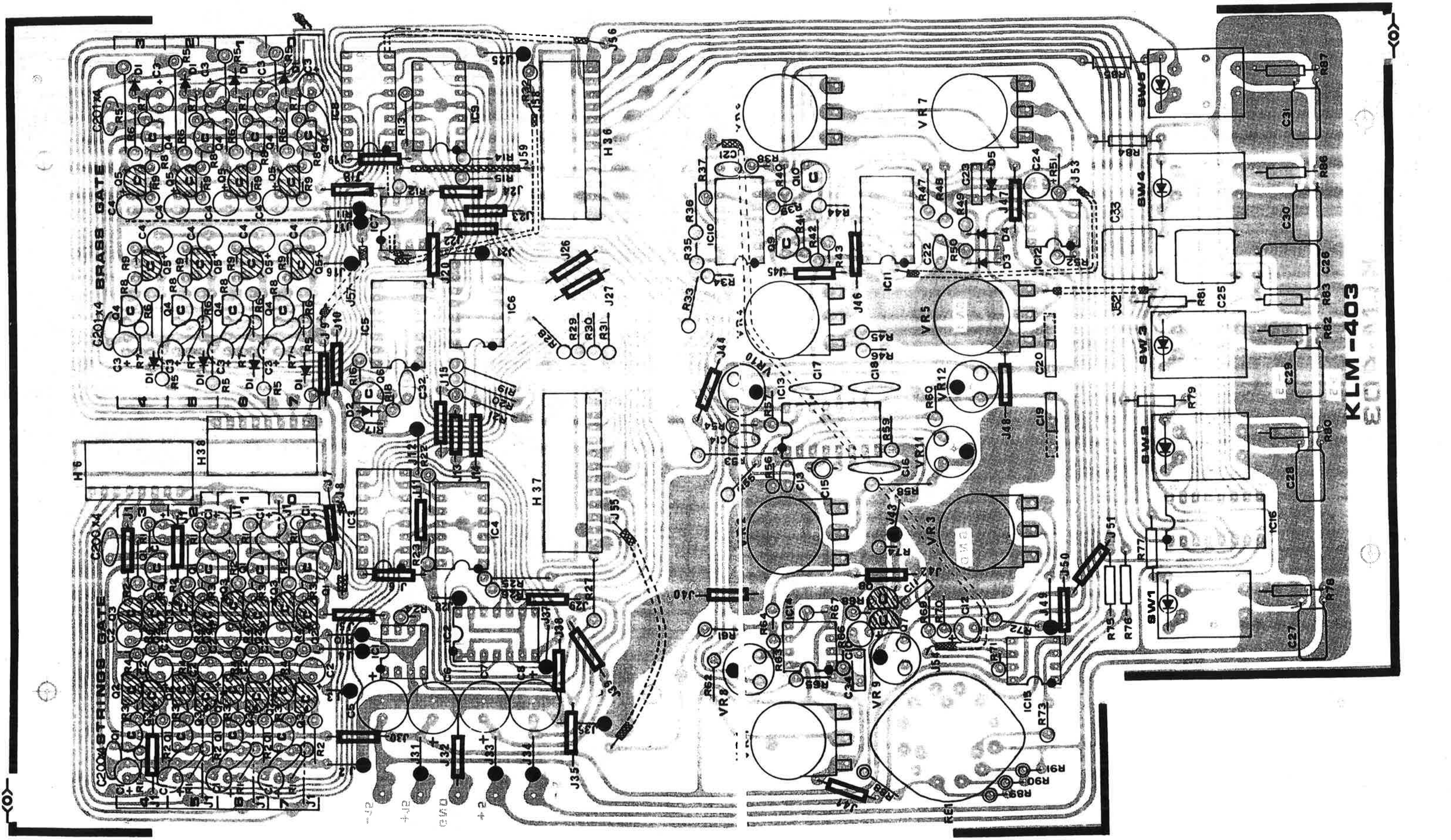

VOICE 7 CN-23
VOICE 6 CN-24
VOICE 5 CN-25
VOICE 4 CN-
VOICE 3 CN-27
VOICE 2 CN-28
VOICE 1 CN-29
VOICE 0 CN-30
CN-379
CN 22
CN 21
STRETCH
VR3
SW1
R42
VR701
VR704/VR601
VR604/VR501
VR504/VR401
VR404/VR301
VR304/VR201
VR204/VR101
VR104/VR001
VR703
VR603
VR503
VR403
VR303
VR203
VR103
VR003
VR004

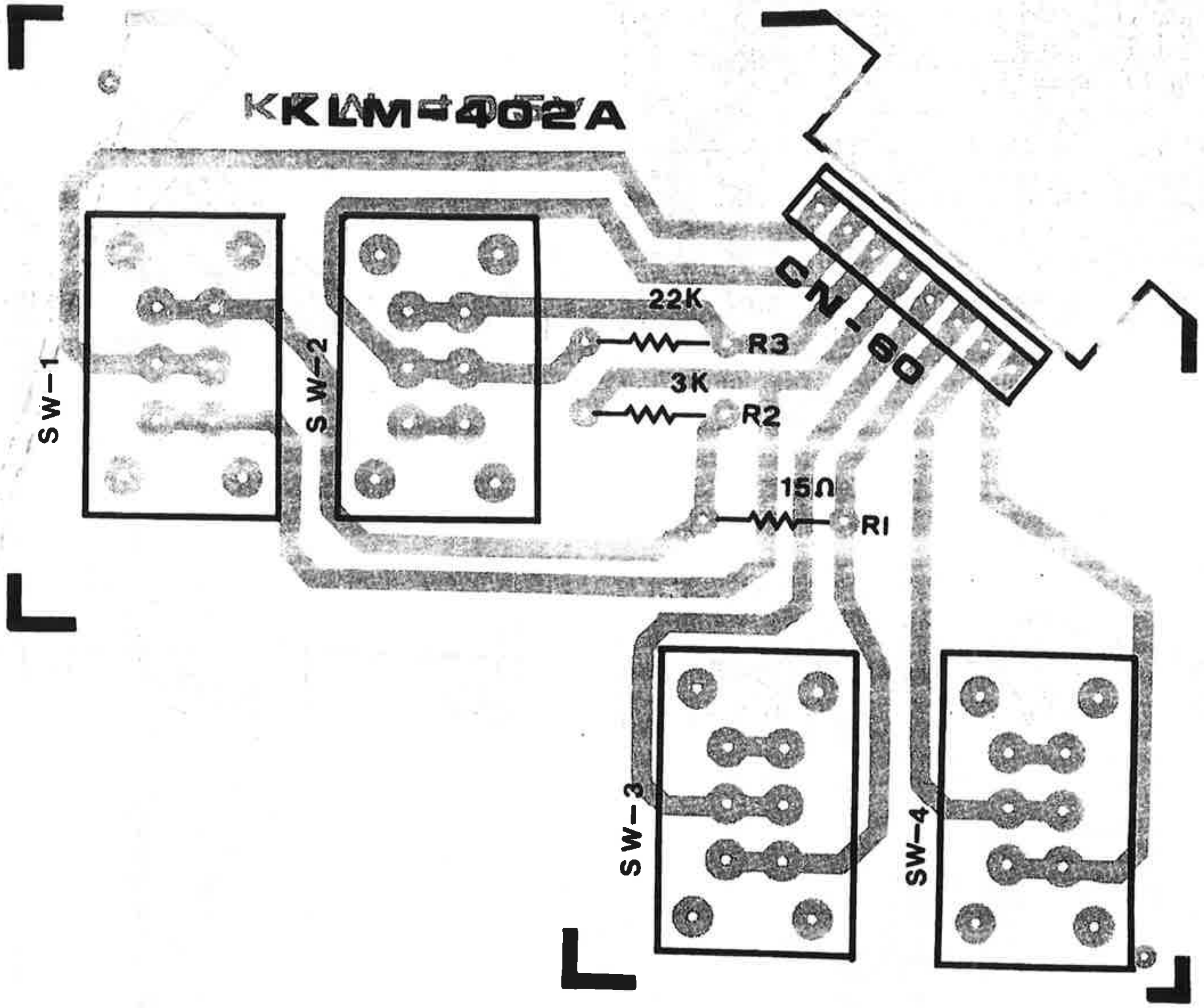

KLM-381B
CN-37
CN-38
CN-39
SW16
SW17
SW18
SW19
SW20
SW21
VR1
VR2
VR3
VR4
VR5
VR6
VR7
VR8
VR9
VR10
VR11
VR12
VR13
VR14
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
C1
C2
C3
C4
C9
C10
C11
C12
C13
C14
C15
R1
R2
R3
R4
R5
R6
R7
R9
R11
R12
R13
R14
R16
R17
R18
R19
R20
R21
R22
R23
RN-1
SW1
SW2
SW3

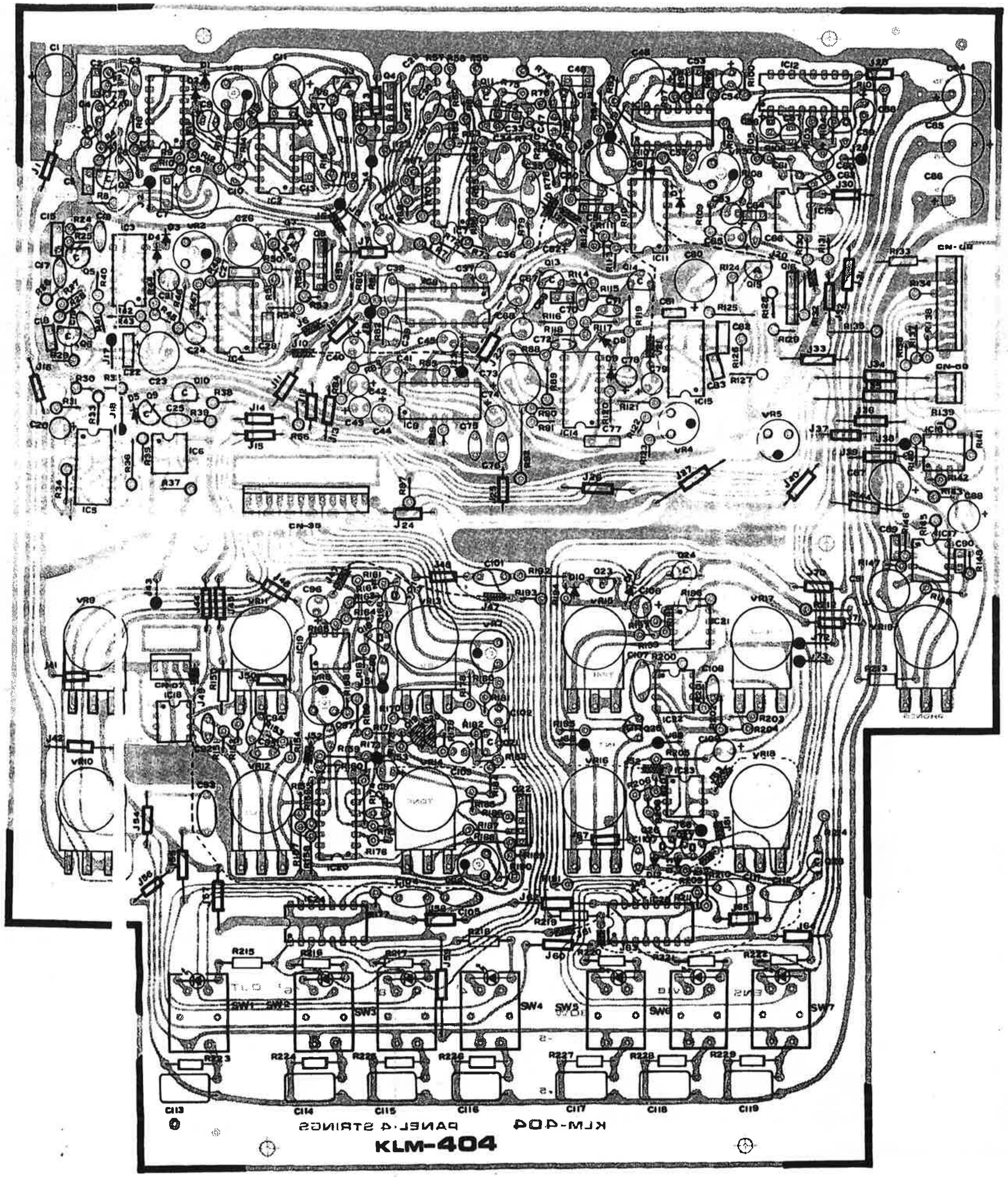


KLM-401

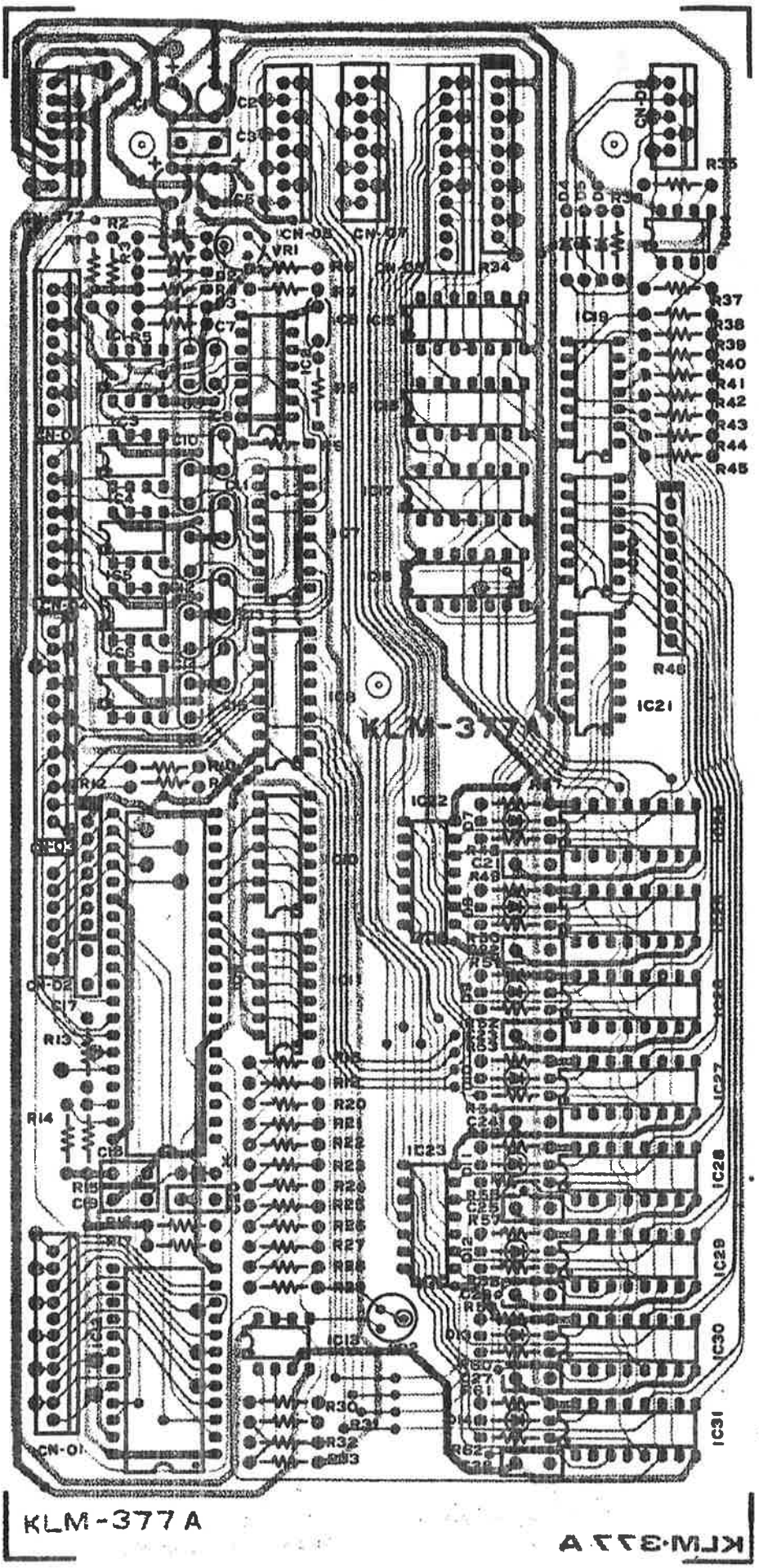
KLM-403

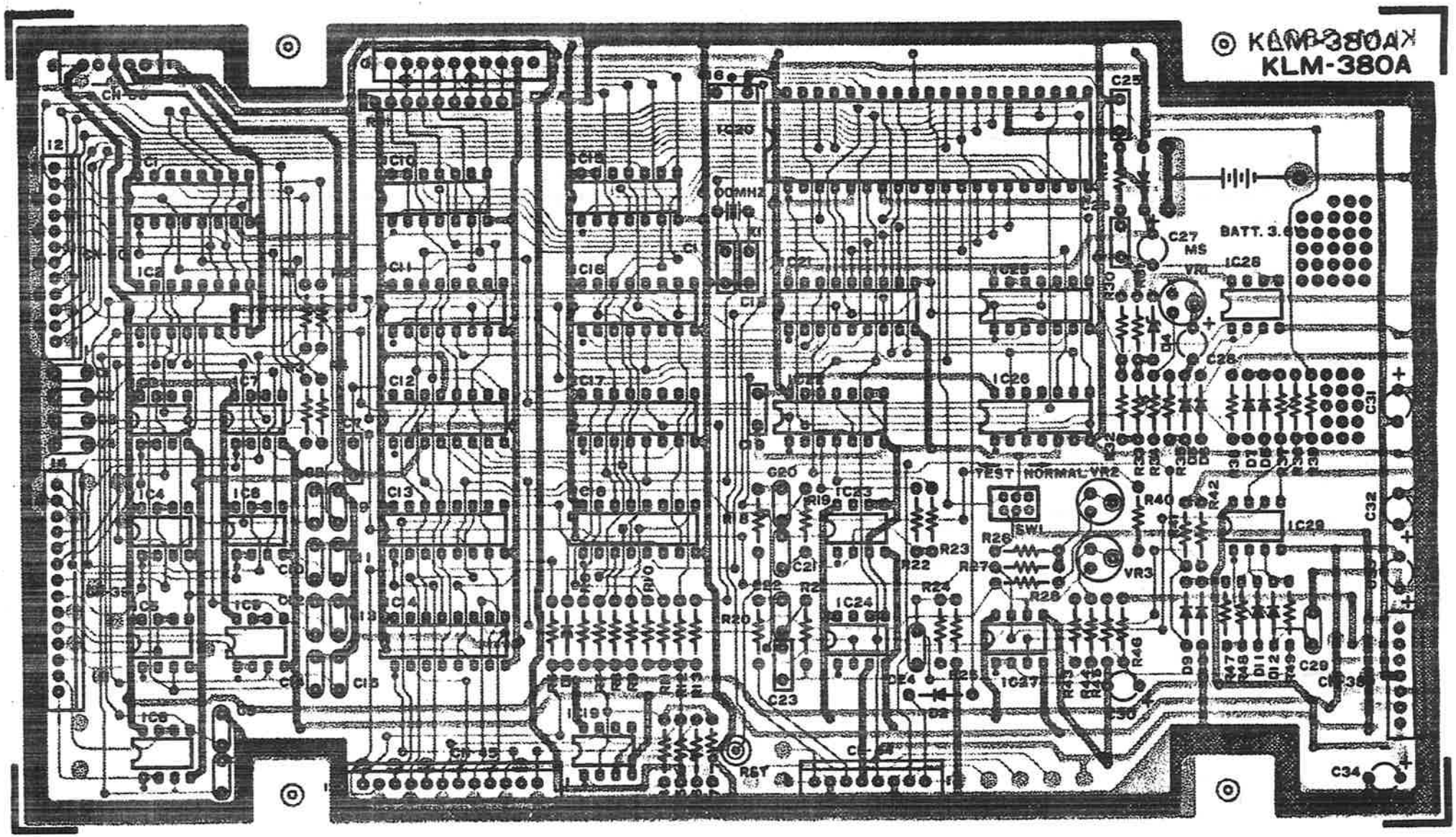


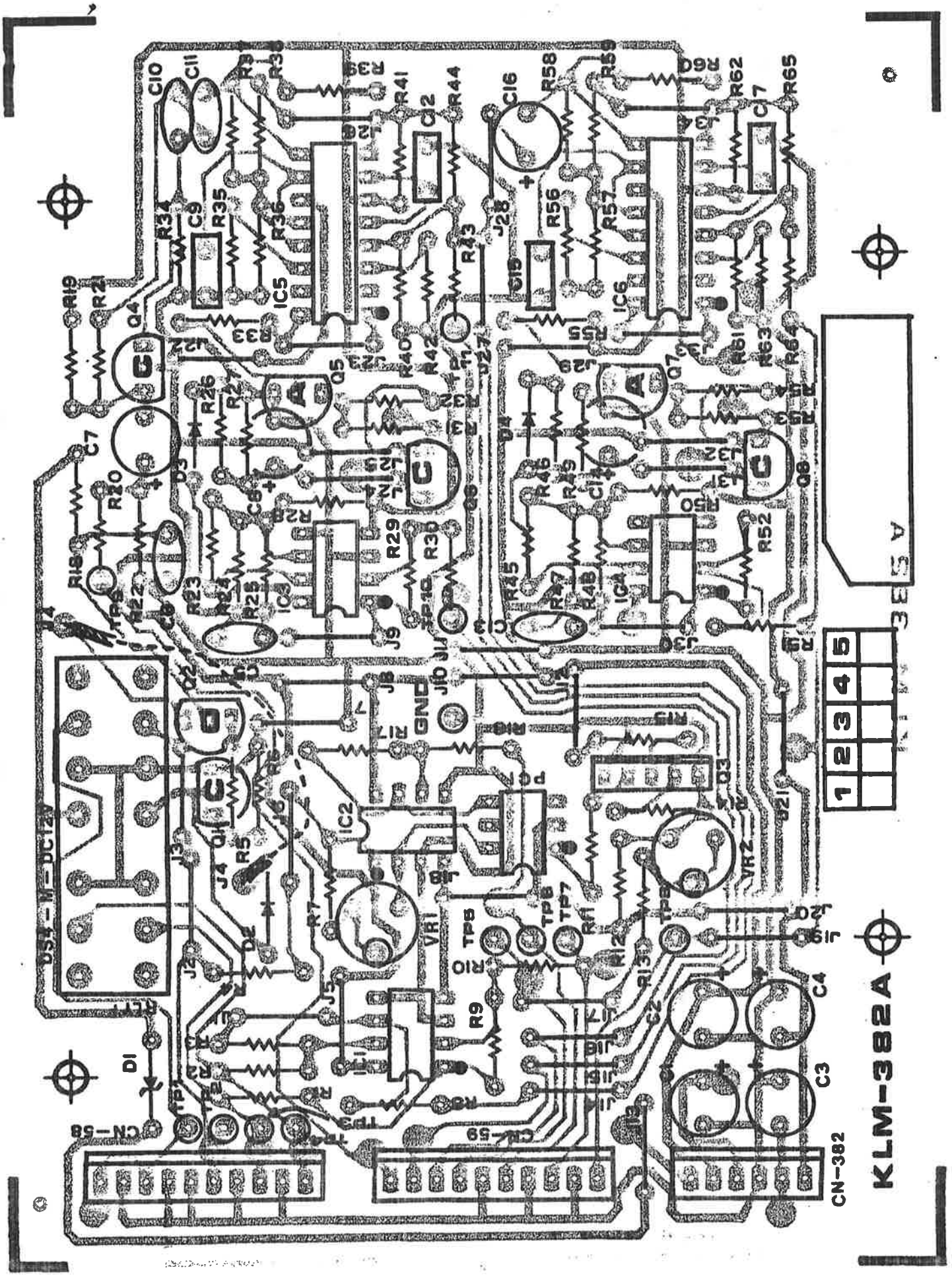

KLM-402A
CN-60
22K
R3
3K
R2
15Ω
R1
SW-1
SW-2
SW-3
SW-4

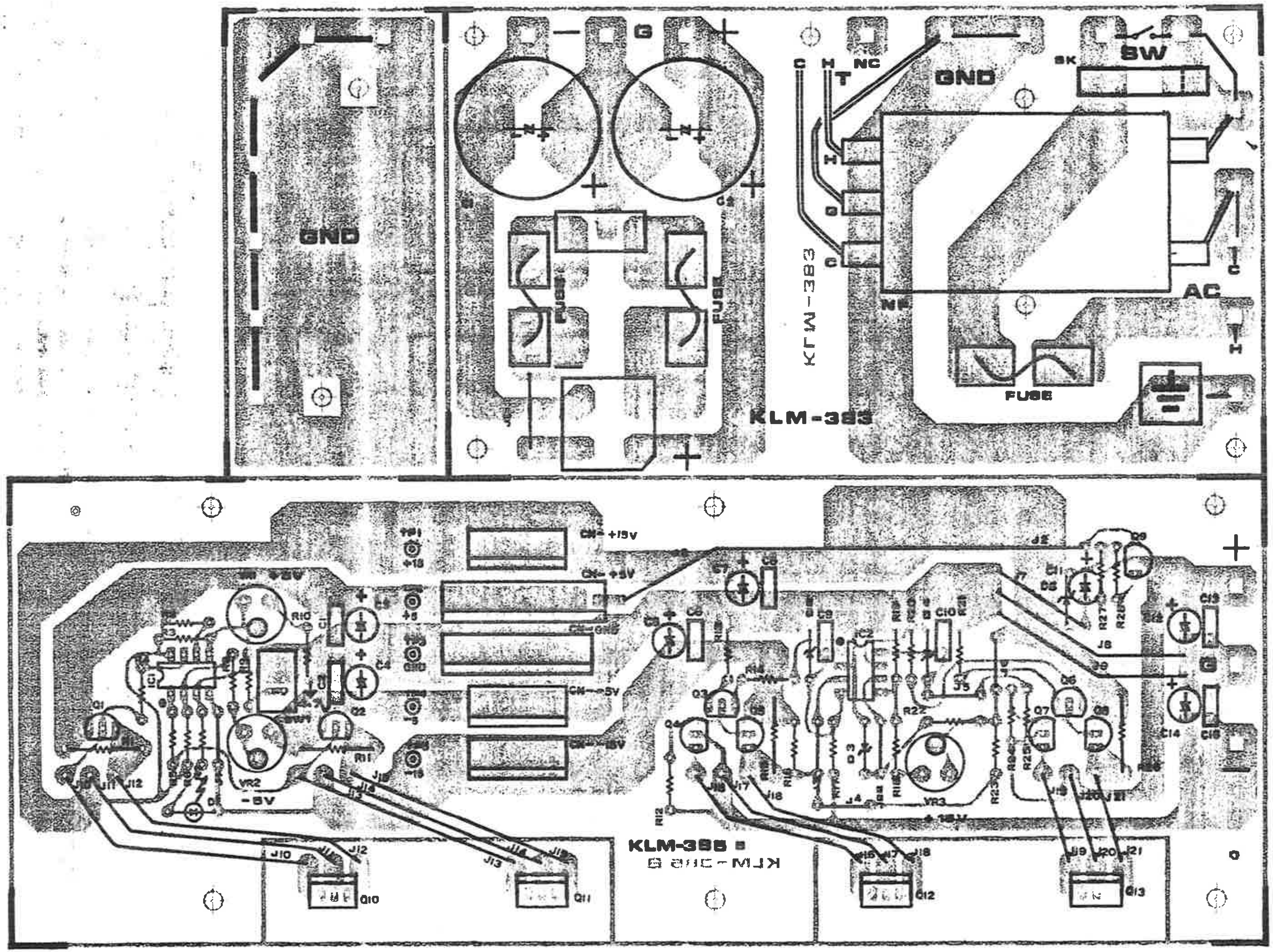

KLM-404

KLM-377,380

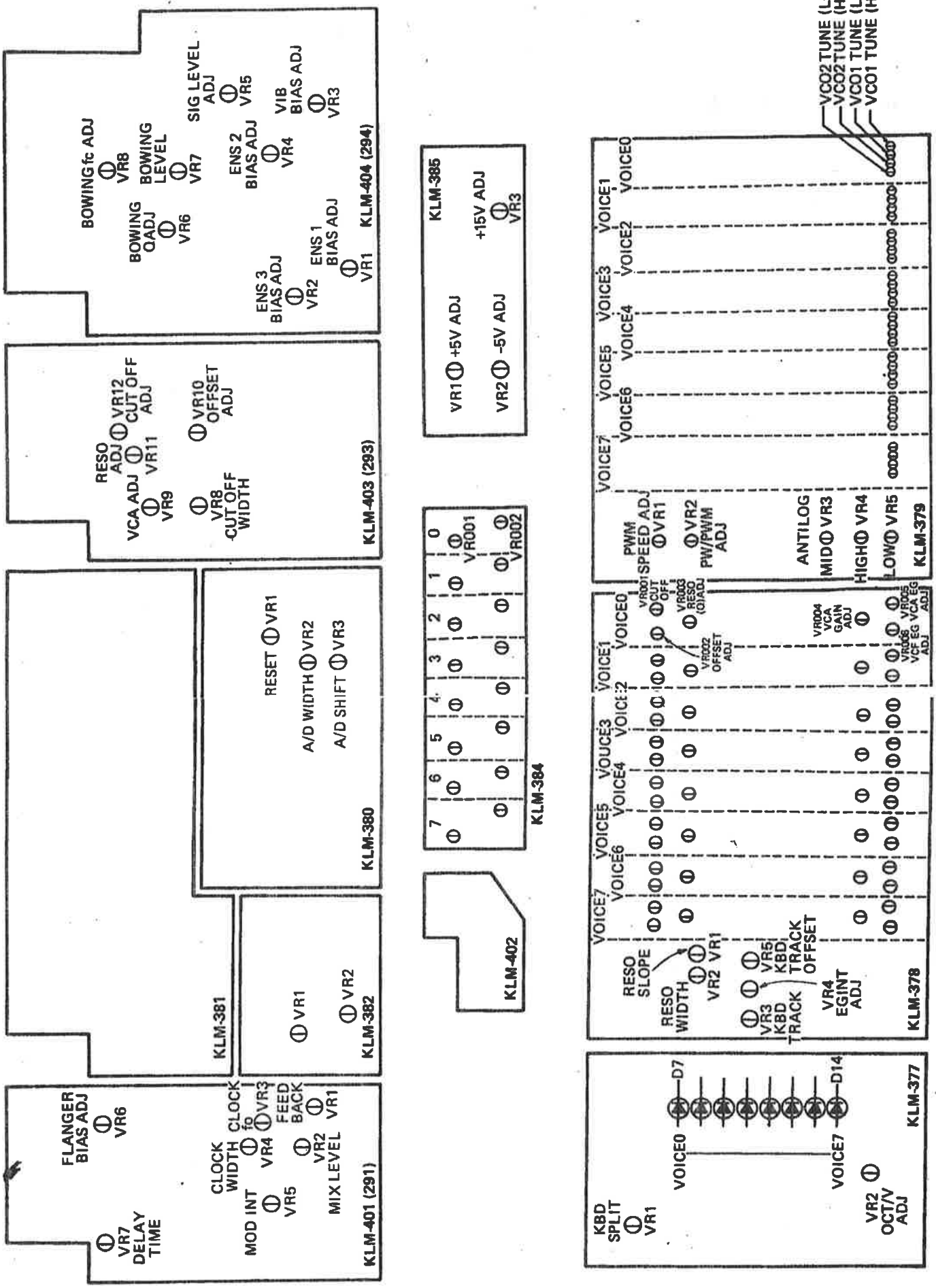



KLM-380A
KLM-380A
C25
C27
MS
BATT. 3.6
VR1
IC28
C28
C31
IC26
TEST
NORMAL
VR2
SW1
R40
R42
C32
IC29
R26
R27
R28
VR3
R24
IC24
R23
R22
IC23
C20
C21
C23
R19
R20
IC27
R25
R46
C29
C34
R&T
20MHZ
X1
IC20
IC25
IC1
IC2
IC3
IC4
IC5
IC6
IC8
IC9
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C22
C24
C26
C30
C33
C35
D1
D2
D9
D11
D12
R47
R48
R49
R50
R51
R52
R53
R54
R55
R56
R57
R58
R59
R60
R61
R62
R63
R64
R65
R66
R67
R68
R69
R70
R71
R72
R73
R74
R75
R76
R77
R78
R79
R80
R81
R82
R83
R84
R85
R86
R87
R88
R89
R90
R91
R92
R93
R94
R95
R96
R97
R98
R99
R100
R101
R102
R103
R104
R105
R106
R107
R108
R109
R110
R111
R112
R113
R114
R115
R116
R117
R118
R119
R120
R121
R122
R123
R124
R125
R126
R127
R128
R129
R130
R131
R132
R133
R134
R135
R136
R137
R138
R139
R140
R141
R142
R143
R144
R145
R146
R147
R148
R149
R150
R151
R152
R153
R154
R155
R156
R157
R158
R159
R160
R161
R162
R163
R164
R165
R166
R167
R168
R169
R170
R171
R172
R173
R174
R175
R176
R177
R178
R179
R180
R181
R182
R183
R184
R185
R186
R187
R188
R189
R190
R191
R192
R193
R194
R195
R196
R197
R198
R199
R200
R201
R202
R203
R204
R205
R206
R207
R208
R209
R210
R211
R212
R213
R214
R215
R216
R217
R218
R219
R220
R221
R222
R223
R224
R225
R226
R227
R228
R229
R230
R231
R232
R233
R234
R235
R236
R237
R238
R239
R240
R241
R242
R243
R244
R245
R246
R247
R248
R249
R250
R251
R252
R253
R254
R255
R256
R257
R258
R259
R260
R261
R262
R263
R264
R265
R266
R267
R268
R269
R270
R271
R272
R273
R274
R275
R276
R277
R278
R279
R280
R281
R282
R283
R284
R285
R286
R287
R288
R289
R290
R291
R292
R293
R294
R295
R296
R297
R298
R299
R300
R301
R302
R303
R304
R305
R306
R307
R308
R309
R310
R311
R312
R313
R314
R315
R316
R317
R318
R319
R320
R321
R322
R323
R324
R325
R326
R327
R328
R329
R330
R331
R332
R333
R334
R335
R336
R337
R338
R339
R340
R341
R342
R343
R344
R345
R346
R347
R348
R349
R350
R351
R352
R353
R354
R355
R356
R357
R358
R359
R360
R361
R362
R363
R364
R365
R366
R367
R368
R369
R370
R371
R372
R373
R374
R375
R376
R377
R378
R379
R380
R381
R382
R383
R384
R385
R386
R387
R388
R389
R390
R391
R392
R393
R394
R395
R396
R397
R398
R399
R400
R401
R402
R403
R404
R405
R406
R407
R408
R409
R410
R411
R412
R413
R414
R415
R416
R417
R418
R419
R420
R421
R422
R423
R424
R425
R426
R427
R428
R429
R430
R431
R432
R433
R434
R435
R436
R437
R438
R439
R440
R441
R442
R443
R444
R445
R446
R447
R448
R449
R450
R451
R452
R453
R454
R455
R456
R457
R458
R459
R460
R461
R462
R463
R464
R465
R466
R467
R468
R469
R470
R471
R472
R473
R474
R475
R476
R477
R478
R479
R480
R481
R482
R483
R484
R485
R486
R487
R488
R489
R490
R491
R492
R493
R494
R495
R496
R497
R498
R499
R500
R501
R502
R503
R504
R505
R506
R507
R508
R509
R510
R511
R512
R513
R514
R515
R516
R517
R518
R519
R520
R521
R522
R523
R524
R525
R526
R527
R528
R529
R530
R531
R532
R533
R534
R535
R536
R537
R538
R539
R540
R541
R542
R543
R544
R545
R546
R547
R548
R549
R550
R551
R552
R553
R554
R555
R556
R557
R558
R559
R560
R561
R562
R563
R564
R565
R566
R567
R568
R569
R570
R571
R572
R573
R574
R575
R576
R577
R578
R579
R580
R581
R582
R583
R584
R585
R586
R587
R588
R589
R590
R591
R592
R593
R594
R595
R596
R597
R598
R599
R600
R601
R602
R603
R604
R605
R606
R607
R608
R609
R610
R611
R612
R613
R614
R615
R616
R617
R618
R619
R620
R621
R622
R623
R624
R625
R626
R627
R628
R629
R630
R631
R632
R633
R634
R635
R636
R637
R638
R639
R640
R641
R642
R643
R644
R645
R646
R647
R648
R649
R650
R651
R652
R653
R654
R655
R656
R657
R658
R659
R660
R661
R662
R663
R664
R665
R666
R667
R668
R669
R670
R671
R672
R673
R674
R675
R676
R677
R678
R679
R680
R681
R682
R683
R684
R685
R686
R687
R688
R689
R690
R691
R692
R693
R694
R695
R696
R697
R698
R699
R700
R701
R702
R703
R704
R705
R706
R707
R708
R709
R710
R711
R712
R713
R714
R715
R716
R717
R718
R719
R720
R721
R722
R723
R724
R725
R726
R727
R728
R729
R730
R731
R732
R733
R734
R735
R736
R737
R738
R739
R740
R741
R742
R743
R744
R745
R746
R747
R748
R749
R750
R751
R752
R753
R754
R755
R756
R757
R758
R759
R760
R761
R762
R763
R764
R765
R766
R767
R768
R769
R770
R771
R772
R773
R774
R775
R776
R777
R778
R779
R780
R781
R782
R783
R784
R785
R786
R787
R788
R789
R790
R791
R792
R793
R794
R795
R796
R797
R798
R799
R800
R801
R802
R803
R804
R805
R806
R807
R808
R809
R810
R811
R812
R813
R814
R815
R816
R817
R818
R819
R820
R821
R822
R823
R824
R825
R826
R827
R828
R829
R830
R831
R832
R833
R834
R835
R836
R837
R838
R839
R840
R841
R842
R843
R844
R845
R846
R847
R848
R849
R850
R851
R852
R853
R854
R855
R856
R857
R858
R859
R860
R861
R862
R863
R864
R865
R866
R867
R868
R869
R870
R871
R872
R873
R874
R875
R876
R877
R878
R879
R880
R881
R882
R883
R884
R885
R886
R887
R888
R889
R890
R891
R892
R893
R894
R895
R896
R897
R898
R899
R900
R901
R902
R903
R904
R905
R906
R907
R908
R909
R910
R911
R912
R913
R914
R915
R916
R917
R918
R919
R920
R921
R922
R923
R924
R925
R926
R927
R928
R929
R930
R931
R932
R933
R934
R935
R936
R937
R938
R939
R940
R941
R942
R943
R944
R945
R946
R947
R948
R949
R950
R951
R952
R953
R954
R955
R956
R957
R958
R959
R960
R961
R962
R963
R964
R965
R966
R967
R968
R969
R970
R971
R972
R973
R974
R975
R976
R977
R978
R979
R980
R981
R982
R983
R984
R985
R986
R987
R988
R989
R990
R991
R992
R993
R994
R995
R996
R997
R998
R999
R1000


KLM-382A
CN-382
CN-58
CN-59
DSI-M-DC12V
1 2 3 4 5


GND
FUSE
KLM-383
SW
AC
KLM-388 B
CN-+15V
CN-+5V
CN-GND
CN--5V
CN--15V
+5V
-5V
+15V

6. SEMI-FIXED RESISTORS POSITION DIAGRAMS



7. INTER CHANGE LIST OF CONNECTOR TERMINAL NUMBER

P.C.B	CONNEC -TOR	FUNCTION	CONNEC -TOR	COLOR
KLM-377 (ASSIGNER)	01 – 1	M10	KEYBOARD	BK
	2	M 9	"	WH
	3	M 8	"	GY
	4	M 7	"	PU
	5	M 6	"	BL
	6	M 5	"	GR
	7	M 4	"	YE
	8	M 3	"	OR
	9	M 2	"	RE
	10	M 1	"	BR
	11	M 0	"	BK
	02 – 1	X 5	KLM-298	GR
	2	X 4	"	YE
	3	X 3	"	OR
	4	X 2	"	RE
	5	X 1	"	BR
	6	X 0	"	BK
	03 – 1	A	50 – 9	BR
	2	A	22 – 1	RE
	3	B	50 – 8	OR
	4	B	22 – 2	YE
	5	C	50 – 7	GR
	6	C	22 – 3	BL
	7	D	50 – 6	PU
	8	D	22 – 4	GY
	9	ASSIGN MODE	35 – 10	WH
	10	MPX GATE	50 – 11	BK
	11	MPX CV	22 – 5	PI
	12	$\overline{IR}$	45 – 1	LB
	04 – 1	ST – CV7	43 – 8	PU
	2	" – CV6	43 – 7	BL
	3	" – CV5	43 – 6	GR
	4	" – CV4	43 – 5	YE
	5	" – CV3	43 – 4	OR
	6	" – CV2	43 – 3	RE
	7	" – CV1	43 – 2	BR
	8	" – CV0	43 – 1	BK
	05 – 1	SY – CV7	11 – 1	PU
	2	" – CV6	11 – 2	BL
	3	" – CV5	11 – 3	GR
	4	" – CV4	11 – 4	YE
	5	" – CV3	11 – 5	OR
	6	" – CV2	11 – 6	RE
	7	" – CF1	11 – 7	BR
	8	" – CV0	11 – 8	BK
	06 – 1	RC 7	13 – 2	PU
	2	GATE 7	13 – 3	"
	3	RC 6	14 – 2	BL
	4	GATE 6	14 – 3	"
	5	RC 5	15 – 2	GR
	6	GATE 5	15 – 3	"
	7	RC 4	16 – 2	YE
	8	GATE 4	16 – 3	"
	07 – 1	RC 3	17 – 2	OR
	2	GATE 3	17 – 3	"
	3	RC 2	18 – 2	RE
	4	GATE 2	18 – 3	"
	5	RC 1	19 – 2	BR
	6	GATE 1	19 – 3	"
	7	RC 0	20 – 2	BK
	8	GATE 0	20 – 3	"
	08 – 1	BR – MPXG	50 – 10	PI
	2	ST – MPXG	50 – 12	RE
	3	SY – ΔΔ	35 – 7	OR
	4	" – ▲	35 – 8	YE
	5	" – ▲	35 – 9	GR
	6	BR – ΔΔ	35 – 4	BL
	7	" – ▲	35 – 5	PU
	8	" – ▲	35 – 6	GY
	9	ST – ΔΔ	35 – 1	WH
	10	" – ▲	35 – 2	BK
	11	" – ▲	35 – 3	BR
KLM-378 (SYNTHE)	09 – 1	Σ BRG	51 – 7	LB
	2	BR – ORG	51 – 3	RE
	3	Σ SYG	12 – 11	GY
	4	ST – ORG	53 – 3	BL
	5	TOTAL – ORG	36 – 2	GR
	10 – 1	VCF – RELEASE	39 – 8	BR
	2	" – DECAY	39 – 6	RE
	3	" – ATTACK	39 – 5	OR
	4	" – SUSTAIN	39 – 7	YE
	5	VCA – RELEASE	39 – 4	GR
	6	" – DECAY	39 – 2	BL
	7	" – ATTACK	39 – 1	PU
	8	" – SUSTAIN	39 – 3	GY
	11 – 1	SY – CV 7	05 – 1	PU
	2	" – CV 6	05 – 2	BL
	3	" – CV 5	05 – 3	GR
	4	" – CV 4	05 – 4	YE
	5	" – CV 3	05 – 5	OR
	6	" – CV 2	05 – 6	RE
	11 – 7	SY – CV 1	05 – 7	BR
	8	" – CV 0	05 – 8	BK
	12 – 1	KBD TRACK	45 – 7	LB
	2	EG INTENSITY	39 – 10	RE
	3	RESONANSE	39 – 14	OR
	4	NO CONNECTION	–	–
	5	AUTO DAMP	45 – 6	GR
	6	RELEASE SW	⑰RELEASE	YE
	7	GND	–	–
	8	SY – SIG OUT (→401)	33 – 5	RE
	9	CUT OFF FREQ	39 – 9	WH
	10	SY-EXT fcM	⑲SY–Vcf fcM	OR
	11	Σ SYG	09 – 3	GY
	12	NO CONNECTION	–	–
	13 – 1	SY-SYG7	23 – 2	PU
	2	RC 7	06 – 1	"
	3	GATE 7	06 – 2	"
	14 – 1	SY – SIG6	24 – 2	BL
	2	RC 6	06 – 3	"
	3	GATE 6	06 – 4	"
	15 – 1	SY – SIG 5	25 – 2	GR
	2	RC 5	06 – 5	"
	3	GATE 5	06 – 6	"
	16 – 1	SY – SIG 4	26 – 2	YE
	2	RC 4	06 – 7	"
	3	GATE 4	06 – 8	"
	17 – 1	SY – SIG 3	27 – 2	OR
	2	RC 3	07 – 1	"
	3	GATE 3	07 – 2	"
	18 – 1	SY – SIG 2	28 – 2	RE
	2	RC 2	07 – 3	"
	3	GATE 2	07 – 4	"
	19 – 1	SY – SIG 1	29 – 2	BR
	2	RC 1	07 – 5	"
	3	GATE 1	07 – 6	"
	20 – 1	SY – SIG 0	30 – 2	BK
	2	RC 0	07 – 7	"
	3	GATE 0	07 – 8	"
KLM-379	21 – 1	DETUNE	39 – 11	LB
	2	ST – 16'	53 – 6	RE
	3	" – 8'	53 – 5	OR
	4	" – 4'	53 – 4	YE
	5	BR – 16'	51 – 9	GR
	6	" – 8'	51 – 10	BL
	7	VCO1 16'	45 – 12	PU
	8	" 8'	45 – 11	GY
	9	" 4'	45 – 10	WH
	10	VCO2 16'	45 – 4	BK
	11	" 8'	45 – 3	BR
	12	VCO2 OFF	45 – 5	PI
	13	SAW	45 – 9	OR
	22 – 1	A	03 – 2	RE
	2	B	03 – 4	YE
	3	C	03 – 6	BL
	4	D	03 – 8	GY
	5	MPX CV	03 – 11	PI
	6	DELAY VIB	36 – 6	LB
	7	MODULATION	36 – 5	PU
	8	TOTAL TUNE	33 – 1	OR
	9	PWM	45 – 8	BR
	10	PW/PWM	39 – 12	BK
	11	PWM SPEED	39 – 13	GR
	23 – 1	BR – SIG 7	49 – 1	PU
	2	SY – SIG 7	13 – 1	"
	3	ST – SIG 7	42 – 8	"
	24 – 1	BR – SIG 6	49 – 2	BL
	2	SY – SIG 6	14 – 1	"
	3	ST – SIG 6	42 – 7	"
	25 – 1	BR – SIG 5	49 – 3	GR
	2	SY – SIG 5	15 – 1	"
	3	ST – SIG 5	42 – 6	"
	26 – 1	BR – SIG 4	49 – 4	YE
	2	SY – SIG 4	16 – 1	"
	3	ST – SIG 4	42 – 5	"
	27 – 1	BR – SIG 3	49 – 5	OR
	2	SY – SIG 3	17 – 4	"
	3	ST – SIG 3	42 – 4	"
	28 – 1	BR – SIG 2	49 – 6	RE
	2	SY – SIG 2	18 – 1	"
	3	ST – SIG 2	42 – 3	"
	29 – 1	BR – SIG 1	49 – 7	BR
	2	SY – SIG 1	19 – 1	"
	3	ST – SIG 1	42 – 2	"
	30 – 1	BR – SIG 0	49 – 8	BK
	2	SY – SIG 0	20 – 1	"
	3	ST – SIG 0	42 – 1	"
KLM-401 (FLANGER)	31 – 1	ST – ON/OFF	53 – 7	LB
	2	ST – SIG IN (←404)	53 – 12	RE
	3	BR – ON/OFF	51 – 11	OR

COLOR	P.C.B	CONNEC -TOR	FUNCTION	CONNEC -TOR	COLOR
		31 — 4	BR — SIG IN (←403)	51 — 1	YE
		32 — 1	GND *	59 — 6	—
		2	SY — SIG OUT *	59 — 5	BR
		3	GND *	59 — 4	—
		4	BR — SIG OUT *	59 — 3	WH
		5	GND *	59 — 2	—
		6	ST — SIG OUT *	59 — 1	GY
		33 — 1	TOTAL TUNE	22 — 8	OR
		2	BR—EXPRESSION	ⓓBR-EXPRESSION	GY
		3	ST — "	J ST —	PU
		4	SY — "	J SY —	WH
		5	SY — SIG IN (←378) *	12 — 8	RE
		6	SY — ON/OFF	37 — 2	PI
		34 — 1	JOY — INT3	JOYSTICK	BK
		2	JOY — INT2 (CCW)	"	BR
		3	Y	"	RE
		4	X	"	OR
		5	JOY — SPEED2	"	YE
		6	JOY — INT1 (CW)	"	GR
		7	JOY — SPEED3	"	BL
		8	JOY — SPEED1(CW)	"	PU
		9	+5V	"	GY
		10	-5V	"	WH
		35 — 1	ST — ▷▷	08 — 9	WH
		2	" — ◀	08 — 10	BK
		3	" — ◀	08 — 11	BR
		4	BR — ▷▷	08 — 6	BL
		5	" — ◀	08 — 7	PU
		6	" — ◀	08 — 8	GY
		7	SY — ▷▷	08 — 3	OR
		8	" — ◀	08 — 4	YE
		9	" — ◀	08 — 5	GR
		10	ASSIGN MODE	03 — 9	WH
		36 — 1	VIB INT2	DELAY VIB VR — CW	BK
		2	TOTAL ORG	09 — 5	GR
		3	VIB INT1	DELAY VIB — CW	RE
		4	VIB INT3	" — CNT	BR
		5	MODULATION	22 — 7	PU
		6	DELAY VIB	22 — 6	LB
	KLM-381 (SY-PANEL)	37 — 1	DATA *	41 — 6	WH
		2	SY — ON/OFF	33 — 6	PI
		3	DO 7	41 — 3	PU
		4	DO 6	41 — 4	BL
		5	DO 5	41 — 5	GR
		6	DO 4	41 — 6	YE
		7	DO 3	41 — 7	OR
		8	DO 2	41 — 8	RE
		9	DO 1	41 — 9	BR
		10	DO 0	41 — 10	BK
		38 — 1	P 26	40 — 1	BR
		2	P 27	40 — 2	RE
		3	P 13	40 — 3	OR
		4	P 12	40 — 4	YE
		5	P 11	40 — 5	GR
		6	P 10	40 — 6	BL
		7	TE	40 — 7	PU
		8	P 20	40 — 8	GY
		9	P 21	40 — 9	WH
		10	P 22	40 — 10	BK
		11	P 23	40 — 11	PI
		12	P 23	40 — 12	LB
	KLM-380 (PROGRAM -MER)	39 — 1	VCA ATTACK	10 — 7	PU
		2	" DECAY	10 — 6	BL
		3	" SUSTAIN	10 — 8	GY
		4	" RELEASE	10 — 5	GR
		5	VCF ATTACK	10 — 3	OR
		6	" DECAY	10 — 2	RE
		7	" SUSTAIN	10 — 4	YE
		8	" RELEASE	10 — 1	BR
		9	CUTOFF FREQ	12 — 9	WH
		10	EG INTENSITY	12 — 2	RE
		11	DETUNE	21 — 1	LB
		12	PW/PWM	22 — 10	BK
		13	PWM SPEED	22 — 11	GR
		14	RESONANCE	12 — 3	OR
		40 — 1	P 26	38 — 1	BR
		2	P 27	38 — 2	RE
		3	P 13	38 — 3	OR
		4	P 12	38 — 4	YE
		5	P 11	38 — 5	GR
		6	P 10	38 — 6	BL
		7	TE	38 — 7	PU
		8	P 20	38 — 8	GY
		9	P 21	38 — 9	WH
		10	P 22	38 — 10	BK
		11	P 23	38 — 11	PI
		12	P 23	38 — 12	LB
		41 — 1	DATA *	37 — 1	WH

P.C.B	CONNEC -TOR	FUNCTION	CONNEC -TOR	COLOR
	41 — 2	GND	—	—
	3	DO 7	37 — 3	PU
	4	DO 6	37 — 4	BL
	5	DO 5	37 — 5	GR
	6	DO 4	37 — 6	YE
	7	DO 3	37 — 7	OR
	8	DO 2	37 — 8	RE
	9	DO 1	37 — 9	BR
	10	DO 0	37 — 10	BK
KLM-384 (ST-KBD, BALANCE)	42 — 1	ST — SIG 0	30 — 3	BK
	2	" 1	29 — 3	BR
	3	" 2	28 — 3	RE
	4	" 3	27 — 3	OR
	5	" 4	26 — 3	YE
	6	" 5	25 — 3	GR
	7	" 6	24 — 3	BL
	8	" 7	23 — 3	PU
	43 — 1	ST — CV 0	04 — 8	BK
	2	" 1	04 — 7	BR
	3	" 2	04 — 6	RE
	4	" 3	04 — 5	OR
	5	" 4	04 — 4	YE
	6	" 5	04 — 3	GR
	7	" 6	04 — 2	BL
	8	" 7	04 — 1	PU
KLM-380	44 — 1	P 12	60 — 7	BR
	2	DO 7	60 — 8	RE
	3	GND	60 — 6	YE
	4	TE	60 — 5	OR
	5	GND A *	—	—
	6	FROM TAPE	60 — 3	YE
	7	GND *	—	—
	8	TO TAPE	60 — 4	BL
	45 — 1	IR	03 — 12	LB
	2	ATTENUATOR	59 — 7	PI
	3	VCO2 8'	21 — 11	BR
	4	VCO2 16'	21 — 10	BK
	5	VCO2 OFF	21 — 12	PI
	6	AUTO DAMP	12 — 5	GR
	7	KBD TRACK	12 — 1	LB
	8	PWM	22 — 9	BR
	9	SAW	21 — 13	OR
	10	VCO1 4'	21 — 9	WH
	11	VCO1 8'	21 — 8	GY
	12	VCO1 16'	21 — 7	PU
KLM-384	46 — 1	ST — BALANCED SIG 0	48 — 8	BK
	2	" 1	48 — 7	BR
	3	" 2	48 — 6	RE
	4	" 3	48 — 5	OR
	5	" 4	48 — 4	YE
	6	" 5	48 — 3	GR
	7	" 6	48 — 2	BL
	8	" 7	48 — 1	PU
	47 — 1	-15V	52 — 1	BL
	2	GND	52 — 3	BK
	3	+15V	52 — 3	RE
	4	ST — KBD BAL.	52 — 4	YE
KLM-403 (BRASS)	48 — 1	ST — BALANCED SIG 7	46 — 8	PU
	2	" 6	46 — 7	BL
	3	" 5	46 — 6	GR
	4	" 4	46 — 5	YE
	5	" 3	46 — 4	OR
	6	" 2	46 — 3	RE
	7	" 1	46 — 2	BR
	8	" 0	47 — 1	BK
	49 — 1	BR SIG 7	23 — 1	PU
	2	" 6	24 — 1	BL
	3	" 5	25 — 1	GR
	4	" 4	26 — 1	YE
	5	" 3	27 — 1	OR
	6	" 2	28 — 1	RE
	7	" 1	29 — 1	BR
	8	" 0	30 — 1	BK
	50 — 1	ST — SIG OUT (←404) *	53 — 10	BL
	2	GND *	—	—
	3	BR — EXT fcM	ⓓBR VCF fcM	BK
	4	ST — RRLEASE	53 — 1	PI
	5	ST — ATTACK	53 — 2	GR
	6	D	03 — 7	PU
	7	C	03 — 5	GR
	8	B	03 — 3	OR
	9	A	03 — 1	BR
	10	BR — MPXG	09 — 1	PI
	11	MPXGATE	03 — 10	BK
	12	ST — MPXG	08 — 2	RE
	51 — 1	BR — SIG OUT (←402)	31 — 4	YE
	2	GND	—	—

P.C.B	CONNEC -TOR	FUNCTION	CONNEC -TOR	COLOR
	51 – 3	BR – ORG	09 – 2	RE
	4	BR – TRIG IN	ⓙBR – TRIG IN	BR
	5	NO CONNECTION	–	–
	6	T.S. – ON/OFF	53 – 9	PU
	7	Σ BRG	09 – 1	LB
	8	BR – TRIG OUT	ⓙBR – TRIG IN	RE
	9	BR – 16'	21 – 5	GR
	10	BR – 8'	21 – 6	BL
	11	BR – ON/OFF	31 – 3	OR
	12	T.S. SW	53 – 8	BR
KLM-404 (STRINGS)	52 – 1	-15V	47 – 1	BL
	2	GND	47 – 2	BK
	3	+15V	47 – 3	RE
	4	ST – KBD BAL.	47 – 4	YE
	53 – 1	ST – RELEASE	50 – 4	PI
	2	ST – ATTACK	50 – 5	GR
	3	ST – ORG	09 – 4	BL
	4	ST – 4'	21 – 4	YE
	5	ST – 8'	21 – 3	OR
	6	ST – 16'	21 – 2	RE
	7	ST – ON/OFF	31 – 1	LB
	8	T.S. – SW	51 – 12	BR
	9	T.S. – ON/OFF	51 – 6	PU
	10	ST – SIG IN (←403) *	50 – 1	BL
	11	GND *	–	–
	12	ST – SIG OUT	31 – 2	RE
	54 – 1	LED CATHODE	LED	BR
	2	LED ANODE	LED	RE
	3	GND		BK
	4	PHONE OUT 1	ⓙPHONES OUT.	YE
	5	" 2		GR
	6	MIXOUT	TOTAL VR	BL
	7	INPUT 1 (SY)	"	PU
	8	" 2 (BR)	"	GY
	9	" 3 (ST)	"	WH
	55 – 1	ST – SIG IN (EQ)	58 – 1	GY
	2	GND (TOTALVR)	GND (TOTAL VR VR'S)	BK
	3	ST SIG OUT (EQ)		OR
KLM-380 (PROGRAM -MER)	56 – 1	-15V	57 – 5	BL
	2	– 5V	57 – 4	LB
	3	GND	57 – 3	BK
	4	+ 5V	57 – 2	OR
	5	+15V	57 – 1	RE
KLM-381 (SY-PANEL)	57 – 1	+15V	56 – 5	RE
	2	+ 5V	56 – 4	OR
	3	GND	56 – 3	BK
	4	-5V	56 – 2	LB
	5	-15V	56 – 1	BL
KLM-382 (FINAL -AMP.)	58 – 1	ST – SIG to EQ	55 – 1*	GY
	2	GAND	–	–
	3	BR – SIG to VR	BR MX VR	WH
	4	GND	"	–
	5	SY – SIG to VR	SY MX VR	BL
	6	GND	"	–
	7	GND *	TOTAL VR	–
	8	MIX SIG IN	"	RE
	9	GND *	GND	–
	10	MIX SIG OUT	ⓙMIX OUT	PU
	59 – 1	ST – SIG IN (←401) *	32 – 6	GY
	2	GND	32 – 5	–
	3	BR – SIG IN (←401) *	32 – 4	WH
	4	GND	32 – 3	–
	5	SY – SIG IN (←401) *	32 – 2	BR
	6	GND	32 – 1	–
	7	ATTENUATOR	45 – 2	PI
	8	CV SIG IN		BR
	9	FL NR IN	KLM-401	WH
	10	FL NR OUT		BK
KLM-402	60 – 1	TO TAPE JACK	ⓙTO TAPE	BL
	2	FROM TAPE JACK	ⓙFROM TAPE	GR
	3	FROM TAPE *	44 – 6	YE
	4	TO TAPE	44 – 8	BL
	5	TE	44 – 4	OR
	6	GND	44 – 3	YE
	7	P12	44 – 1	BR
	8	DO7	44 – 2	RE

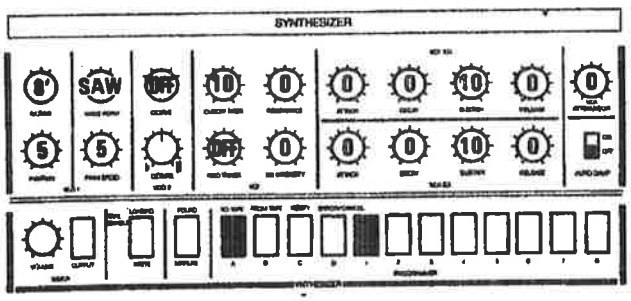
COLOR
BR – BROWN
RE – RED
OR – ORANGE
YE – YELLOW
GR – GREEN
BL – BLUE
PU – PURPLE
GY – GRAY
WH – WHITE
BK – BLACK
PI – PINK
LB – LIGHT BLUE

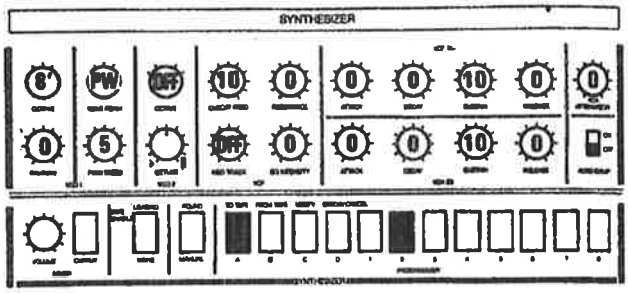
ⓙ JACK
* SEALED

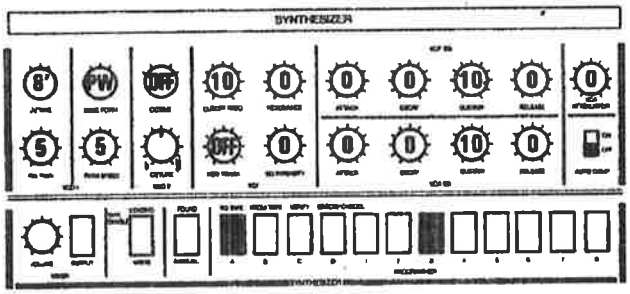
FUNCTION
SY – SYNTE
BR – BRASS
ST – STRINGS

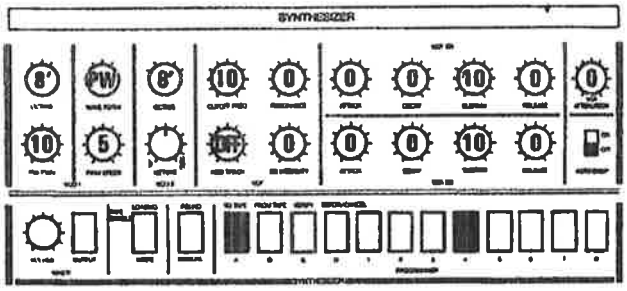
8. TEST SETTING DIAGRAMS

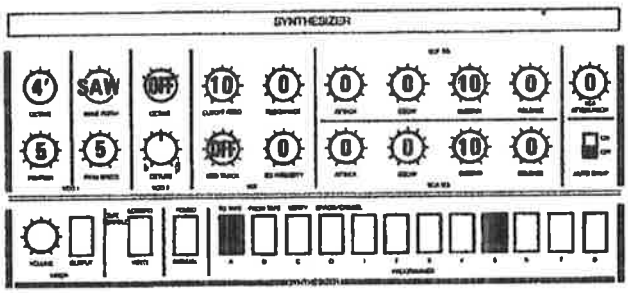
(A) 1 ▷ 8

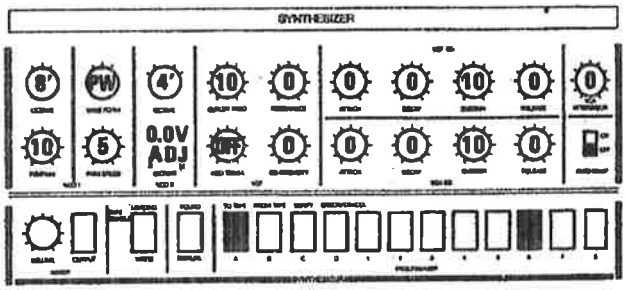


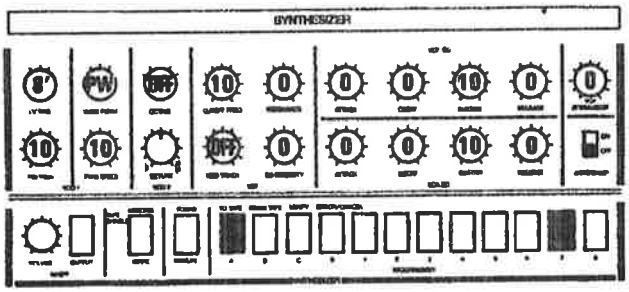


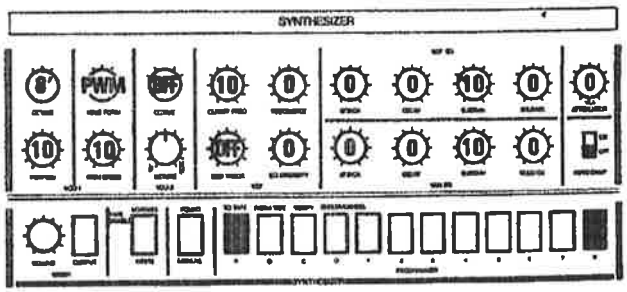




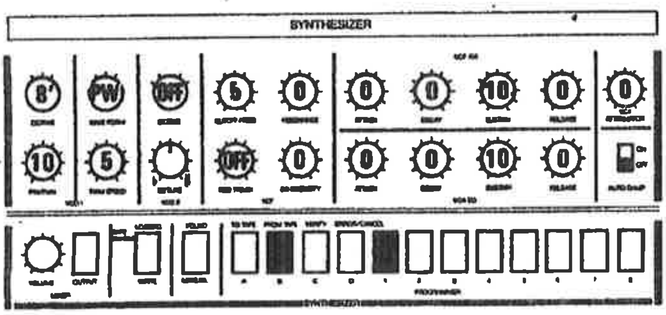


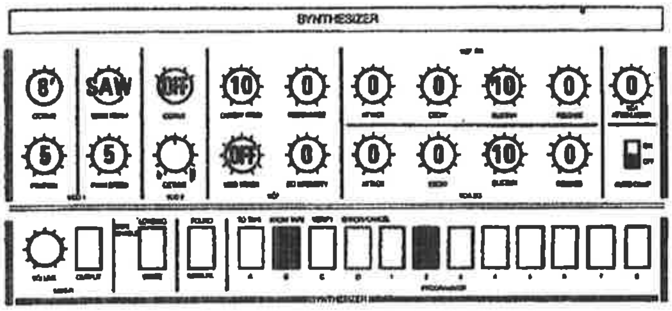


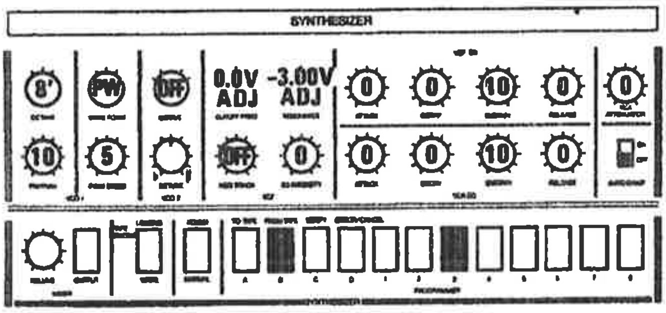


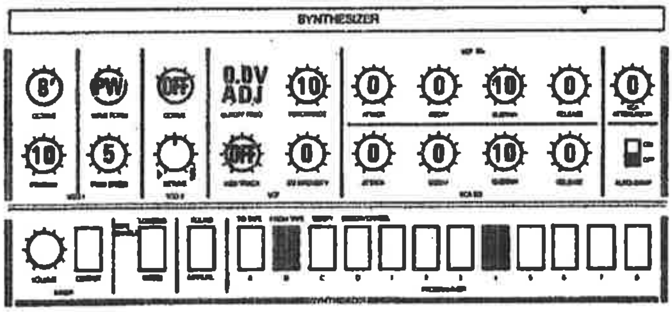


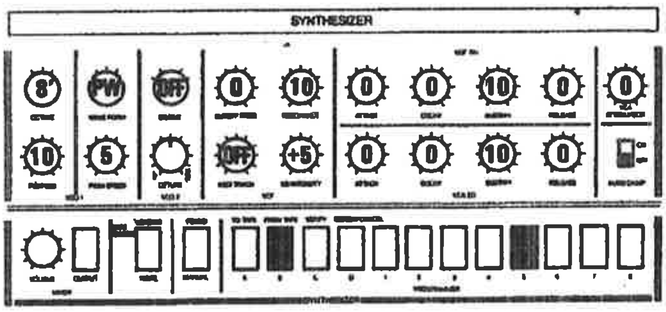
(B) 1 ▷ 8

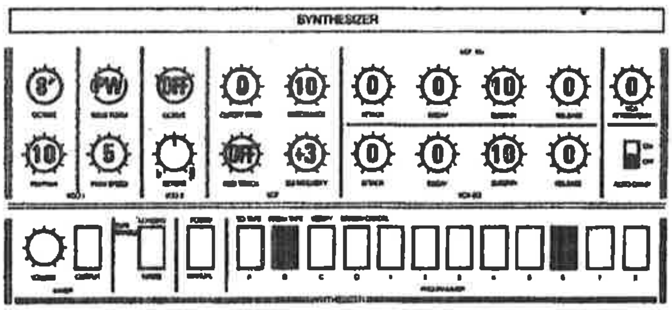

SYNTHESIZER
8' PW OFF 5 0 0 0 10 0 0
10 5 OFF 0 0 0 10 0

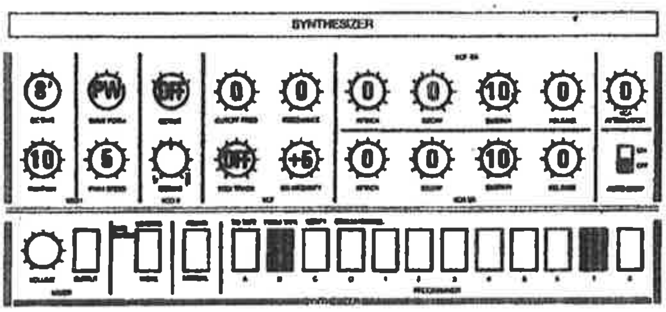

SYNTHESIZER
8' SAW OFF 10 0 0 0 10 0 0
5 5 OFF 0 0 0 10 0

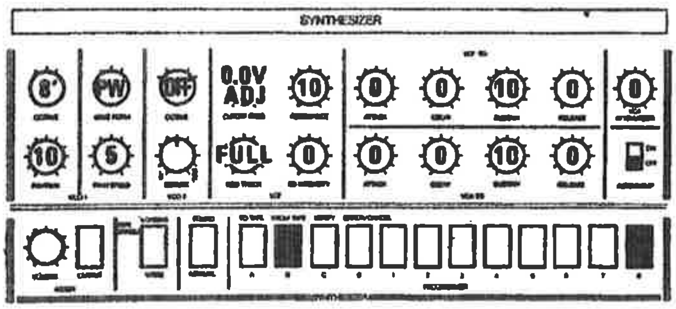

SYNTHESIZER
8' PW OFF 0.0V ADJ -3.00V ADJ 0 0 10 0 0
10 5 OFF 0 0 0 10 0


SYNTHESIZER
8' PW OFF 0.0V ADJ 10 0 0 10 0 0
10 5 OFF 0 0 0 10 0

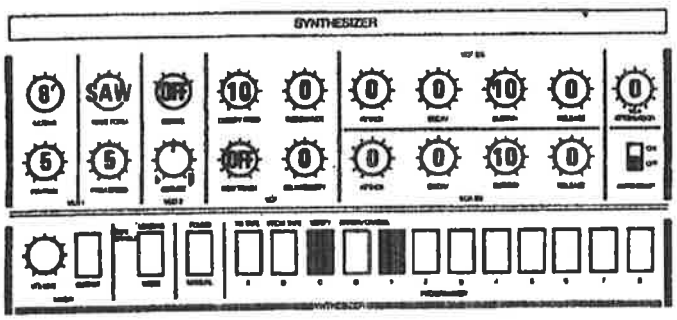

SYNTHESIZER
8' PW OFF 0 10 0 0 10 0 0
10 5 OFF +5 0 0 10 0

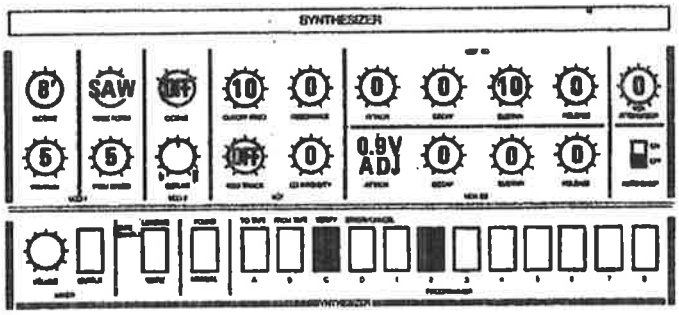

SYNTHESIZER
8' PW OFF 0 10 0 0 10 0 0
10 5 OFF +3 0 0 10 0

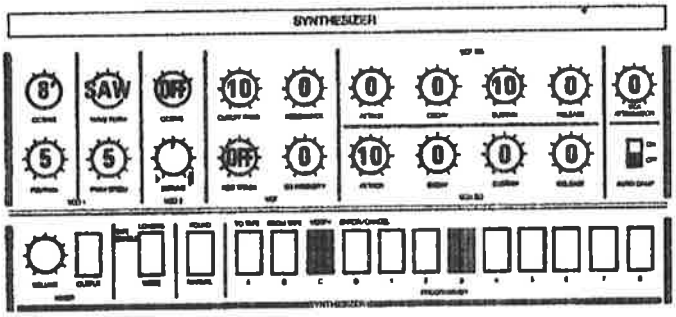

SYNTHESIZER
8' PW OFF 0 0 0 0 10 0 0
10 5 OFF 0 0 10 0

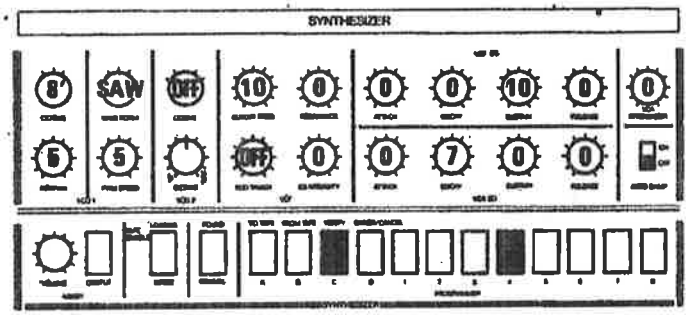

SYNTHESIZER
8' PW OFF 0.0V ADJ 10 0 0 10 0 0
10 5 FULL 0 0 0 10 0

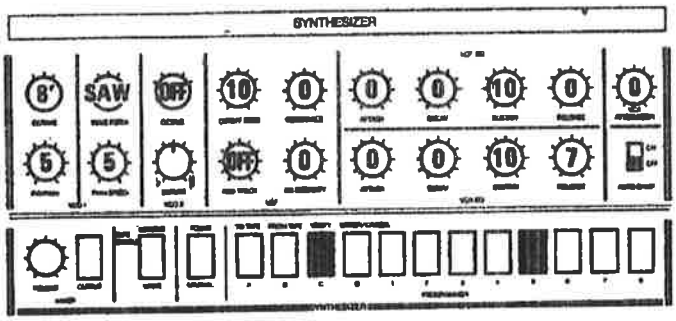
(C) 1 ▷ 8

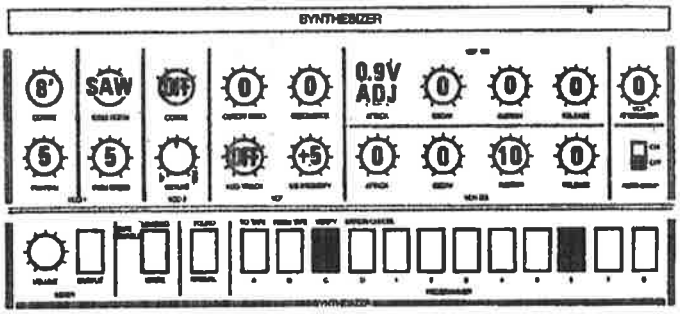

SYNTHESIZER
8'
5
SAW
5
OFF
OFF

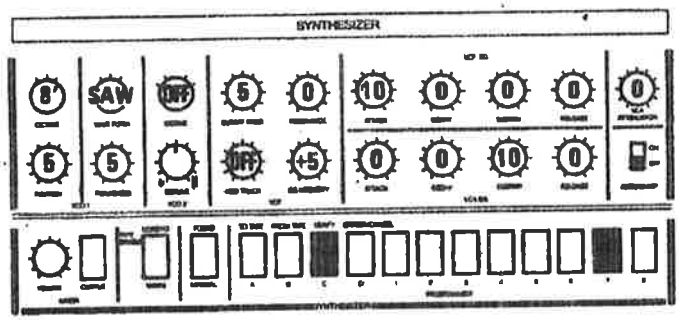

SYNTHESIZER
8'
5
SAW
5
OFF
OFF
0.9V
ADJ

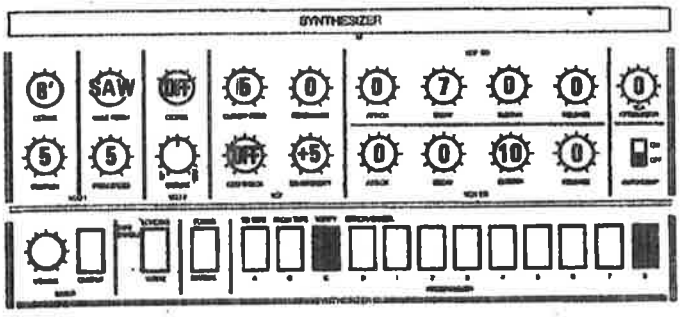

SYNTHESIZER
8'
5
SAW
5
OFF
OFF


SYNTHESIZER
8'
5
SAW
5
OFF
OFF

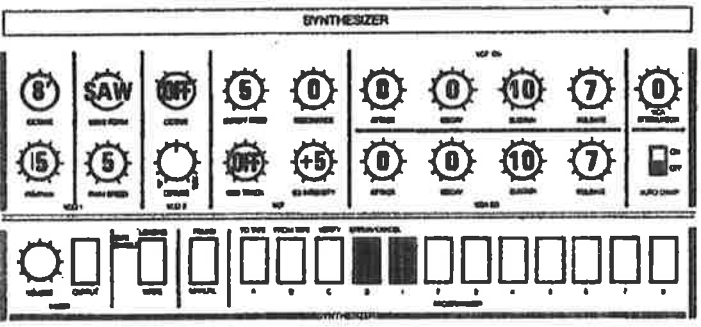

SYNTHESIZER
8'
5
SAW
5
OFF
OFF

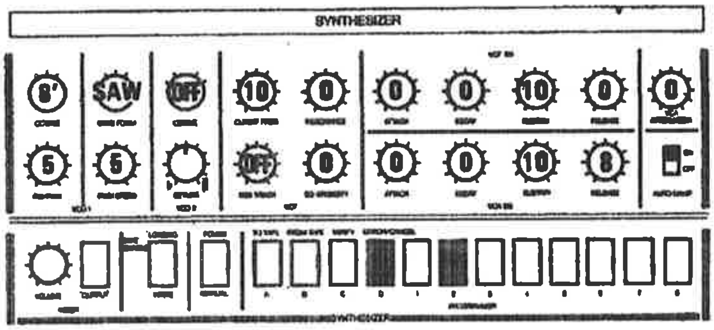

SYNTHESIZER
8'
5
SAW
5
OFF
OFF
0.9V
ADJ
+5

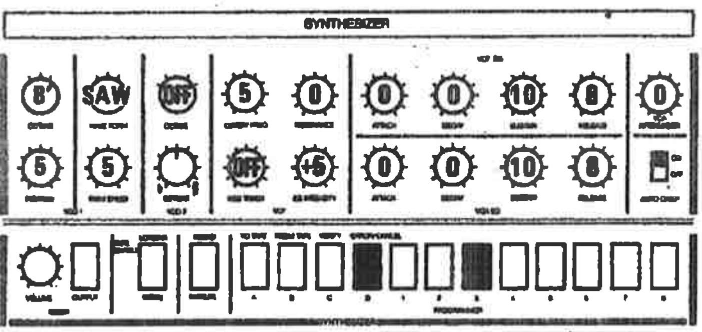

SYNTHESIZER
8'
6
SAW
5
OFF
+5

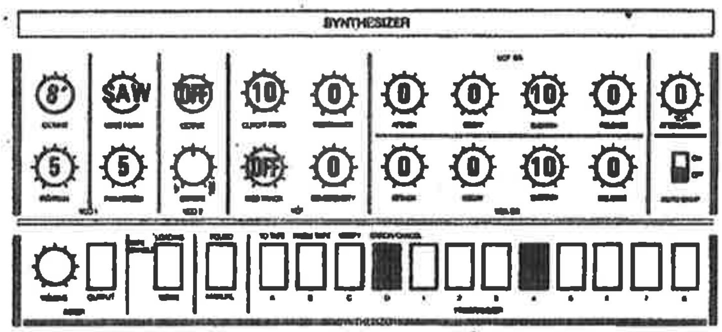

SYNTHESIZER
8'
5
SAW
5
OFF
+5

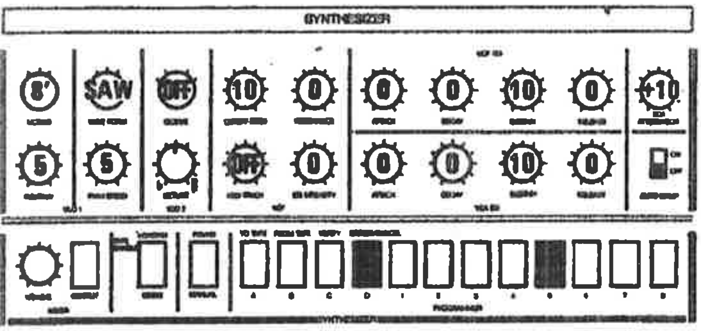
(D) 1 ▷ 8

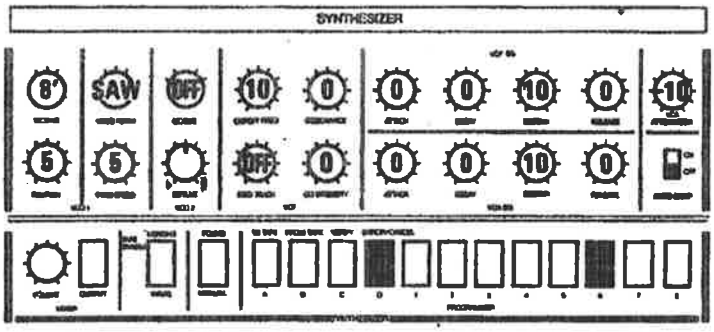

SYNTHESIZER

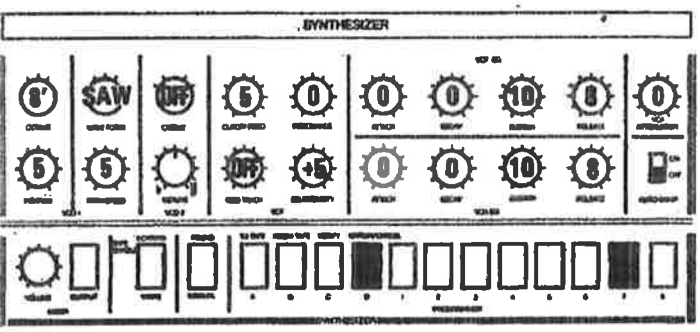

SYNTHESIZER

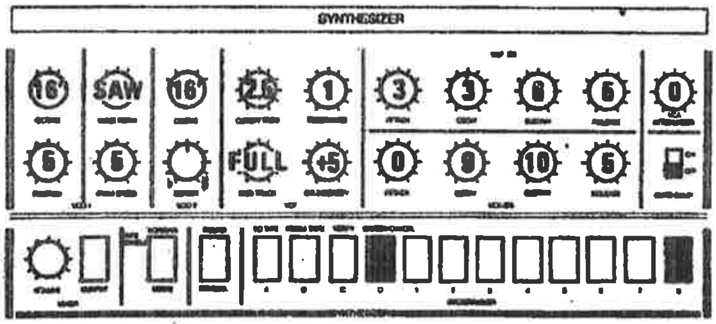

SYNTHESIZER


SYNTHESIZER


SYNTHESIZER


SYNTHESIZER


SYNTHESIZER


SYNTHESIZER

9. CHECK AND ADJUSTMENT PROCEDURE

Caution: Each unit has been completely adjusted at the factory♪ Therefore, do not adjust anything other than those variable resistors required for servicing.
Wait at least ten minutes after turning on power before beginning check and adjustment procedures.
Test setting diagrams and variable resistor position diagrams are on separate pages.
Where test setting voltages are listed, they are for measurements taken at the control's center.

Please check the following items before beginning adjustment.
1) Connectors are firmly connected to the correct positions.
2) Check KLM-380 battery with DVM and confirm 3.60V~4.10V.
3) Use DVM to check both terminals of R29 (100Ω) on KLM-380 and confirm voltage of 5mV or less.
4) Turn on power and confirm that power indicator (on panel and D1 on KLM-385), bank A, programmer-1, brass-8', and strings-8' LEDs all light up. Also check for sound of relay operation within 3-seconds.
5) When the tape enable switch is set to the enable position, confirm that the tape enable LED lights up and the bank and programmer LEDs go out and there is no sound from the keyboard.
6) Select any program; check the edit function and operation of all switches and knobs.

The following equipment is required for servicing.
* Digital voltmeter (DVM) 4-1/2 digit
* Oscilloscope
* Tuner (WT-12, etc.)
* Audio amp and speakers, or headphones.
* Tape recorder

1. KLM-377 check and adjustment (key assigner).

1. **Assign mode check and adjustment.**
   1) Switch assign mode switch to 1, then, 2, then back to 1 again to reset the assigner.
   2) Check assign mode 1 operation.
      Play one note at a time and confirm that KLM-377 LEDs D7~D14 (voices 0~7) light up in order.
   3) Check assign mode 2 operation.
      Play a chord and then release it; confirm that LEDs begin to light up from last note released and that there is no shift to another voice as long as you do not play a chord.
   4) Return to assign mode 1 after completion.

2. **KBD SPLIT check and adjustment.**
   1) Check KBD SPLIT operation for synthe, brass, and strings sections.
      (1) ◀▷ : sound from all 61 keys.
      (2) ◀ : sound from bottom two octaves only (to left of ◀▷ mark.)
      (3) ▷ : sound from top three octaves only (to right of ◀▷ mark)
   2) Confirm that all 8 voices split properly between B2 and C3 without any distortion. Adjust VR1 if necessary.

3. **Release cancel check.**
   1) Check release and cancel functions for synthe, brass, and strings sections.
      (1) Set release to 10 for section being checked; set KBD SPLIT to ▷.
      (2) Play any eight keys in the top three octaves and release them at the same time to hear the sound of the release condition.
      (3) Play any single key in the bottom two octaves eight times and confirm release for each note.
      (4) Set keyboard split to ◀ and reverse check procedure for upper and lower octaves.
   2) After completion, return to ◀▷ position.

4. **OCT/V CV compensation adjustment.**
   1) Use tuner to check pitch of any particular section.
   2) Play G3 and G#3 and adjust VR2 and total tune to obtain a ±0 cent reading for both.

2. KLM-380 check and adjustment (programmer).

1. **Program Load.**
   1) Make connections between Trident MKII and tape recorder as shown in fig-1.

Trident MKII TO TAPE → Tape recorder line in (mic in)
FROM TAPE ← Tape recorder line out (earphone out)

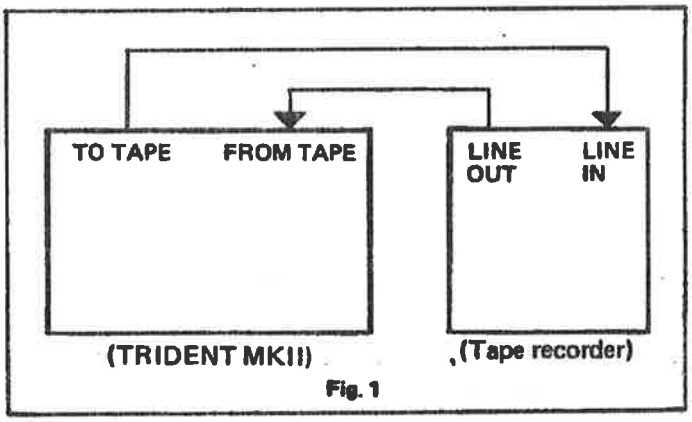


Fig. 1

2. **Follow procedure to save program data on tape (to avoid erasing user's program data.)**
   1) Set tape enable switch and write enable switch to enable.
   2) Switch the output level according to input jack of tape recorder.
   3) Turn on the to tape SW and confirm the tape enable led lights up.
   4) Confirm the programmer LEDs 1~8 light up in order.

3. **How to verify**
   1) Rewind the tape of 2, set tape, write enable SWs to enable.
   2) Turn on verify switch and play tape.
   3) Check to see that the FOUND LED lights up as the first part of the data is found, and that programmer LEDs 1~8 light up in order to confirm each program. Confirm that all LEDs go out when all data is correct.
   4) If there is an error, the ERROR/CANCEL LED will light and the programmer LEDs 1~8 will stop at the point of the error. If this occurs, check or adjust the tape recorder's volume and tone controls.

4. Loading tape data into programmer.
   1) Put supplied factory patch tape in tape recorder.
   2) Set tape write and enable switches to enable position.
   3) Turn on FROM TAPE switch and confirm that LED lights.
   4) Play tape and confirm that the FOUND and LOADING LEDs light, and then the programmer LEDs 1~8 light up in order; when all data is loaded, all LEDs except for TAPE ENABLE should go out.
   5) Load user's tape (from item 2 above) according to the procedure in item 4)
   6) Set tape enable and write enable switches to disable.
   7) Select several of the programs and play the keyboard to check program contents.

5. Reset circuit check.
   1) Select program A-1.
   2) Turn on SW1 switch on KLM-385 circuit board.
   3) Check TP2 (+5V) on KLM-385 with DVM; confirm approximately 4.7V.
   4) Turn VR1 clockwise, stopping at the point where BANK A~D, MANUAL, and PROGRAM 1~8 LEDs all light up. (If any LEDs are on before beginning this procedure, turn VR1 counterclockwise until the LEDs go out.)
   5) Turn off SW1 on KLM-385 and confirm that only PROGRAM A-1 lights up.

6. D/A adjustment.
   1) Set program mode to MANUAL; set VCA attack to 0 and VCA decay to o.
   2) Switch KLM-380 SW1 to test position.
   3) Confirm that only programmer LEDs 2 and 7 light up when you switch TAPE ENABLE to DISABLE, ENABLE, and then back to DISABLE. If other LEDs light, adjust VR3 (shift) and VR2 (width) so that only LEDs 2 and 7 light.
   4) Turn VR2 clockwise, stopping at the point where LEDs 1 and 8 light up. The change from LED 2 to 1 and 7 to 8 should occur at the same time. If both LEDs don't change at the same time, adjust VR3 so that timing will be nearly the same.

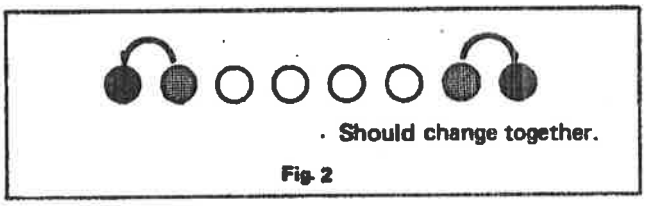


Fig. 2

   5) Shift SW1 to normal position and confirm that LEDs 1 and 8 remain lit.
   6) Confirm that the PROGRAMMER A-1 LED lights when TP-RST is connected to ground.

3. KLM-385 check and adjustment.

1. Power supply voltage adjustment.
   1) Ground DVM at TP3 (GND).
   2) Use DVM to check TP1 (+15V); adjust VR3 as necessary to obtain +14.95V~+15.05V.
   3) Check TP2 (+5V) and adjust VR1 to obtain +4,990V ~+5.010V.
   4) Check TP4 (-5V) and adjust VR2 to obtain -4,990V ~-5.010V.
   5) Check TP5 (-15V) and confirm -14.70V~-15.03V.

4. KLM-379 check and adjustment

1. PW/PWM adjustment.
   1) Select program A-7.
   2) Check TP1 with oscilloscope and DVM.
   3) Adjust VR2 to obtain DC voltage of +1.1V (±20mV).
   4) Select program A-8.
   5) Adjust VR1 so that sawtooth wave oscillator cycle is 100msec (±10msec).
   6) Turn PWM SPEED control from 10 to 0 and confirm that speed gets gradually slower; cycle should be 3~5sec at 0 setting.

2. SYNTHE waveform check.
   1) Set assign mode to 2.
   2) Connect oscilloscope (0.2V/div, 1msec/div) to TP003.
      (1) Select program A-1 and check the items below.
      * Select voice 0 depending on last note played; confirm change in cycle corresponding to keyboard position.
      * Switch octave selector to 16', 8', and 4' and confirm corresponding changes in sawtooth wave cycle.
      * Confirm no DC fluctuation when octave is changed.
      * Confirm no abnormality in waveform.
      (2) Select program A-2 and check items below.
      * Confirm no excessive DC fluctuation when program is switched from A-1 to A-2 (should be less than waveform amplitude).
      * Confirm change in pulse width when PW/PWM knob is turned; waveform should disappear at around 8~10.
      * Confirm no abnormality in waveform.
      (3) Select program A-3 and check the following items.
      * Confirm change in PWM depth when PW/PWM knob is turned (from where there starts to be a change to where the waveform disappears).
      * Confirm speed change when PWM speed knob is turned. (10Hz to about 0.2Hz).
      (4) Select program A-4 and check following items.
      * Change VC02 octave selector from 16' to 8' to 4' and confirm that sawtooth waveform changes accordingly.
      * Confirm absence of DC fluctuation during octave switching. Confirm that DC fluctuation is not excessive when unit is switched from OFF to 16' (should be about the same as waveform amplitude).
   3) Repeat procedures for TP103~TP001 (voices 1~7).

3. BRASS waveform check.
   1) Connect oscilloscope to TP001.
   2) Check Brass waveform switches.
      (1) Confirm that switches will turn 16' and 8' waveforms on and off.
      (2) Confirm that 16' and 8' waveforms can be mixed.
      (3) Confirm that there is no DC fluctuation during switching.
      (4) Confirm that there are no abnormalities in the waveforms.
   3) Repeat check procedure for TP101~701 (voices 1~7).

4. Strings waveform check.
   1) Check TP002 with oscilloscope.
   2) Check strings octave (scale) switches and confirm the following items:

(1) 16', 8', and 4' waveforms can be switched on and off.
(2) All three waveforms can be mixed.
(3) There is no DC fluctuation during switching.
(4) There are no abnormalities in the waveforms.

3) Repeat check procedure for TP102~107 (voices 1~7).
4) After completion, return assign mode to 1.

5. Antilog adjustment.

1) Check TP3 with oscilloscope and DVM to confirm DC voltage of -9.9~-10.1V.
2) Make sure that assign mode is at 1, total tune is at center, and SW1 is at normal position.
3) Connect DVM ground to TP3; connect positive probe to TP4.
4) Adjust antilog.
   (1) Play C6 8 times and adjust VR4 to obtain 3.200V (±0.002V).
   (2) Play C3 8 times and adjust VR3 to obtain 0.4000V (±0.0004V).
   (3) Play C1 8 times and adjust VR5 to obtain 0.1000V (±0.0002V).
   (4) Repeat above procedure several times and then confirm following specifications.
   Play each note 8 times.
   C6: 3.200V ±0.003V
   C5: 1.600V ±0.005V
   C4: 0.8000V ±0.005V
   C3: 0.4000V ±0.0004V
   C2: 0.2000V ±0.0005V
   C1: 0.1000V ±0.0002V

6. VC01 tuning.

1) Select program A-5. SW1 (switch 1) should be at normal and the DVM should not be connected.
2) Use tuner to check synthe section output signal.
3) Perform tuning as follows.
   (1) Reset assigner by switching assign mode from 1 to 2 and then back to 1 again.
   (2) Play C6 and adjust VR004 (VC01 high, voice 0) to obtain a 0 cent reading.
   (3) Play C6, in order, and adjust VR104~704 for voices 1~7.
   (4) Play C1 and adjust VR003 (VC01 low, voice 0) to obtain a 0 cent reading.
   (5) Play C1, in order, and adjust VR103~704 for voices 1~7.
   (6) Repeat steps (2) ~ (5) several times and confirm following specifications. Play each key 8 times.
   C6: 0±1 cent
   C5: 0±5 cents Deviation between voices should be within 5 cents.
   C4: 0±5 cents Deviation between voices should be within 5 cents.
   C3: 0±5 cents Deviation between voices should be within 5 cents.
   C2: 0±5 cents Deviation between voices should be within 5 cents.
   C1: 0±1 cents

7. VC02 tuning.

1) Select program A-6.
2) Use tuner to check synthe section output signal.
3) Perform tuning as follows.
   (1) Switch assign mode from 1 to 2 and then back to 1 again.
   (2) Play C6 and adjust VR002 (VC02 high, voice 0) to obtain a 0 cent reading.
   (3) Play C6, in order, and adjust VR102~702 for voices 1~7.
   (4) Play C1 and adjust VR001 (VC02 low, voice 0) to obtain a 0 cent reading.
   (5) Play C1, in order, and adjust VR101~701 for voices 1~7.
   (6) Repeat steps (2) ~ (5) above and confirm following specifications. Play each key 8 times.
   C6: 0±1 cent
   C5: 0±5 cents Deviation between voices should be within 5 cents.
   C4: 0±5 cents Deviation between voices should be within 5 cents.
   C3: 0±5 cents Deviation between voices should be within 5 cents.
   C2: 0±5 cents Deviation between voices should be within 5 cents.
   C1: 0±1 cents

8. Stretch tuning check.

1) Set SW1 to stretch position.
2) Check synthe section output with tuner.
3) Select program A-5.
4) Play C1 8 times and check to see that voices 0~7 pitch is all -10~-15 cents (VC01).
5) Select program A-6.
6) Play C1 eight times and confirm that pitch of voices 0~7 is all -10~-15 cents (VC02).

9. Detune check.

1) Select program A-6.
2) Check synthe section output signal with tuner; play C3.
3) Confirm that pitch is C♯ ±20 cents when the detune knob is turned all the way to the sharp side. Deviation between the eight voices should be within 10 cents. (C3).
4) Confirm that pitch is B±20 cents when the detune knob is turned all the way to the flat side. Deviation between the eight voices should be within 10 cents. (C3).

10. Total tune check.

1) Select program A-5.
2) Use tuner to check synthe section output; play C3.
3) Set tuner to C♯ and confirm that pitch is between 0 cent and 50 cents when total tune knob is turned all the way to the sharp side. Deviation between the eight voices should be within 5 cents. (C3)
4) Set tuner to B and confirm that pitch is between -50 cents and 0 cents when total tune knob is turned all the way to the flat side.

5. KLM-378 check and adjustment

1. OFFSET adjustment.

1) Connect oscilloscope or DVM ground to TP4. (For these items, touch probe directly to check points.)
2) Select program B-1.
3) Check TP001 offset (with DVM or oscilloscope).
4) Adjust VR002 to obtain 0mV (±2mV).
5) In the same way, adjust VR102~702 for TP101~701.

2. VCA adjustment.

1) Select program B-2.
2) Use oscilloscope (0.1V/div, 1msec/div) to observe TP3 waveform.

3) Play C3 to select voice 0.
4) Adjust VR004 to obtain sawtooth waveform amplitude of 0.6Vp-p (±5%).
5) In the same way, adjust VR104~704 for voices 1~7.

3. **Resonance adjustment.**
1) Select program B-3. Check TP3 with oscilloscope.
2) Play C3 to select voice 0.
3) Adjust VR003 to obtain sine wave (VCF oscillation waveform) amplitude of 0.2Vp-p (±20mV).
4) In the same way, adjust VR103~703 for voices 1~7.
5) Oscillation for all voices should begin at a setting between 6.5 and 8.5.

4. **Cutoff frequency adjustment.**
1) Select program B-4.
2) Check TP3 with oscilloscope, tuner, and frequency counter.
3) Play and single key to select voice 1.
4) Adjust VR001 to obtain an oscillation frequency of 523Hz, C ±10 cents.
5) In the same way, adjust VR101~701 for voices 1~7.
6) After adjustment, select each voice and turn the cutoff knob from 0 to 10, checking to see that:
(1) Frequency is 5~20Hz at 0.
(2) Frequency is 26~33kHz at 10.
(3) Amplitude is 0.2Vp-p or more throughout entire range.

5. **EG intensity adjustment.**
1) Select program B-5.
2) Check TP3 with oscilloscope and frequency counter.
3) Play any single key.
4) Adjust VR4 to obtain oscillation frequency of 5kHz (±500Hz).
5) Confirm oscillation frequency of 5kHz (±500Hz) for each voice. With cutoff at 10 and EG intensity at -5, confirm 50~250Hz for each voice.
6) Select program B-6.
7) Play any single key and confirm that there are no significant pitch differences between the voices.
8) Select program B-7.
9) Play any single key and confirm that DC click noise is within ±100mV for all voices.

6. **KBD TRACK adjustment.**
1) Select program B-8.
2) Check TP3 with oscilloscope and tuner.
3) Play middle G3♯.
4) Adjust VR5 to obtain oscillation frequency of 523Hz, (C ±10 cents.)
5) Set assign mode to 2.
6) Alternately play G3♯ and G4♯ and adjust VR3 so that there is a one octave (±20 cents) difference the two oscillation frequencies.
7) Set assign mode to 1.
8) Confirm that you hear a close approximation of a scale when you play the middle octave. Each other individual octave should also sound like a scale.
9) Confirm that changes in oscillation frequency correspond to KBD TRACK settings of Quarter, HALF, FULL, and OVER. Note, however, that QUARTER, is 1/3 (±10%) of FULL, and HALF is 2/3 (±10%) of FULL.

7. **Resonance compensation VCA adjustment.**
1) Select program C-1.
2) Set SW1 to off position.
3) Use oscilloscope (0.2V/div, 1msec/div) to check TP1 waveform.
4) Set assign mode to 2 and play any single key.
5) Adjust VR1 and VR2 so that sawtooth waveform amplitude is 0.6Vp-p when resonance is set to 0, and 1.2Vp-p when resonance is set to 10.
VR1; controls slope.
VR2; controls overall amplitude.
6) After completion, return SW1 to normal position.

8. **VCA EG adjustment.**
1) Select program C-2. Set assign mode to 2.
2) Use oscilloscope (5V/div, 50msec/div) to check TP003.
3) Use last note to select voice 0.
4) Play any single key and adjust VR005 to obtain attack time of 250msec (±10msec).
On oscilloscope, use normal trigger and adjust trigger level for this procedure.
5) In the same way, adjust VR105~705 for TP103~703.

9. **VCA EG attack check.**
1) Select program C-3. Set assign mode to 1.
2) Play any single key and measure, for each voice, the time between the end of the slow attack and the disappearance of the sound.
Confirm 15 to 25 seconds for all voices and that there is no more than 5 seconds difference between voices.

10. **VCA EG decay check.**
1) Select program C-4.
2) Play any single key and confirm that there is no significant difference in decay times between voices.

11. **VCA EG release check.**
1) Select program C-5.
2) Play any single key and confirm that there is no significant difference in release times between voices.

12. **VCF EG adjustment.**
1) Select program C-6. Set assign mode to 2.
2) Use oscilloscope to check TP004.
3) Use last note to select voice 0.
4) Play any single key and adjust VR006 to obtain an attack time of 250msec (±10msec).
5) Repeat procedure using VR106~706 for TP104~704.

13. **VCF EG attack check.**
1) Select program C-7. Set assign mode to 1.
2) Play any single key and measure, for each voice, the time it takes for the cutoff frequency to rise and disappear. Confirm 15 to 25 seconds for all voices and that there is no more than a 5 second difference between voices.

14. **VCF EG decay check.**
1) Select program C-8.
2) Play any single key and confirm no significant difference in decay time between voices.

15. **VCF EG release check.**
1) Select program D-1.
2) Play any single key and confirm no significant difference in release time between voices.

16. AUTO DAMP check.

1) Select program D-2.
2) Check auto damp operation (VCA).
   (1) Confirm that each note is released separately when you play in a staccato style.
   (2) Confirm that release is heard on all notes in a chord and that when the next note is played, the previous note's release disappears.
3) Select program D-3.
4) Check auto damp operation (VCF).
   (1) Connect Base of Q3 (C945) to ground.
   (2) Perform same check as for VCA, above.

17. Release switch check.

1) Select program D-7.
2) Apply S-1 foot switch signal (⊣) to release trig in jack.
3) Check release switch (damper effect) operation.
   (1) Release becomes 0 when plug is inserted in trig in jack.
   (2) When foot switch signal is applied, release corresponds to knob setting.
   (3) Auto damp effect is applied in this condition. Disconnect foot switch after completion.

18. EXT FcM check.

1) Select program B-4.
2) Apply DC-5~+5 control voltage to EXT FcM CV IN jack.
3) Confirm that oscillator frequency changes from a minimum of 5~20Hz to a maximum of 26~33kHz. Disconnect CV after completion.

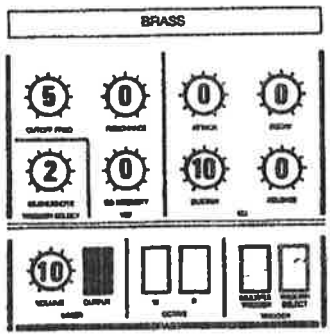
6. KLM-382 check and adjustment.

1. Attenuator adjustment.

1) Select program D-4.
2) Use oscilloscope to check TP2 on KLM-382 circuit board.
3) Play C3 (any voice is okay).
4) Adjust VR1 to obtain sawtooth waveform amplitude of 1.0Vp-p (±0.05V).
5) Confirm that waveform amplitude of program D-5 is ten times that of D-6.

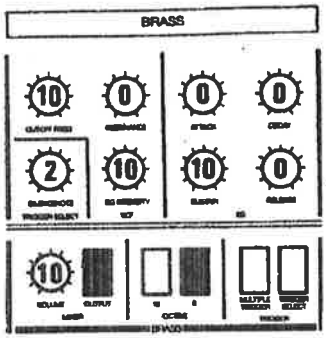
7. KLM-403 (293) check and adjustment

1. Offset adjustment.



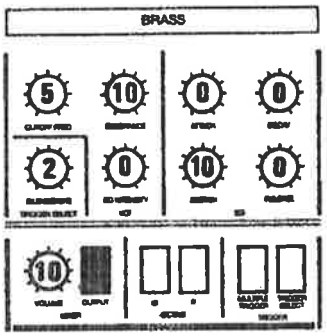
1) Set controls as shown in diagram.
2) Connect oscilloscope or DVM ground lead to ground on KLM-403. (Test directly with probe for these items.)
3) Use oscilloscope or DVM to check IC13 number 3 pin.
4) Adjust VR10 to obtain 0mV (±2mV).

2. VCA adjustment.



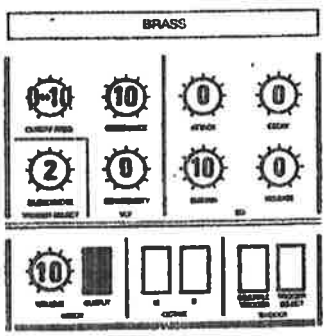
1) Set controls as shown in diagram.
2) Use oscilloscope (0.1V/div, 1msec/div) to check KLM-382 TP7.
3) Play C3.
4) Adjust VR9 to obtain sawtooth waveform amplitude of 0.6Vp-p (±5%).
5) Play C3, in order, and confirm amplitude of 0.5~0.7 Vp-p for vioces 0~7. (assign mode 1)
6) Use oscilloscope to check KLM-382 TP3 and confirm that waveform amplitude for all voices is 0.8~1.3 Vp-p and that deviation between voices is no more than 0.2V. Note: phase is inverted.

3. Resonance adjustment.



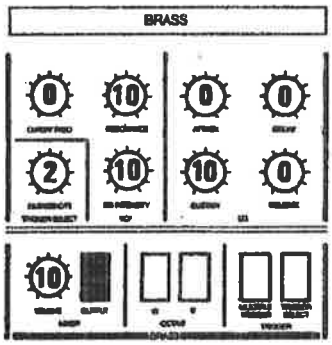
1) Set controls as shwon in diagram.
2) Use oscilloscope (0.5V/div, 1msec/div) to check KLM-382 TP7.
3) Play any single key.
4) Adjust VR11 to obtain sine wave (VCF oscillation) amplitude of 3.0Vp-p (±0.15V).

4. Cutoff adjustment.



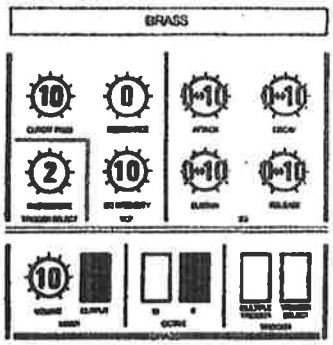
1) Set controls as shown in diagrm.
2) Use oscilloscope (0.5V/div, 20~0.1msec/div) and frequency counter to check KLM-382 TP7.
3) Play any single key.
4) Adjust VR12 to obtain 180~200Hz oscillation frequency when cutoff knob is at 5.
5) Adjust VR8 to obtain 5.0~6.0kHz oscillation frequency when cutoff knob is at 10.
6) After repeating adjustments 4) and 5) above, confirm 2~10Hz oscillation frequency when cutoff knob is at 0.
7) Confirm oscillation waveform amplitude of 0.5Vp-p or more throughout cutoff knob setting range.

5. EG intensity check.



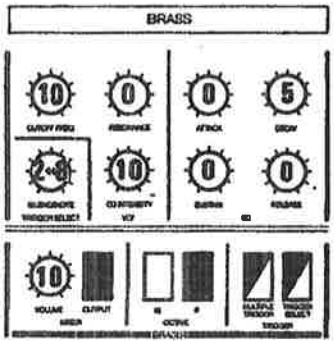
1) Set controls as shown in diagram.
2) Use oscilloscope or frequency counter to check KLM-382 TP7.
3) Confirm oscillation frequency of 7.0~10kHz. Confirm that oscillation frequency changes smoothly when EG intensity knob is turned.

6. EG check.



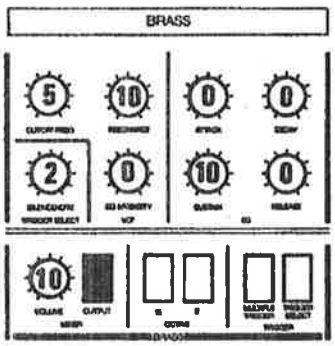
1) Set controls as shwon in diagram.
2) Turn attack knob and confirm change in attack time with 2~5 seconds at maximum setting.
3) Turn decay knob and confirm change in decay time with 4~8 seconds at maximum setting.
4) Turn sustain knob and confirm that sustain level changes from 0 to 10.
5) Turn release knob and confirm change in release time with 10~16 seconds at maximum setting.

7 Trigger check.



1) Set controls as shown in diagram.
2) Play any single key.
3) Confirm that multiple trigger switch turns multiple trigger effect on and off.
4) Confirm that trigger select switch turns trigger select effect on and off. Confirm that the silence note selector determines the number of voices needed to produce a trigger signal in accordance with the knob setting.
5) Connect S-1 foot switch to EXT TRIG IN jack. ( )
6) Confirm that foot switch triggers sound only when trigger select switch is turned on.
Disconnect foot switch after completion.

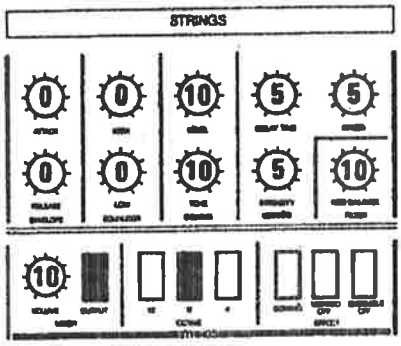
8. EXT FcM check.



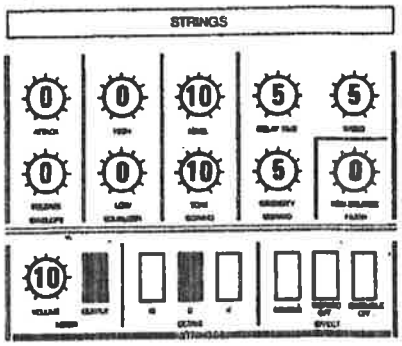
1) Set controls as shown in diagram.
2) Use oscilloscope or frequency counter to check KLM-382 TP7.
3) Apply DC -5~+5V control voltage to EXT FcM CV IN jack.
4) Confirm 2~20Hz minimum and 15~20kHz maximum VCF oscillation frequency.

8. KLM-384 check and adjustment

1. KBD BALANCE adjustment.



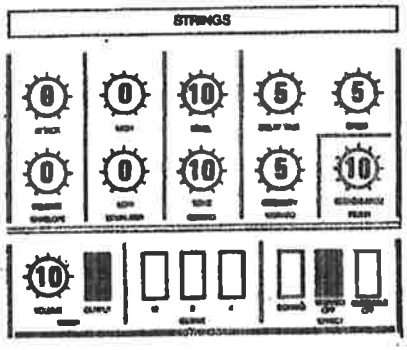
1) Set strings section controls as shown in diagram.
2) Use oscilloscope (0.5V/div, 1msec/div) to check TP0 on KLM-384 circuit board.
3) Play C3.
4) Adjust VR002 to obtain sawtooth waveform amplitude of 1.0Vp-p (±0.05V).
5) In the same way, adjust VR102~702 for TP1~TP7. (The above is for VCA adjustment.)



6) Set controls as shown in diagram.
7) Use oscilloscope (0.1V/div, 1msec/div) to check TP0 on KLM-384 circuit board.
8) Play C3.
9) Adjust VR001 to obtain 0.6Vp-p (±0.05V) amplitude for waveform shown in diagram.
10) In the same way, adjust VR101~701 for TP1~TP7. (The above is for VCF adjustment.)

9. KLM-404 (294) check and adjustment (strings section)

1. Vibrato bias adjustment.

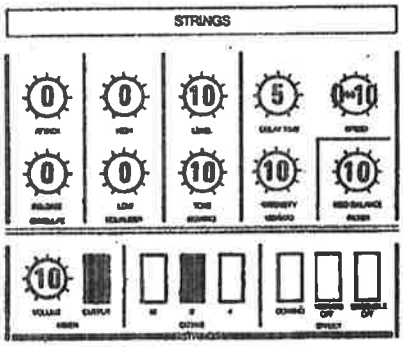


1) Set controls as shown in diagram.
2) Apply standard signal generator triangle wave to R105 and R106 connection point.
3) Use oscilloscope to check Q11 emitter.
4) Adjust signal generator output and VR3 to obtain maximum undistorted amplitude in the triangle wave.

2. Ensemble bias adjustment.

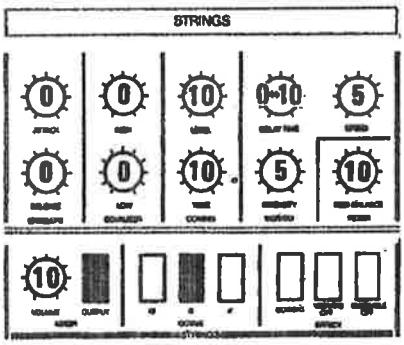
1) Set controls as the same setting as that of vibrato bias adjustment.
2) Apply standard signal generator triangle wave to R75 and R76 connection point.
3) Use oscilloscope to check Q2 emitter.
4) Adjust signal generator output and VR3 to obtain maximum undistorted amplitude in the triangle wave.
5) In the same way, adjust VR4 for ENSEMBLE 2, and adjust VR2 for ENSEMBLE 3.

3. Vibrato LFO check.



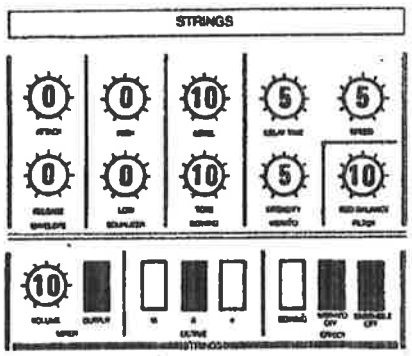
1) Set controls as shown in diagram.
2) Use oscilloscope to check center of vibrato intensity control.
3) Confirm triangle wave frequency (cycle) of:
   2~4Hz (250~500msec) when vibrato speed is at 0.
   10~20Hz (50~100msec) when vibrato speed is at 10.

4. Vibrato delay time check.



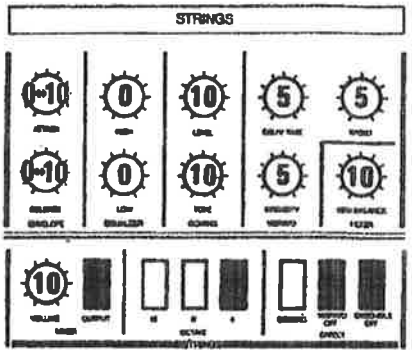
1) Set controls as shown in diagram.
2) Use oscilloscope to check IC21 number 1 pin.
3) Play any key and confirm that the time it takes for the vibrato waveform to begin is:
   2~3msec when delay time is at 0;
   0.8~1.2sec when delay time is at 10.
   Also confirm continuous variation from 0 to 10.

5. Output level adjustment.



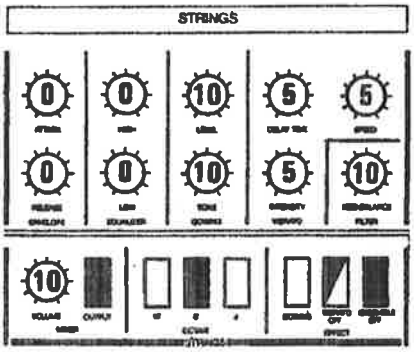
1) Set controls as shown in diagram.
2) Use oscilloscope (0.1V/div, 1msec/div) to check TP8 on KLM-382 circuit board.
3) Play C3 eight times.
4) Adjust VR5 so that sawtooth waveform amplitude is 0.5~0.7Vp-p for voices 1~7.

6. Envelope check.



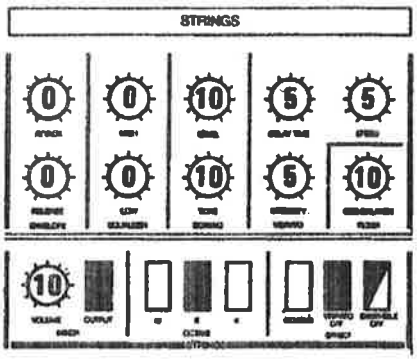
1) Set controls as shown in diagram.
2) Use oscilloscope (0.1V/div, 10msec/div) to check TP8 on KLM-382.
3) Play any key. (Upper octaves are easier to check)
4) Confirm that the waveform's rising characteristic is smooth and not stepped. Also confirm that there is no noise when attack is set to between 0 and 2.
5) Confirm that attack time changes when attack knob is turned. It should be 10 seconds or more at maximum setting.
6) Confirm change in release time when knob is turned; should be 10 seconds or more at maximum setting.
7) Confirm that there is no click noise, amplitude ringing, or other abnormalities when attack is at 0. (This checks compander operation.)

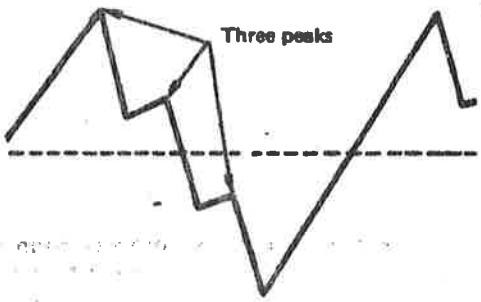
7. Vibrato waveform check.



1) Set controls as shown in diagram.
2) Use oscilloscope (0.2V/div, 0.2msec/div) to check TP8 on KLM-382.
3) Play any key.
4) Turn on vibrato switch and confirm that vibrato is applied to the sawtooth waveform.
5) Confirm that vibrato depth changes when intensity knob is turned.
6) Confirm vibrato frequency change when speed knob is turned.
7) Confirm that there is a change in the time it takes for vibrato to be applied when you turn the delay time knob.
8) Confirm that the vibrato off switch turns the vibrato effect on and off.

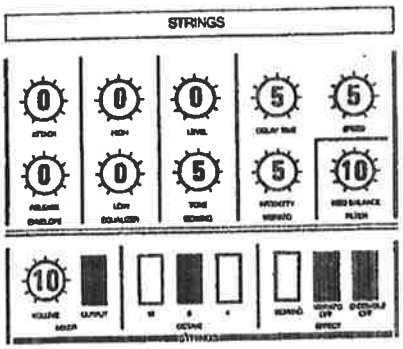
8. Ensemble waveform check.





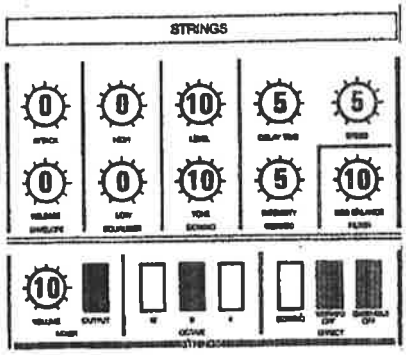
1) Set controls as shown in diagram.
2) Use oscilloscope (0.2V/div, 0.2msec/div) to check TP8 on KLM-382.
3) Play any key.
4) Confirm ensemble effect in sawtooth waveform, as shown in diagram.
5) Confirm that ensemble off switch turns effect on and off.

9. Bowing adjustment.



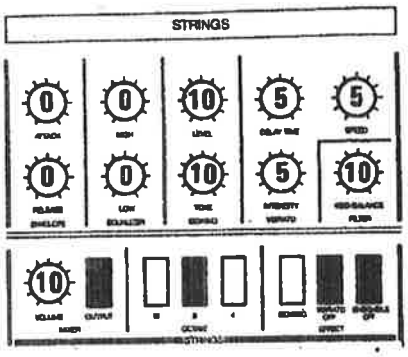
1) Set controls as shown in the diagram.
2) Use oscilloscope (2V/div, 1msec/div) to check IC20 number 8 pin.
3) Turn VR6 all the way clockwise and adjsut VR8 to obtain an oscillation frequency of 1kHz.
4) Adjust VR6 so that there are 3 or 4 peaks in ringing characteristic in the sawtooth waveform (using same check point).
5) Confirm that there is a change in the spacing in the ringing characteristic when the tone knob is adjusted.
6) Set Bowing level to 10, Tone to 10, and Turn ON Bowing SW, other setting the same as above.
7) Use oscilloscope (0.1V/div, 1msec/div) to check TP8 on KLM-382.
8) Play C3.
9) Adjust VR7 so that the ratio between the level right after a note is played and the regular level is 3:1.
10) Confirm that level ratio decreases when level knob is turned down, reaching 1.4:1.
11) Confirm that the bowing switch turns the bowing effect on and off.

10. Noise reduction check.

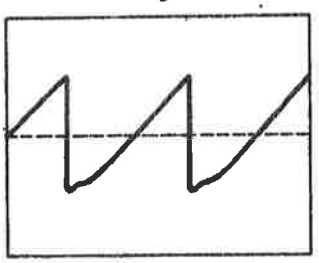


1) Set controls as shown in diagram.
2) Use oscilloscope to check TP4 on KLM-382 circuit board.
3) Play C3 and confirm that sawtooth waveform amplitude is 0.8~1.3Vp-p (and difference between voices is within 0.2V).
4) Change scale setting from 8' to 4'.
5) Play C6 and confirm that sawtooth waveform amplitude is 0.3~0.7Vp-p (and difference between voices is within 0.2V).
6) Next, ground the base of Q8 (C945) on the KLM-382 circuit board.
7) With this connection, confirm that in the lower octaves of the keyboard, you get a sound without harmonics (a dull sound), and that there is almost no amplitude in the high range of the keyboard.

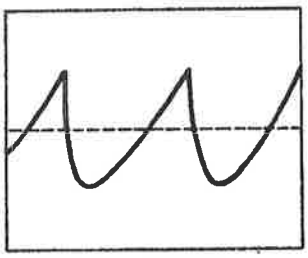
11. Equalizer check.



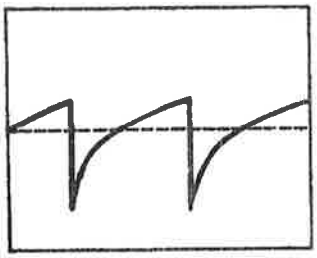
1) Set controls as shown in the diagram.
2) Use oscilloscope (0.1V/div, 1msec/div) to check STRINGS SEPARATE OUT.
3) Play C3.
4) Adjust the equalizer high and low controls and confirm that the waveforms match the settings shown below.



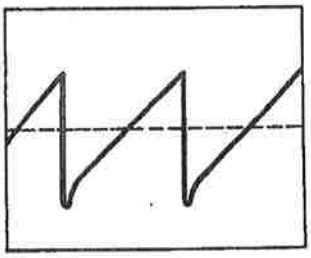
HIGH = 0 LOW = 0



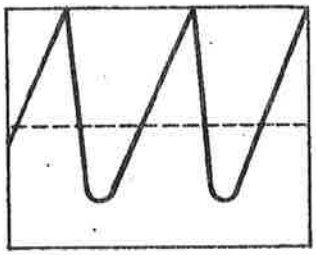
HIGH = -5 LOW = 0



HIGH = 0 LOW = -5



HIGH = +5 LOW = 0

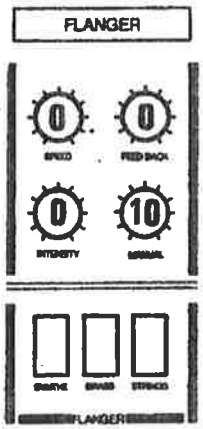


HIGH = 0 LOW = +5

10. KLM-401'(291) check and adjustment.

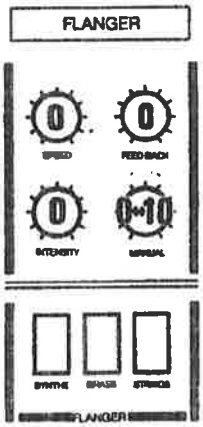
1. Modulation check and adjustment.
   1) Select program A-6.
   2) Use oscilloscope to check IC13 number 1 pin.
   3) Play any key and adjust VR7 so that it takes 0.5 sec. between point key is depressed and waveform begins.
      Confirm single trigger.
   4) Use oscilloscope to check IC4 number 1 pin.
   5) Adjust VR5 so that waveform amplitude is the same when the joy stick is all the way to the TRIL (rectangle) and all the way to VIBRATO (triangle). Be careful to move the joystick straight and not to the pitch bend sides.
   6) Leave joy stick all the way at the TRIL position and check rectangle wave cycle. Confirm following.
      With speed at 0: 0.6~0.8sec.
      With speed at 10: 80~120msec.
   7) Check synthe section output with oscilloscope.
   8) Set joystick intensity to 10 and play any single key.
   9) Confirm the following:
      * Pitch canges by ±1 octave (±20~80 cents) when joy stick is moved all the way to the pitch bend sides.
      * TRIL goes up by bout a minor third (up to E♭ if C3 is played)
      * VIBRATO effect is in order.
      * Intensity can be varied from 1 to 10.
      * Speed can be varied from 1 to 10.
   10) Confirm that delayed vibrato is produced when DELAY VIBRATO is turned on and that joystick VIBRATO and TRIL are no longer applied.
   11) With total tune and detune all the way to the ♯ positions and joystick intensity at 10, play C6 and confirm that oscillation does not stop regardless of joystick position.

2. Bias adjustment.



   1) Set controls as shown in diagram.
   2) Connect standard signal generator to R67, R68 connection point.
   3) Use oscilloscope (0.5V/div, 0.5msec/div) to check IC9 number 1 pin.
   4) Adjust VR6 to obtain an undistorted triangle waveform.

3. Clock adjustment.



   1) Set controls as shown in the diagram.
   2) Use frequency counter to check IC6 number 3 pin.
   3) Adjust VR3 and VR4 so that frequency is 90~110 kHz when the manual knob is at 0, and 0.9~1.1 MHz when the knob is at 10.
      [VR3; adjusts center frequency.
      VR4; adjusts range of variation.]

4. MIX LEVEL adjustment.

   1) Set controls as shown in diagram.
   2) Use oscilloscope (0.2V/div, 0.5msec) to check TP-2 on KLM-382 circuit board.
   3) Select synthe section program A-2 and apply flanger to the synthe sound.
   4) Play C3.
   5) Turn MANUAL knob up from the 0 position and stop at around 3~5 where waveform amplitude becomes smallest. Then adjust VR2 to further reduce amplitude to the smallest level possible.

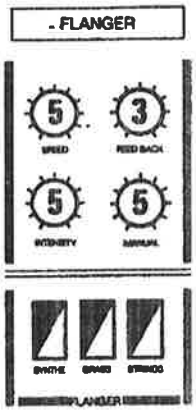
5. Feedback adjustment.

1) Set controls as shown in diagram.
2) Use oscilloscope to check TP2 on KLM-382 circuit board.
3) Apply flanger to synthe section (program A-2).
4) Without playing the keyboard, turn the FEEDBACK knob from 0 up toward 10 and adjust VR1 so that the flanger goes into self-oscillation at 7 and above.

6. Speed adjsutment.

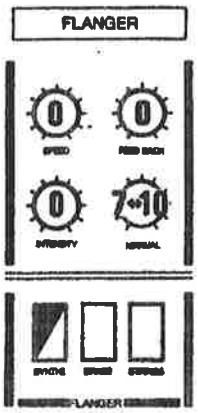
1) Use oscilloscope to check IC11 number 1 pin.
2) Confirm triangle wave oscillation frequency of: 8~12Hz (80~125msec cycle) when speed is at 10; 0.05~0.08Hz (12~18sec cycle) when speed is at 0.

7. Operation check.



1) Set controls as shown in diagram.
2) Use oscilloscope (0.1V/div, 1msec/div) to check TP1 on KLM-382 circuit board.
3) Confirm that switches control application of flanging effect to synthe, brass, and strings sections. (Listen and check waveform.)
4) Listen to sound and confirm operation of speed, feedback, manual, and intensity knobs.

8. Noise reduction check.



1) Set controls as shown in diagram.
2) Select program A-5 in synthe section.
3) Use oscilloscope (0.1V/div, 0.1msec/div) to check TP2 on KLM-382 circuit board.
4) Apply flanger to synthe section, play a single key in the upper octave (C5~C6) and adjust the MANUAL knob to otbain maximum amplitude.
5) Turn the synthe section flanger effect on and off and confirm no more than ±20% change in amplitude.
6) Ground base of Q6 (C945) on KLM-382 circuit board.
7) With this connection, confirm that when the synthe section flanger effect is turned on and off, the low range produces a sound without any harmonics and the high range has almost no amplitude.

10. PARTS LIST

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
CARBON RESISTORS (NOT LISTED)			
SOLID RESISTORS			
11013810	1/4KY 10M	KLM-382	1
11013822	1/4KY 22M	KLM-379	1
11113810	1/4KT 10M	KLM-401	4
		KLM-404	7
METAL FILM RESISTORS			
12066100	1/8BY 100K	KLM-377	5
		KLM-379	5
12066200	1/8BY 200K	KLM-377	6
12113243	1/4FY 243Ω	KLM-385	1
12113249	1/4FY 249Ω	KLM-380	1
12114100	1/4FY 1.00K		2
12114187	1/4FY 1.87K		1
12114324	1/4FY 3.24K	KLM-385	1
12114453	1/4FY 4.53K	KLM-380	1
12114487	1/4FY 4.87K	KLM-385	1
12114845	1/4FY 8.45K		1
12115100	1/4FY 10K	KLM-380	1
		KLM-385	2
12115150	1/4FY 15K	KLM-380	1
		KLM-385	2
12115200	1/4FY 20K	KLM-377	1
12115205	1/4FY 20.5K	KLM-380	1
12115348	1/4FY 34.8K	KLM-385	1
12115392	1/4FY 39.2K	KLM-377	1
		KLM-380	1
12115442	1/4FY 44.2K	KLM-385	1
12115499	1/4FY 49.9K	KLM-380	2
12115619	1/4FY 61.9K		1
12115634	1/4FY 63.4K	KLM-377	1
12116100	1/4FY 100K		1
		KLM-380	3
12116107	1/4FY 107K	KLM-377	1
12116124	1/4FY 124K	KLM-380	1
12116130	1/4FY 130K	KLM-377	8
12116196	1/4FY 196K		1
12116200	1/4FY 200K		1
		KLM-380	1
12116249	1/4FY 249K		1
12116499	1/4FY 499K		1
12413100	1/4TP 100Ω	KLM-378	4
12413402	1/4TP 402Ω		6
12413499	1/4TP 499Ω		1
		KLM-379	1
12413806	1/4TP 806Ω	KLM-378	16
12414100	1/4TP 1.00K		9
12414130	1/4TP 1.3K	KLM-379	1
12414158	1/4TP 1.58K	KLM-378	4
12414316	1/4TP 3.16K		8
12414634	1/4TP 6.34K		16
12415100	1/4TP 10.0K		4
		KLM-379	17
12415150	1/4TP 15.0K		1
12415174	1/4TP 17.4K		8
12415191	1/4TP 19.1K		8
12415200	1/4TP 20K		16
12415221	1/4TP 22.1K	KLM-378	1
12415237	1/4TP 23.7K		1
12415243	1/4TP 24.3K		1
12415274	1/4TP 27.4K	KLM-379	16
12415374	1/4TP 37.4K		8
12415432	1/4TP 43.2	KLM-378	8
12415487	1/4TP 48.7K	KLM-379	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
12415499	1/4TO 49.9K	KLM-378	3
		KLM-379	16
12415619	1/4TP 61.9K	KLM-378	1
12415750	1/4TP 75K	KLM-379	1
12415806	1/4TP 80.6K		24
12415909	1/4TP 90.9K	KLM-378	1
12416100	1/4TP 100K		8
		KLM-379	24
12416200	1/4TP 200K		1
12416301	1/4TP 301K	KLM-378	2
12416383	1/4TP 383K	KLM-379	1
12416475	1/4TP 475K		1
12614499	1/4FT 4.99K	KLM-403	1
12615200	1/4FT 20K		3
12616100	1/4FT 100K	KLM-401	1
12616121	1/4FT 121K		1
12616487	1/4FT 487K		1
LINEAR RESISTORS			
13234100	LT36 1/8SJ 1K	KLM-403	1
BLOCK RESISTORS			
13425100	RKC1/8B4J 10K	KLM-379	8
13426100	RKC1/4B4J 100K		1
13436100	RKC1/8B5J 100K	KLM-381	1
13534470	RKC1/8B6J 4.7K	KLM-377	1
13635100	RKC1/8B8J 10K	KLM-378	1
		KLM-380	1
13636100	RKC1/8B8J 100K	KLM-377	1
		KLM-378	1
13645100	RKC1/8B9J 100K	KLM-377	1
13655100	RKC1/8B12J 100K	KLM-379	1
13735100	RKC1/8B3SJ 10K		8
13744100	RKC1/8B4SJ 1K	KLM-378	4
13745100	RKC1/8B4SJ 10K	KLM-379	16
13756100	RKC1/8B5SJ 100K		1
METAL OXIDE FILM RESISTORS			
17021050	1WJY 0.5Ω	KLM-385	2
17022033	2WJY 0.33Ω		1
THERMISTORS			
18032310	TD5-A110DA	KLM-378	6
18032350	TD5 A150DA	KLM-379	1
18032450	TD5-C250DA	KLM-378	1
MYLAR CAPACITORS			
20002468	50V 0.0068UFJ		24
20003410	50V 0.001UFK	KLM-377	2
		KLM-379	1
		KLM-380	1
		KLM-384	8
		KLM-403	1
		KLM-404	2
20003412	50V 0.0012UFK	KLM-401	1
		KLM-404	10
20003418	50V 0.0018UFK		1
20003422	50V 0.0022UFK	KLM-403	1
		KLM-404	5
20003433	50V 0.0033UFK	KLM-380	1
		KLM-403	2
20003439	50V 0.0039UFK	KLM-401	1
20003447	50V 0.0047UFK	KLM-381	1
		KLM-401	4
		KLM-403	5
		KLM-404	7

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
20003456	50V 0.0056UFK		3
20003482	50V 0.0028UFK	KLM-377	1
		KLM-401	1
20003510	50V 0.01UFK	KLM-378	8
20003510	50V 0.01UFK	KLM-380	1
		KLM-401	13
		KLM-404	8
20003512	50V 0.012UFK	KLM-401	1
20003515	50V 0.015UFK	KLM-382	2
20003522	50V 0.022UFK	KLM-401	1
		KLM-403	9
		KLM-404	4
20003547	50V 0.047UFK	KLM-377	8
		KLM-378	18
		KLM-379	9
		KLM-380	16
20003556	50V 0.056UFK	KLM-401	1
		KLM-404	1
20003568	50V 0.068UFK	KLM-382	2
		KLM-401	1
20003610	50V 0.1UFK	KLM-382	1
		KLM-401	6
		KLM-403	3
		KLM-404	5
20003615	50V 0.15UFK		3
	STYROL CAPACITORS		
20502368	50V GT 680PF	KLM-403	1
	CERAMIC CAPACITORS		
21238610	25V 0.1UF	KLM-377	4
		KLM-378	20
		KLM-379	29
		KLM-380	4
		KLM-381	7
		KLM-385	8
		KLM-401	1
		KLM-403	2
		KLM-404	8
21253210	50V 10PF	KLM-377	1
		KLM-379	1
		KLM-380	2
		KLM-403	1
21256222	50V 22PF	KLM-377	1
		KLM-380	1
		KLM-401	1
		KLM-404	2
21256233	50V 33PFJ		3
21256310	50V 100PF	KLM-378	20
21256310	50V 100PF	KLM-403	1
21256315	50V 150PF	KLM-401	3
21256322	50V 220PFJ	KLM-379	1
21256333	50V 330PF	KLM-377	8
		KLM-401	1
21256347	50V 470PF	KLM-378	9
		KLM-380	1
		KLM-382	4
		KLM-403	1
21277356	50V 560PFK	KLM-378	8
21277368	50V 680PFK	KLM-401	3
		KLM-404	10
21277447	50V 4700PF	KLM-378	1
	NOISE FILTER		
21800300	ZCB-2203-11		1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
	SPARK KILLER		
21900300	PME265MC 533		1
	ELECTROLYTIC CAPACITORS		
23007210	A16V 10UF	KLM-377	4
		KLM-378	4
		KLM-379	39
		KLM-380	5
		KLM-381	6
		KLM-382	6
		KLM-384	8
		KLM-401	2
		KLM-404	10
23007222	A16V 22UF	KLM-378	8
23007247	A16V 47UF	KLM-401	6
		KLM-403	17
		KLM-404	3
23007310	A16V 100UF	KLM-384	2
		KLM-385	4
		KLM-401	6
		KLM-403	4
		KLM-404	14
23007322	A16V 220UF	KLM-401	3
23011133	A25V 3.3UF	KLM-404	3
23013210	A35V 10UF	KLM-385	2
23013447	A35V 4700UF		1
23013468	A35V 6800UF		1
23015110	A50V 1UF	KLM380	1
		KLM-381	1
		KLM-382	2
		KLM-385	1
		KLM-401	7
		KLM-404	9
3307210	A16V 10UF	KLM-380	1
23315022	A50V 0.22UF	KLM-403	1
23315047	A50V 0.47UF	KLM-378	1
		KLM-403	16
23315110	A50V 1UF	KLM-404	1
23315122	A50V 2.2UF	KLM-379	1
		KLM-401	1
		KLM-403	1
		KLM-404	7
	POLYPROPYLENE CAPACITORS		
26000462	PPC 100V 0.0062UFF	KLM-379	16
26001515	PPC 100V 0.015UFG	KLM-403	3
	TRANSISTORS		
30000727	2SA733 AK	KLM-379	1
		KLM-382	2
		KLM-385	4
		KLM-401	2
		KLM-404	3
30001006	2SA798 F	KLM-378	1
		KLM-382	1
		KLM-384	16
		KLM-404	1
30001311	2SA1175 K	KLM-379	16
30100328	2SB744AP		1
30100425	2SB 553Y	KLM-385	2
30200327	2SC945 AK	KLM-378	18
		KLM-382	4
		KLM-385	5
		KLM-401	8
		KLM-403	19
		KLM-404	14

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
30200399	2SC945 AK SELECTED	KLM-378	16
		KLM-401	1
		KLM-403	26
		KLM-404	2
30201106	2SC1583 F	KLM-401	1
30201106	2SC1583 F	KLM-404	3
30202211	2SC2786 K	KLM-379	48
30300625	2SD 552 Y	KLM-385	2
	FET		
30600115	2SK 30A TM-O	KLM-378	1
		KLM-379	17
		KLM-382	1
		KLM-401	12
		KLM-404	4
30600232	2SK 30A TM-GR	KLM-401	2
		KLM-404	1
	DIODES		
31000100	1S1555		61
		KLM-377	6
		KLM-380	11
		KLM-381	43
		KLM-382	3
		KLM-401	30
		KLM-403	12
		KLM-404	13
	BRIDGE DIODES		
31010200	4B4B41	KLM-385	1
	ZENER DIODES		
31102000	02BZ 3.9A	KLM-380	1
31102200	1SZ-47	KLM-385	1
31102300	RD-15EB3		2
31102400	1SS-16	KLM-381	4
31102500	RD-20EB3	KLM-385	1
31102600	RD-10EB1	KLM-382	1
	LED		
31200700	PR-5534S		1
31201400	PR 3932S	KLM-381	1
31201500	LT-8001P	KLM-377	8
		KLM-385	1
	DIODES		
31400100	1S1555 TP	KLM-378	5
		KLM-379	38
	IC		
32001029	UPD-8048 C 203ES	KLM-377	1
32001034	UPC-1571 C	KLM-404	3
32001037	UPD-8048-345	KLM-380	1
32002006	MN-3004	KLM-404	4
32002017	AN-829	KLM-401	2
32003004	TC-9130 P	KLM-403	1
		KLM-404	2
32003006	TC-5514 APL-3	KLM-380	1
32004002	HD-14007 UBP	KLM-403	1
		KLM-404	1
32004003	HD-14070 BP	KLM-377	3
		KLM-378	1
		KLM-403	1
32004004	HD-14066 BP	KLM-379	24
		KLM-401	1
		KLM-403	2

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
32004007	HD-14001 BP	KLM-378	1
		KLM-403	2
32004008	HD-14011 BP	KLM-380	3
		KLM-381	1
32004009	HD-14013 BP	KLM-379	16
		KLM-404	3
32004010	HD-14023 BP	KLM-377	4
		KLM-403	1
32004011	HD-14024 BP	KLM-378	1
32004012	HD-14028 BP	KLM-377	1
32004013	HD-14042 BP		8
		KLM-380	6
32004015	HD-14046 BP	KLM-404	1
32004017	HD-14051 BP	KLM-377	1
		KLM-378	3
		KLM-379	1
		KLM-380	2
		KLM-381	2
		KLM-403	2
32004018	HD-14068 BP	KLM-377	3
32004019	HD-14069 UBP		2
		KLM-401	1
		KLM-404	1
32004022	HD-14514 BP	KLM-377	1
32004030	HA-17408P	KLM-380	1
32009001	NJM-4558 DV	KLM-377	1
		KLM-378	12
		KLM-379	36
		KLM-380	8
		KLM-381	1
		KLM-382	2
		KLM-385	2
		KLM-401	8
		KLM-403	4
		KLM-404	8
32009002	NJM-4556 D		1
32009009	NJM-072D	KLM-377	5
		KLM-378	2
		KLM-380	3
		KLM-382	2
		KLM-403	1
32009010	NJM-072DH	KLM-379	9
32020022	MC-14013 BCP	KLM-401	1
32021017	LM-393 N	KLM-377	1
		KLM-379	4
		KLM-380	2
32021029	SN-74LS08		2
32021030	SN-74LS75	KLM-381	4
32022006	LM-13600 N	KLM-378	1
		KLM-379	1
32022091	LM-13600 N SELECTED	KLM-382	2
		KLM-384	8
		KLM-404	1
32023004	UA-726 HC	KLM-379	1
32029004	SSM-2044	KLM-378	8
		KLM-403	1
32029006	SSM-2056	KLM-378	16
32033001	SAD-1024 A	KLM-401	1
	PHOTO COUPLERS		
33000800	HTV P-1501	KLM-378	1
		KLM-382	1
	CERAMIC OSCILLATORS		
33500900	EFO-A6R0M01	KLM-377	1
		KLM-380	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
	P.C. BOARD		
34013700	KLM-263		1
34014703	KLM-298C		2
34014802	KLM-299		1
34037701	KLM-377	KLM-377	1
34037801	KLM-378	KLM-378	1
34037902	KLM-379	KLM-379	1
34038001	KLM-380	KLM-380	1
34038102	KLM-381	KLM-381	1
34038201	KLM-382	KLM-382	1
34038300	KLM-383		1
34038401	KLM-384	KLM-384	1
34038503	KLM-385	KLM-385	1
34040100	KLM-401	KLM-401	1
34040201	KLM-402		1
34040300	KLM-403	KLM-403	1
34040400	KLM-404	KLM-404	1
	SEMI-FIXED RESISTORS		
35001122	H0651A 220ΩB	KLM-380	1
35001147	H0651A 470Ω		1
35001222	H0651A 2.2KB	KLM-379	16
35001247	H0651A 4.7KB	KLM-377	1
35001310	H0651A 10KB		1
35001410	H0651A 100KB	KLM-379	16
		KLM-380	1
		KLM-384	8
35001422	H0651A 220KB		8
35202122	H1021A 220ΩB	KLM-385	2
35202247	H1021A 4.7KB	KLM-379	1
		KLM-385	1
35202410	H1021A 100KB	KLM-379	2
35241315	EVT-R6SA00BC4 15K	KLM-404	5
		KLM-403	1
35241322	EVT-R6SA00BE4 22K	KLM-378	1
		KLM-382	1
		KLM-401	2
35241347	EVT-R6SA00BQ4 47K	KLM-378	1
		KLM-403	1
35241410	EVT-R6SA00B15 100K	KLM-378	34
		KLM-379	1
		KLM-382	1
		KLM-401	1
		KLM-403	2
		KLM-404	1
35241415	EVT-R6SA00BC5 150K	KLM-379	1
35241422	EVT-R6SA00BET 220K	KLM-401	2
		KLM-404	1
35241468	EVT-R6SA00BS5 680K	KLM-378	1
35241510	EVT-R6SA00B16 1M		8
		KLM-401	2
		KLM-403	1
		KLM-404	1
	ROTARY VR		
36005300	EVH-COAK15B14		4
36005700	EVH-5LA802B15	KLM-401	3
		KLM-404	2
36005800	EVH-5LA802B14	KLM-381	13
		KLM-403	4
		KLM-404	6
36005900	EVH-5LA802A15	KLM-401	1
36006000	EVH-5LA802A16	KLM-403	1
		KLM-404	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
36006100	EVH-5LA802B16		1
36006200	EVH-5LA802A26	KLM-403	2
		KLM-404	1
36010800	EVH-6LA802B14	KLM-381	1
36011400	EVH-5LA802C14	KLM-401	1
36013200	K1611008SE10KB		2
36201300	E3JXC03-10KBX2		1
36202400	K164A0006A10KBX4		1
	ROTARY SW		
37001500	SRM-1034362	KLM-381	1
		KLM-403	1
37001700	SRM-1025255 L=15	KLM-381	1
37002300	SRM-1033146		2
37002600	SRM-1018131		1
	SLIDE SW		
37301000	SSB-122019		4
		KLM-381	1
		KLM-401	1
37301600	SSB-123014		3
37303400	SSS-322031	KLM-378	1
		KLM-379	1
		KLM-380	1
		KLM-385	1
	TACT SW		
37503400	KHC-11901	KLM-381	15
		KLM-401	4
		KLM-403	5
		KLM-404	7
	POWER SW		
37503800	1801-0121		1
	POWER TRANSFORMERS		
40007300	TA-003 100V–120V		1
40007400	TB-003 220V–240V		1
	RELAY		
40300400	AG2043 DC12V	KLM-382	1
	KEY BOARD		
42001500	C-C ESK-3010		1
	PHONE JACK		
45000100	S-G 7501 #01		8
45000700	S-G 7617 #01		7
45001200	S-G 7721 #01		1
	FUSE		
46402301	125V 2A UL		1
46402501	125V 3A UL		2
46462301	250V T2.0A		1
46462501	250V T3.15A		2
	HARNESS		
47028300	HNS-183		1
47028400	HNS-184		1
47028500	HNS-185		1
47028600	HNS-186		1
47028700	HNS-187		1
47028800	HNS-188		1
	CONNECTOR TOP		
47100301	B3P-SHF-1	KLM-378	8
		KLM-379	8

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
47100401	B4P-SHF-1	KLM-384	1
47100501	B5P-SHF-1	KLM-377	1
		KLM-380	1
47100601	B6P-SHF-1	KLM-377	1
		KLM-378	1
		KLM-382	1
47100701	B7P-SHF-1	KLM-377	1
		KLM-380	1
		KLM-385	3
47100801	B8P-SHF-1	KLM-377	4
		KLM-378	2
		KLM-379	1
		KLM-380	1
		KLM-384	3
47101001	B10P-SHF-1	KLM-380	1
		KLM-382	2
47101101	B11P-SHF-1	KLM-377	2
		KLM-379	1
		KLM-385	1
47101201	B12P-SHF-1	KLM-377	1
		KLM-378	1
		KLM-380	2
		KLM-385	1
47101301	B13P-SHF-1	KLM-379	1
47101401	B14P-SHF-1	KLM-380	1
	CONNECTOR BOTTOM		
47300301	BE3P-SHF-AA	KLM-404	1
47300401	BE4P-SHF-AA	KLM-401	1
		KLM-404	1
47300501	BE5P-SHF-AA	KLM-381	1
47300601	BE6P-SHF-AA	KLM-401	3
47300801	BE8P-SHF-AA		1
		KLM-403	2
47300901	BE9P-SHF-AA	KLM-404	1
47301001	BE10P-SHF-AA	KLM-381	1
		KLM-401	2
47301201	BE12P-SHF-AA	KLM-381	1
		KLM-403	2
		KLM-404	1
	IC SOCKET		
48002142	14P IC30-1403S4	KLM-378	16
48002162	16P IC30-1603S4		9
		KLM-379	1
48002402	40P IC30-4006S4	KLM-377	1
		KLM-380	1
	FUSE HOLDER		
51501600	S-N5053 #01		6
	BATTERY		
52000900	3/170DK (3.6V 170MAH)	KLM-380	1
	BUSHING		
54000300	SR-4K-4	UNI	1
		117 2P	1
54000400	SR-5P-4	JAM	1
		240 AU	1
54000500	SR-6W-1	220 GE	1
		220 SE	1
		240 AF	1
		DEMKO	1
		SEMKO	1
		NEMKO	1
		240 GE	1
		220 FR	1

PART CODE	PART NAME SPECIFICATIONS	P.C. BOARD	Q'TY
	LED HOLDER		
54003800	5φ		1
	CORD KEEP		
54005200	K-105G		5
	BUSHING		
54005800	TA-310		19
54005900	TB-300		21
54005903	TA-320		2
	TEST PIN		
54007100	LC-2-G-YELLOW	KLM-378	41
		KLM-379	27
		KLM-380	1
		KLM-382	9
		KLM-385	5
	CORD BAND		
54007600	No. 113 BLACK		1
	TACT SW MASK		
55002900	KOC-F40151		31
	RADIATION BOARD		
56002200	EGH-419 L=70		1
	RADIATION SHEET		
56500300	BFG-30		4
	SHIELDING SHEET		
58016401	KOC-F40205		1
	DUST COVER		
59002300	TRIDENT MK2		1
	AC CORD		
60000200	SPT-2 18AWG/2 2.5M	UNI	1
		117 2P	1
60000300	CLASS1HO5VV-F3X0.75	220 GE	1
		DEMKO	1
		SEMKO	1
		MEMKO	1
60000300	CLASS1HO5VV-F3X0.75	240 GE	1
60000400	SAA 3X0.75 2.5M	240 AU	1
60000500	240AF 2.5M	240 AF	1
60000600	SVT 18AWGX3 2.5M	JAM	1
60000900	SEV 2.5M	220 SE	1
60001300	KP4819D 3X0.75 2.5M	220 FR	1
	CONNECTION CORD		
60201300	NEW 6.3 2.5M		1
	SLIDE SW KNOB		
62001800	SW SSB L=9		4
	TACT SW KNOB		
62001900	BROWN KOC-E30019		8
62002900	IVORY KOC-E30019		14
62003100	RED KOC-E30019		1
62003300	GRAY KOC-E30019		5
62003400	ORANGE KOC-E30019		3
	JOY-STICK LEVER KNOB		
62005300	KOC-E40035		1

PART CODE	PART NAME SPECIFICATION	P.C. BOARD	Q'TY
	ROTARY VR OR SW KNOB		
62009400 62009500	IVORY NO.1 E40087 GRAY NO.2 E40087		19 31
	SLIDE SW KNOB		
62009600	NEW KOC-E40096		5
	JOYSTICK VR MOUNTING BOARD		
64026700	C40230		1
	MUSIC STAND		
64052300	KOC-C30162		1
	MAIN PANEL		
64056800	KOC-C10004		1
	METAL FITTING OF MAIN PANEL (R)		
64056900	KOC-C30161		1
	METAL FITTING OF MAIN PANEL (L)		
64056901	KOC-C30161		1
	PHONE JACK PLATE		
64057000	KOC-C20113		1
	METAL FITTING OF CONTROL PANEL		
64057100	C20229		1
	WOODEN CASE		
64508200			1
	CONTROL PANEL		
64605300	KOC-E40068		1
	CORD STOPPER		
64608601	KOC-E40099		2
	LUG		
67200100 67200200	3φ 4φ		1 2
	MODEL NUMBER PLATE		
68600200	KOC-C40144		1

KORG®

KEIO ELECTRONIC LABORATORY CORP.
15-12, Shimotakaido 1-chome, Suginami-ku, Tokyo, Japan.

562DTH PRINTED IN JAPAN