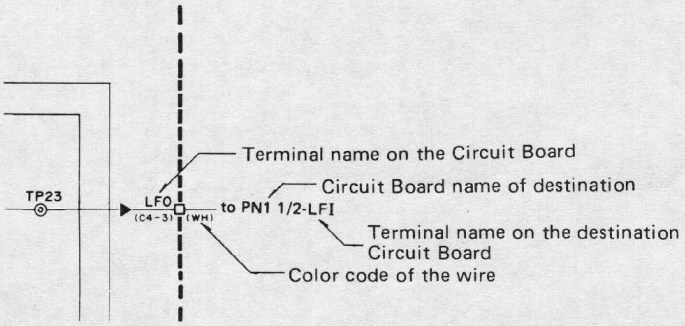
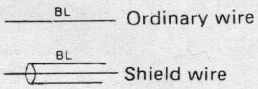
CONTENTS

CODING GUIDE

1 Wiring Notation

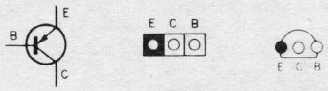


Note: Types of wire



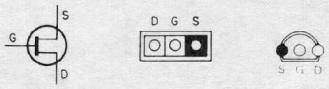
2 Symbol Description

Transistor



E: Emitter
C: Collector
B: Base

FET



S: Source
G: Gate
D: Drain

Capacitors

Electrolytic capacitor
Polarity
△ : Tantalum capacitor
NP : Nonpolar capacitor

Mylar, ceramic or polystyrene capacitor

Diode

(Zener Diode)

Switch

B : Break
T : Transfer
M : Make

3 Abbreviations of Wire Color Codes

BLACK (クロ) ..... BL	BROWN (チャ) ..... BR	RED (アカ) ..... RE
ORANGE (ダイ) ..... OR	YELLOW (キイ) ..... YE	GREEN (ミド) ..... GR
BLUE (アオ) ..... BE	VIOLET (ムラ) VI	GRAY (ハイ) ..... GY
WHITE (シロ) ..... WH	GRASS GREEN (クサ) ..... GG	SKY BLUE (ソラ) ..... SB
PINK (モモ) ..... PK	TRANSPARENT (トウメイ) ..... TR	

4 Relation of Color Coding and Notes

C	C♯	D	D♯	E	F	F♯	G	G♯	A	A♯	B
BR	RE	OR	YE	GR	BE	VI	GY	WH	GG	SB	PK
(チャ)	(アカ)	(ダイ)	(キイ)	(ミド)	(アオ)	(ムラ)	(ハイ)	(シロ)	(クサ)	(ソラ)	(モモ)

5 Logic Symbols

	MIL	YAMAHA
NOT		
NOR		
NAND		

Exclusive OR
(排他的論理和)

Truth Table

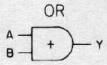
A	B	Y
L	L	L
H	L	H
L	H	H
H	H	L

NOT
(Inverter)

Truth Table

A	Y
L	H
H	L

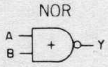
OR



Truth Table

A	B	Y
L	L	L
H	L	H
L	H	H
H	H	H

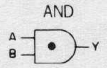
NOR



Truth Table

A	B	Y
L	L	H
H	L	L
L	H	L
H	H	L

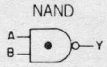
AND



Truth Table

A	B	Y
L	L	L
H	L	L
L	H	L
H	H	H

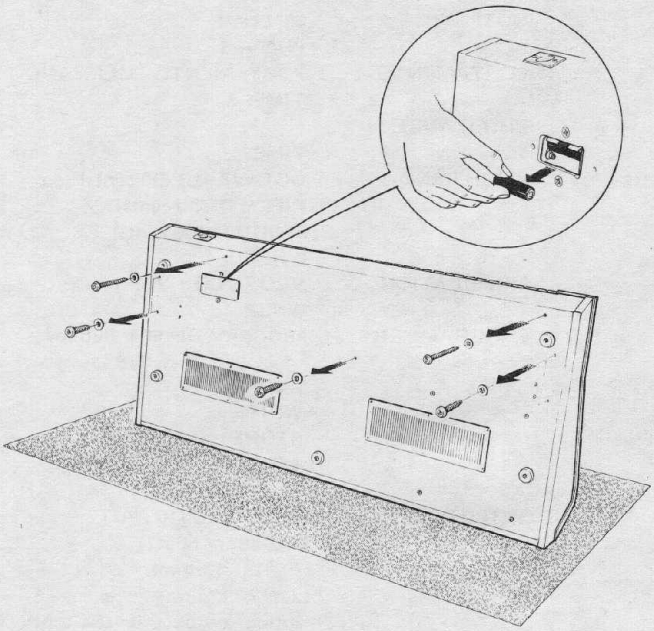
NAND



Truth Table

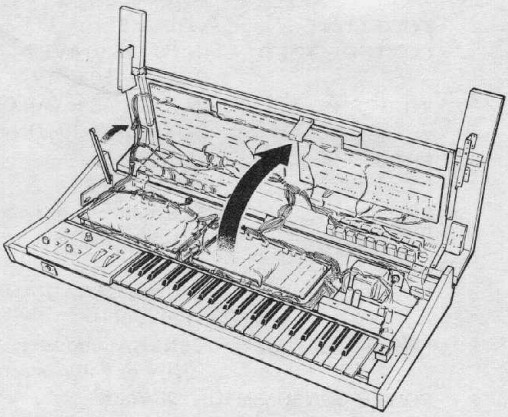
A	B	Y
L	L	H
H	L	H
L	H	H
H	H	L

DISASSEMBLY PROCEDURE

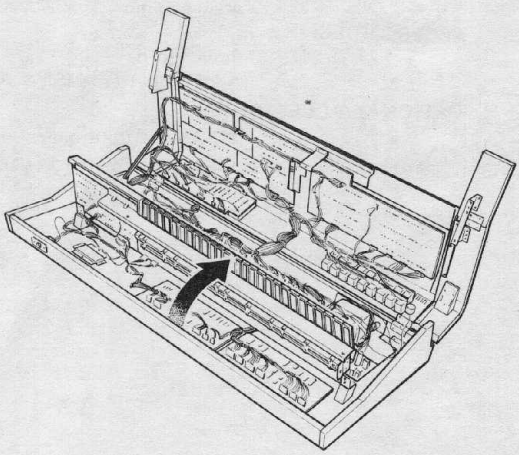


Opening panel and keyboard

- Put the body on a seat of cloth so that the rear panel should not be damaged. Remove screws of the bottom plate.



- Uplift the arm, turn it and fix it with the stopper on the left side.



- You can rotate the keyboard, holding the clapper.

SPECIFICATIONS

KEYBOARD . . . . . 37 keys, c1 through c4 (3 octaves)

CONTROLS

VCO 1, VCO 2 . . . . PITCH: −500 to +700 cents
FEET: 64', 32', 16', 8', 4', 2'
WAVE: ⩘, ◺, ⊓
MODULATION FUNCTION:
∿, ◺, ◿, ⊓, S/H, GL+, GL−
MODULATION DEPTH
PW: 50% to 90%
PWM (LFO ∿)

MIXER. . . . . VCO 1
VCO 2
NOISE

VCF . . . . . CUT OFF FREQ.
RESONANCE: Q= 0.5 to 10
HP/BP/LP
HP:12dB/oct.
BP: ±6dB/oct.
LP: −12dB/oct.
MODULATION FUNCTION:
∿, ◺, ◿, ⊓, S/H
MODULATION DEPTH
EG DEPTH

VCA . . . . . ∿ 1
MODULATION FUNCTION:
∿, ◺, ◿, ⊓
MODULATION DEPTH
INITIAL LEVEL

EG-VCF . . . . . ⌒ / ◿
NORMAL / TIME x 5
ATTACK TIME: 0.001 to 1 sec.
(at "NORMAL" setting)
DECAY TIME: 0.01 to 10 sec.
(ditto)
SUSTAIN LEVEL
RELEASE TIME: 0.01 to 10 sec.
(ditto)

EG-VCA . . . . . NORMAL / TIME x 5
ATTACK TIME: 0.001 to 1 sec.
(at "NORMAL" setting)
DECAY TIME: 0.01 to 10 sec.
(ditto)
SUSTAIN LEVEL
RELEASE TIME: 0.01 to 10 sec.
(ditto)

LFO . . . . . TRIGGER: REPEAT / OFF
SPEED: 0.1 to 100Hz

GLIDE . . . . . TIME: 0.015 to 15 sec.

OUTPUT. . . . . VOLUME
PHONES

PORTAMENTO. . . . PORTAMENTO / GLISSANDO
TIME

BRILLIANCE

SUSTAIN . . . . . TIME

PITCH BEND . . . . . OCTAVE (±1200 cents)
FIFTH (±700 cents)
THIRD (±400 cents)
WHEEL

MODULATION . . . . VCO / VCO + VCF / VCF
WHEEL

PROGRAMMER . . . PROGRAM SELECT Buttons
1, 2, 3, 4, 5, 6, 7, 8
PANEL
WRITE
STORE
LOAD

JACKS

OUTPUT. . . . . BALANCED OUTPUT
(−16dBm / 600Ω)
HIGH (−13dBm)
LOW (−32dBm)
During output of saw-tooth wave
(◺) at basic setting.

FOOT SW. . . . . SUSTAIN
PORTAMENTO

FOOT CONT. . . . . VOLUME

CONTROL VOLT . . IN (0.125 to 4V)
OUT (0.125 to 4V)

TRIGGER . . . . . IN (OFF: 15 to 3V, ON: 0 to −10V)
OUT: (OFF: 3V, ON: −7V)

PROGRAM . . . . . TO TAPE
FROM TAPE

PHONES . . . . . 24.5 millivolts rms nominal
(8Ω or higher impedance)

OTHERS

POWER SOURCE. . . U.S. and CANADIAN models:
120V, 60Hz
GENERAL model:
220V or 240V selectable, 50/60Hz

POWER CONSUMPTION: 28 Watts

DIMENSIONS. . . . . 849 x 177 x 455.5mm
(W x H x D) (33-3/8 x 7 x 17-7/8")

WEIGHT . . . . . 16kg (35.3 lbs.)

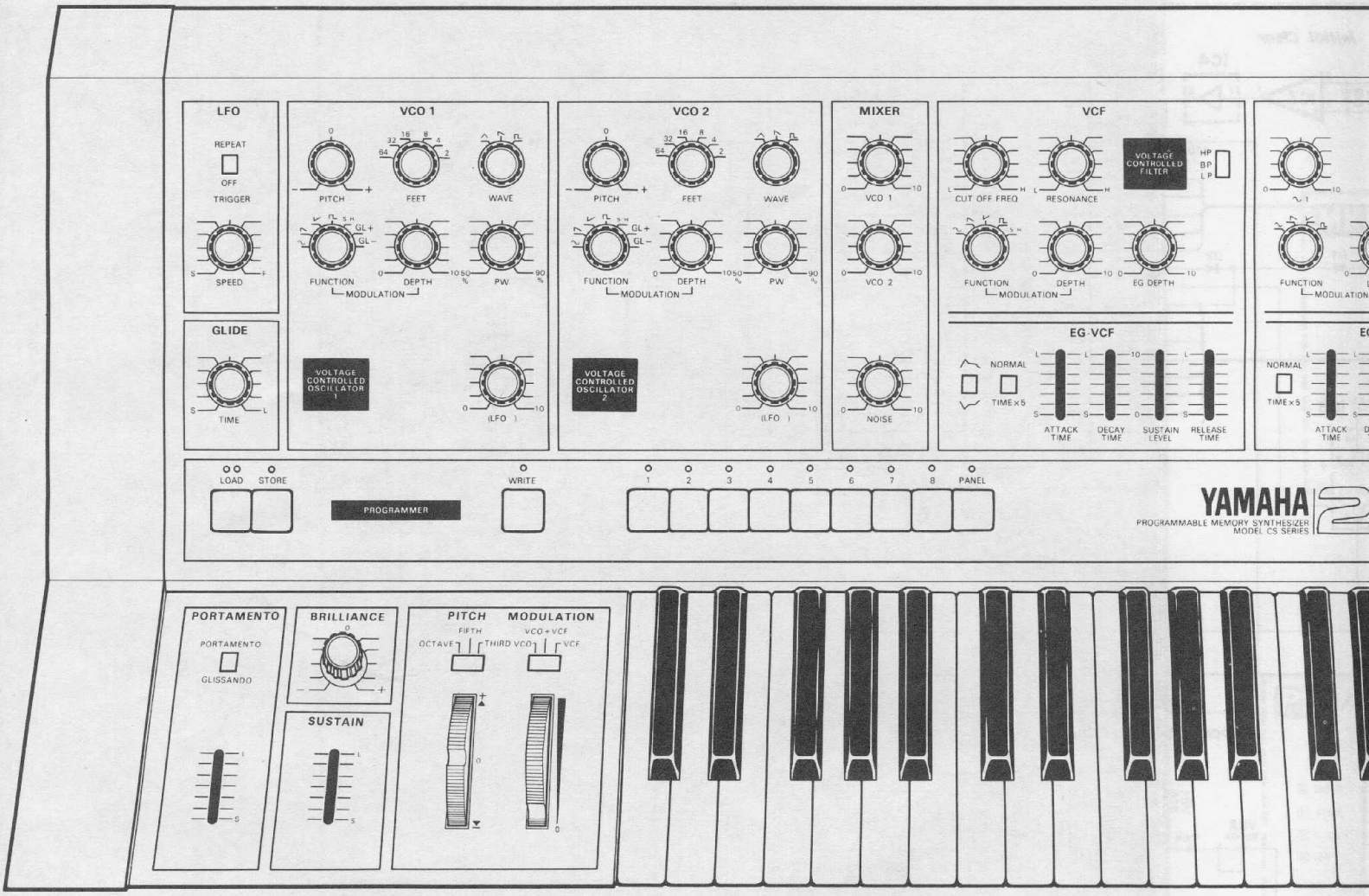
FINISH. . . . . Semi-gloss black panels, rosewood-grain cabinet

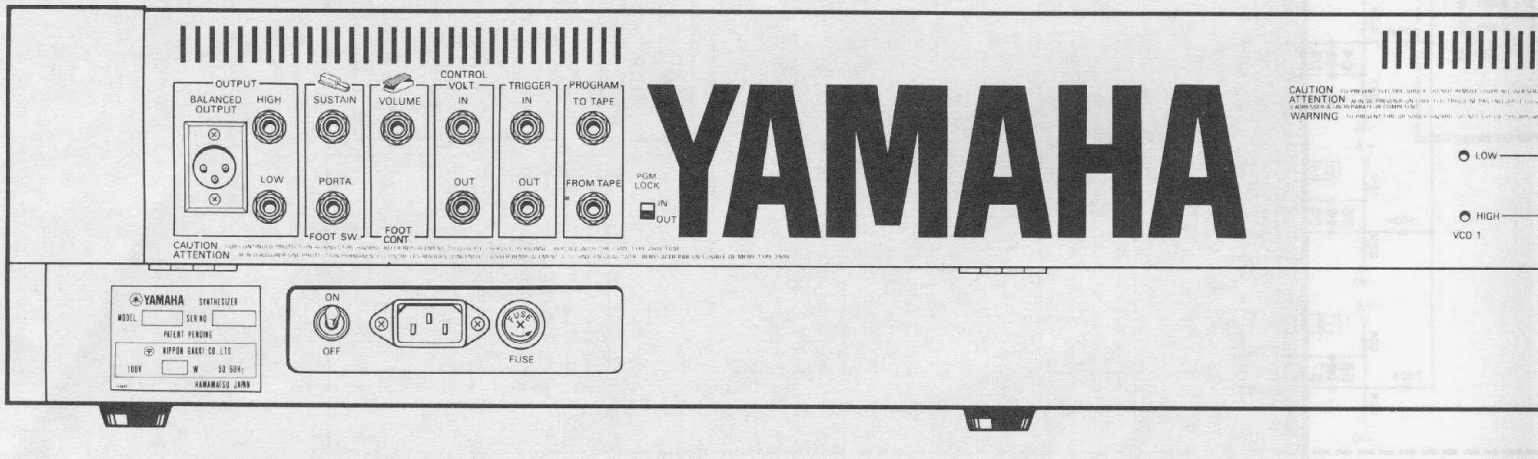
ACCESSORIES:
Power cord
Alkaline batteries (Size: AA) x 2

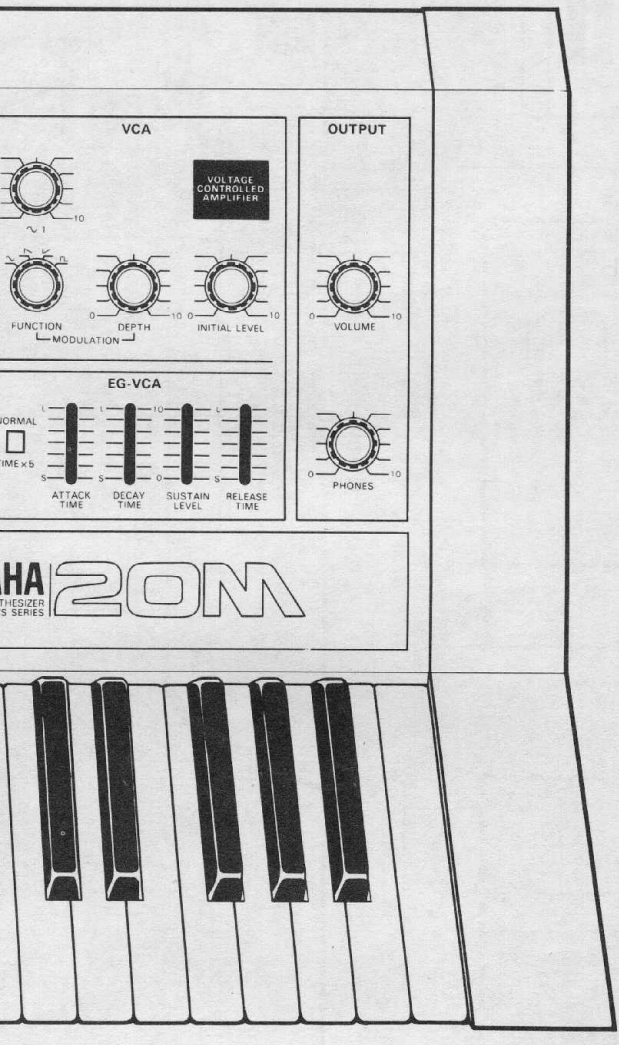
OPTIONAL ACCESSORIES:
FC-3 Foot Controller
FC-4 Foot Switch Pedal

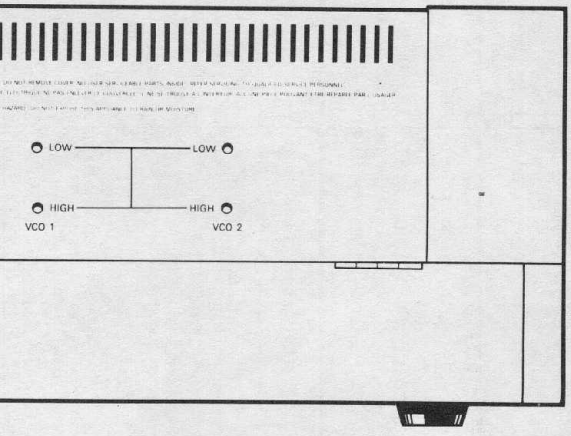
Specifications subject to change without notice.

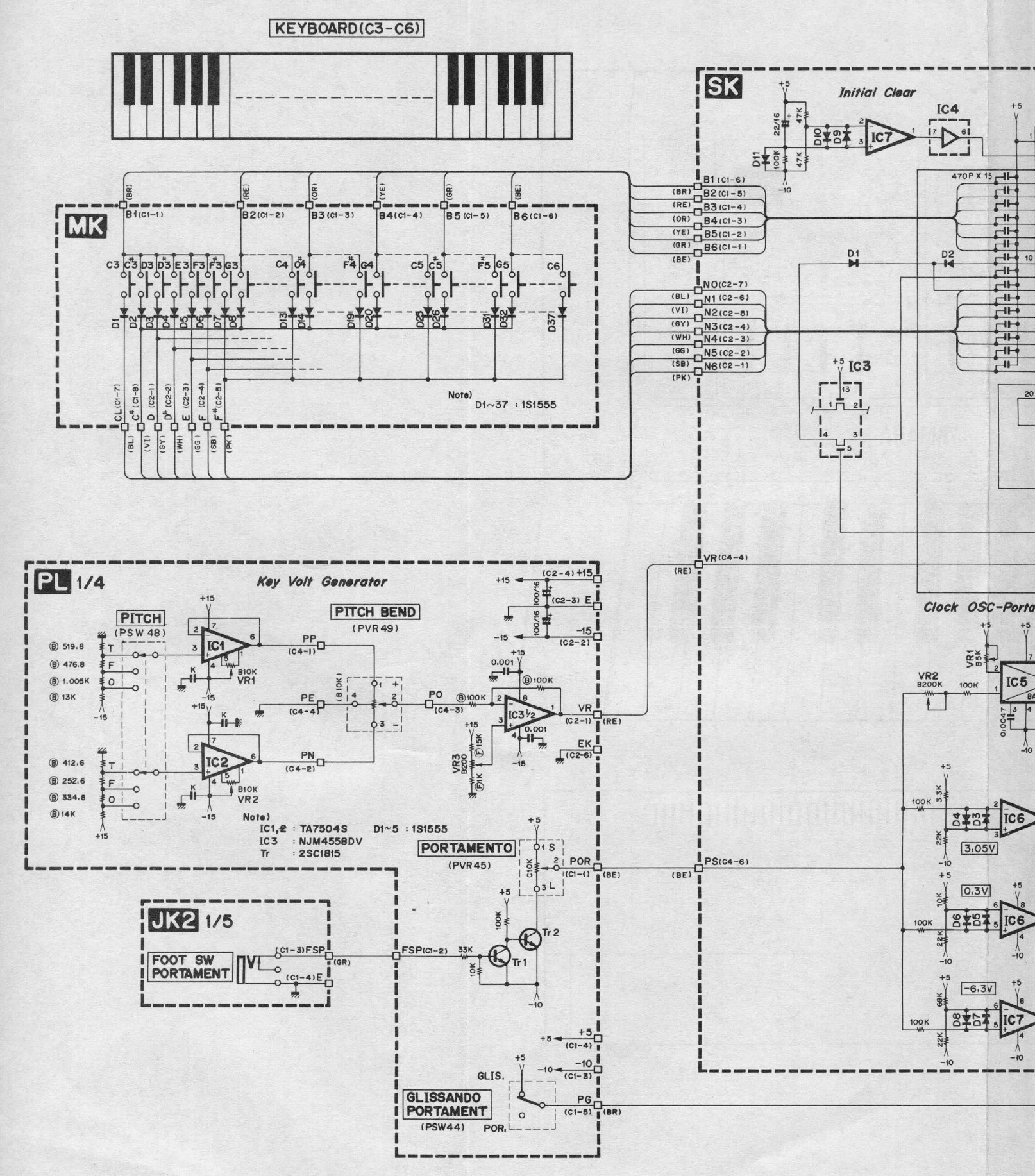
PANEL LAYOUT



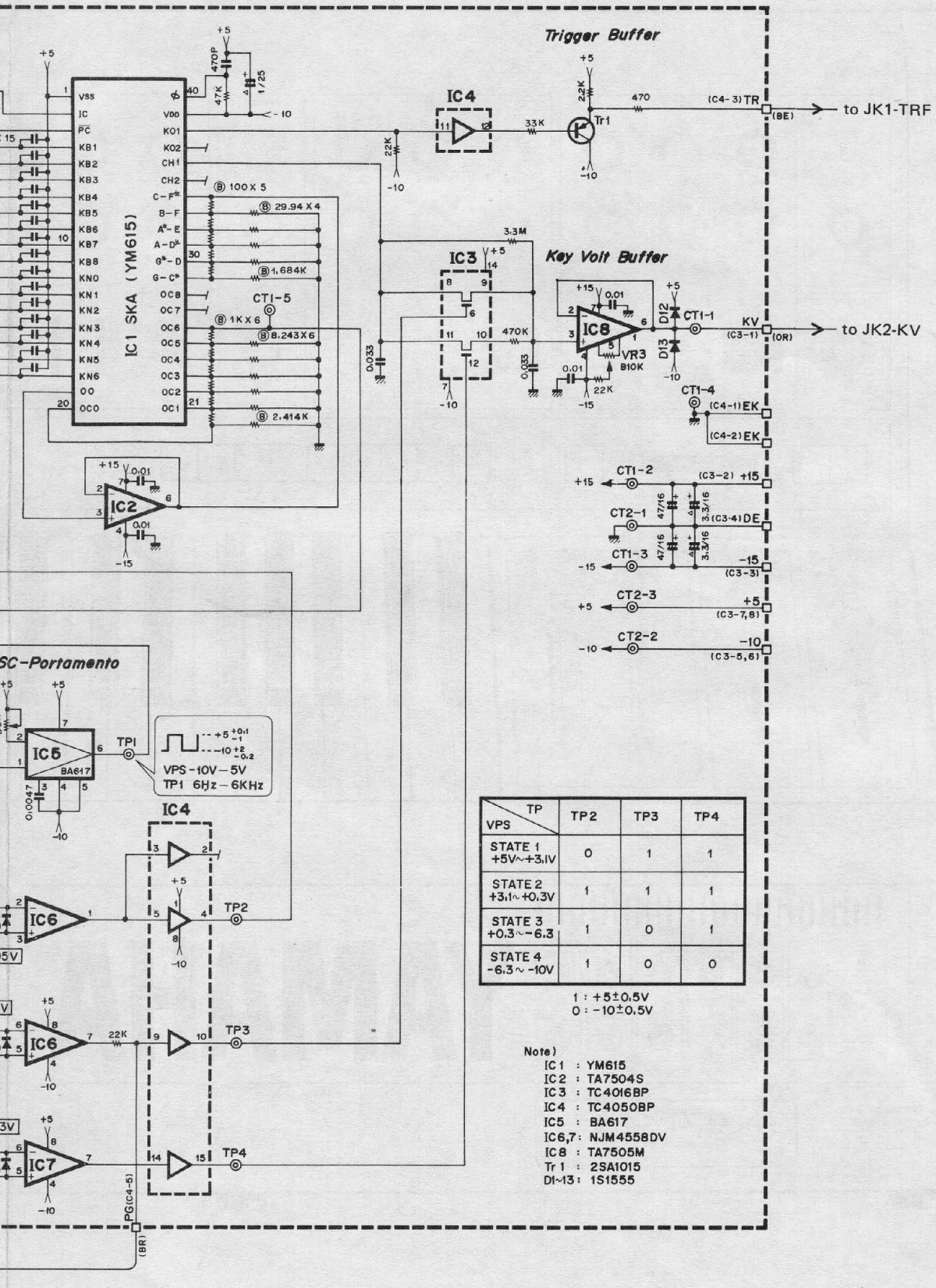



VCA
VOLTAGE CONTROLLED AMPLIFIER
OUTPUT
FUNCTION
MODULATION
DEPTH
INITIAL LEVEL
VOLUME
EG-VCA
ATTACK TIME
DECAY TIME
SUSTAIN LEVEL
RELEASE TIME
PHONES
20M


LOW
LOW
HIGH
HIGH
VCO 1
VCO 2


KEYBOARD(C3-C6)
SK
Initial Clear
IC4
IC7
IC3
MK
B1(C1-1)
B2(C1-2)
B3(C1-3)
B4(C1-4)
B5(C1-5)
B6(C1-6)
Note)
D1~37 : 1S1555
B1 (C1-6)
B2 (C1-5)
B3 (C1-4)
B4 (C1-3)
B5 (C1-2)
B6 (C1-1)
NO(C2-7)
N1 (C2-6)
N2 (C2-5)
N3 (C2-4)
N4 (C2-3)
N5 (C2-2)
N6 (C2-1)
470P X 15
PL 1/4
Key Volt Generator
PITCH
(PSW 48)
PITCH BEND
(PVR49)
IC1
IC2
IC3 1/2
VR1
VR2
VR3
PP
PE
PN
PO
VR
EK
Note)
IC1,2 : TA7504S
IC3 : NJM4558DV
Tr : 2SC1815
D1~5 : 1S1555
PORTAMENTO
(PVR45)
POR
PS(C4-6)
JK2 1/5
FOOT SW
PORTAMENT
FSP(C1-2)
Tr1
Tr2
GLIS.
GLISSANDO
PORTAMENT
(PSW44)
PG
VR(C4-4)
Clock OSC-Porto
IC5
IC6
IC7
3.05V
0.3V
-6.3V

SK Circuit Diagram

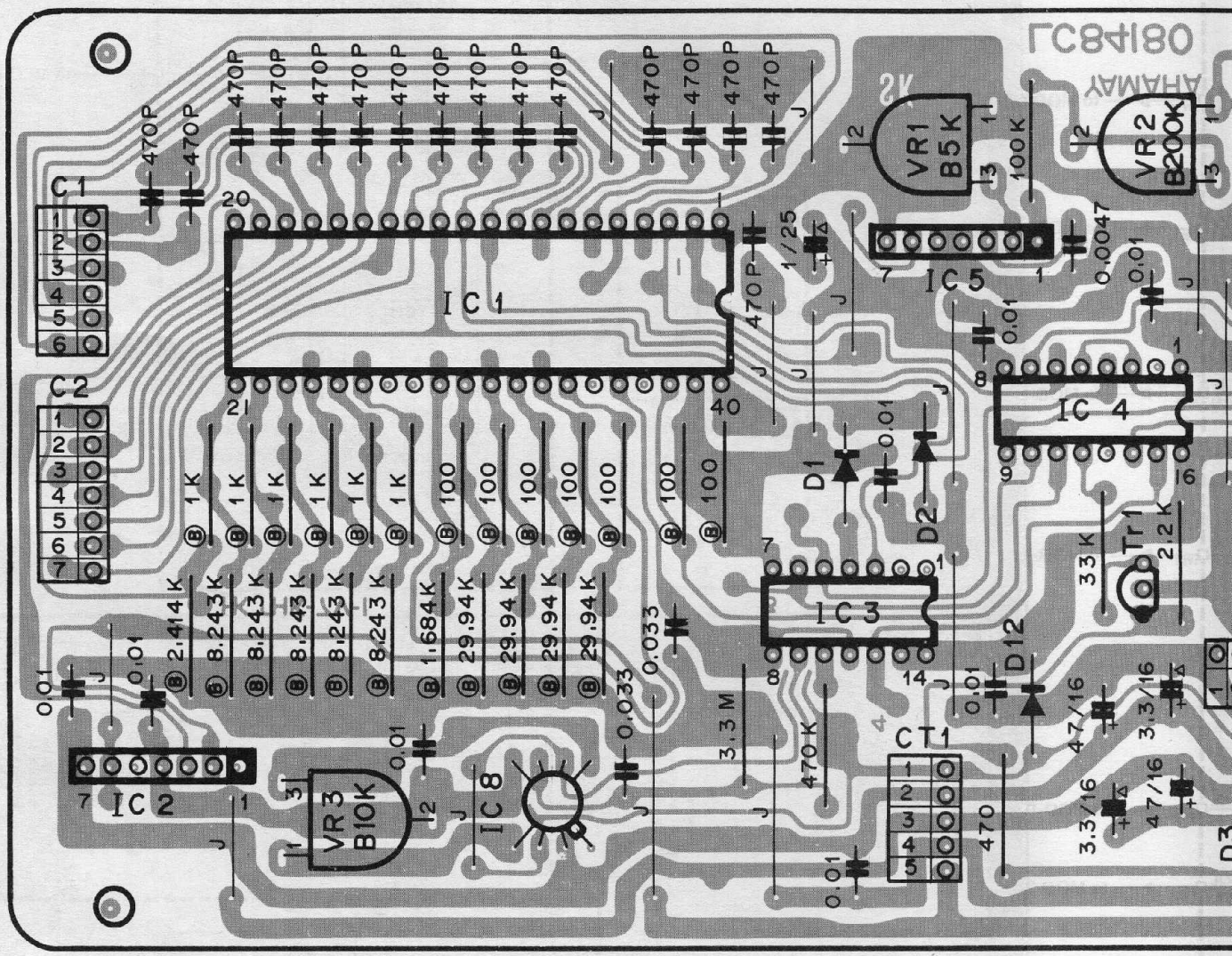


TP / VPS	TP2	TP3	TP4
STATE 1 +5V~+3.1V	0	1	1
STATE 2 +3.1~+0.3V	1	1	1
STATE 3 +0.3~-6.3	1	0	1
STATE 4 -6.3~-10V	1	0	0

1 : +5±0.5V
0 : -10±0.5V

Note)
IC1 : YM615
IC2 : TA7504S
IC3 : TC4016BP
IC4 : TC4050BP
IC5 : BA617
IC6,7 : NJM4558DV
IC8 : TA7505M
Tr1 : 2SA1015
D1~13 : 1S1555

SK Circuit Board & Wiring



C1

B6	1
B5	2
B4	3
B3	4
B2	5
B1	6

C2

N6	1
N5	2
N4	3
N3	4
N2	5
N1	6
NO	7

CT1

KV	1
+15	2
−15	3
EK	4
VR	5

CT2

DE	1

C1

Pin No.	Pin Name	Wire Color	Destination
1	B6	BE	MK-B6 (C1-6)
2	B5	GR	MK-B5 (C1-5)
3	B4	YE	MK-B4 (C1-4)
4	B3	OR	MK-B3 (C1-3)
5	B2	RE	MK-B2 (C1-2)
6	B1	BR	MK-B1 (C1-1)

C2

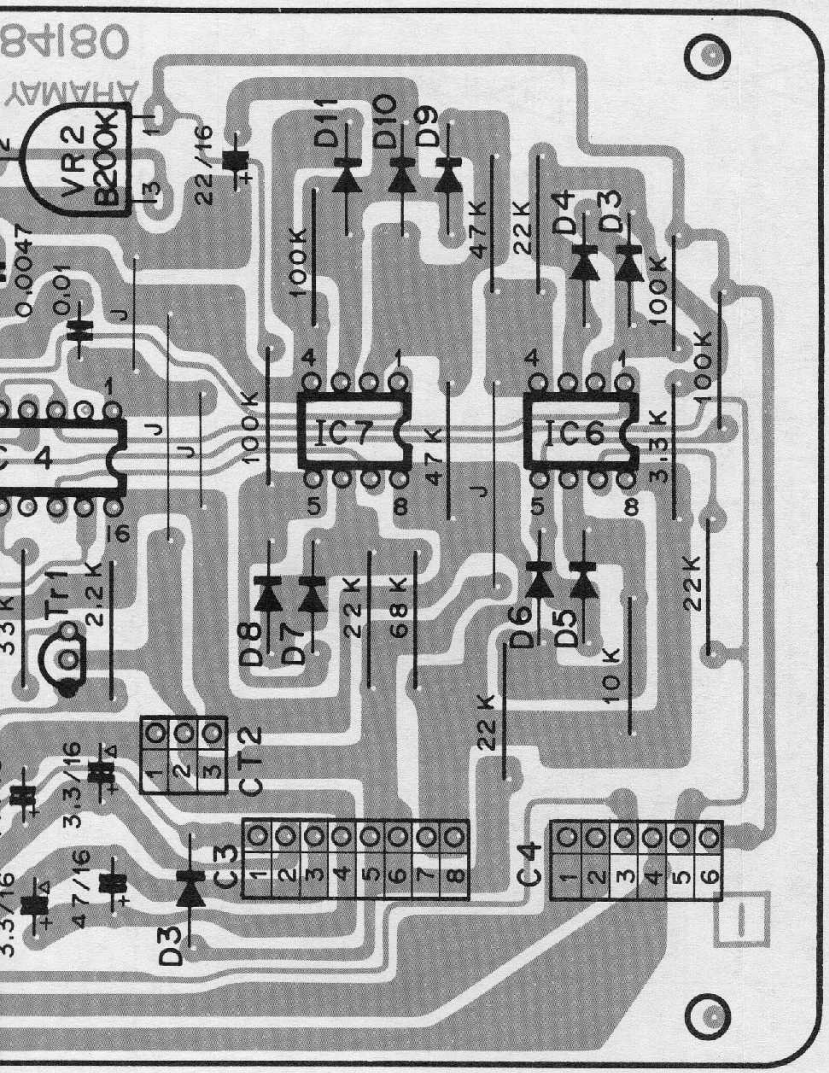
Pin No.	Pin Name	Wire Color	Destination
1	N6	PK	MK-F# (C2-5)
2	N5	SB	MK-F (C2-4)
3	N4	GG	MK-E (C2-3)
4	N3	WH	MK-D# (C2-2)
5	N2	GY	MK-D (C2-1)
6	N1	VI	MK-C# (C1-8)
7	NO	BL	MK-CL (C1-7)

C3

Pin No.	Pin Name	Wire Color	Destination
1	KV	OR	JK2-KV (C2-1)
2	+15	BR	DC-+15 (C4-1)
3	−15	BR	DC- −15 (C4-5)
4	DE	BL	DC-DE (C4-8)
5	−10	BE	DC- −10 (C4-10)
6	−10	BE	PL- −10 (C1-3)
7	+5	GR	DC-+5 (C4-7)
8	+5	GR	PL-+5 (C1-4)

C4

Pin No.	Pin Name	Wire Color	Destination
1	EK	BL	DC-AE (C4-3)
2	EK	BL	PL-EK (C2-6)
3	TR	BE	JK1-TRF (C2-7)
4	VR	RE	PL-VR (C2-1)
5	PG	BR	PL-PG (C1-5)
6	PS	BR	PL-POR (C1-1)



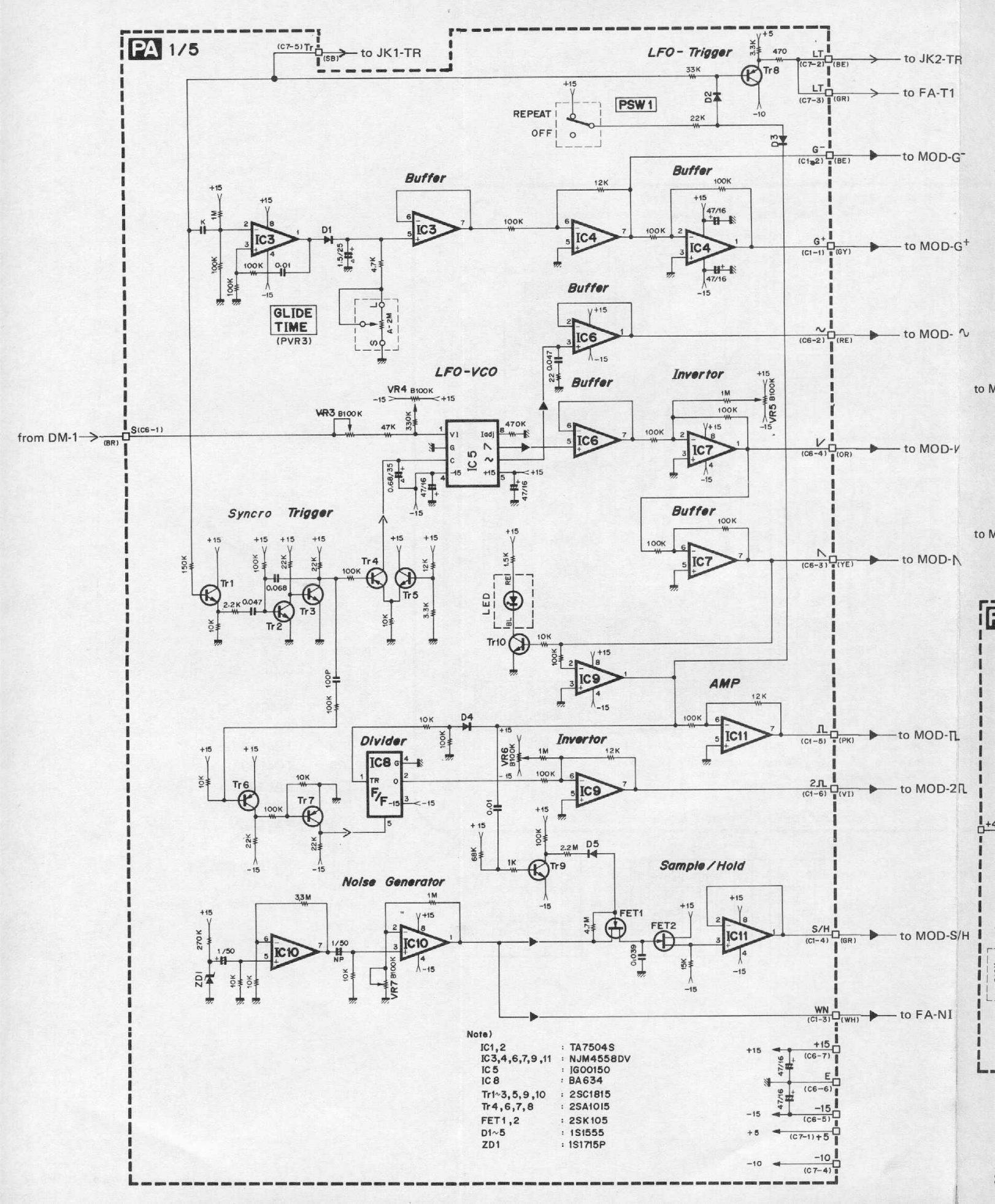
CT2	
DE	1
−10	2
+5	3

C3	
KV	1
+15	2
−15	3
DE	4
−10	5
−10	6
+5	7
+5	8

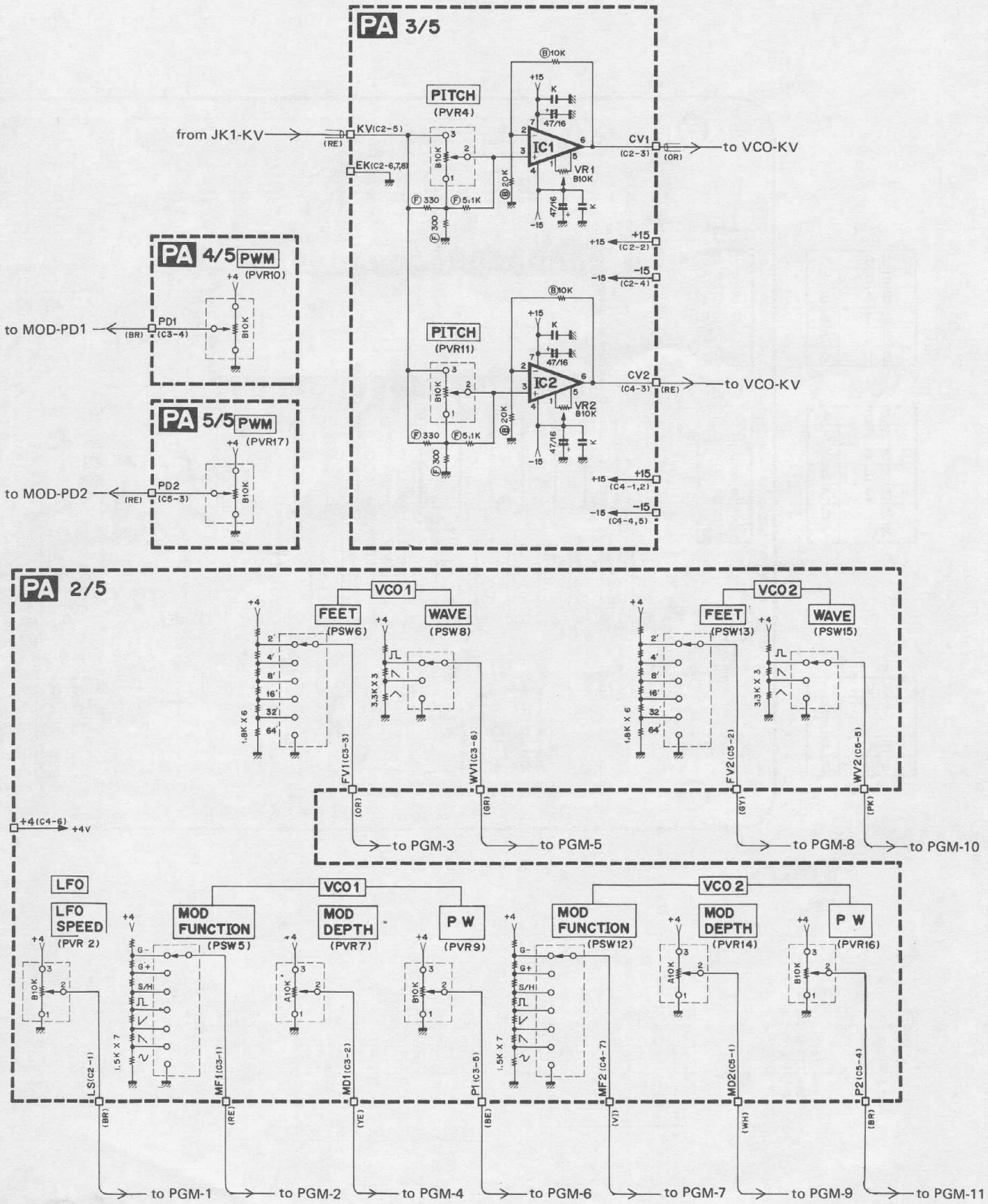
C4	
EK	1
EK	2
TR	3
VR	4
PG	5
PS	6

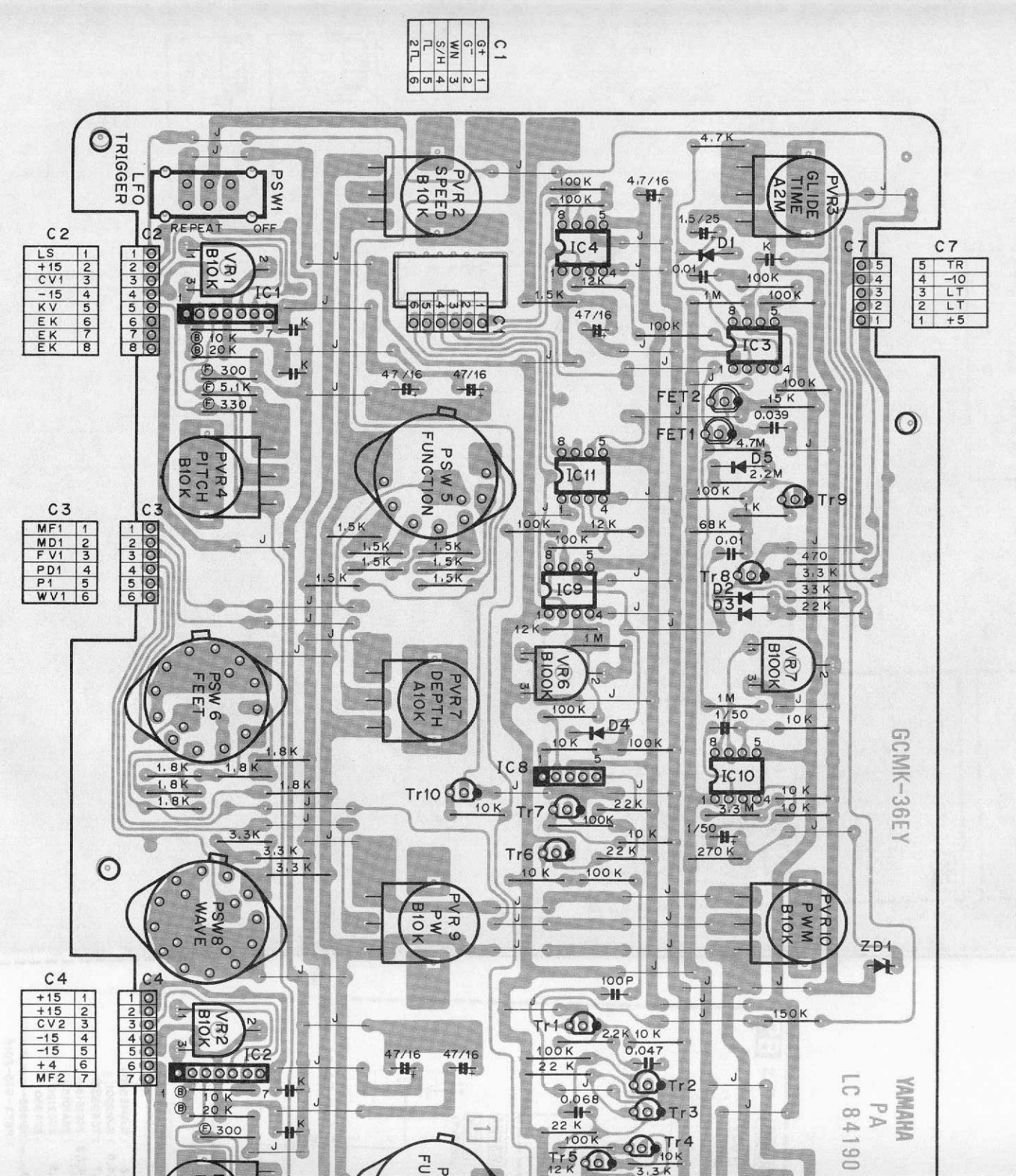
Note)

1. Circuit Board : LC84181
2. IC
   - IC1 : YM615
   - IC2 : TA7504S
   - IC3 : TC4016BP
   - IC4 : TC4050BP
   - IC5 : BA617
   - IC6,7 : NJM4558DV
   - IC8 : TA7505M
3. Transistor
   - Tr1 : 2SA1015
4. Capacitor
   - △marked : Tantalum Capacitor
5. Diode
   - D1 ~ 13 : 1S1555


PA 1/5
(C7-5) Tr
(SB)
to JK1-TR
LFO - Trigger
Tr8
LT (C7-2) (BE)
to JK2-TR
LT (C7-3) (GR)
to FA-T1
PSW1
REPEAT
OFF
D2
D3
G⁻ (C1-2) (BE)
to MOD-G⁻
Buffer
IC3
IC4
G⁺ (C1-1) (GY)
to MOD-G⁺
GLIDE TIME (PVR3)
Buffer
IC6
(C6-2) (RE)
to MOD-∿
LFO-VCO
VR4 B100K
VR3 B100K
IC5
Buffer
Invertor
VR5 B100K
IC7
V (C6-4) (OR)
to MOD-V
from DM-1
S(C6-1) (BR)
Syncro Trigger
Tr1
Tr2
Tr3
Tr4
Tr5
LED
Tr10
Buffer
IC7
N (C6-3) (YE)
to MOD-N
IC9
AMP
IC11
Π (C1-5) (PK)
to MOD-Π
Divider
IC8
F/F
D4
Invertor
VR6 B100K
IC9
2Π (C1-6) (VI)
to MOD-2Π
Tr6
Tr7
Tr9
D5
Sample / Hold
FET1
FET2
IC11
S/H (C1-4) (GR)
to MOD-S/H
Noise Generator
IC10
ZD1
VR7 B100K
WN (C1-3) (WH)
to FA-NI
to MOD
Note)
IC1,2 : TA7504S
IC3,4,6,7,9,11 : NJM4558DV
IC5 : IG00150
IC8 : BA634
Tr1~3,5,9,10 : 2SC1815
Tr4,6,7,8 : 2SA1015
FET1,2 : 2SK105
D1~5 : 1S1555
ZD1 : 1S1715P
+15 (C6-7)
E (C6-6)
-15 (C6-5)
+5 (C7-1)
-10 (C7-4)

PA Circuit Diagram




C1
G+ 1
G− 2
WN 3
S/H 4
−L 5
2−L 6
C2
LS 1
+15 2
CV1 3
−15 4
KV 5
EK 6
EK 7
EK 8
C3
MF1 1
MD1 2
FV1 3
PD1 4
P1 5
WV1 6
C4
+15 1
+15 2
CV2 3
−15 4
−15 5
+4 6
MF2 7
C7
5 TR
4 −10
3 LT
2 LT
1 +5
LFO TRIGGER
PSW1
REPEAT
OFF
PVR 2 SPEED B10K
PVR3 GLIDE TIME A2M
VR1 B10K
IC1
IC2
IC3
IC4
IC8
IC9
IC10
IC11
PVR4 PITCH B10K
PSW 5 FUNCTION
PSW 6 FEET
PVR7 DEPTH A10K
VR6 B100K
VR7 B100K
PSW8 WAVE
PVR 9 PW B10K
PVR10 PWM B10K
VR2 B10K
D1
D2
D3
D4
D5
ZD1
FET1
FET2
Tr1
Tr2
Tr3
Tr4
Tr5
Tr6
Tr7
Tr8
Tr9
Tr10
GCMK-36EY
YAMAHA
PA
LC 84190

View from the printed pattern side of the circuit board

PA Circuit Board & Wiring

C1

Pin No.	Pin Name	Wire Color	Destination
1	G^+	GY	MOD-G^+ (C2-8)
2	G^-	BE	MOD-G^- (C2-6)
3	WN	SWH	FA-NI (C6-1)
4	S/H	GR	MOD-S/H (C2-5)
5	⊓	WH	MOD-⊓ (C2-3)
6	2⊓	VI	MOD-2⊓ (C2-7)

C6

Pin No.	Pin Name	Wire Color	Destination
1	S	BR	DM-1 (C5-9)
2	∿	RE	MOD-∿ (C2-1)
3	⋀	YE	MOD-⋀ (C2-4)
4	⩗	OR	MOD-⩗ (C2-2)
5	−15	YE	DC-−15 (C1-5)
6	E	BL	DC-AE (C1-3)
7	+15	BR	DC-+15 (C1-1)

C2

Pin No.	Pin Name	Wire Color	Destination
1	LS	BR	PGM-1 (C6-10)
2	+15	BR	PA-+15 (C4-2)
3	CV1	SOR	VCO-KV (C2-2)
4	−15	YE	PA-−15 (C4-5)
5	KV	SRE	JK1-KV (C2-1)
6	EK	SRES	
7	EK	BL	JK2-EK (C2-4)
8	EK	BL	VCO-EK (C1-1)

C7

Pin No.	Pin Name	Wire Color	Destination
1	+5	GR	PB-+5 (C1-5)
2	LT	BE	JK2-TR (C2-5)
3	LT	GR	FA-T1 (C3-6)
4	−10	BE	PB-−10 (C1-2)
5	TR	SB	JK1-TR (C2-6)

C3

Pin No.	Pin Name	Wire Color	Destination
1	MF1	RE	PGM-2 (C6-9)
2	MD1	YE	PGM-4 (C6-7)
3	FV1	OR	PGM-3 (C6-8)
4	PD1	BR	MOD-PD1 (C3-3)
5	P1	BE	PGM-6 (C6-1)
6	WV1	GR	PGM-5 (C6-6)

C4

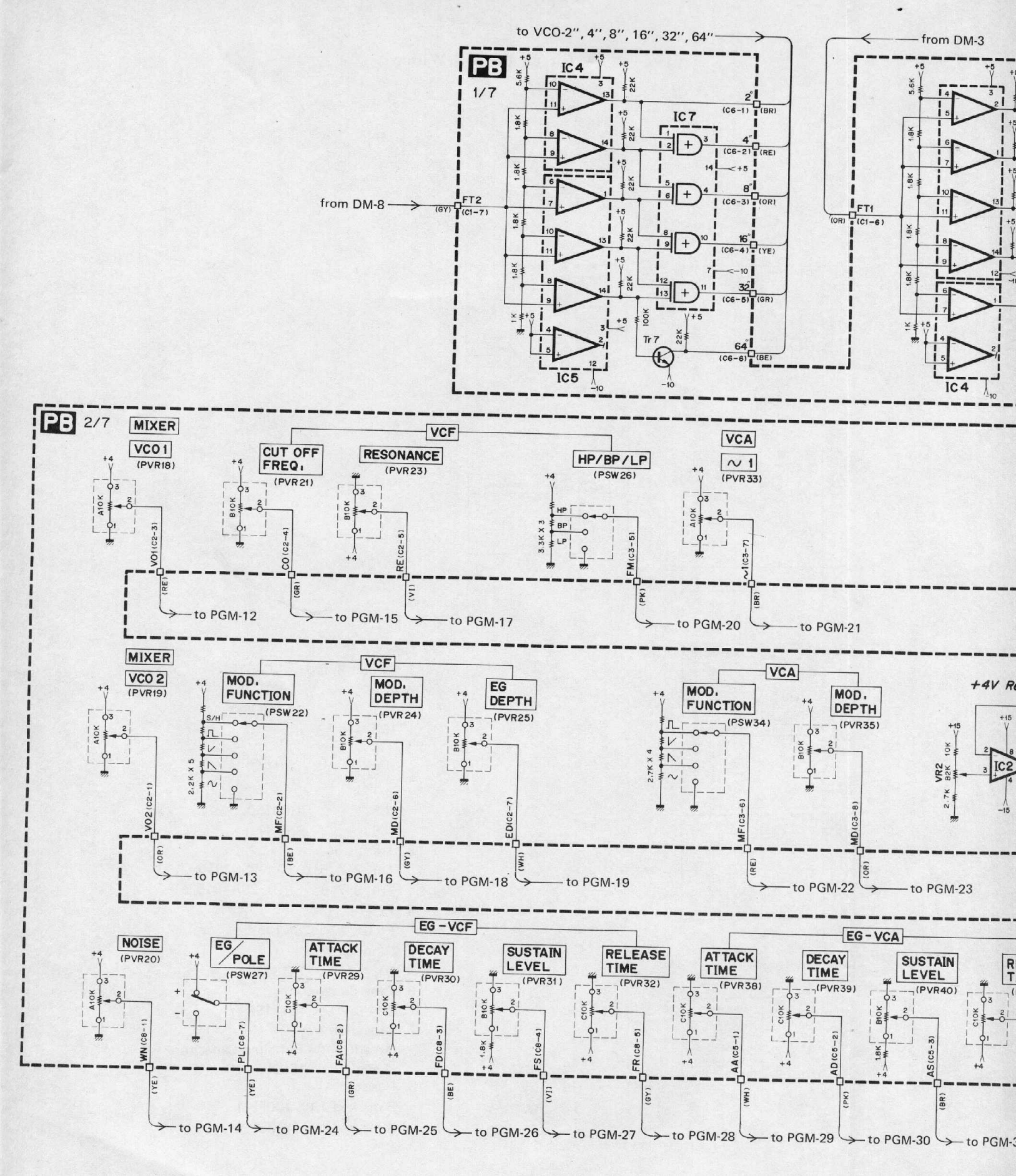
Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DC-+15 (C3-1)
2	+15	BR	PA-+15 (C2-2)
3	CV2	RE	VCO-KV (C1-2)
4	−15	YE	DC-−15 (C3-5)
5	−15	YE	PA-−15 (C2-4)
6	+4	VI	PB-+4 (C3-4)
7	MF2	VI	PGM-7 (C6-2)

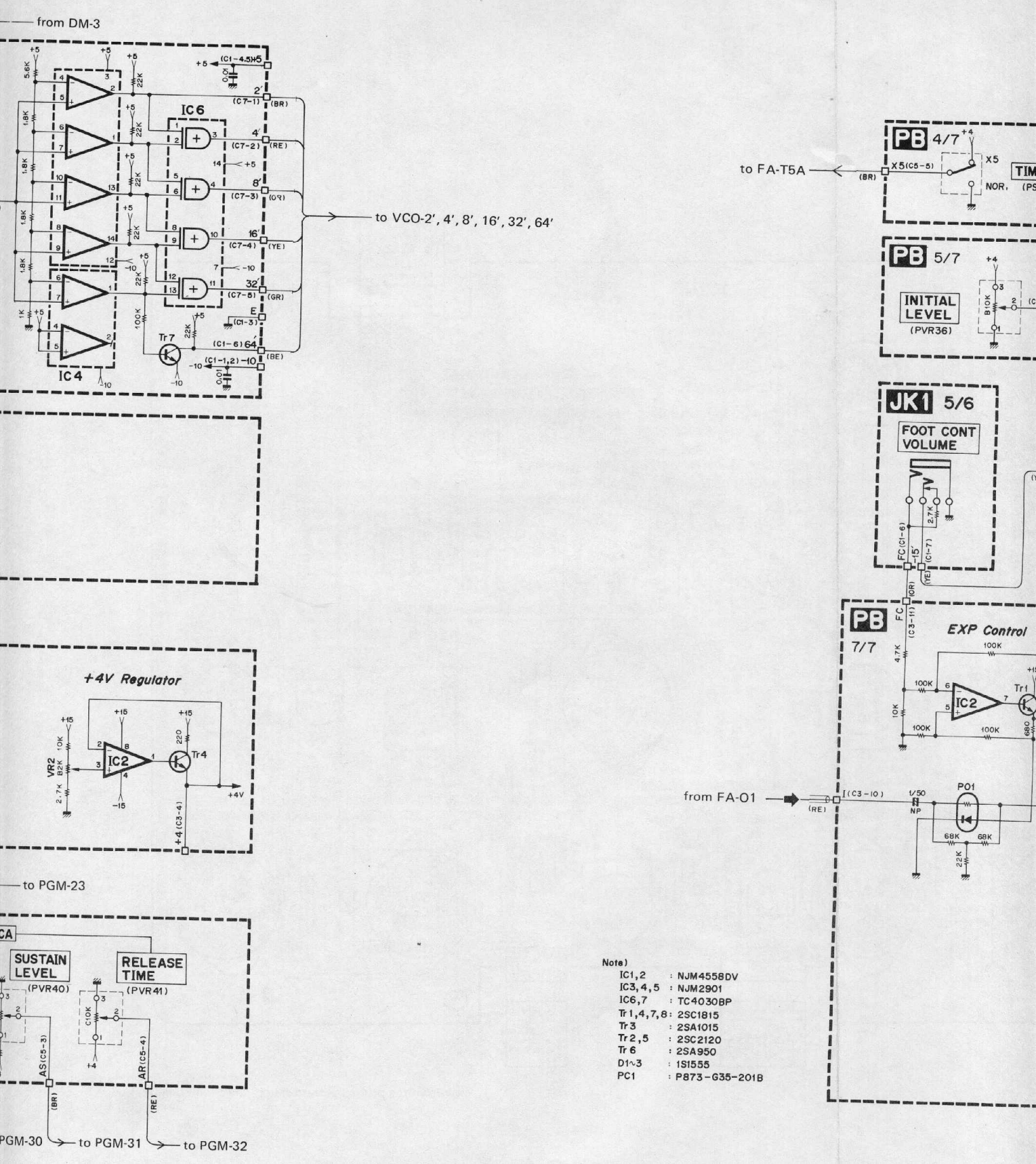
C5

Pin No.	Pin Name	Wire Color	Destination
1	MD2	WH	PGM-9 (C6-4)
2	FV2	GY	PGM-8 (C6-3)
3	PD2	RE	MOD-PD2 (C3-4)
4	P2	BR	PGM-11 (C8-1)
5	WV2	PK	PGM-10 (C6-5)

Note)

1. Circuit Board : LC84191
2. IC
   - IC1, 2 : TA7504S
   - IC3, 4 / 6, 7 / 9, 10 / 11 : NJM4558DV
   - IC5 : iG00150
   - IC8 : BA634
3. Transistor
   - Tr1, 2, 3, 5, 9, 10 : 2SC1815
   - Tr4, 6, 7, 8 : 2SA1015
4. FET
   - FET1, 2 : 2SK105
5. Diode
   - D1 ~5 : 1S1555
6. Zenerdiode
   - ZD1 : 1S1715P
7. Capacitor
   - △mark : Tantalum Capacitor
   - K mark : 1000P
8. Resistor
   - F marked : 1% 100PPM
   - B marked : 0.1% 25PPM

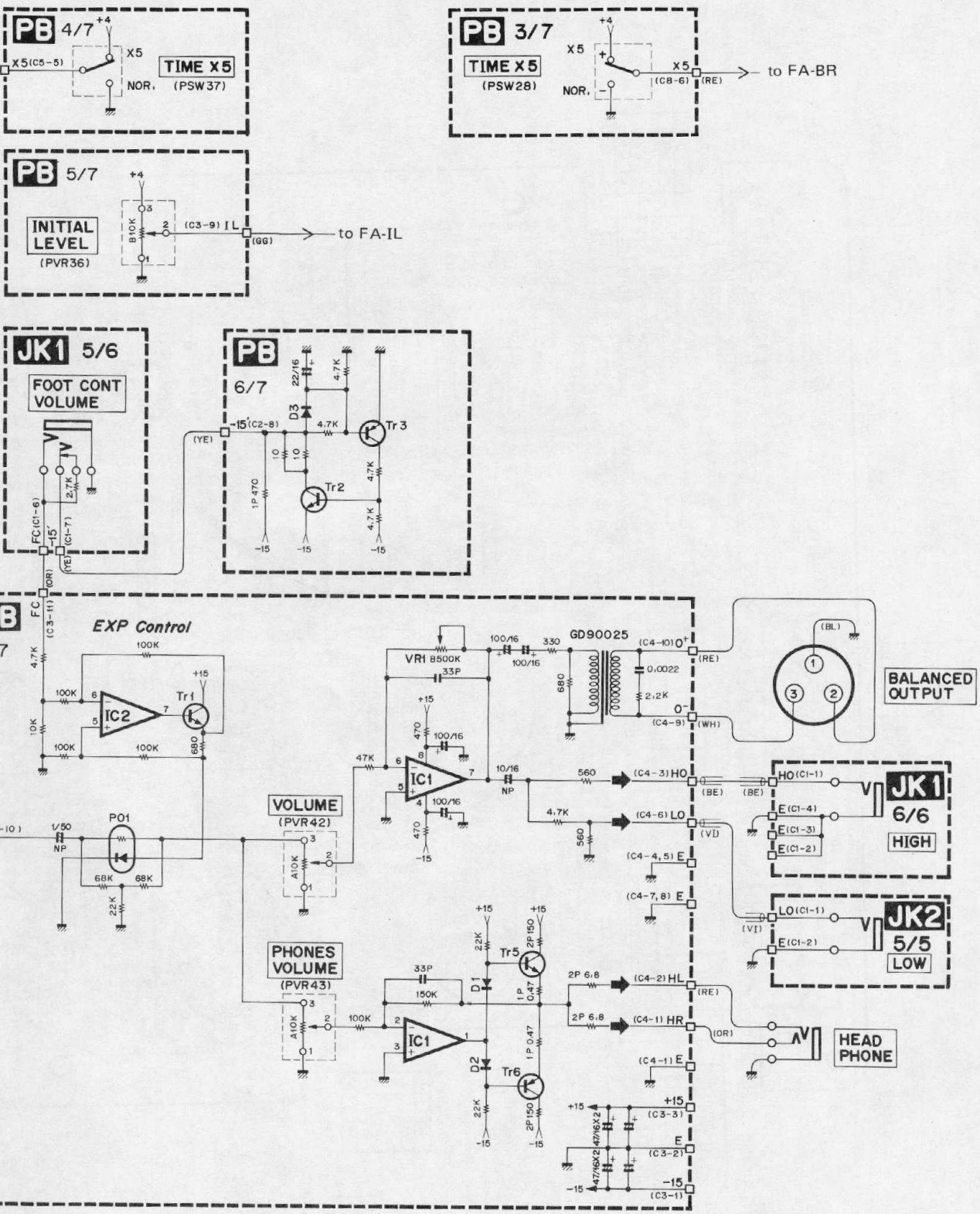

to VCO-2'', 4'', 8'', 16'', 32'', 64''
from DM-3
PB 1/7
IC4
IC7
IC5
Tr7
from DM-8
FT2 (GY) (C1-7)
FT1 (OR) (C1-6)
2' (C6-1) (BR)
4' (C6-2) (RE)
8' (C6-3) (OR)
16' (C6-4) (YE)
32' (C6-5) (GR)
64' (C6-6) (BE)
PB 2/7
MIXER
VCO 1 (PVR18)
CUT OFF FREQ. (PVR21)
RESONANCE (PVR23)
VCF
HP/BP/LP (PSW26)
VCA
∼ 1 (PVR33)
VO1 (C2-3) (RE)
CO (C2-4) (GR)
RE (C2-5) (VI)
FM (C3-5) (PK)
∼ (C3-7) (BR)
to PGM-12
to PGM-15
to PGM-17
to PGM-20
to PGM-21
MIXER
VCO 2 (PVR19)
MOD. FUNCTION (PSW22)
MOD. DEPTH (PVR24)
EG DEPTH (PVR25)
VCF
MOD. FUNCTION (PSW34)
MOD. DEPTH (PVR35)
VCA
+4V Ref
VO2 (C2-1) (OR)
MF (C2-2) (BE)
MD (C2-6) (GY)
ED (C2-7) (WH)
MF (C3-6) (RE)
MD (C3-8) (OR)
to PGM-13
to PGM-16
to PGM-18
to PGM-19
to PGM-22
to PGM-23
NOISE (PVR20)
EG POLE (PSW27)
ATTACK TIME (PVR29)
DECAY TIME (PVR30)
SUSTAIN LEVEL (PVR31)
RELEASE TIME (PVR32)
EG-VCF
ATTACK TIME (PVR38)
DECAY TIME (PVR39)
SUSTAIN LEVEL (PVR40)
EG-VCA
WN (C8-1) (YE)
PL (C8-7) (YE)
FA (C8-2) (GR)
FD (C8-3) (BE)
FS (C8-4) (VI)
FR (C8-5) (GY)
AA (C5-1) (WH)
AD (C5-2) (PK)
AS (C5-3) (BR)
to PGM-14
to PGM-24
to PGM-25
to PGM-26
to PGM-27
to PGM-28
to PGM-29
to PGM-30

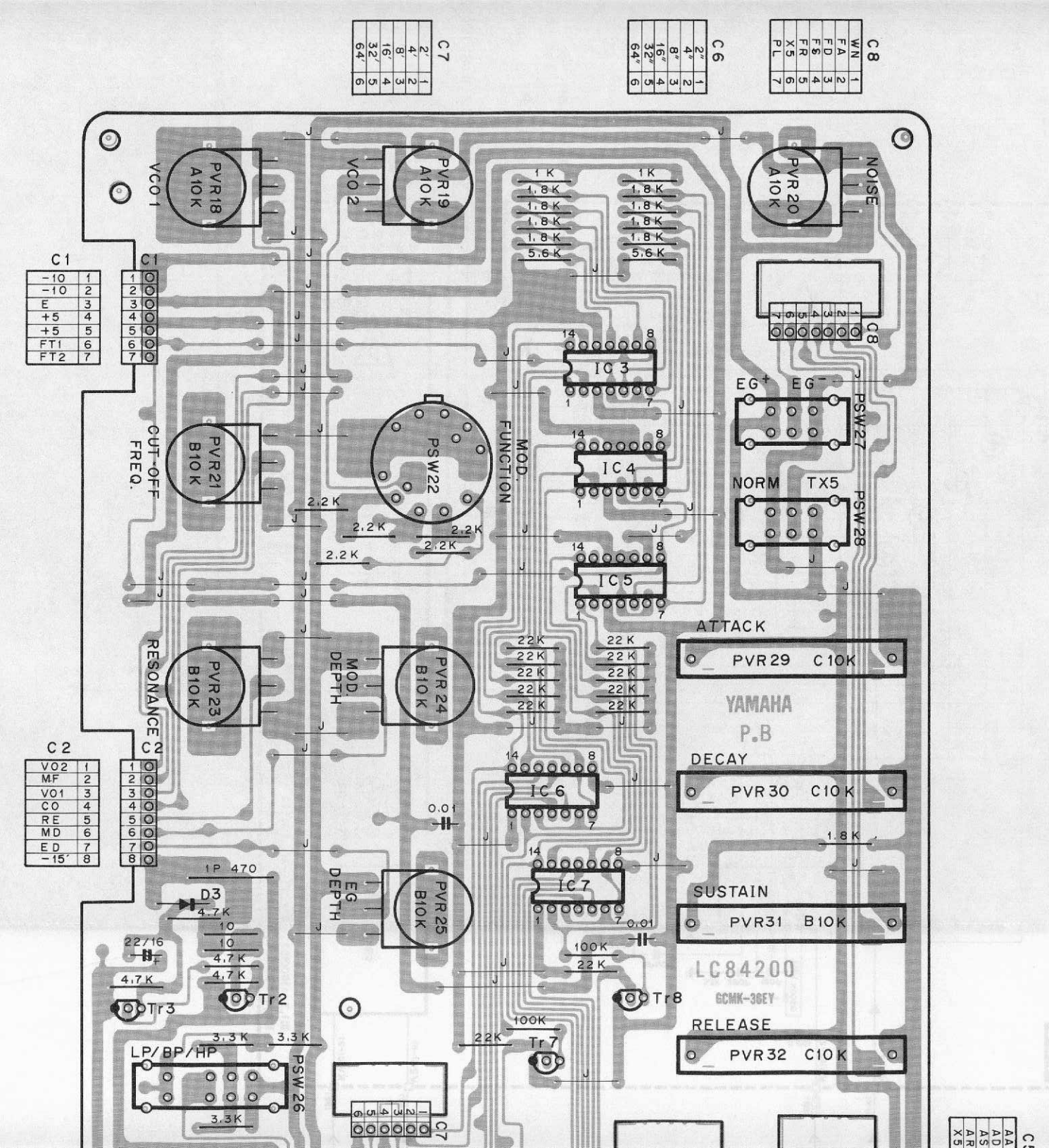


Note)

IC1,2	: NJM4558DV
IC3,4,5	: NJM2901
IC6,7	: TC4030BP
Tr1,4,7,8	: 2SC1815
Tr3	: 2SA1015
Tr2,5	: 2SC2120
Tr6	: 2SA950
D1~3	: 1S1555
PC1	: P873-G35-201B

PB Circuit Diagram




C7
2'
4'
8'
16'
32'
64'
C6
2"
4"
8"
16"
32"
64"
C8
WN
FA
FD
FS
FR
X5
PL
C1
-10
-10
E
+5
+5
FT1
FT2
C2
VO2
MF
VO1
CO
RE
MD
-15'
ED
VCO 1
VCO 2
NOISE
PVR18 A10K
PVR19 A10K
PVR20 A10K
1K
1.8K
5.6K
IC 3
IC 4
IC 5
IC 6
IC 7
EG+
EG-
PSW27
NORM
TX5
PSW28
CUT-OFF FREQ.
PVR21 B10K
PSW22
MOD. FUNCTION
2.2K
RESONANCE
PVR23 B10K
MOD. DEPTH
PVR24 B10K
22K
ATTACK
PVR29 C10K
YAMAHA
P.B
DECAY
PVR30 C10K
0.01
1P 470
D3
4.7K
10
22/16
EG DEPTH
PVR25 B10K
SUSTAIN
PVR31 B10K
100K
LC84200
GCMK-36EY
Tr2
Tr3
Tr8
RELEASE
PVR32 C10K
3.3K
LP/BP/HP
PSW26
Tr7

Pin No.	Pin Name
1	−10
2	−10
3	E
4	+5
5	+5
6	FT1
7	FT2

Pin No.	Pin Name
1	VO2
2	MF
3	VO1
4	CO
5	RE
6	MD
7	ED
8	−15'

Pin No.	Pin Name
1	−15
2	E
3	+15
4	+4
5	FM
6	MF
7	1
8	MD
9	IL
10	I
11	FC

Pin No.	Pin Name
1	HR
2	HL
3	HO
4	E
5	E
6	LO
7	E
8	E
9	O-
10	O+

Pin No.	Pin Name
1	AA
2	AD
3	AS
4	AR
5	X5

View from the printed pattern side of the circuit board

PB Circuit Board & Wiring

C1

Pin No.	Pin Name	Wire Color	Destination
1	−10	BE	DC-−10 (C1-10)
2	−10	BE	PA-−10 (C7-4)
3	E	BL	DC-DE (C1-8)
4	+5	GR	DC-+5 (C1-7)
5	+5	GR	PA-+5 (C7-1)
6	FT1	OR	DM-3 (C5-7)
7	FT2	GY	DM-8 (C5-2)

C2

Pin No.	Pin Name	Wire Color	Destination
1	VO2	OR	PGM-13 (C7-8)
2	MF	BE	PGM-16 (C7-5)
3	VO1	RE	PGM-12 (C7-9)
4	CO	GR	PGM-15 (C7-6)
5	RE	VI	PGM-17 (C7-4)
6	MD	GY	PGM-18 (C7-3)
7	ED	WH	PGM-19 (C7-2)
8	−15′	YE	JK1-−15′ (C1-7)

C3

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	DC-−15 (C1-6)
2	E	BL	DC-AE (C1-4)
3	+15	BR	DC-+15 (C1-2)
4	+4	VI	PA-+4 (C4-6)
5	FM	PK	PGM-20 (C7-1)
6	MF	RE	PGM-22 (C9-3)
7	1	BR	PGM-21 (C9-4)
8	MD	OR	PGM-23 (C9-2)
9	IL	GG	FA-IL (C3-2)
10	I	SRE	FA-O1 (C5-1)
11	FC	OR	JK1-PC (C1-6)

C4

Pin No.	Pin Name	Wire Color	Destination
1	HR	RE	HP-HR
2	HL	OR	HP-HL
3	HO	SBE	JK1-HO (C1-1)
4	E	SBES	
5	E	SVIS	
6	LO	SVI	SK2-LO (C1-1)
7	E	BL	JK1-E (C1-4)
8	E	BL	FA-E (C5-3)
9	O⁻	RE	XLR-3
10	O⁺	WH	XLR-2

C5

Pin No.	Pin Name	Wire Color	Destination
1	AA	WH	PGM-29 (C8-5)
2	AD	PK	PGM-30 (C8-6)
3	AS	BR	PGM-31 (C9-6)
4	AR	RE	PGM-32 (C9-5)
5	X5	BR	FA-T5A (C3-4)

C6

Pin No.	Pin Name	Wire Color	Destination
1	2″	BR	VCO-2″ (C4-6)
2	4″	RE	VCO-4″ (C4-5)
3	8″	OR	VCO-8″ (C4-4)
4	16″	YE	VCO-16″ (C4-3)
5	32″	GR	VCO-32″ (C4-2)
6	64″	BE	VCO-64″ (C4-1)

C7

Pin No.	Pin Name	Wire Color	Destination
1	2′	BR	VCO-2′ (C3-6)
2	4′	RE	VCO-4′ (C3-5)
3	8′	OR	VCO-8′ (C3-4)
4	16′	YE	VCO-16′ (C3-3)
5	32′	GR	VCO-32′ (C3-2)
6	64′	BE	VCO-64′ (C3-1)

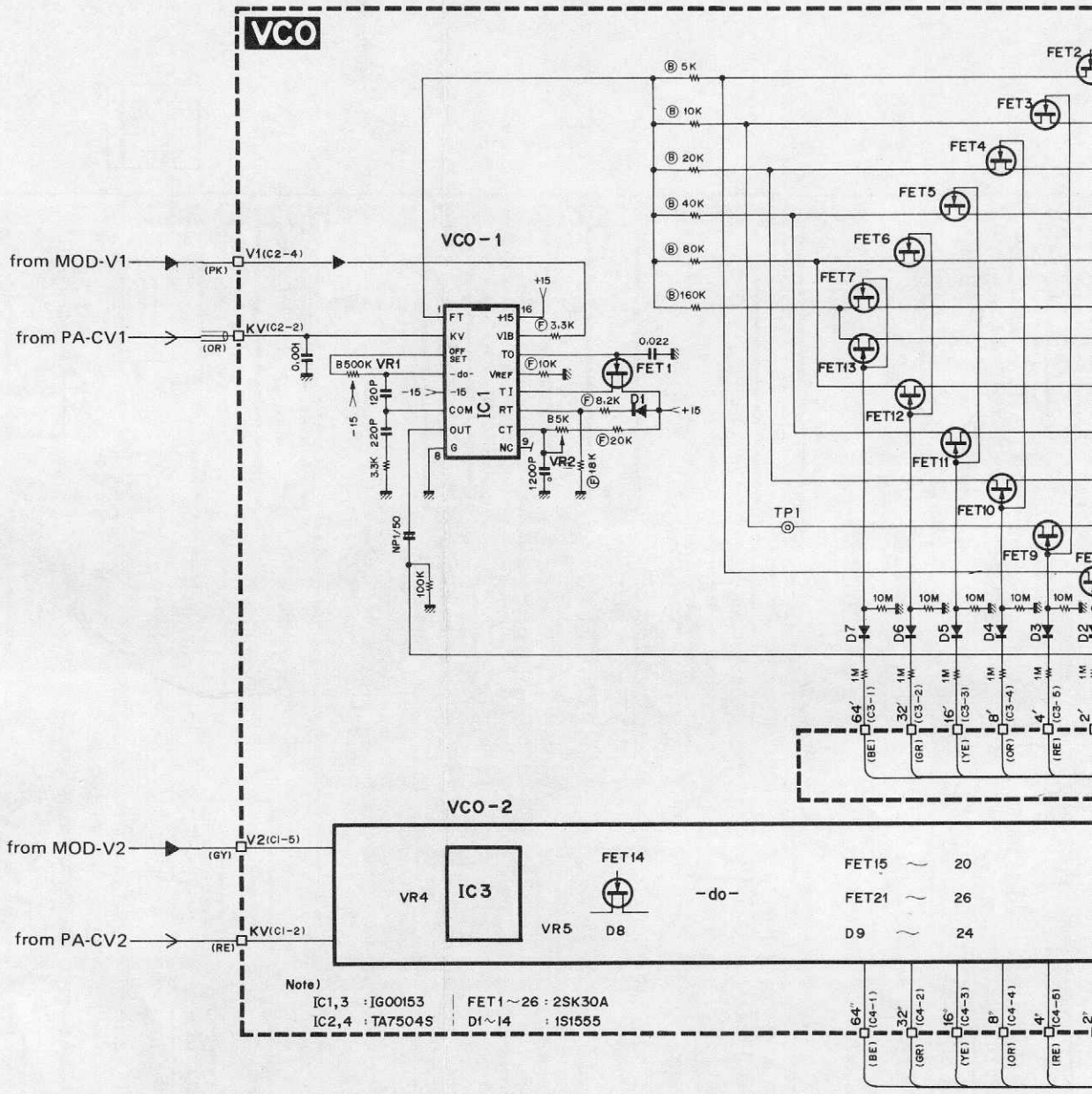
C8

Pin No.	Pin Name	Wire Color	Destination
1	WN	YE	PGM-14 (C7-7)
2	FA	GR	PGM-25 (C8-7)
3	FD	BE	PGM-26 (C8-2)
4	FS	VI	PGM-27 (C8-3)
5	FR	GY	PGM-28 (C8-4)
6	X5	RE	FA-T5F (C3-5)
7	PL	YE	PGM-24 (C9-1)

Note)

1. Circuit Board : LC84201
2. IC
   - IC1, 2 : NJM4558DV
   - IC3, 4, 5 : NJM2901
   - IC6, 7 : TC4030BP
3. Transistor
   - Tr1, 4, 7, 8 : 2SC1815
   - Tr3 : 2SA1015
   - Tr2, 5 : 2SC2120
   - Tr6 : 2SA950
4. Diode
   - D1, 2, 3 : 1S1555

VCO Circuit Diagram

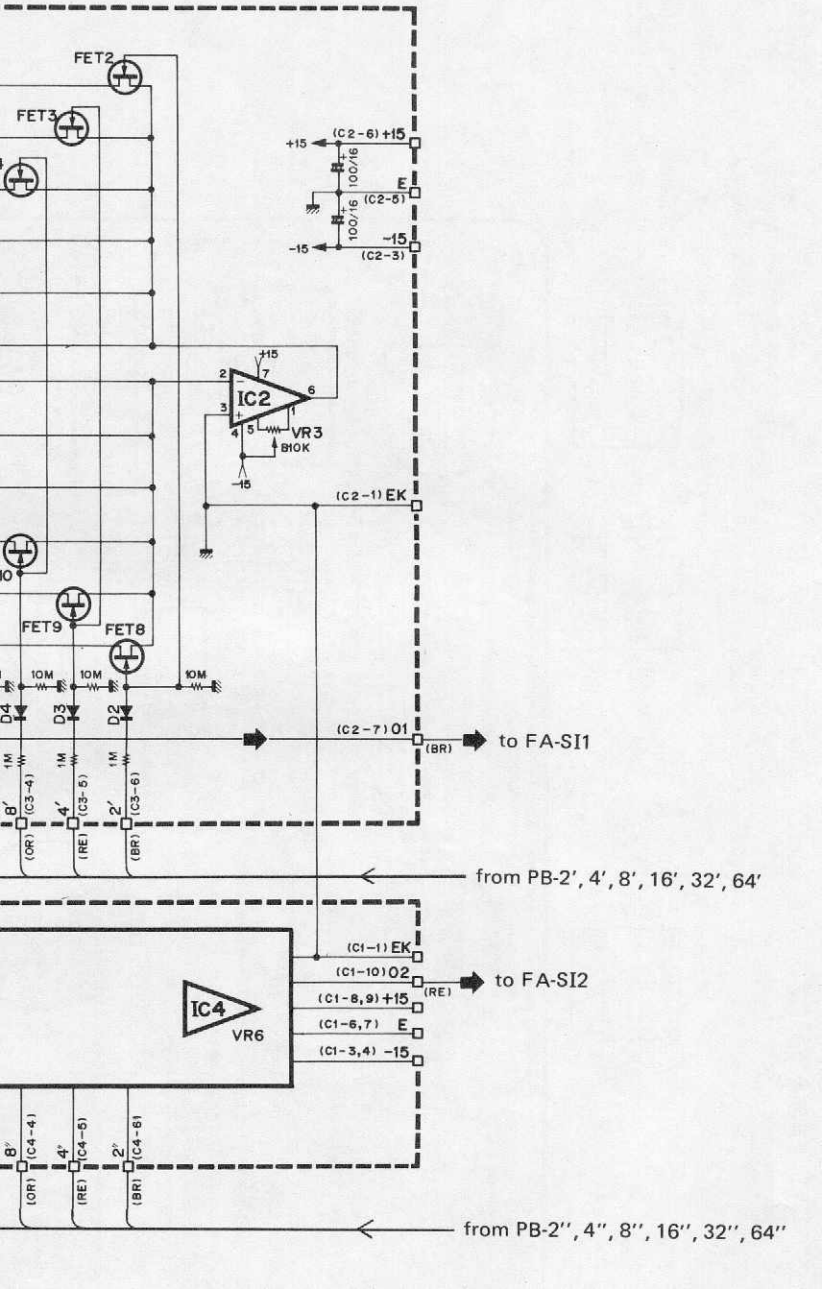


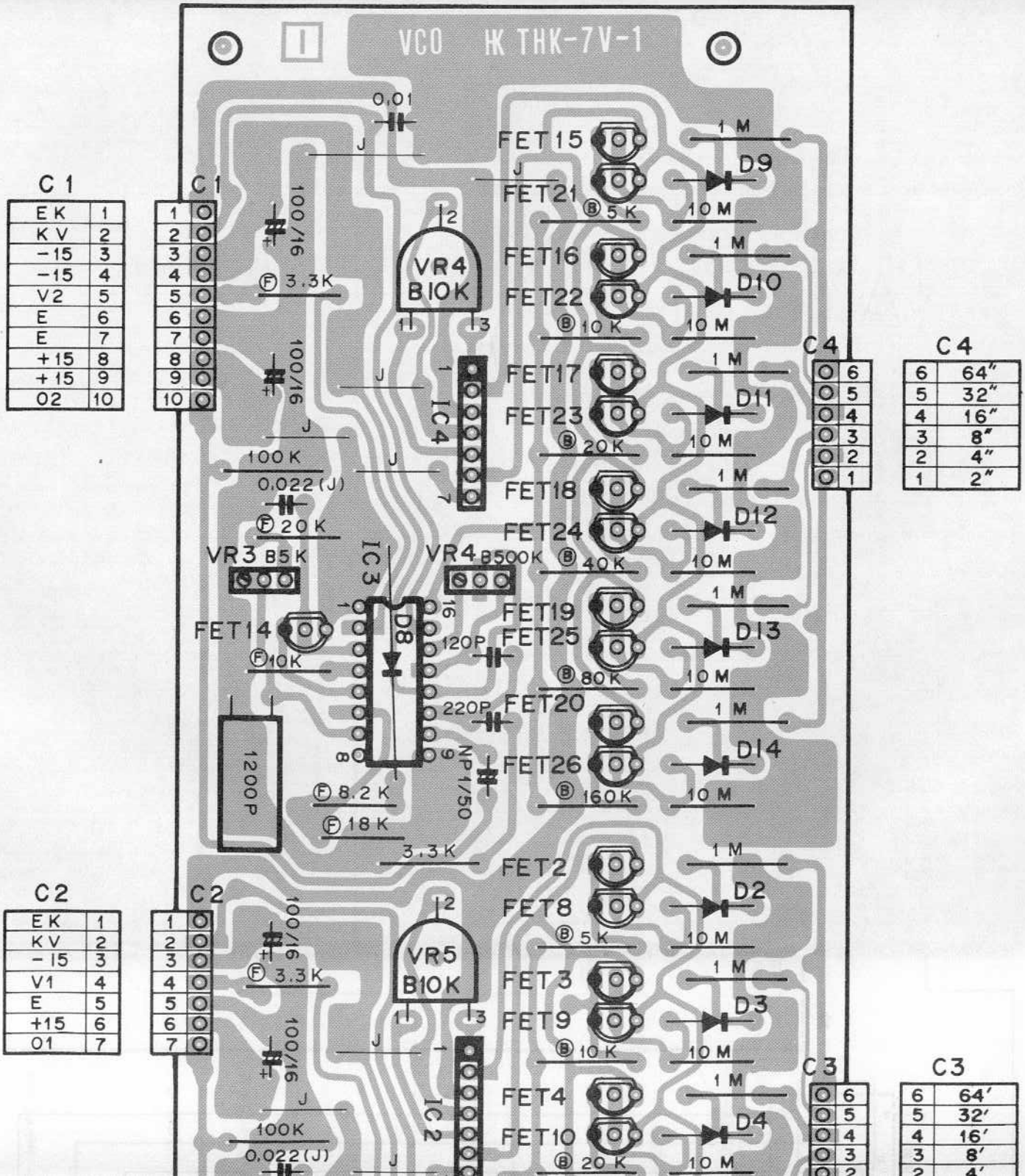
Note)

IC1,3 : IG00153 | FET1~26 : 2SK30A

IC2,4 : TA7504S | D1~14 : 1S1555

Diagram


FET2
FET3
FET9
FET8
+15
(C2-6) +15
100/16
E
(C2-5)
100/16
-15
(C2-3)
IC2
VR3
B10K
(C2-1) EK
10M
10M
10M
D4
D3
D2
1M
1M
1M
(C2-7) O1
(BR)
to FA-SI1
8'
(C3-4)
(OR)
4'
(C3-5)
(RE)
2'
(C3-6)
(BR)
from PB-2', 4', 8', 16', 32', 64'
IC4
VR6
(C1-1) EK
(C1-10) O2
(RE)
to FA-SI2
(C1-8,9) +15
(C1-6,7) E
(C1-3,4) -15
8''
(C4-4)
(OR)
4''
(C4-5)
(RE)
2''
(C4-6)
(BR)
from PB-2'', 4'', 8'', 16'', 32'', 64''


VCO HK THK-7V-1
C1
EK 1
KV 2
-15 3
-15 4
V2 5
E 6
E 7
+15 8
+15 9
02 10
C2
EK 1
KV 2
-15 3
V1 4
E 5
+15 6
01 7
C4
6 64"
5 32"
4 16"
3 8"
2 4"
1 2"
C3
6 64'
5 32'
4 16'
3 8'
2 4'
1 2'
0,01
100/16
3.3K
VR4 B10K
IC4
100K
0,022(J)
20K
VR3 B5K
VR4 B500K
IC3
D8
FET14
10K
120P
220P
1200P
NP1/50
8.2K
18K
3.3K
VR5 B10K
IC2
FET15
FET21
5K
FET16
FET22
10K
FET17
FET23
20K
FET18
FET24
40K
FET19
FET25
80K
FET20
FET26
160K
FET2
FET8
5K
FET3
FET9
10K
FET4
FET10
20K
1M
10M
D9
D10
D11
D12
D13
D14
D2
D3
D4

C1

Pin No.	Pin Name	Wire Color	Destination
1	EK	BL	PA-EK (C2-8)
2	KV	RE	PA-CV2 (C4-3)
3	−15	YE	DC- −15 (C3-6)
4	−15	YE	VCO- −15 (C2-3)
5	V2	GY	MOD-V2 (C4-5)
6	E	BL	DC-AE (C3-4)
7	E	BL	VCO-E (C2-5)
8	+15	BR	DC-+15 (C3-2)
9	+15	BR	VCO-+15 (C2-6)
10	O2	RE	FA-SI2 (C1-3)

C2

Pin No.	Pin Name	Wire Color	Destination
1	EK	SORS	
2	KV	SOR	PA-CV1 (C2-3)
3	−15	YE	VCO- −15 (C1-4)
4	V1	PK	MOD-V1 (C4-8)
5	E	BL	VCO-E (C1-7)
6	+15	BR	VCO-+15 (C1-9)
7	O1	BR	FA-SI1 (C1-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	64'	BE	PB-64' (C7-6)
2	32'	GR	PB-32' (C7-5)
3	16'	YE	PB-16' (C7-4)
4	8'	OR	PB-8' (C7-3)
5	4'	RE	PB-4' (C7-2)
6	2'	BR	PB-2' (C7-1)

C4

Pin No.	Pin Name	Wire Color	Destination
1	64''	BE	PB-64'' (C6-6)
2	32''	GR	PB-32'' (C6-5)
3	16''	YE	PB-16'' (C6-4)
4	8''	OR	PB-8'' (C6-3)
5	4''	RE	PB-4'' (C6-2)
6	2''	BR	PB-2'' (C6-1)

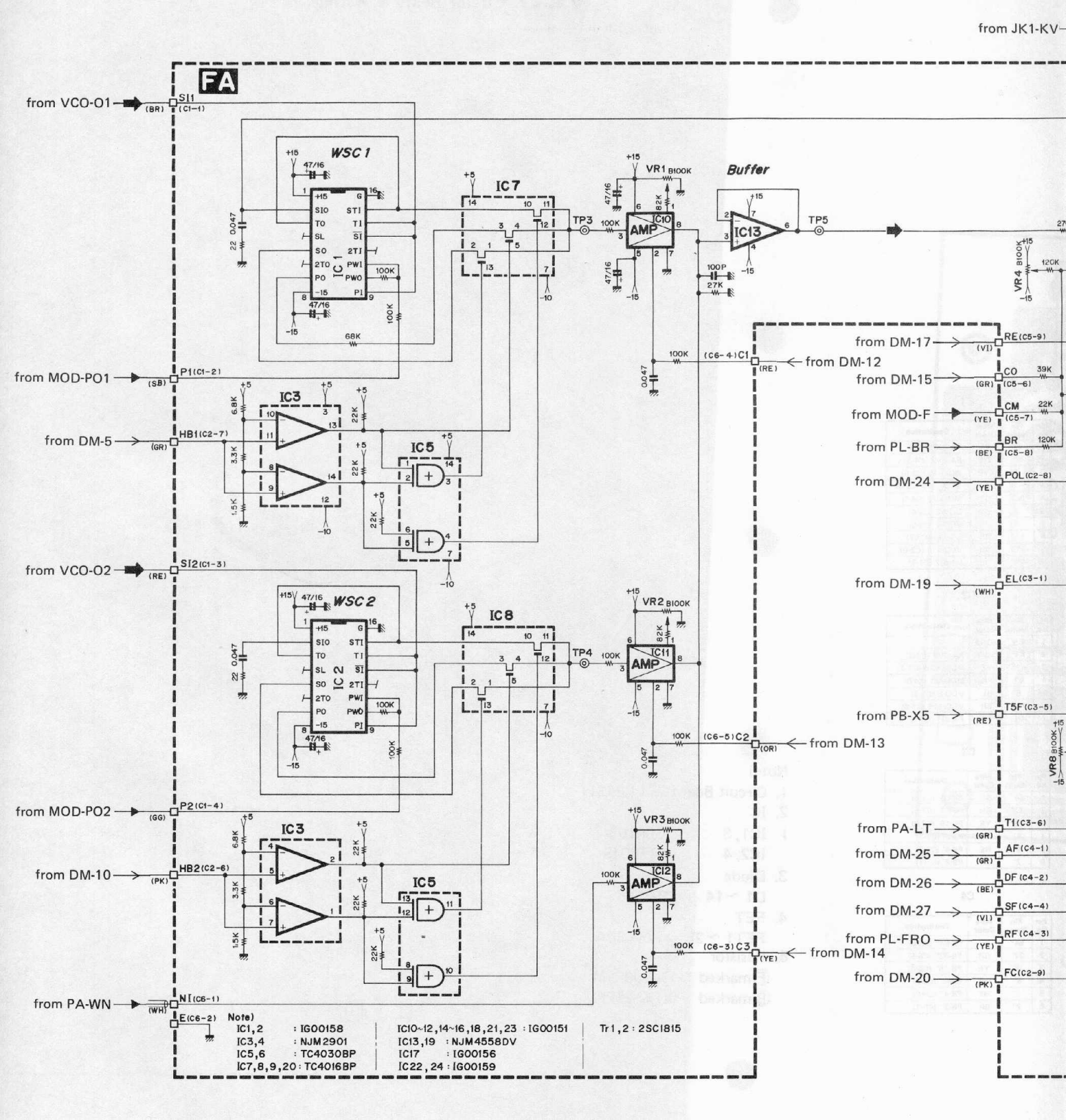
VCO Circuit Board & Wiring

Note)

1. Circuit Board : LC84211
2. IC

I IC1, 3 : iG00153
IC2, 4 : TA7504S

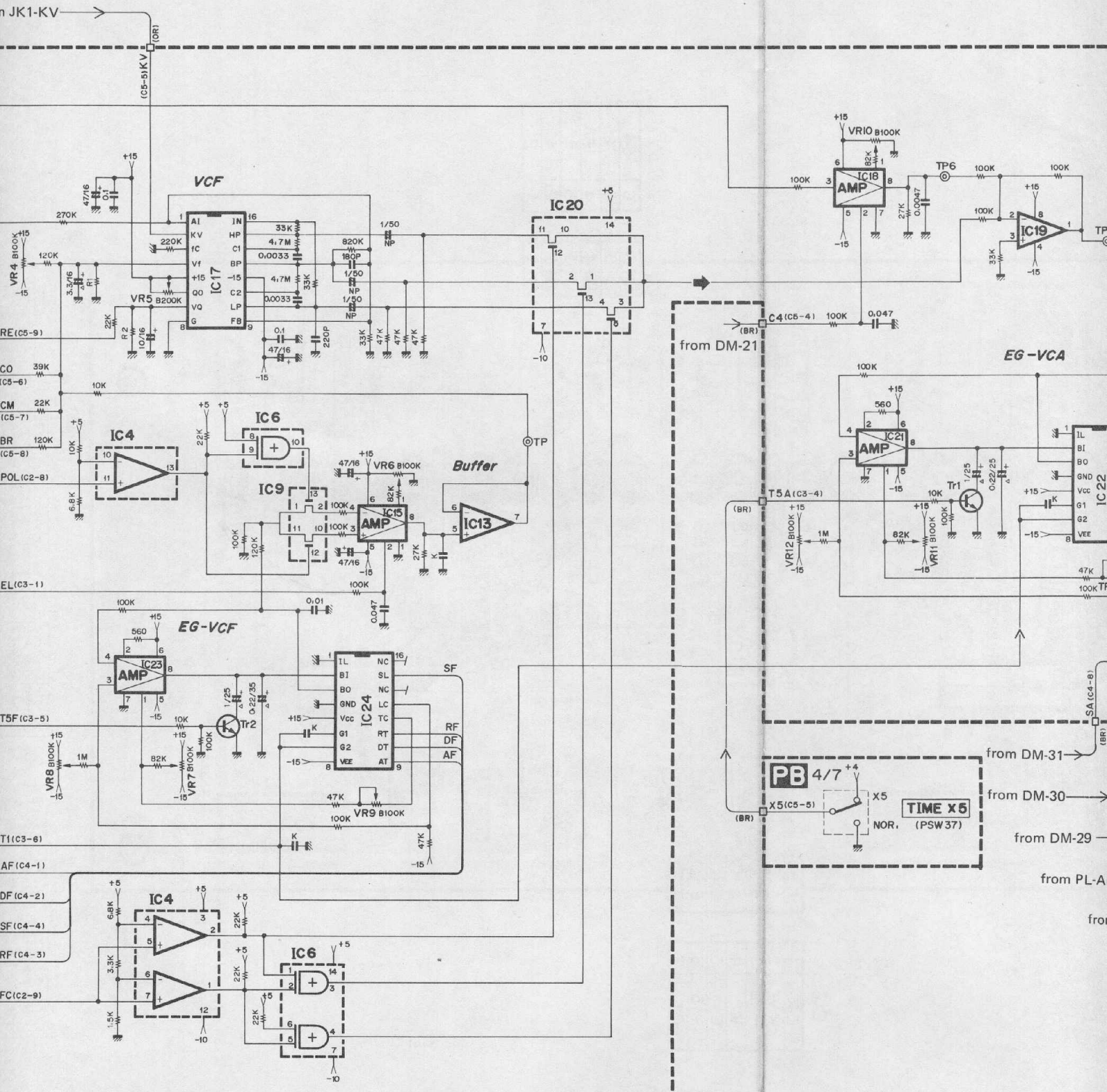
3. Diode
   D1 ~14 : 1S1555
4. FET
   FET1 ~26 : 2SK30A-
5. Resistor
   Ⓕmarked : 1% 100PPM
   Ⓑmarked : 0.1% 25PPM



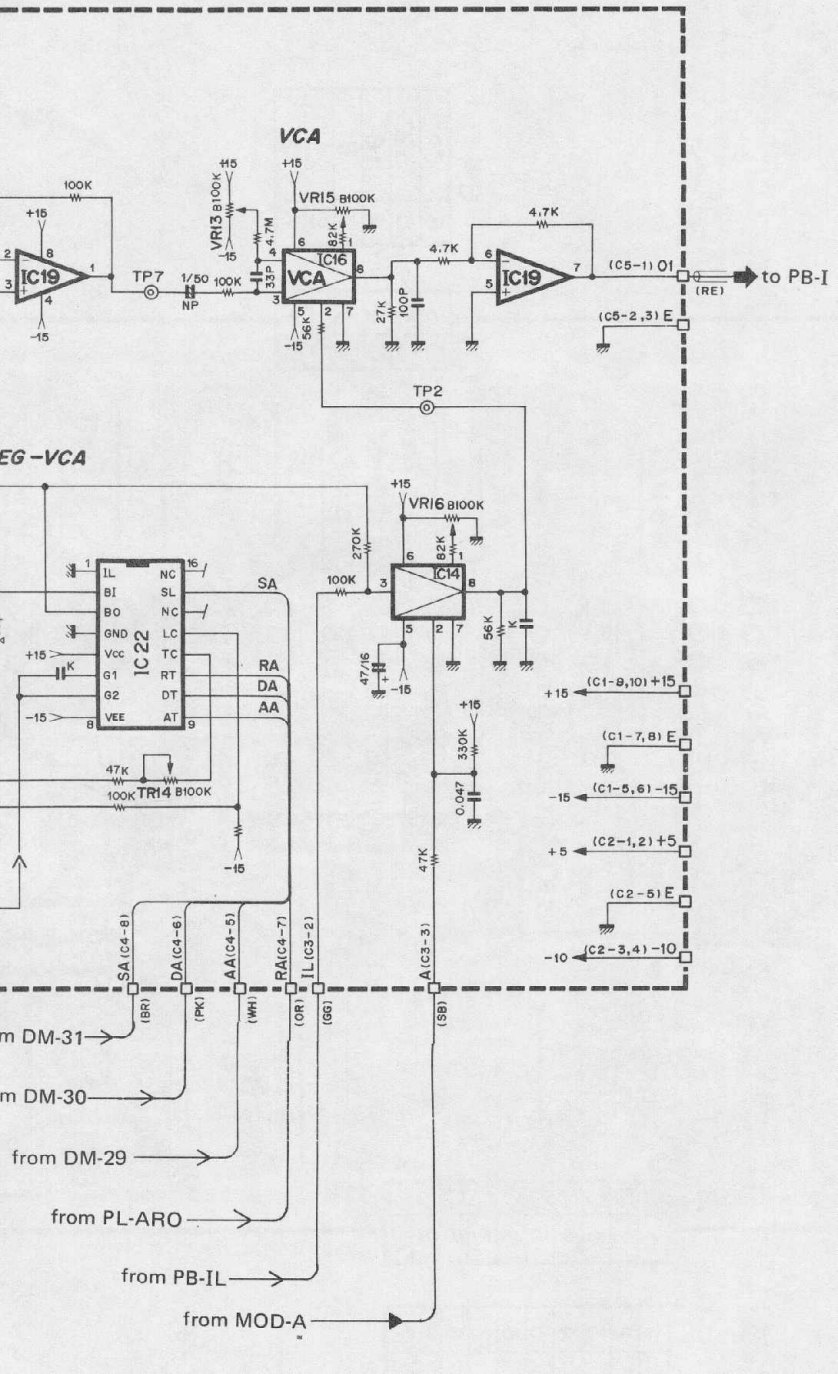
Note)

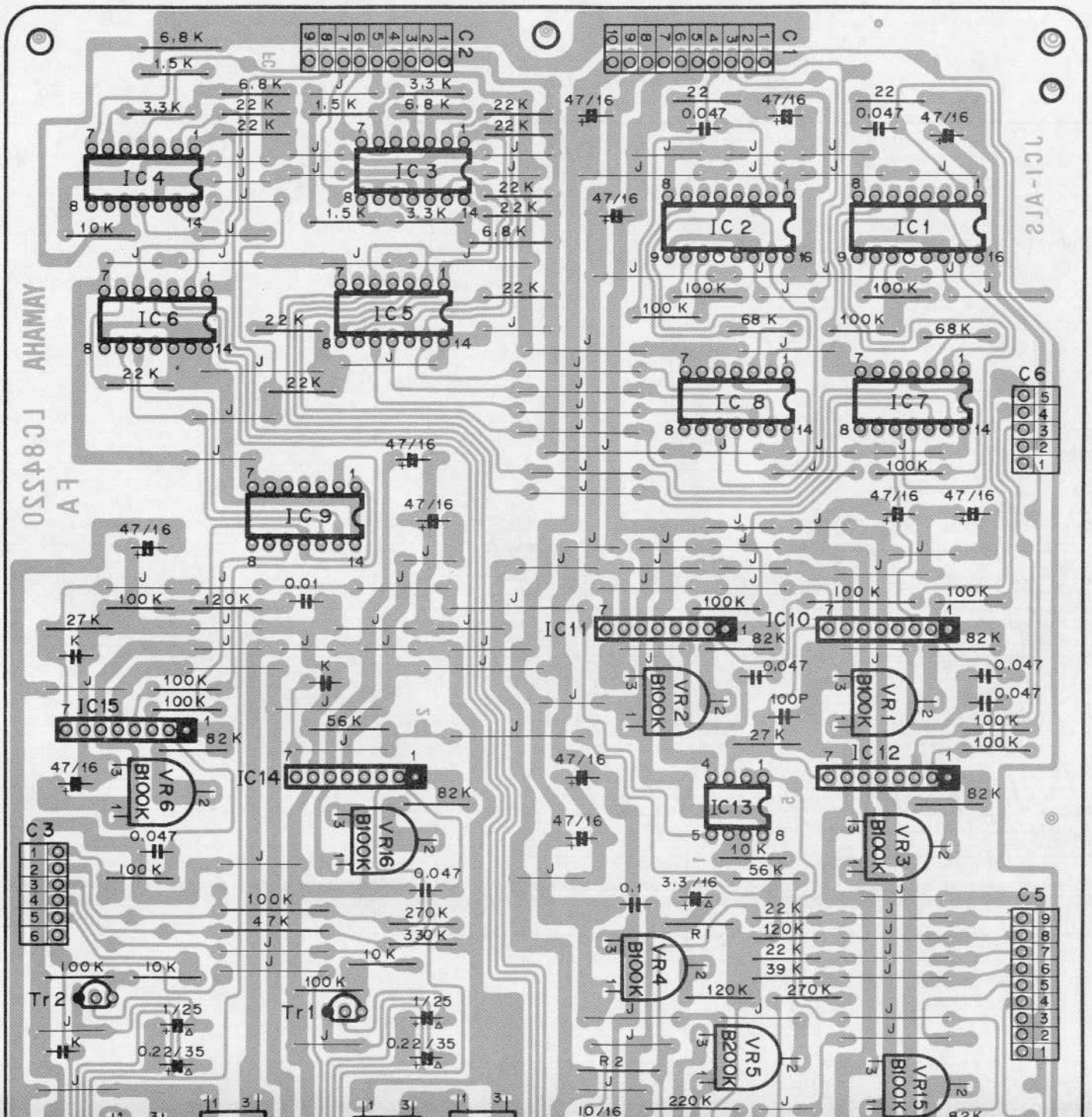
IC1,2	: IG00158	IC10~12,14~16,18,21,23	: IG00151
IC3,4	: NJM2901	IC13,19	: NJM4558DV
IC5,6	: TC4030BP	IC17	: IG00156
IC7,8,9,20	: TC4016BP	IC22,24	: IG00159

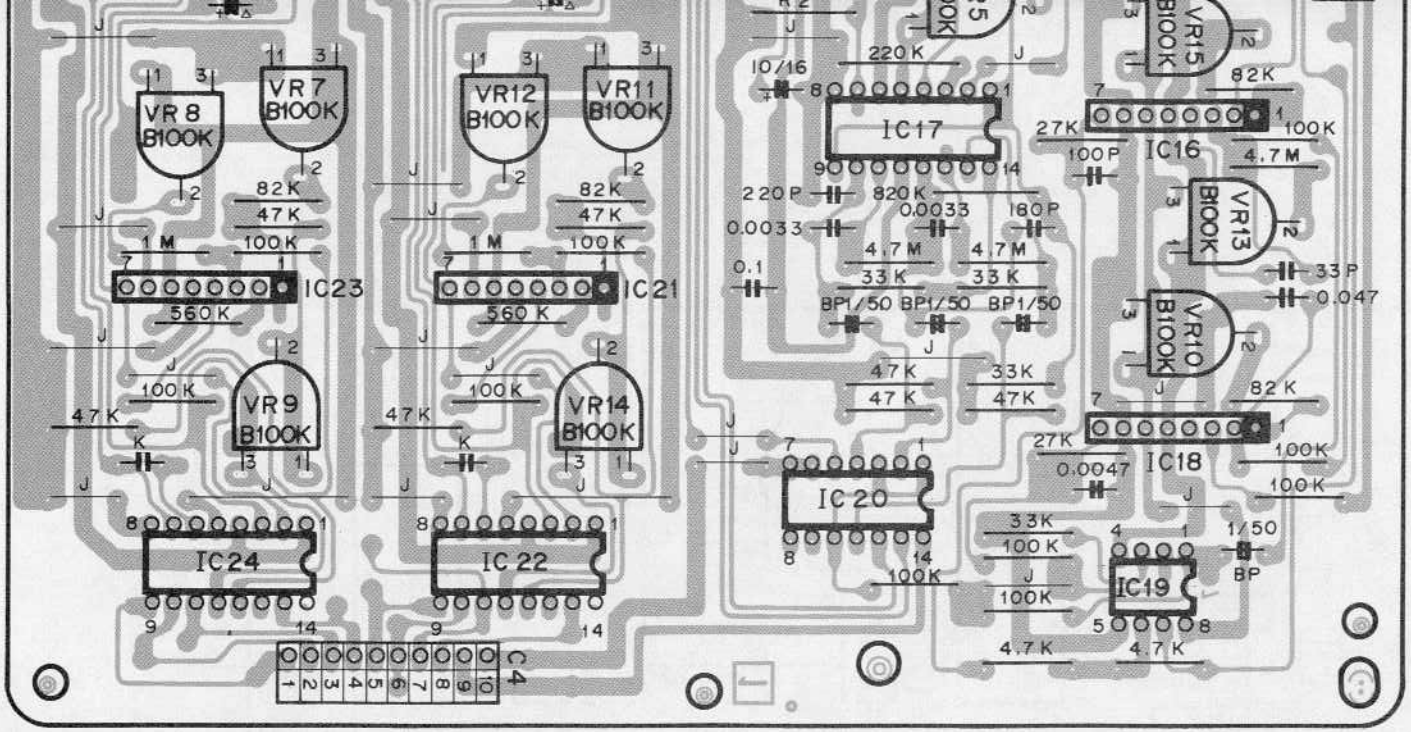
Tr1,2 : 2SC1815


n JK1-KV
(C5-5)KV
(OR)
VCF
IC17
IC20
IC18
AMP
IC19
VR10 B100K
TP6
VR4 B100K
VR5 B200K
RE(C5-9)
CO (C5-6)
CM (C5-7)
BR (C5-8)
POL(C2-8)
EL(C3-1)
T5F(C3-5)
T1(C3-6)
AF(C4-1)
DF(C4-2)
SF(C4-4)
RF(C4-3)
FC(C2-9)
IC4
IC6
IC9
IC15
IC13
Buffer
TP
VR6 B100K
EG-VCF
IC23
IC24
Tr2
VR7 B100K
VR8 B100K
VR9 B100K
SF
RF
DF
AF
from DM-21
C4(C5-4)
EG-VCA
IC21
Tr1
VR11 B100K
VR12 B100K
T5A(C3-4)
PB 4/7
X5(C5-5)
X5
NOR.
TIME X5
(PSW37)
from DM-31
from DM-30
from DM-29
from PL-A
fro

FA Circuit Diagram




C2
+5 1
+5 2
-10 3
-10 4
E 5
HB2 6
HB1 7
POL 8
FC 9
C1
S11 1
P1 2
S12 3
P2 4
-15 5
-15 6
E 7
E 8
+15 9
+15 10
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC14
IC15
VR1 B100K
VR2 B100K
VR3 B100K
VR4 B100K
VR5 B200K
VR6 B100K
VR15 B100K
VR16 B100K
Tr1
Tr2
C6
5 C2
4 C1
3 C3
2 E
1 NI
C5
9 RE
8 BR
7 CM
6 CO
5 KV
4 C4
3 E
2 E
1 01
C3
EL 1
IL 2
A 3
T5A 4
T5F 5
T1 6
AHAMAY
LC8422O
FA


VR 8 B100K
VR7 B100K
VR12 B100K
VR11 B100K
VR15 B100K
VR13 B100K
VR10 B100K
VR9 B100K
VR14 B100K
IC23
IC21
IC17
IC16
IC18
IC20
IC24
IC22
IC19
82K
47K
1M
100K
560K
220K
10/16
27K
100P
4.7M
220P
820K
0.0033
180P
0.1
33K
BP1/50
33P
0.047
47K
0.0047
1/50
BP
4.7K
C4
AF
DF
RF
SF
AA
DA
RA
SA
+5
-10

FA Circuit Board & Wiring

C1

Pin No.	Pin Name	Wire Color	Destination
1	SI1	BR	VCO-O1 (C2-7)
2	P1	SB	MOD-PO1 (C4-7)
3	SI2	RE	VCO-O2 (C1-10)
4	P2	GG	MOD-PO2 (C4-4)
5	−15	YE	DC- −15 (C2-6)
6	−15	YE	MOD- −15 (C3-9)
7	E	BL	DC-DE (C3-9)
8	E	BL	MOD-E (C3-8)
9	+15	BR	DC-+15 (C2-2)
10	+15	BR	MOD-+15 (C3-10)

C2

Pin No.	Pin Name	Wire Color	Destination
1	+5	GR	MOD-+5 (C1-8)
2	+5	GR	FA-+5 (C4-9)
3	−10	BE	MOD- −10 (C1-6)
4	−10	BE	FA- −10 (C4-10)
5	E	–	–
6	HB2	PK	DM-10 (C4-9)
7	HB1	GR	DM-5 (C5-5)
8	POL	YE	DM-24 (C3-5)
9	FC	PK	DM-20 (C3-9)

C3

Pin No.	Pin Name	Wire Color	Destination
1	EL	WH	DM-19 (C3-10)
2	IL	GG	PB-IL (C3-9)
3	A	SB	MOD-A (C4-1)
4	T5A	BR	PB-X5 (C5-5)
5	T5F	RE	PB-X5 (C8-6)
6	T1	GR	PA-LT (C7-3)

C4

Pin No.	Pin Name	Wire Color	Destination
1	AF	GR	DM-25 (C3-4)
2	DF	BE	DM-26 (C3-3)
3	RF	YE	PL-FRO (C1-8)
4	SF	VI	DM-27 (C3-2)
5	AA	WH	DM-29 (C2-7)
6	DA	PK	DM-30 (C2-6)
7	RA	OR	PL-ARO (C1-9)
8	SA	BR	DM-31 (C2-5)
9	+5	GR	FA-+5 (C2-2)
10	−10	BE	FA- −10 (C2-4)

C5

Pin No.	Pin Name	Wire Color	Destination
1	O1	SRE	PB-I (C3-10)
2	E	SRES	
3	E	BL	PB-E (C4-8)
4	C4	BR	DM-21 (C3-8)
5	KV	OR	JK1-KV (C2-2)
6	CO	GR	DM-15 (C4-4)
7	CM	YE	MOD-F (C4-2)
8	BR	BE	PL-BR (C2-5)
9	RE	VI	DM-17 (C4-2)

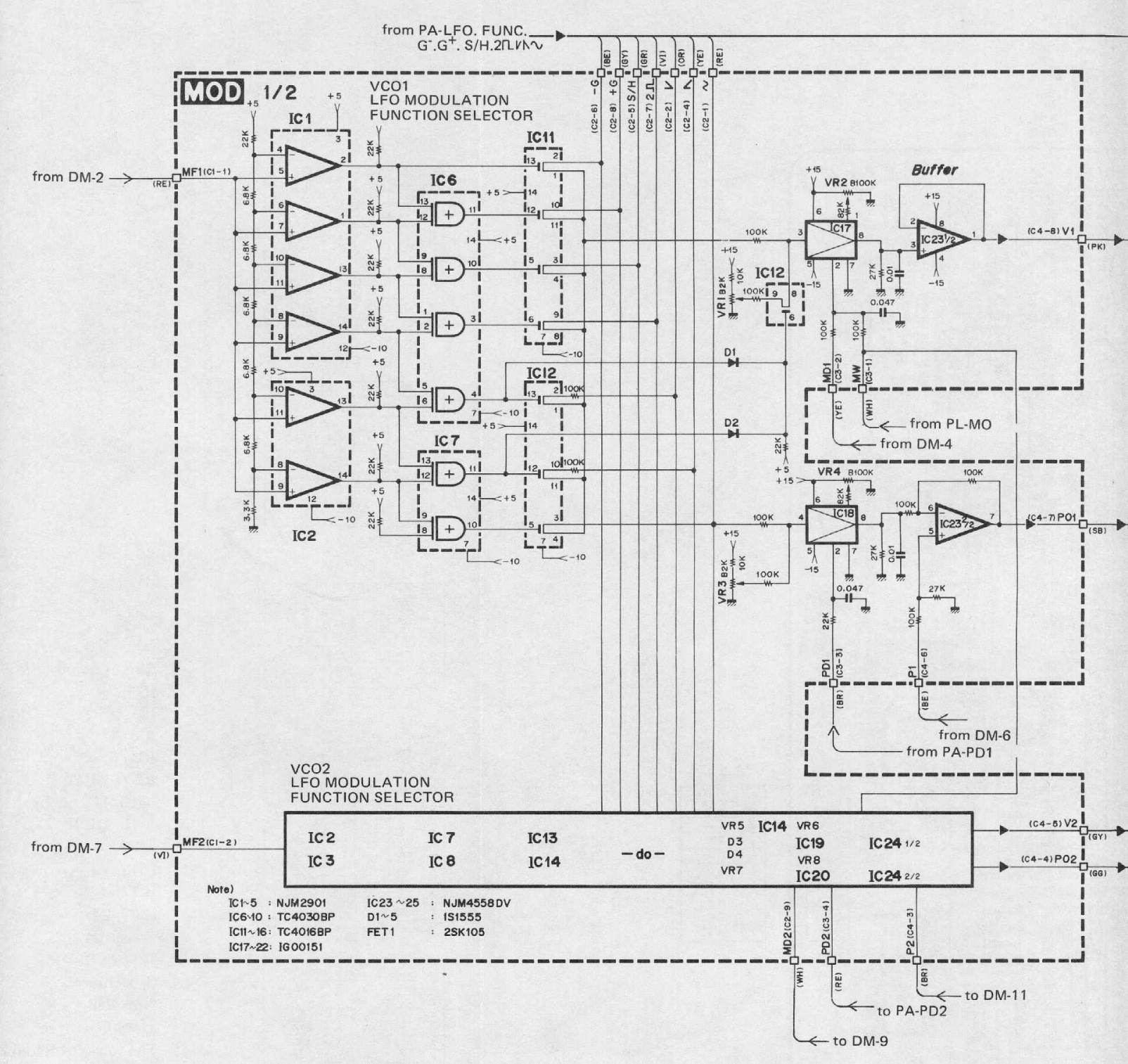
C6

Pin No.	Pin Name	Wire Color	Destination
1	NI	SWH	PA-WN (C1-3)
2	E	SWHS	
3	C3	YE	DM-14 (C4-5)
4	C1	RE	DM-12 (C4-7)
5	C2	OR	DM-13 (C4-6)

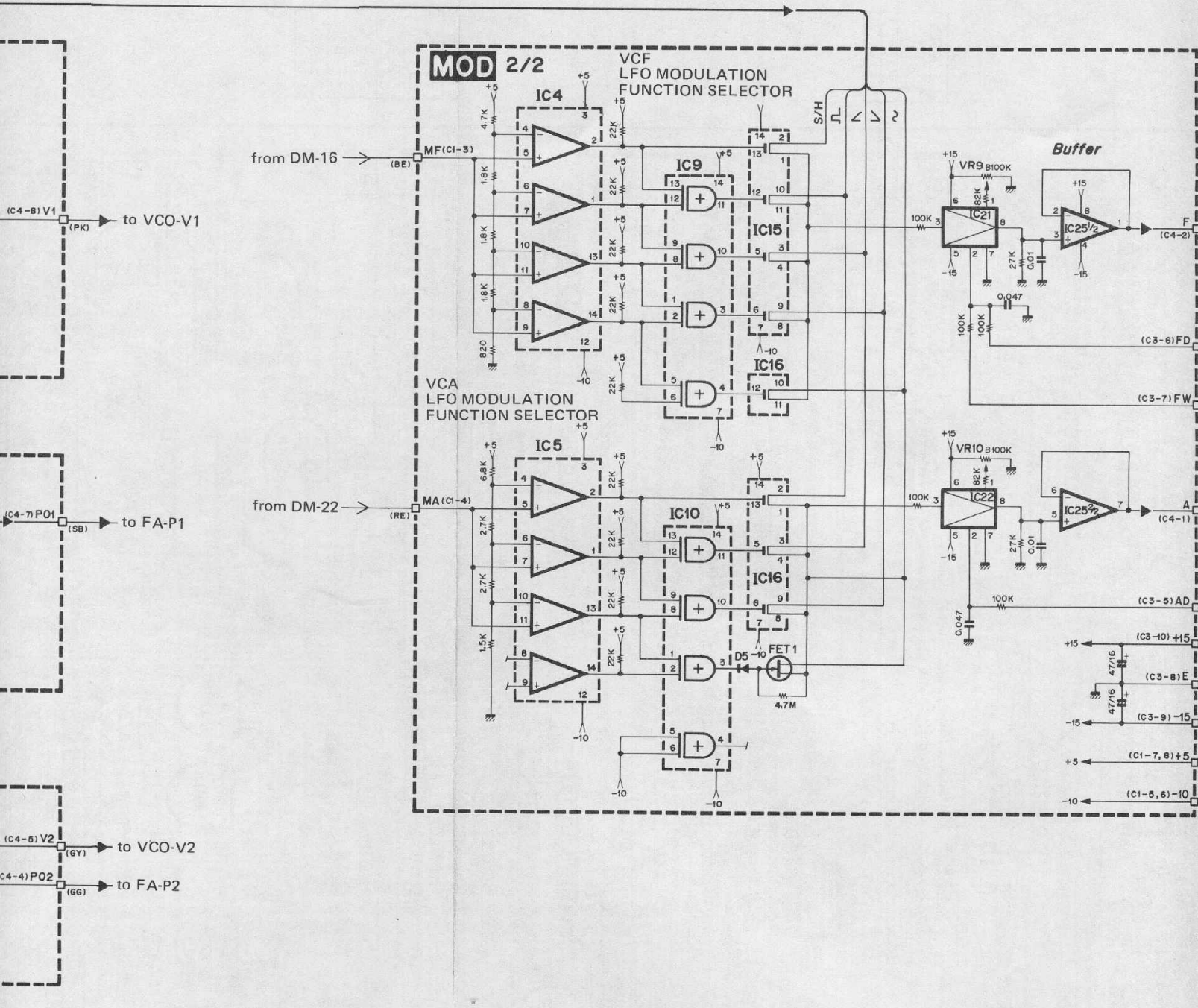
Note)

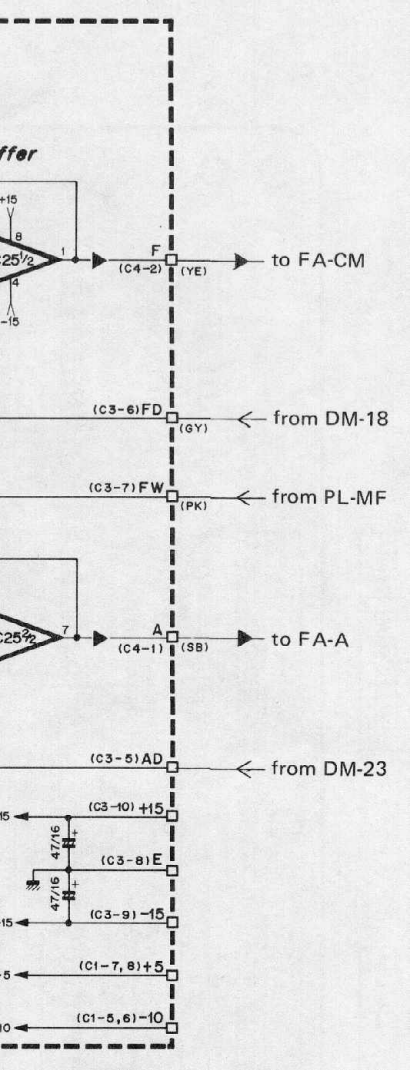
1. Circuit Board : LC84221
2. IC
   - IC1, 2 : iG00158
   - IC3, 4 : NJM2901
   - IC5, 6 : TC4030BP
   - IC7, 8, 9, 20 : TC4016BP
   - IC10, 11, 12, 14, 15, 16, 18, 21, 23 : iG00151
   - IC13, 19 : NJM4558DV
   - IC17 : iG00156
   - IC22, 24 : iG00159
3. Transistor
   - Tr1, 2 : 2SC1815
4. Capacitor
   - △ marked : Tantalum Capacitor
   - K marked : Ceramic Capacitor 1000P
5. The valves of R1 and R2 depend on the rank of IC17 (iG00156) as follows.

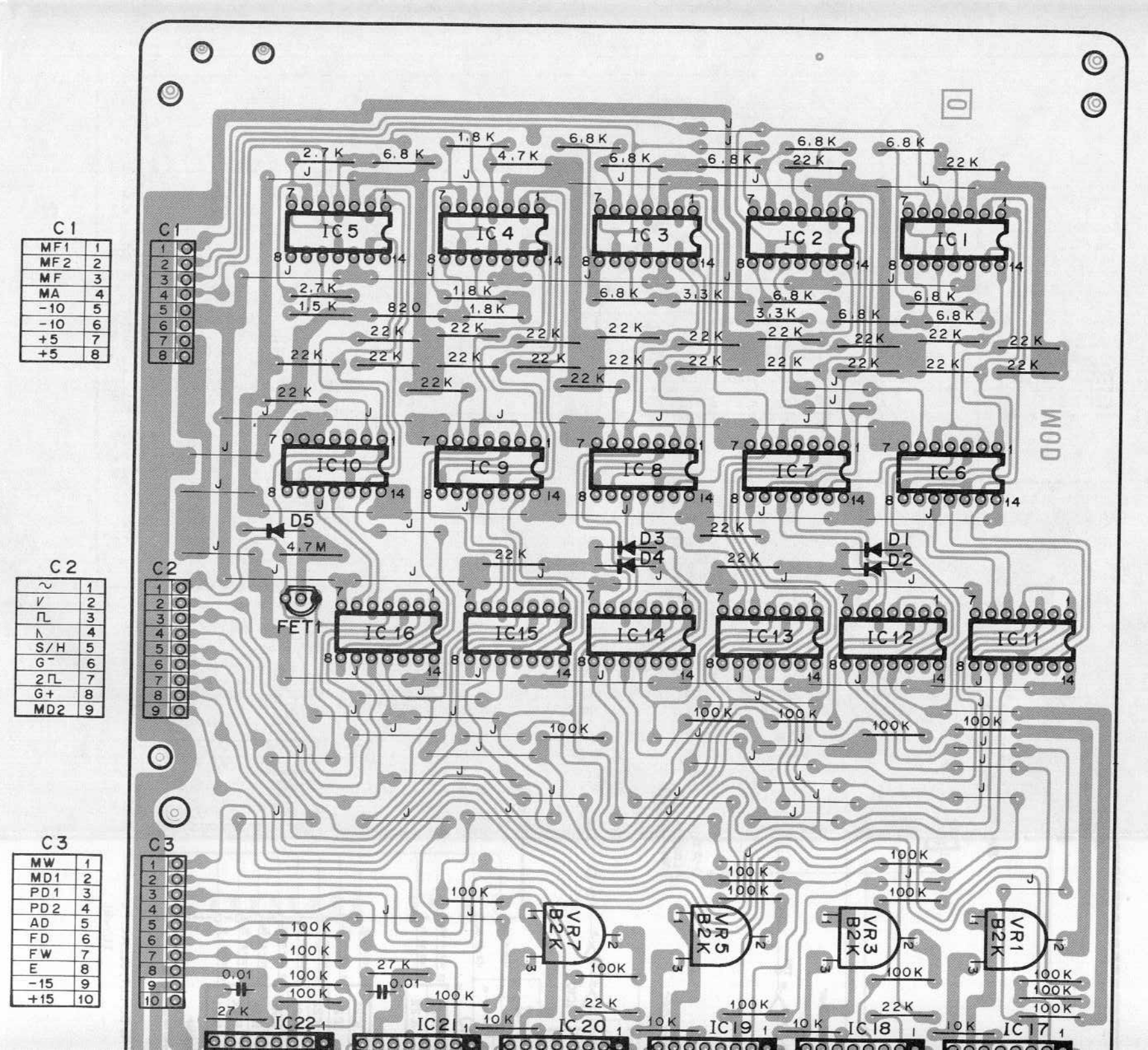
Rank	R1	R2
A	2.2K	470
B	2 K	430
C	1.8K	390

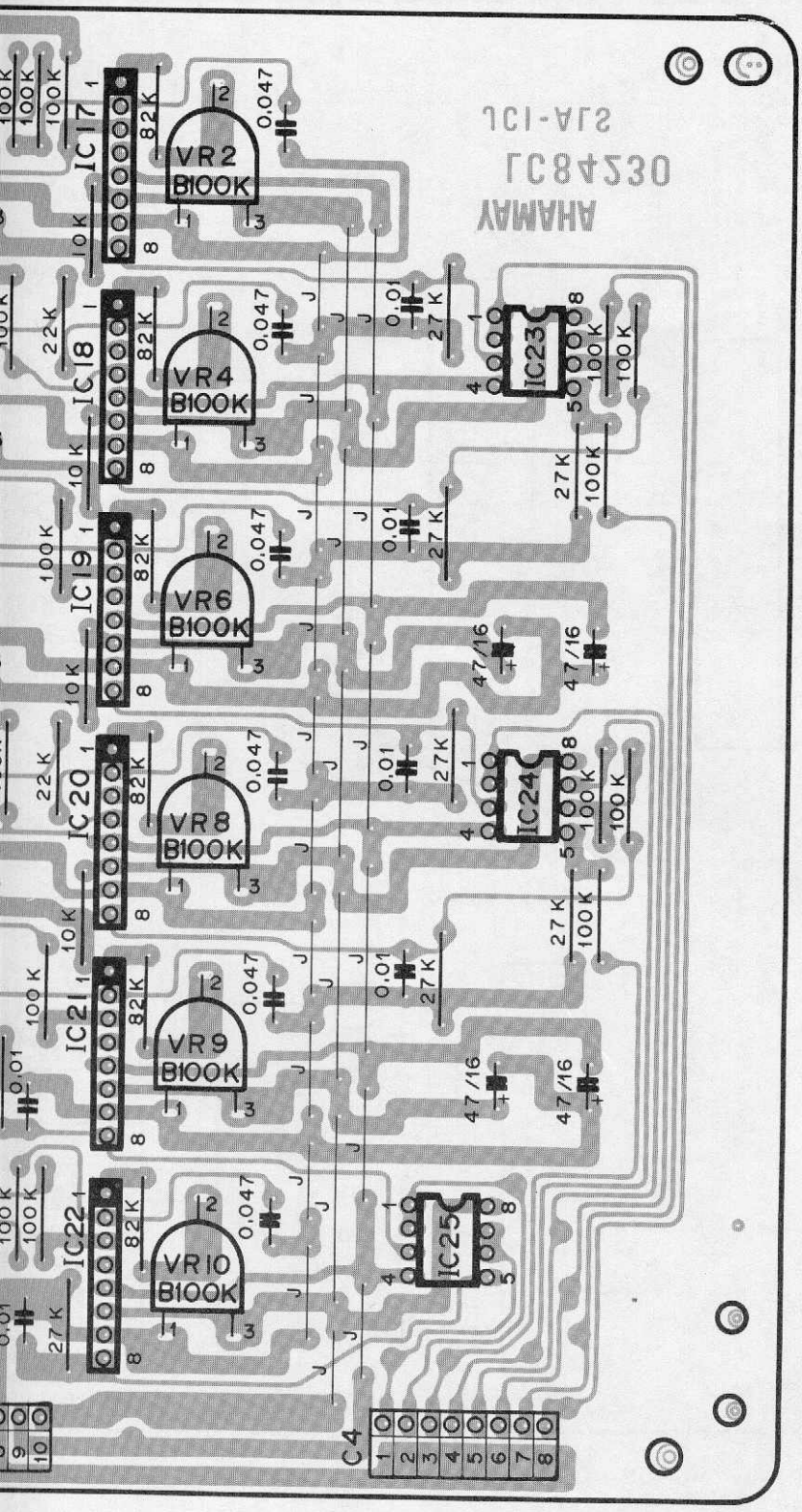

from PA-LFO. FUNC.
G⁻.G⁺. S/H.2ΠLV/\~
MOD 1/2
VCO1
LFO MODULATION
FUNCTION SELECTOR
IC1
IC2
IC6
IC7
IC11
IC12
from DM-2
MF1(C1-1)
(RE)
D1
D2
VR1 B2K
VR2 B100K
VR3 B2K
VR4 B100K
IC12
IC17
IC18
IC23 1/2
IC23 2/2
Buffer
(C4-8) V1
(PK)
(C4-7) P01
(SB)
MD1 (C3-2)
MW (C3-1)
(YE)
(WH)
from PL-MO
from DM-4
PD1 (C3-3)
P1 (C4-6)
(BR)
(BE)
from DM-6
from PA-PD1
VCO2
LFO MODULATION
FUNCTION SELECTOR
from DM-7
MF2(C1-2)
(VI)
IC2 IC7 IC13
IC3 IC8 IC14
— do —
VR5 IC14 VR6
D3 IC19 IC24 1/2
D4 VR8
VR7 IC20 IC24 2/2
(C4-5) V2
(GY)
(C4-4) P02
(GG)
Note)
IC1~5 : NJM2901
IC6~10 : TC4030BP
IC11~16: TC4016BP
IC17~22: IG00151
IC23~25 : NJM4558DV
D1~5 : 1S1555
FET1 : 2SK105
MD2(C2-9)
PD2(C3-4)
P2(C4-3)
(WH)
(RE)
(BR)
to DM-11
to PA-PD2
to DM-9

MOD Circuit Diagram




ffer
+15
8
25½
1
4
-15
F
(C4-2)
(YE)
to FA-CM
(C3-6)FD
(GY)
from DM-18
(C3-7)FW
(PK)
from PL-MF
25½
7
A
(C4-1)
(SB)
to FA-A
(C3-5)AD
from DM-23
15
(C3-10) +15
47/16
(C3-8)E
47/16
15
(C3-9) -15
-5
(C1-7, 8)+5
10
(C1-5, 6)-10


C1
MF1 1
MF2 2
MF 3
MA 4
-10 5
-10 6
+5 7
+5 8
C2
~ 1
V 2
⊓ 3
⋀ 4
S/H 5
G⁻ 6
2⊓ 7
G+ 8
MD2 9
C3
MW 1
MD1 2
PD1 3
PD2 4
AD 5
FD 6
FW 7
E 8
-15 9
+15 10
IC5
IC4
IC3
IC2
IC1
IC10
IC9
IC8
IC7
IC6
IC16
IC15
IC14
IC13
IC12
IC11
IC22
IC21
IC20
IC19
IC18
IC17
FET1
D5
D3
D4
D1
D2
VR7 B2K
VR5 B2K
VR3 B2K
VR1 B2K
MOD



View from the printed pattern side of the circuit board

C1

Pin No.	Pin Name	Wire Color	Destination
1	MF1	RE	DM-2 (C5-8)
2	MF2	VI	DM-7 (C5-3)
3	MF	BE	DM-16 (C4-3)
4	MA	RE	DM-22 (C3-7)
5	−10	BE	DC-10 (C3-10)
6	−10	BE	FA-−10 (C2-3)
7	+5	GR	DC-+5 (C3-7)
8	+5	GR	FA-+5 (C2-1)

C2

Pin No.	Pin Name	Wire Color	Destination
1	∿	RE	PA-∿(C6-2)
2	⋁	OR	PA-⋁ (C6-4)
3	⊓	WH	PA-⊓ (C1-5)
4	⋀	YE	PA-⋀ (C6-3)
5	S/H	GR	PA-S/H (C1-4)
6	G⁻	BE	PA-G⁻ (C1-2)
7	2⊓	VI	PA-2⊓ (C1-6)
8	G⁺	GY	PA-G⁺ (C1-1)
9	MD2	WH	DM-9 (C5-1)

C3

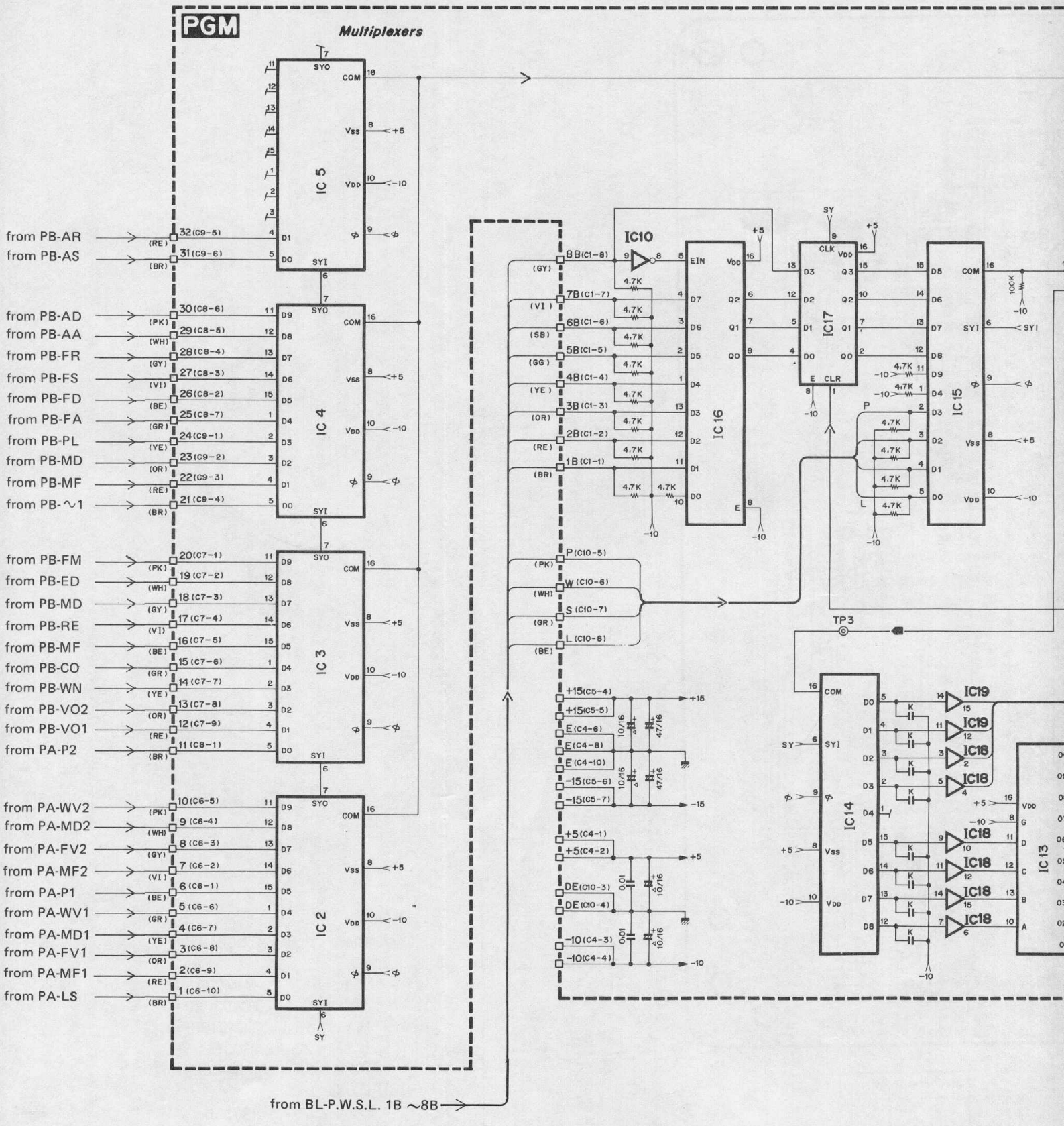
Pin No.	Pin Name	Wire Color	Destination
1	MW	WH	PL-MO (C2-7)
2	MD1	YE	DM-4 (C5-6)
3	PD1	BR	PA-PD1 (C3-4)
4	PD2	RE	PA-PD2 (C5-3)
5	AD	OR	DM-23 (C3-6)
6	FD	GY	DM-18 (C4-1)
7	FW	PK	PL-MF (C2-8)
8	E	BL	FA-E (C1-8)
9	−15	YE	FA-−15 (C1-6)
10	+15	BR	FA-+15 (C1-10)

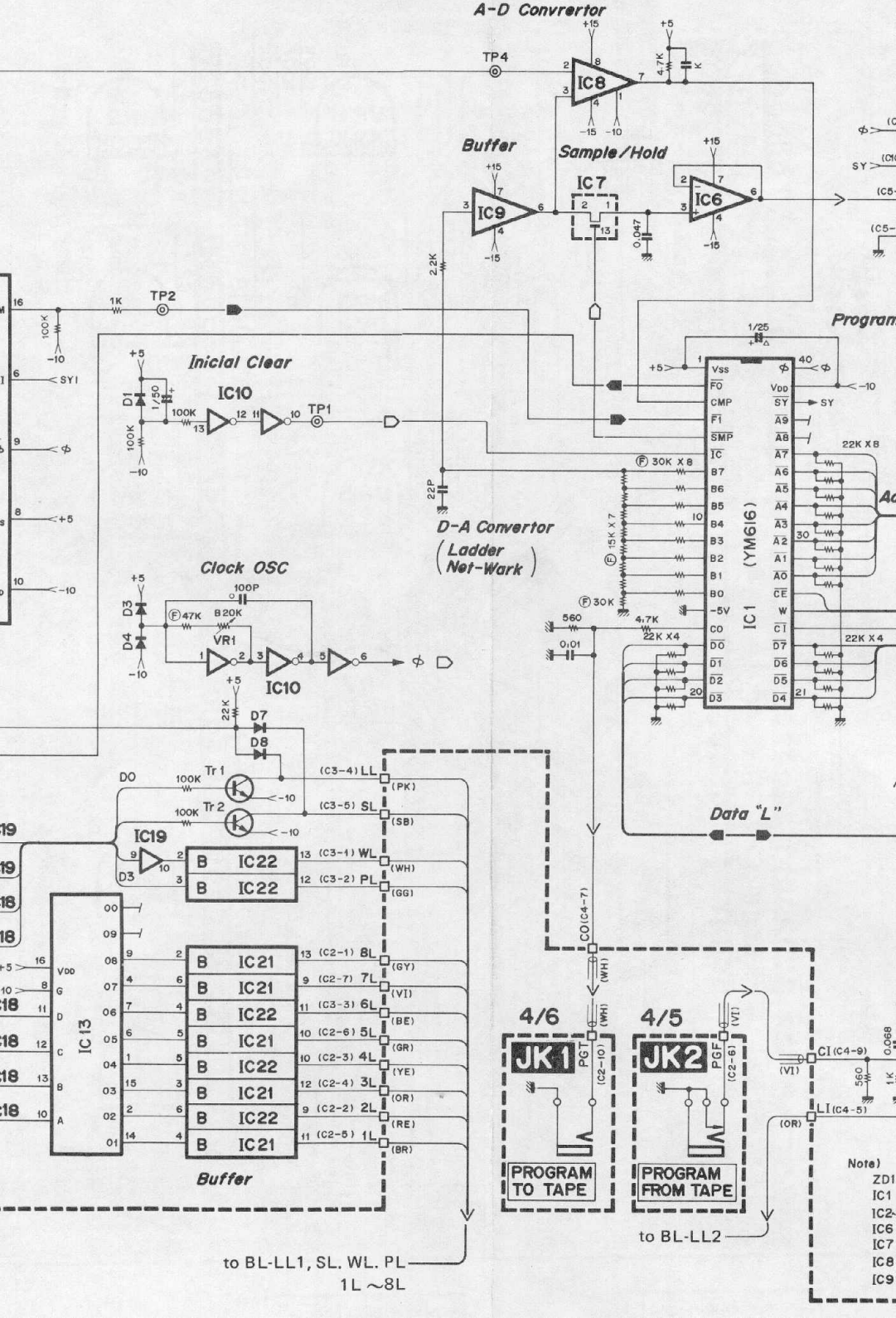
C4

Pin No.	Pin Name	Wire Color	Destination
1	A	SB	FA-A (C3-3)
2	F	YE	FA-CM (C5-7)
3	P2	BR	DM-11 (C4-8)
4	PO2	GG	FA-P2 (C1-4)
5	V2	GY	VCO-V2 (C1-5)
6	P1	BE	DM-6 (C5-4)
7	PO1	SB	FA-P1 (C1-2)
8	V1	PK	VCO-V1 (C2-4)

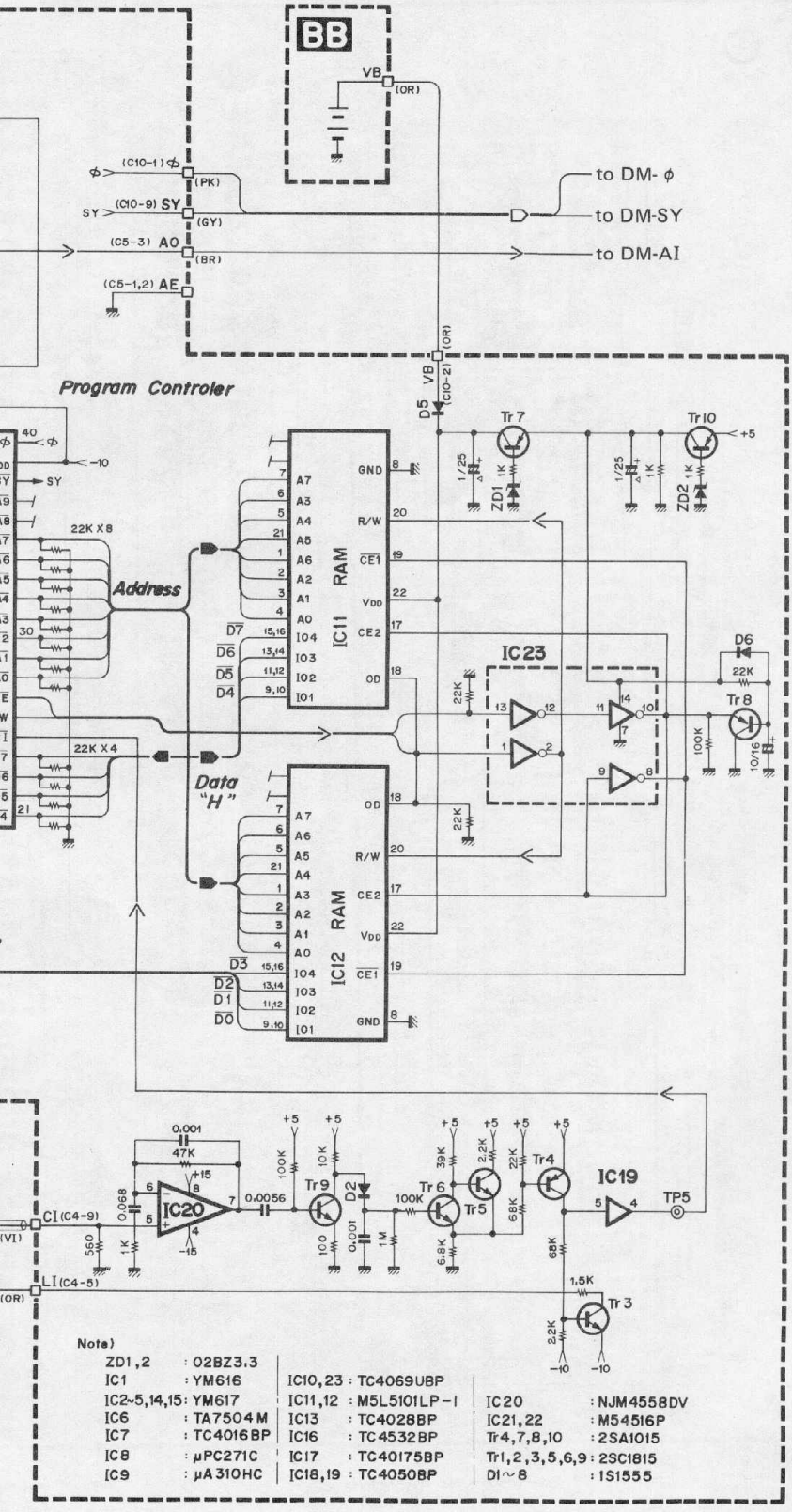
Note)

1. Circuit Board : LC84230
2. IC
   - IC1 ~5 : NJM2901
   - IC6 ~10 : TC4030BP
   - IC11 ~16 : TC4016BP
   - IC17 ~22 : iG00151
   - IC23 ~25 : NJM4558DV
3. Diode
   - D1 ~5 : 1S1555
4. FET
   - FET1 : 2SK105

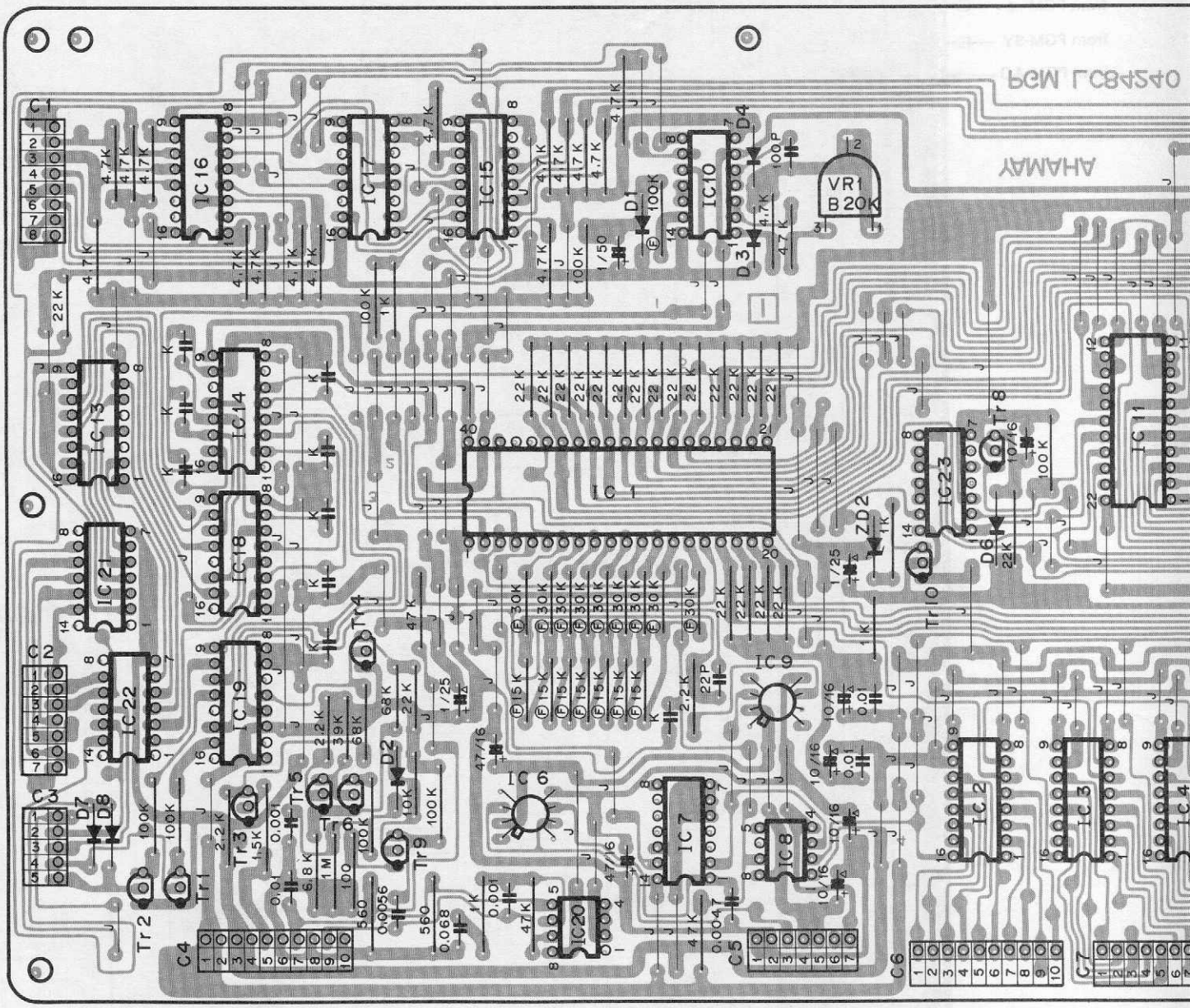

PGM
Multiplexers
IC 5
IC 4
IC 3
IC 2
IC10
IC 16
IC17
IC15
IC14
IC13
IC18
IC19
TP3
from PB-AR
from PB-AS
from PB-AD
from PB-AA
from PB-FR
from PB-FS
from PB-FD
from PB-FA
from PB-PL
from PB-MD
from PB-MF
from PB-~1
from PB-FM
from PB-ED
from PB-MD
from PB-RE
from PB-MF
from PB-CO
from PB-WN
from PB-VO2
from PB-VO1
from PA-P2
from PA-WV2
from PA-MD2
from PA-FV2
from PA-MF2
from PA-P1
from PA-WV1
from PA-MD1
from PA-FV1
from PA-MF1
from PA-LS
from BL-P.W.S.L. 1B ~8B
8B(C1-8)
7B(C1-7)
6B(C1-6)
5B(C1-5)
4B(C1-4)
3B(C1-3)
2B(C1-2)
1B(C1-1)
P(C10-5)
W(C10-6)
S(C10-7)
L(C10-8)
+15(C5-4)
+15(C5-5)
E(C4-6)
E(C4-8)
E(C4-10)
-15(C5-6)
-15(C5-7)
+5(C4-1)
+5(C4-2)
DE(C10-3)
DE(C10-4)
-10(C4-3)
-10(C4-4)
4.7K
100K
0.01
10/16
47/16


A-D Convrertor
TP4
IC8
Buffer
Sample/Hold
IC7
IC9
IC6
TP2
Inicial Clear
IC10
TP1
D-A Convertor
(Ladder Net-Work)
IC1 (YM616)
Clock OSC
VR1
IC10
D7
D8
Tr 1
Tr 2
IC19
IC22
IC21
IC13
Buffer
Data "L"
CO(C4-7)
4/6
4/5
JK1
JK2
PGT
PGF
PROGRAM TO TAPE
PROGRAM FROM TAPE
to BL-LL2
to BL-LL1, SL. WL. PL
1L ~8L
CI (C4-9)
LI (C4-5)
Note)
ZD1
IC1
IC2
IC6
IC7
IC8
IC9

PGM Circuit Diagram

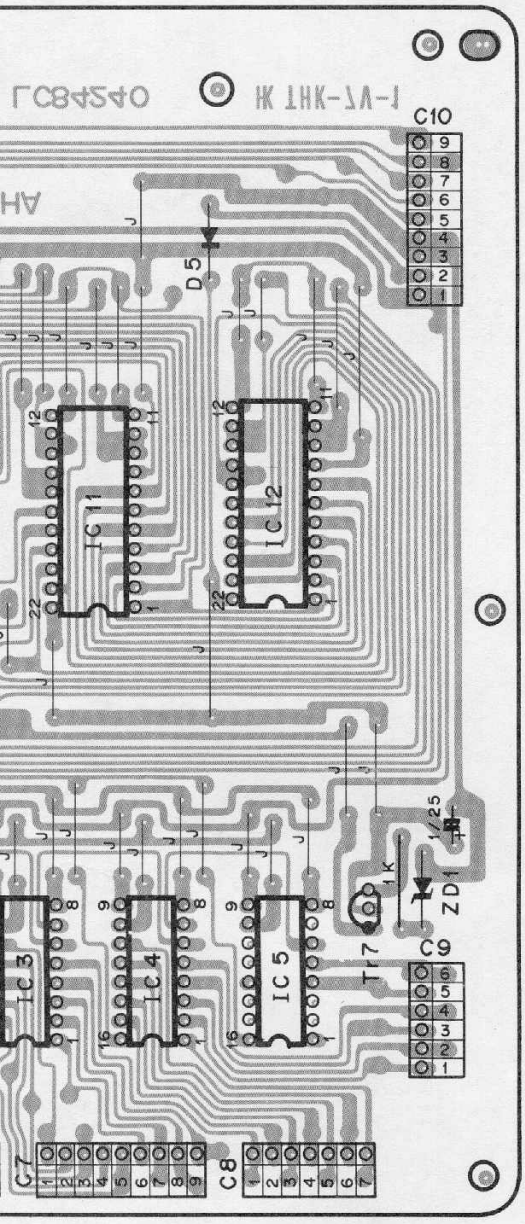


PGM Circuit Board & Wiring



Note)

1. Circuit Board : LC84241
2. IC
   - IC1 : YM61600
   - IC2 ~5, 14, 15 : YM61700
   - IC6 : TA7504
   - IC7 : TC4016BP
   - IC8 : μPC271C
   - IC9 : μA810HC
   - IC10, 23 : TC4069UBP
   - IC11, 12 : M5L5101LP-1
   - IC13 : TC4028BP
   - IC16 : TC4532BP
   - IC17 : TC40175
   - IC18, 19 : TC4050BP
   - IC20 : NJM4558DV
   - IC21, 22 : M54516P
3. Transistor
   - Tr4, 7, 8, 10 : 2SA1015
   - Tr1, 2, 3, 5, 6, 9 : 2SC1815
4. Diode



C10

9	SY
8	L
7	S
6	W
5	P
4	DE
3	DE
2	VB
1	φ

C9

6	31
5	32
4	21
3	22
2	23
1	24

C7

1	20
2	19
3	18
4	17
5	16
6	15
7	14
8	13
9	12

C8

1	11
2	26
3	27
4	28
5	29
6	30
7	25

C1

Pin No.	Pin Name	Wire Color	Destination
1	1B	BR	BL-1B (C2-1)
2	2B	RE	BL-2B (C2-2)
3	3B	OR	BL-3B (C2-3)
4	4B	YE	BL-4B (C2-4)
5	5B	GG	BL-5B (C2-5)
6	6B	SB	BL-6B (C3-5)
7	7B	VI	BL-7B (C3-6)
8	8B	GY	BL-8B (C3-7)

C2

Pin No.	Pin Name	Wire Color	Destination
1	8L	GY	BL-8L (C3-2)
2	2L	RE	BL-2L (C2-9)
3	4L	YE	BL-4L (C2-7)
4	3L	OR	BL-3L (C2-8)
5	1L	BR	BL-1L (C2-10)
6	5L	GR	BL-5L (C2-6)
7	7L	VI	BL-7L (C3-3)

C3

Pin No.	Pin Name	Wire Color	Destination
1	WL	WH	BL-WL (C2-11)
2	PL	GG	BL-PL (C3-1)
3	GL	BE	BL-6L (C3-4)
4	LL	PK	BL-LL1 (C1-2)
5	SL	SB	BL-SL (C1-1)

C4

Pin No.	Pin Name	Wire Color	Destination
1	+5	GR	DC-+5 (C2-7)
2	+5	GR	DM-+5 (C1-2)
3	−10	BE	DC- −10 (C2-10)
4	−10	BE	DM- −10 (C1-5)
5	LI	OR	BL-LL2 (C1-3)
6	E	SWHS	
7	CO	SWH	JK1-PGT (C2-10)
8	E	SVIS	
9	CI	SVI	JK2-PGF (C2-6)
10	E	BL	DC-DE (C3-8)

C5

Pin No.	Pin Name	Wire Color	Destination
1	AE	BL	DC-AE (C2-3)
2	AE	BL	DM-E (C2-3)
3	AO	BR	DM-AI (C2-1)
4	+15	BR	DC-+15 (C2-1)
5	+15	BR	DM-+15 (C2-2)
6	−15	YE	DC- −15 (C2-5)
7	−15	YE	DM- −15 (C2-4)

C6

Pin No.	Pin Name	Wire Color	Destination
1	6	BE	PA-P1 (C3-5)
2	7	VI	PA-MF2 (C4-7)
3	8	GY	PA-FV2 (C5-2)
4	9	WH	PA-MD2 (C5-1)
5	10	PK	PA-WV2 (C5-5)
6	5	GR	PA-WV1 (C3-6)
7	4	YE	PA-MD1 (C3-2)
8	3	OR	PA-FV1 (C3-3)
9	2	RE	PA-MF1 (C3-1)
10	1	BR	PA-LS (C2-1)

C7

Pin No.	Pin Name	Wire Color	Destination
1	20	PK	PB-FM (C3-5)
2	19	WH	PB-ED (C2-7)
3	18	GY	PB-MD (C2-6)
4	17	VI	PB-RE (C2-5)
5	16	BE	PB-MF (C2-2)
6	15	GR	PB-CO (C2-4)
7	14	YE	PB-WN (C8-1)
8	13	OR	PB-VO2 (C2-1)
9	12	RE	PB-VO1 (C2-3)

C8

Pin No.	Pin Name	Wire Color	Destination
1	11	BR	PA-P2 (C5-4)
2	26	BE	PB-FD (C8-3)
3	27	VI	PB-FS (C8-4)
4	28	GY	PB-FR (C8-5)
5	29	WH	PB-AA (C5-1)
6	30	PK	PB-AD (C5-2)
7	25	GR	PB-FA (C8-2)

C9

Pin No.	Pin Name	Wire Color	Destination
1	24	YE	PB-PL (C8-7)
2	23	OR	PB-MD (C3-8)
3	22	RE	PB-MF (C3-6)
4	21	BR	PB-∿1 (C3-7)
5	32	RE	PB-AR (C5-4)
6	31	BR	PB-AS (C5-3)

C10

Pin No.	Pin Name	Wire Color	Destination
1	Ø	PK	DM-Ø (C1-4)
2	VB	OR	BB-VB
3	DE	BL	DC-DE (C2-8)
4	DE	BL	BB-E
5	P	PK	BL-PB (C3-8)
6	W	WH	BL-WB (C1-6)
7	S	GR	BL-SB (C1-5)
8	L	BE	BL-LB (C1-4)
9	SY	GY	DM-SY (C1-1)

TC4028BP
TC4532BP
TC40175
TC4050BP
NJM4558DV
M54516P

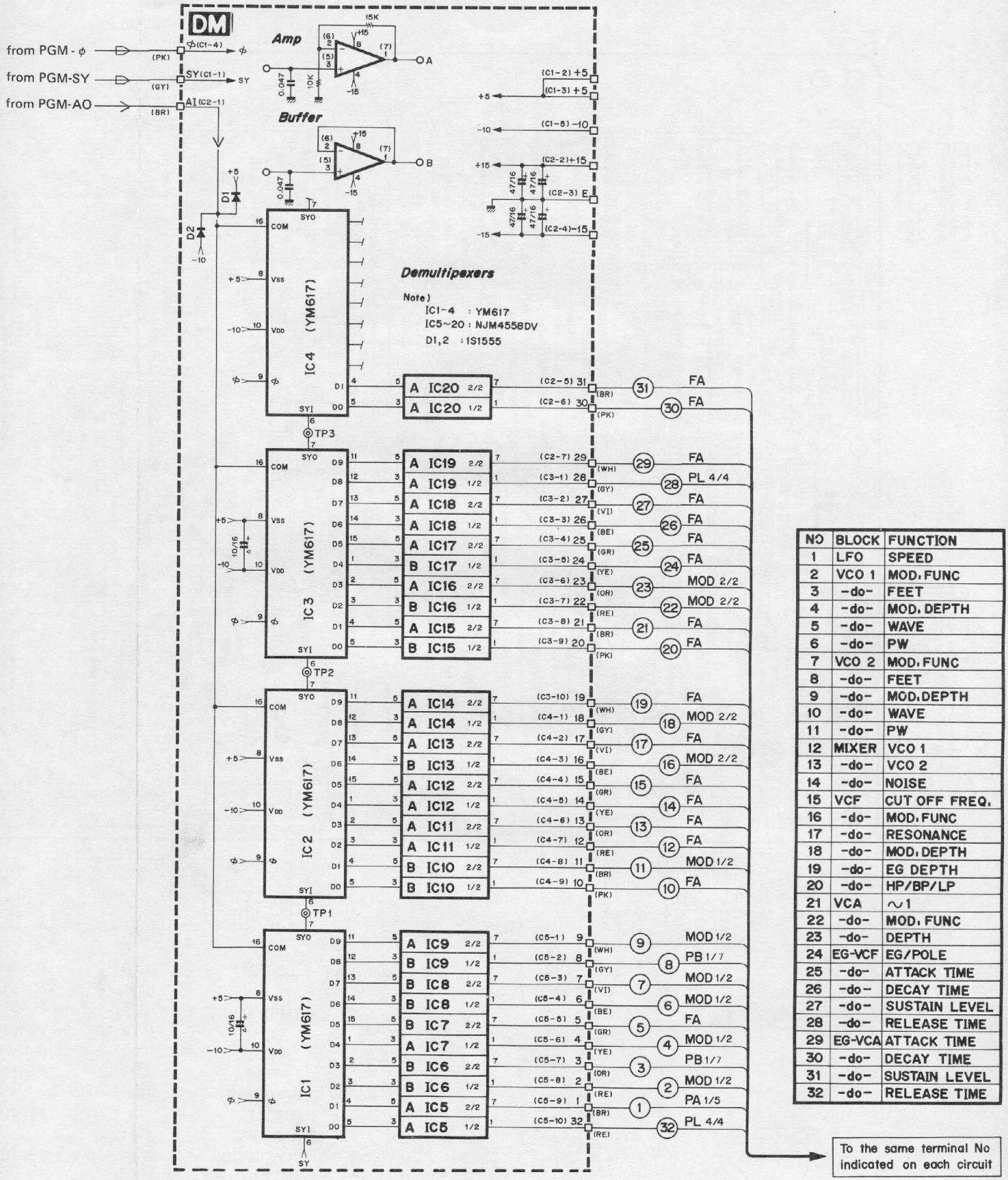
2SA1015

2SC1815

D1 ~8 : 1S1555
ZD1, 2 : 02BZ3-3

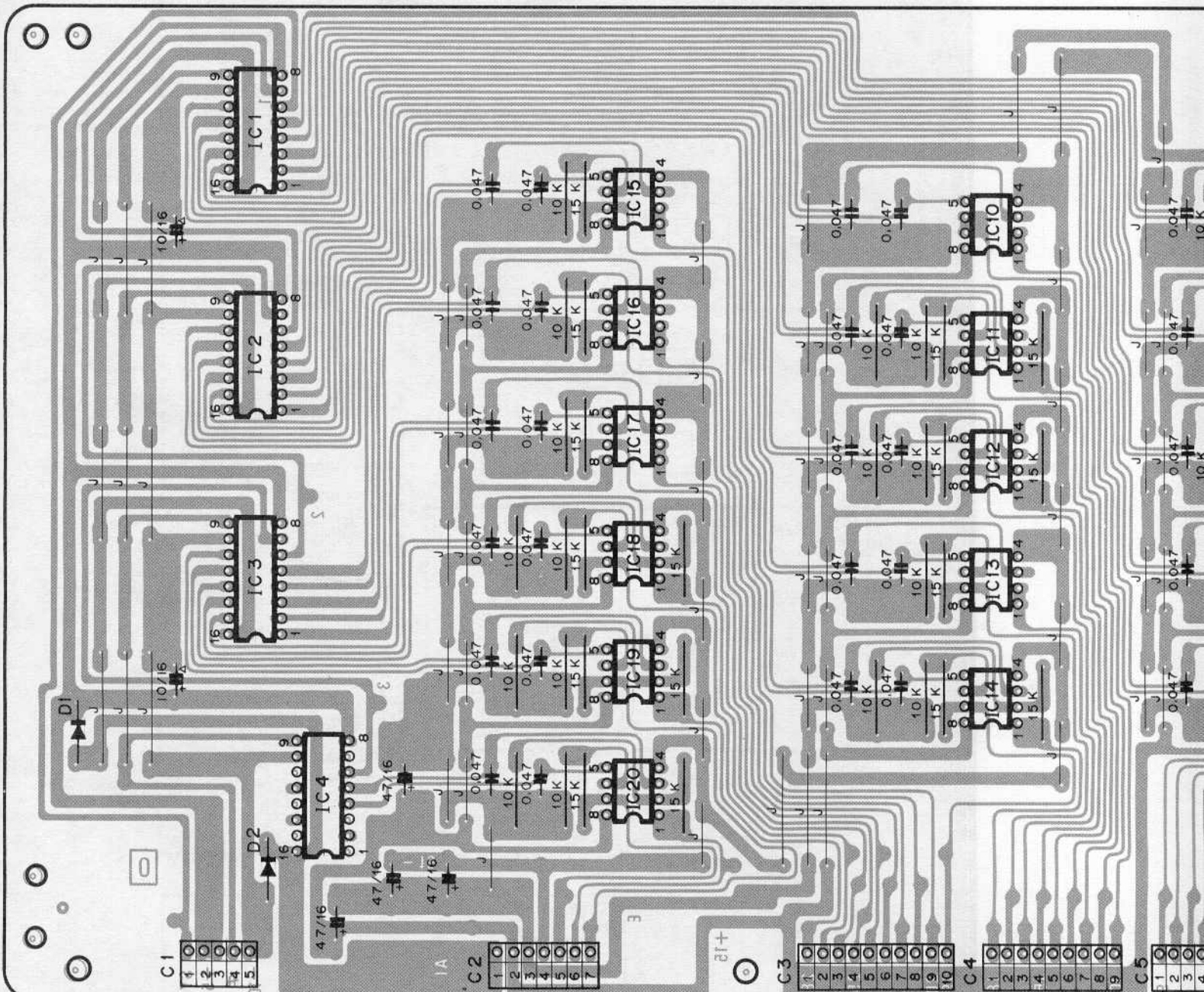
5. Capacitor
△marked : Tantalum Capacitor
K marked : Ceramic Capacitor 1000P

DM Circuit Diagram



NO	BLOCK	FUNCTION
1	LFO	SPEED
2	VCO 1	MOD. FUNC
3	-do-	FEET
4	-do-	MOD. DEPTH
5	-do-	WAVE
6	-do-	PW
7	VCO 2	MOD. FUNC
8	-do-	FEET
9	-do-	MOD. DEPTH
10	-do-	WAVE
11	-do-	PW
12	MIXER	VCO 1
13	-do-	VCO 2
14	-do-	NOISE
15	VCF	CUT OFF FREQ.
16	-do-	MOD. FUNC
17	-do-	RESONANCE
18	-do-	MOD. DEPTH
19	-do-	EG DEPTH
20	-do-	HP/BP/LP
21	VCA	∼1
22	-do-	MOD. FUNC
23	-do-	DEPTH
24	EG-VCF	EG/POLE
25	-do-	ATTACK TIME
26	-do-	DECAY TIME
27	-do-	SUSTAIN LEVEL
28	-do-	RELEASE TIME
29	EG-VCA	ATTACK TIME
30	-do-	DECAY TIME
31	-do-	SUSTAIN LEVEL
32	-do-	RELEASE TIME

DM Circuit Board & Wiring



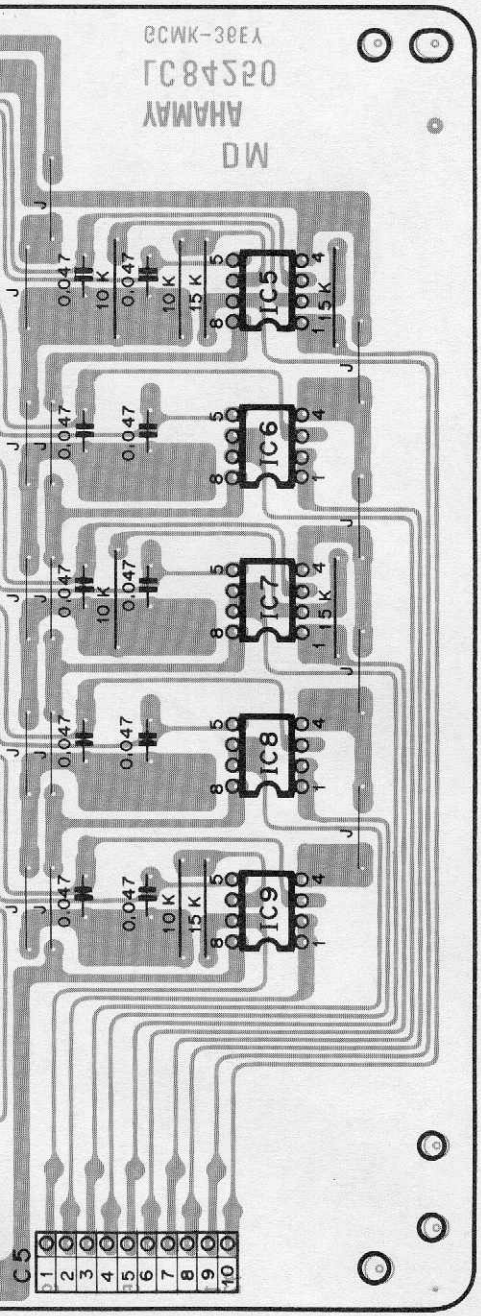
C1	
SY	1
+5	2
+5	3
ø	4
−10	5

C2	
A1	1
+15	2
E	3
−15	4
31	5
30	6
29	7

C3	
28	1
27	2
26	3
25	4
24	5
23	6
22	7
21	8
20	9
19	10

C4	
18	1
17	2
16	3
15	4
14	5
13	6
12	7
11	8
10	9

C5	
9	1
8	2
7	3
6	4



C1

Pin No.	Pin Name	Wire Color	Destination
1	SY	GY	PGM-SY (C10-9)
2	+5	GR	PGM-+5 (C4-2)
3	+5	GR	BL-+5 (C3-9)
4	∅	PK	PGM-∅ (C10-1)
5	−10	BE	PGM-−10 (C4-4)

C2

Pin No.	Pin Name	Wire Color	Destination
1	AI	BR	PGM-AO (C5-3)
2	+15	BR	PBM-+15 (C5-5)
3	E	BL	PGM-AE (C5-2)
4	−15	YE	PGM-−15 (C5-7)
5	31	BR	FA-SA (C4-8)
6	30	PK	FA-DA (C4-6)
7	29	WH	FA-AA (C4-5)

C3

Pin No.	Pin Name	Wire Color	Destination
1	28	GY	PL-FPI (C1-6)
2	27	VI	FA-SF (C4-4)
3	26	BE	FA-DF (C4-2)
4	25	GR	FA-AF (C4-1)
5	24	YE	FA-POL (C2-8)
6	23	OR	MOD-AD (C3-5)
7	22	RE	MOD-MA (C1-4)
8	21	BR	FA-C4 (C5-4)
9	20	PK	FA-FC (C2-9)
10	19	WH	FA-EL (C3-1)

C4

Pin No.	Pin Name	Wire Color	Destination
1	18	GY	MOD-FD (C3-6)
2	17	VI	FA-RE (C5-9)
3	16	BE	MOD-MF (C1-3)
4	15	GR	FA-C0 (C5-6)
5	14	YE	FA-C3 (C6-3)
6	13	OR	FA-C2 (C6-5)
7	12	RE	FA-C1 (C6-4)
8	11	BR	MOD-P2 (C4-3)
9	10	PK	FA-HB2 (C2-6)

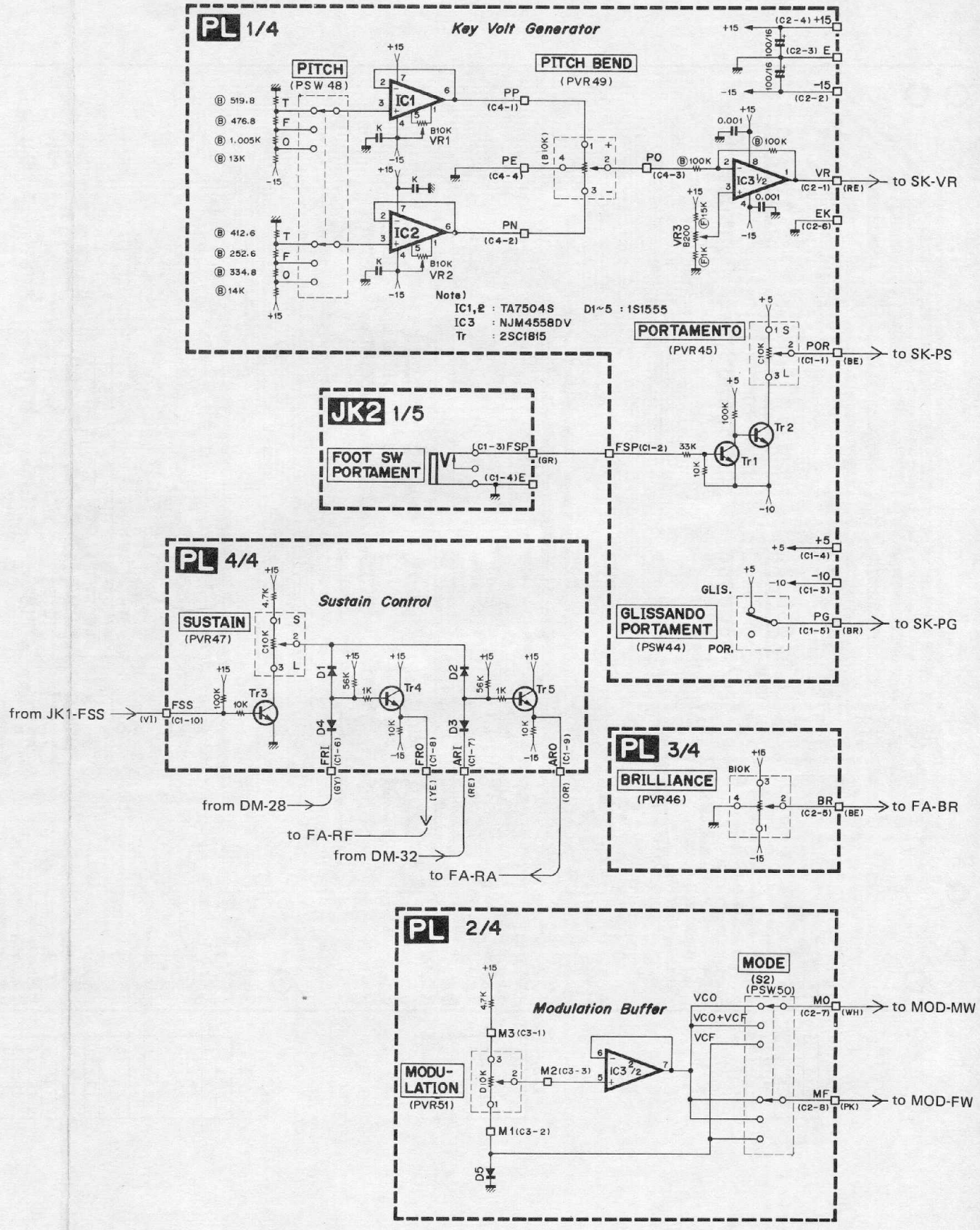
C5

Pin No.	Pin Name	Wire Color	Destination
1	9	WH	MOD-MD2 (C2-9)
2	8	GY	PB-FT2 (C1-7)
3	7	VI	MOD-MF2 (C1-2)
4	6	BE	MOD-P1 (C4-6)
5	5	GR	FA-HB1 (C2-7)
6	4	YE	MOD-MD1 (C3-2)
7	3	OR	PB-FT1 (C1-6)
8	2	RE	MOD-MF1 (C1-1)
9	1	BR	PA-S (C6-1)
10	32	RE	PL-ARI (C1-7)

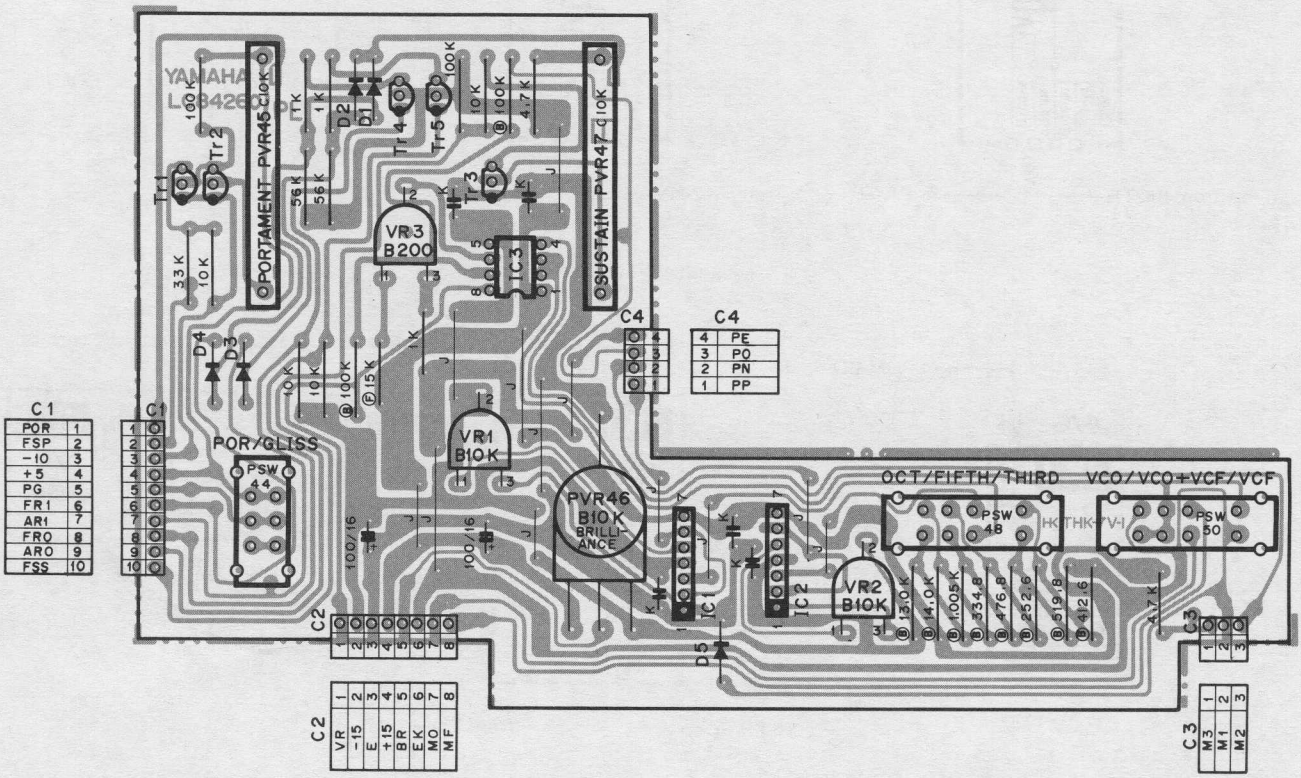
Note)

1. Circuit Board : LC84250
2. IC
   - IC1 ~ 4 : YM61700
   - IC5 ~ 20 : NJM4558DV
3. Diode
   - D1, 2 : 1S1555
4. Capacitor
   - △ marked : Tantalum Capacitor

PL Circuit Diagram



PL Circuit Board & Wiring



C1	
POR	1
FSP	2
−10	3
+5	4
PG	5
FR1	6
AR1	7
FRO	8
ARO	9
FSS	10

C4	
4	PE
3	PO
2	PN
1	PP

C2	
1	VR
2	−15
3	E
4	+15
5	BR
6	EK
7	MO
8	MF

C3	
1	M3
2	M1
3	M2

View from the printed pattern side of the circuit board

C1

Pin No.	Pin Name	Wire Color	Destination
1	POR	BE	SK-PS (C4-6)
2	FSP	GR	JK2-FSP (C1-3)
3	−10	BE	SK- −10 (C3-6)
4	+5	GR	SK-+5 (C3-8)
5	PG	BR	SK-PG (C4-5)
6	FRI	GY	DM-28 (C3-1)
7	ARI	RE	DM-32 (C5-10)
8	FRO	YE	FA-RF (C4-3)
9	ARO	OR	FA-RA (C4-7)
10	FSS	VI	JK1-FSS (C1-5)

C2

Pin No.	Pin Name	Wire Color	Destination
1	VR	RE	SK-VR (C4-4)
2	−15	YE	DC- −15 (C4-6)
3	E	BL	DC-AE (C3-3)
4	+15	BR	DC-+15 (C4-2)
5	BR	BE	FA-BR (C5-8)
6	EK	BL	SK-EK (C4-2)
7	MO	WH	MOD-MW (C3-1)
8	MF	PK	MOD-FW (C3-7)

C3

Pin No.	Pin Name	Wire Color	Destination
1	M3	RE	W1-3
2	M1	BL	W1-1
3	M3	BR	W1-2

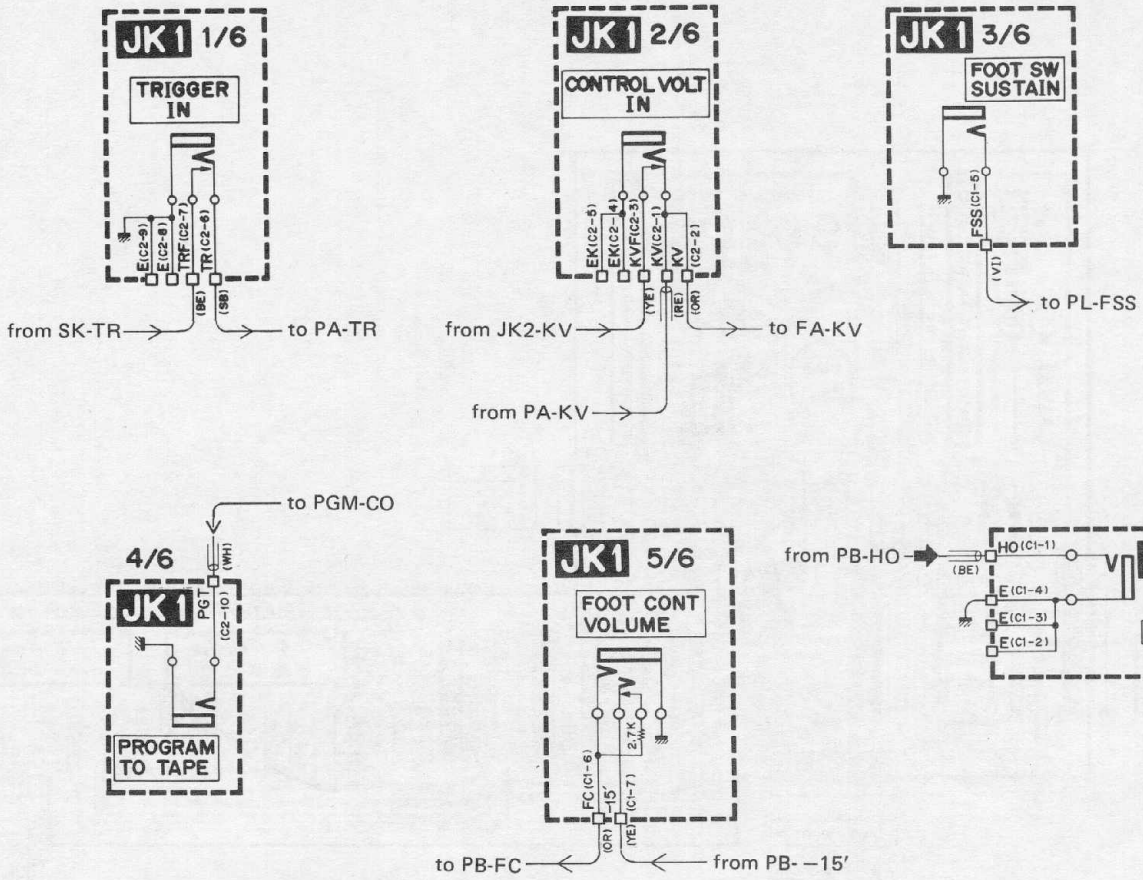
C4

Pin No.	Pin Name	Wire Color	Destination
1	PP	BR	W2-1
2	PN	OR	W2-3
3	PO	RE	W2-2
4	PE	BL	W2-4

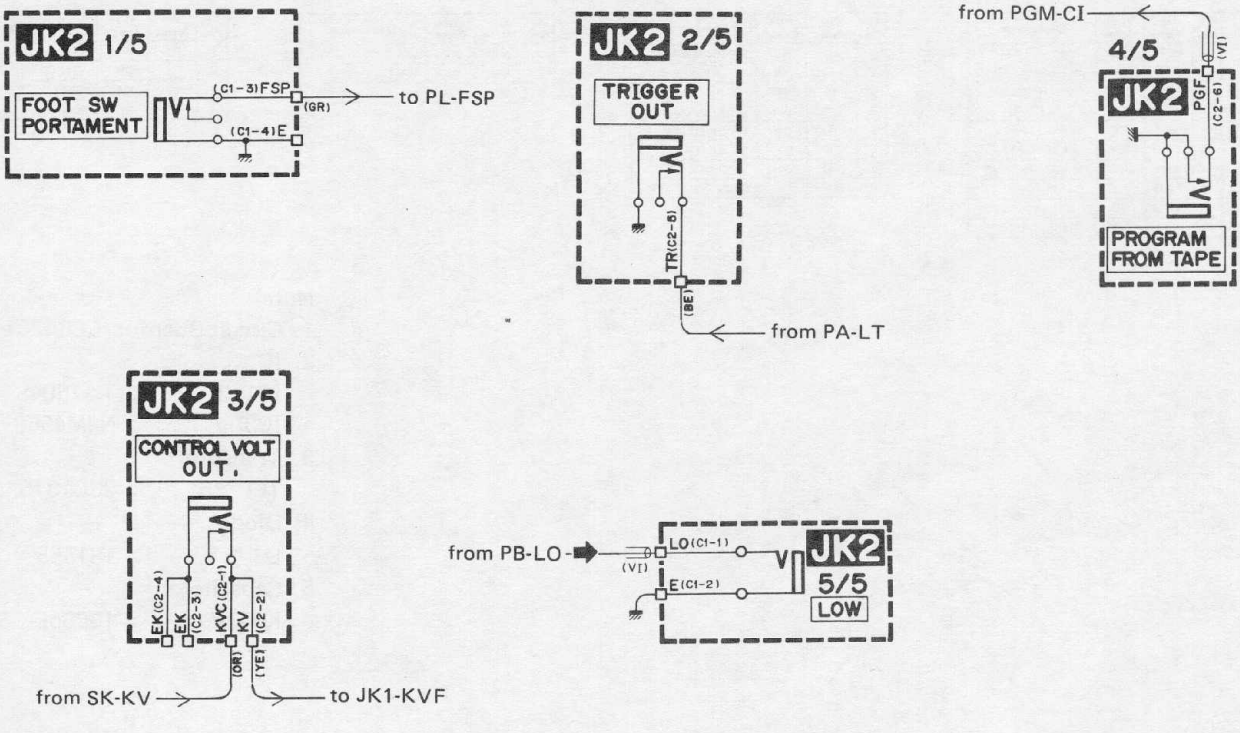
Note)

1. Circuit Board : LC84261
2. IC
   - IC1, 2 : TA7504S
   - IC3 : NJM4558
3. Transistor
   - Tr1 ~5 : 2SC1815
4. Diode
   - D1 ~5 : 1S1555
5. Capacitor
   - K marked : 1000pF

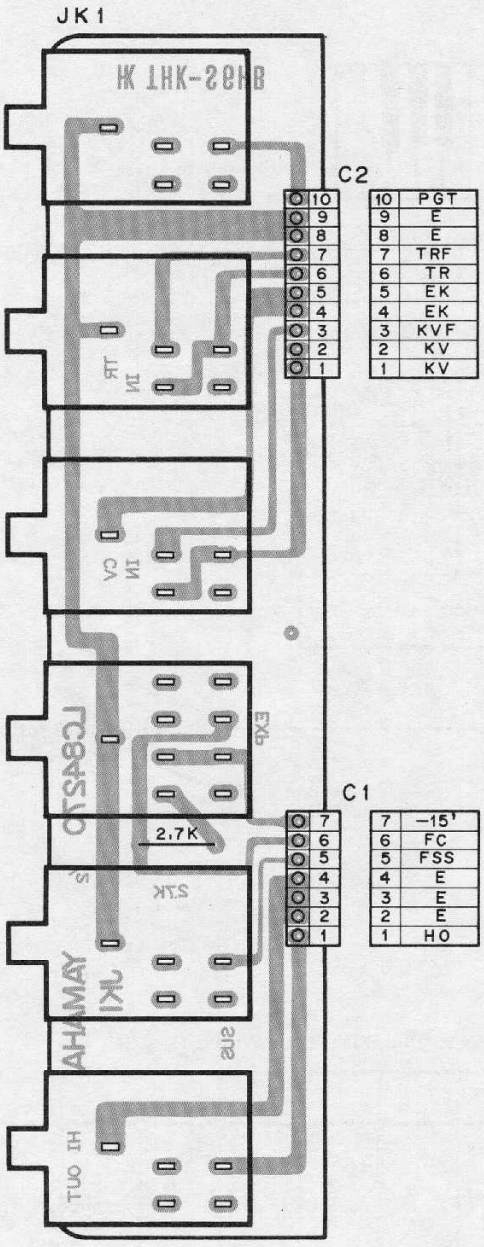
JK1 Circuit Diagram



JK2 Circuit Diagram



JK1 Circuit Board & Wiring



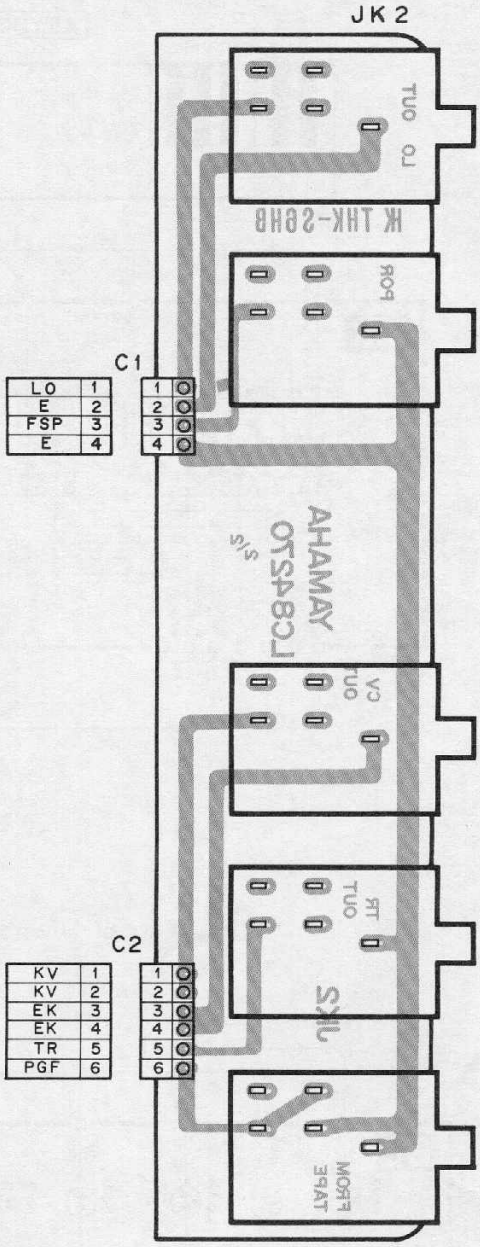
C1

Pin No.	Pin Name	Wire Color	Destination
1	HO	SBE	PB-HO (C4-3)
2	E	SBES	
3	E	BL	DC-DE (C2-9)
4	E	BL	PB-E (C4-7)
5	FSS	VI	PL-FSS (C1-10)
6	FC	OR	PB-FC (C3-11)
7	−15'	YE	PB-−15' (C2-8)

C2

Pin No.	Pin Name	Wire Color	Destination
1	KV	SRE	PA-KV (C2-5)
2	KV	OR	FA-KV (C5-5)
3	KVF	YE	JK2-KV (C2-2)
4	EK	BL	DC-AE (C4-4)
5	EK	BL	JK2-KE (C2-3)
6	TR	SB	PA-TR (C7-5)
7	TRF	BE	SK-TR (C4-3)
8	E	BL	DC-DE (C1-9)
9	E	BL	JK2-E (C1-4)
10	PGT	SWH	PGM-CO (C4-7)

JK2 Circuit Board & Wiring



C1

Pin No.	Pin Name	Wire Color	Destination
1	LO	SVI	PB-LO (C4-6)
2	E	SVIS	
3	FSP	GR	PL-RSP (C1-2)
4	E	BL	JK1-E (C2-9)

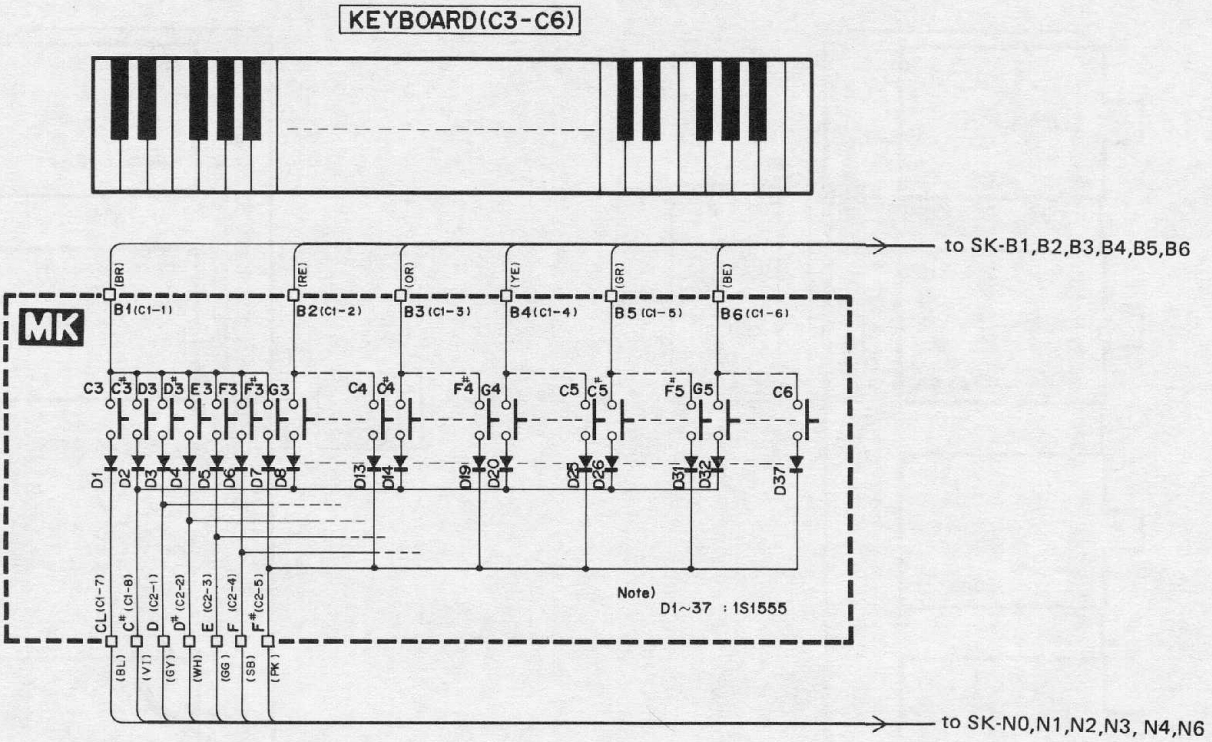
C2

Pin No.	Pin Name	Wire Color	Destination
1	KV	OR	SK-KV (C3-1)
2	KV	YE	JK1-KVF (C2-3)
3	EK	BL	JK1-EK (C2-5)
4	EK	BL	PA-EK (C2-7)
5	TR	BE	PA-LT (C7-2)
6	PGF	SVI	PGM-CI (C4-9)

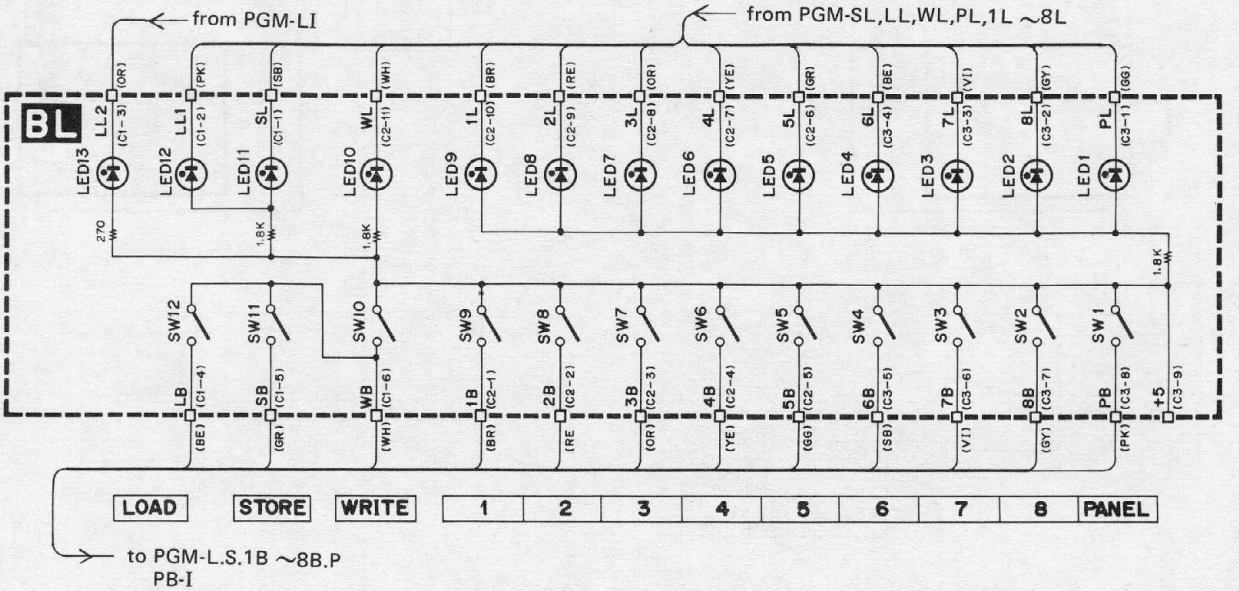
Note)

1. Circuit Board : LC84270

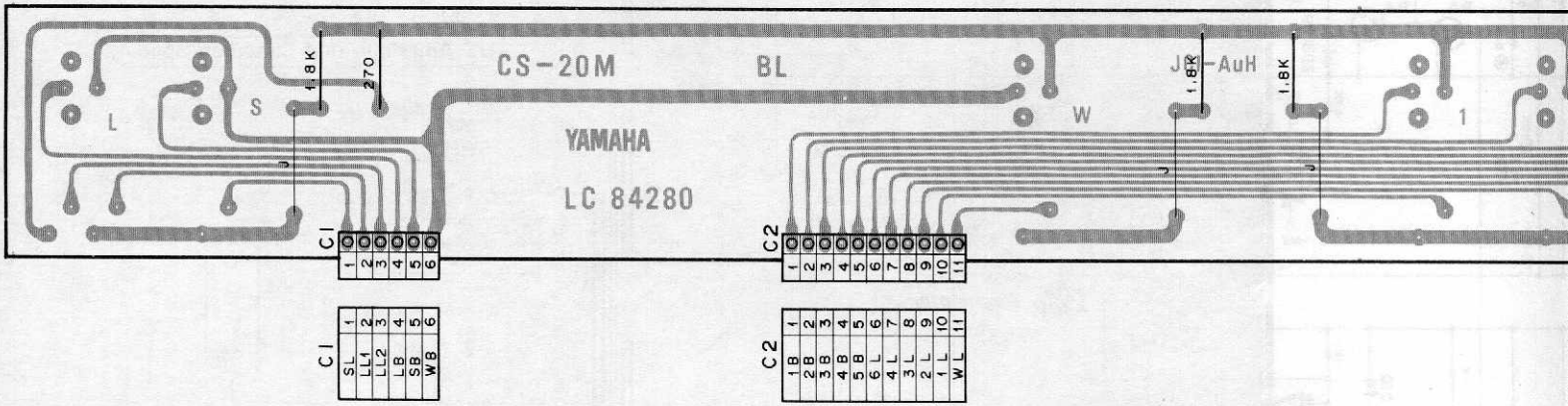
MK Circuit Diagram



BL Circuit Diagram



BL Circuit Board & Wiring



C1

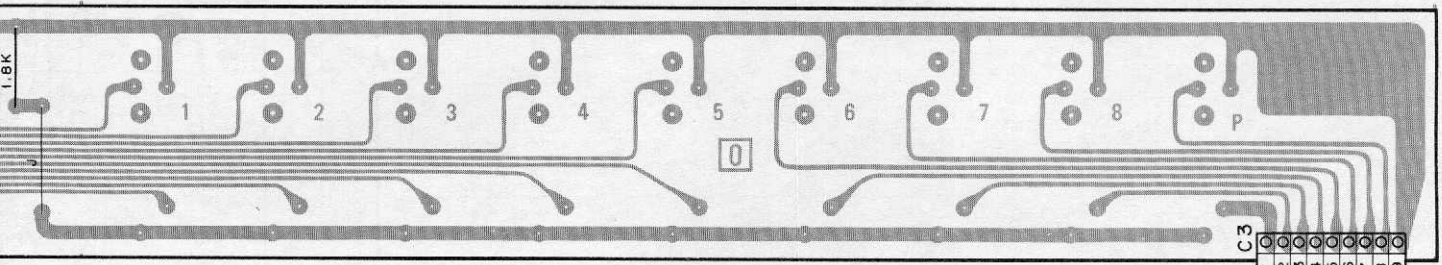
Pin No.	Pin Name	Wire Color	Destination
1	SL	SB	PGM-SL (C3-5)
2	LL1	PK	PGM-LL (C3-4)
3	LL2	OR	PGM-LI (C4-5)
4	LB	BE	PGM-L (C10-8)
5	SB	GR	PGM-S (C10-7)
6	WB	WH	PGM-W (C10-6)

C2

Pin No.	Pin Name	Wire Color	Destination
1	1B	BR	PGM-1B (C1-1)
2	2B	RE	PGM-2B (C1-2)
3	3B	OR	PGM-3B (C1-3)
4	4B	YE	PGM-4B (C1-4)
5	5B	GG	PGM-5B (C1-5)
6	5L	GR	PGM-5L (C2-6)
7	4L	YE	PGM-4L (C2-3)
8	3L	OR	PGM-3L (C2-4)
9	2L	RE	PGM-2L (C2-2)
10	1L	BR	PGM-1L (C2-5)
11	WL	WH	PGM-WL (C3-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	PL	GG	PGM-PL (C3-2)
2	8L	GY	PGM-8L (C2-1)
3	7L	VI	PGM-7L (C2-7)
4	6L	BE	PGM-6L (C3-3)
5	6B	SB	PGM-6B (C1-6)
6	7B	VI	PGM-7B (C1-7)
7	8B	GY	PGM-8B (C1-8)
8	PB	PK	PGM-P (C10-5)
9	+5	GR	DM-+5 (C1-3)

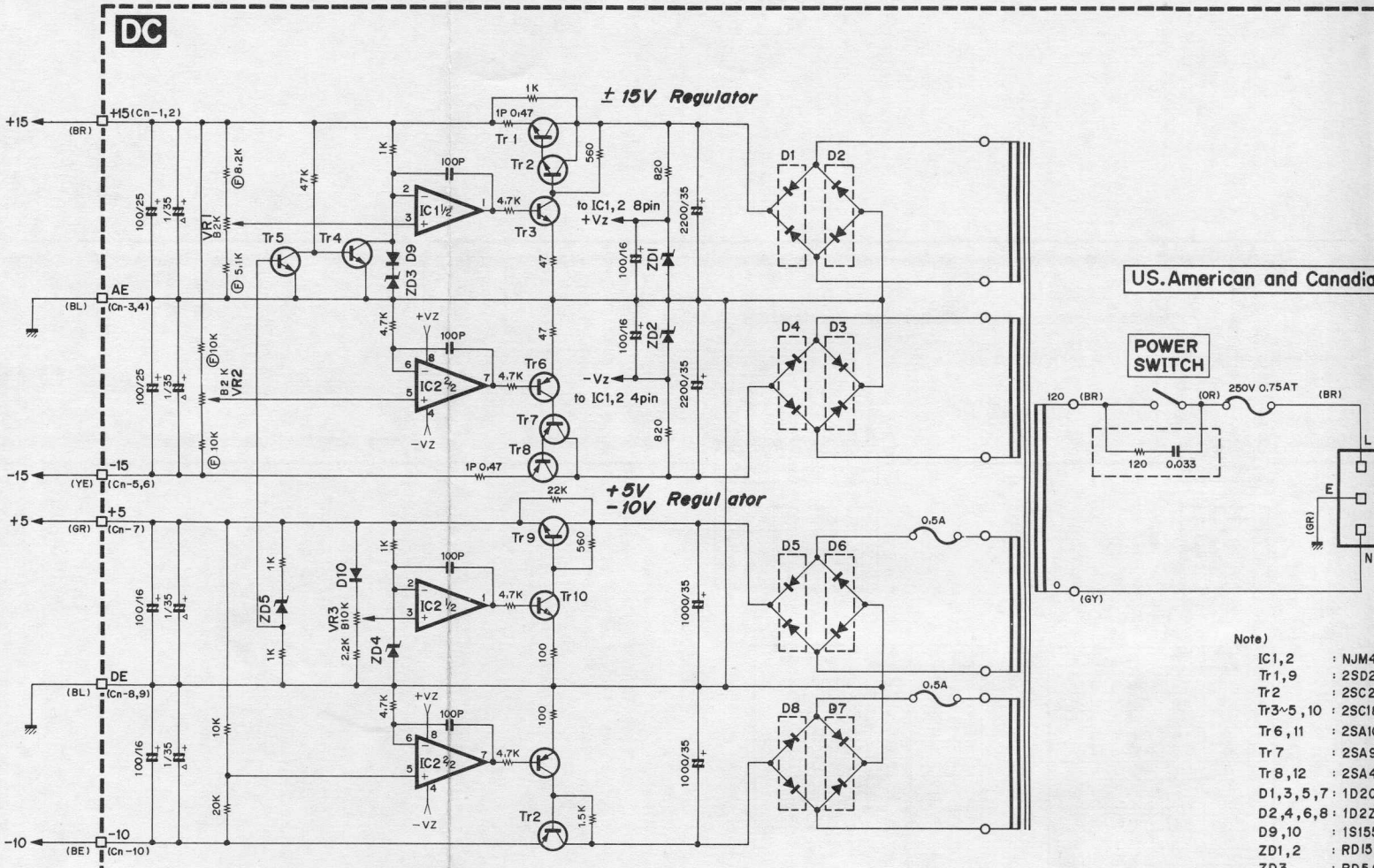


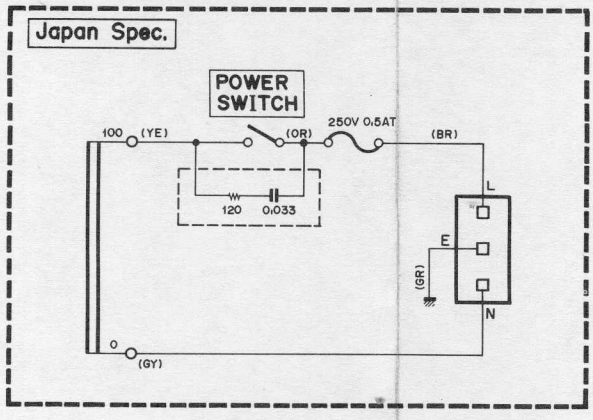
View from the printed pattern side of the circuit board

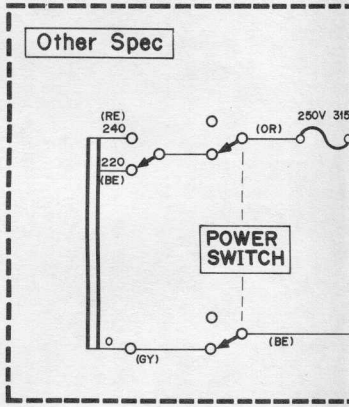
Note)

1. Circuit Board : LC80514

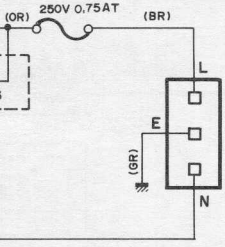
DC Circuit Diagram







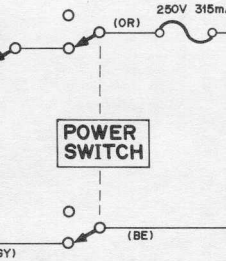
erican and Canadian Spec.



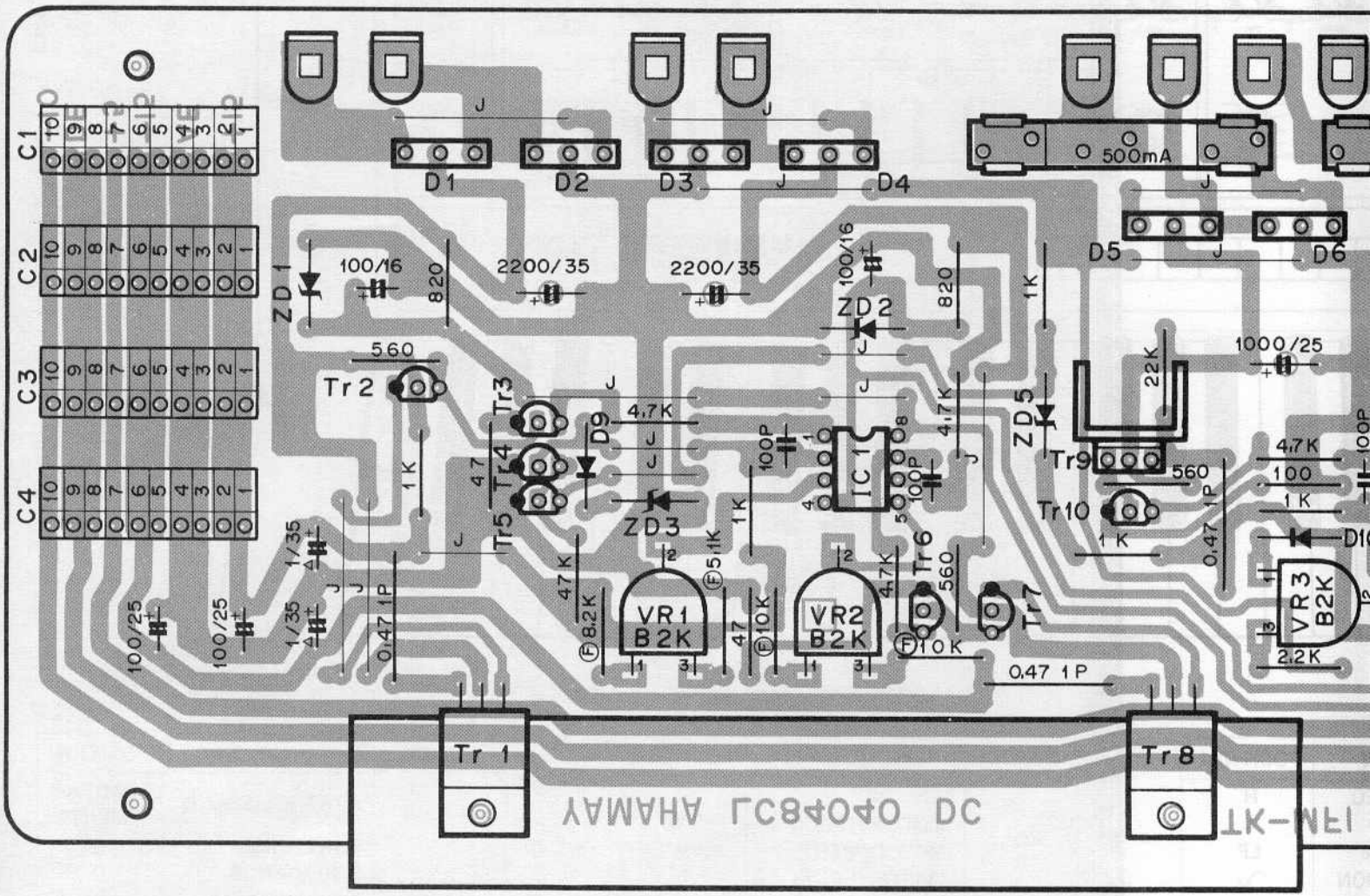
Note)

IC1,2	: NJM4558
Tr1,9	: 2SD235
Tr2	: 2SC2120
Tr3~5,10	: 2SC1815
Tr6,11	: 2SA1015
Tr7	: 2SA950
Tr8,12	: 2SA490
D1,3,5,7	: 1D2C1
D2,4,6,8	: 1D2Z1
D9,10	: 1S1555
ZD1,2	: RD15EB3
ZD3	: RD5.6EB3
ZD4,5	: RD3.6EB1

ec



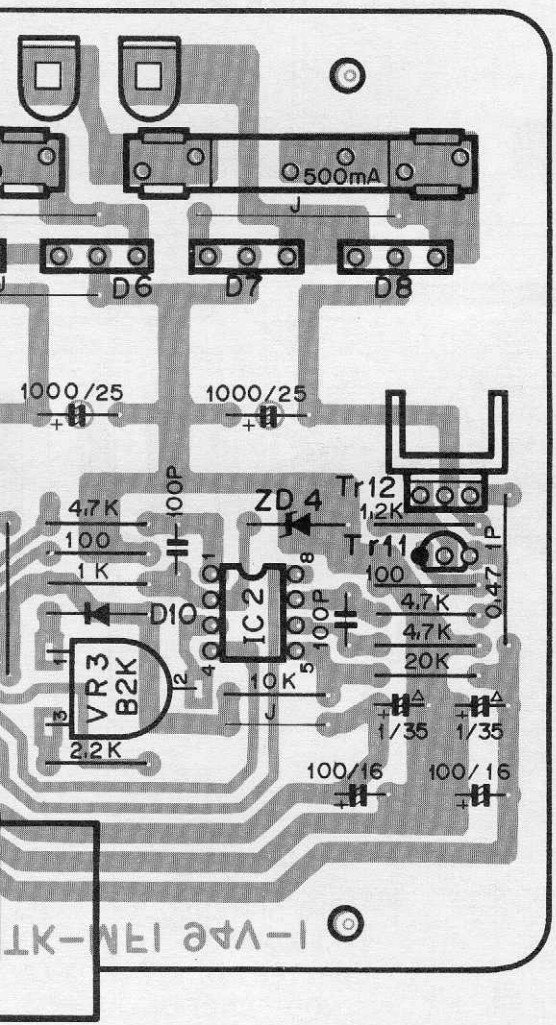
C1~C4	
10	−10
9	DE
8	DE
7	+5
6	−15
5	−15
4	AE
3	AE
2	+15
1	+15



Note)

1. Circuit Board : LC84040
2. IC
   IC1, 2 : NJM4558DV
3. Transistor
   Tr1, 9 : 2SD235
   Tr2 : 2SC2120
   Tr3 ~ 5, 10 : 2SC1815
   Tr6, 11 : 2SA1015
   Tr7 : 2SA950
   Tr8, 12 : 2SA490
4. Diode
   D1, 3, 5, 7 : 1D2C1
   D2, 4, 6, 8 : 1D2Z1
   D9, 10 : 1S1555
   ZD1, 2 : RD15EB3
   ZD4, 5 : RD3, 6EB1
5. Capacitor
   △marked : Tantalum Capacitor

DC Circuit Board & Wiring



C1

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	PA-+15 (C6-7)
2	+15	BR	PB-+15 (C3-3)
3	AE	BL	PA-E (C6-6)
4	AE	BL	PB-E (C3-2)
5	−15	YE	PA-−15 (C6-5)
6	−15	YE	PB-−15 (C3-1)
7	+5	GR	PB-+5 (C1-4)
8	DE	BL	PB-E (C1-3)
9	DE	BL	JK1-E (C2-8)
10	−10	BE	PB-−10 (C1-1)

C2

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	PGM-+15 (C5-4)
2	+15	BR	FA-+15 (C1-9)
3	AE	BL	PGM-AE (C5-1)
4	AE	–	–
5	−15	YE	PGM-−15 (C5-6)
6	−15	YE	FA-−15 (C1-5)
7	+5	GR	PGM-+5 (C4-1)
8	DE	BL	PGM-DE (C10-3)
9	DE	BL	JK1-DE (C1-3)
10	−10	BE	PGM-−10 (C4-3)

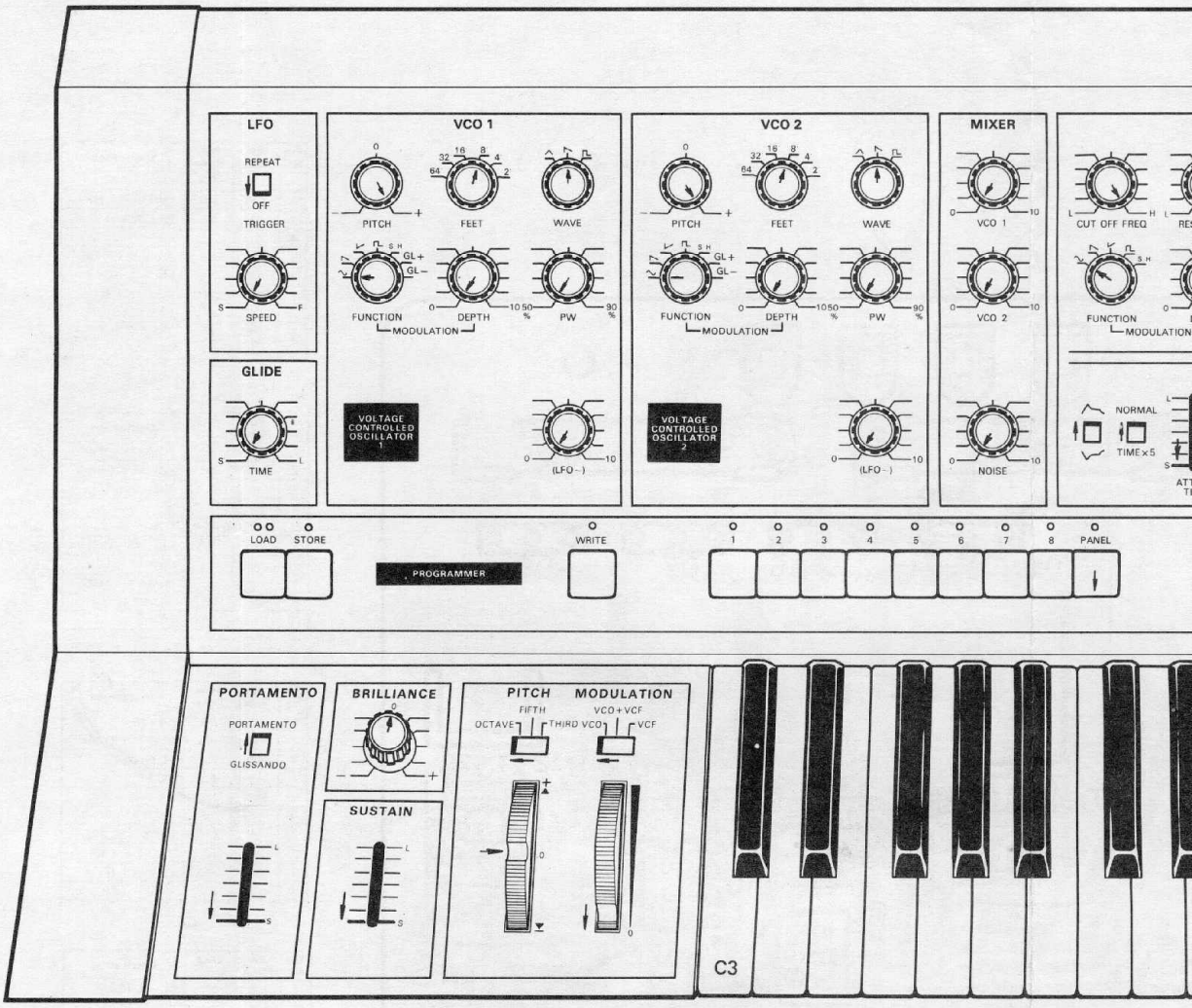
C3

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	PA-+15 (C4-1)
2	+15	BR	VCO-+15 (C1-8)
3	AE	BL	PL-E (C2-3)
4	AE	BL	VCO-E (C1-6)
5	−15	YE	PA-−15 (C4-4)
6	−15	YE	VCO-−15 (C1-3)
7	+5	GR	MOD-+5 (C1-7)
8	DE	BL	PGM-E (C4-10)
9	DE	BL	FA-E (C1-7)
10	−10	BE	MOD-−10 (C1-5)

C4

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	SK-+15 (C3-2)
2	+15	BR	PL-+15 (C2-4)
3	AE	BL	SK-EK (C4-1)
4	AE	BL	JK1-EK (C2-4)
5	−15	YE	SK-−15 (C3-3)
6	−15	YE	PL-−15 (C2-2)
7	+5	GR	SK-+5 (C3-7)
8	DE	BL	SK-DE (C3-4)
9	DE	–	–
10	−10	BE	SK-−10 (C3-5)

Electrical Checks & Adjustments

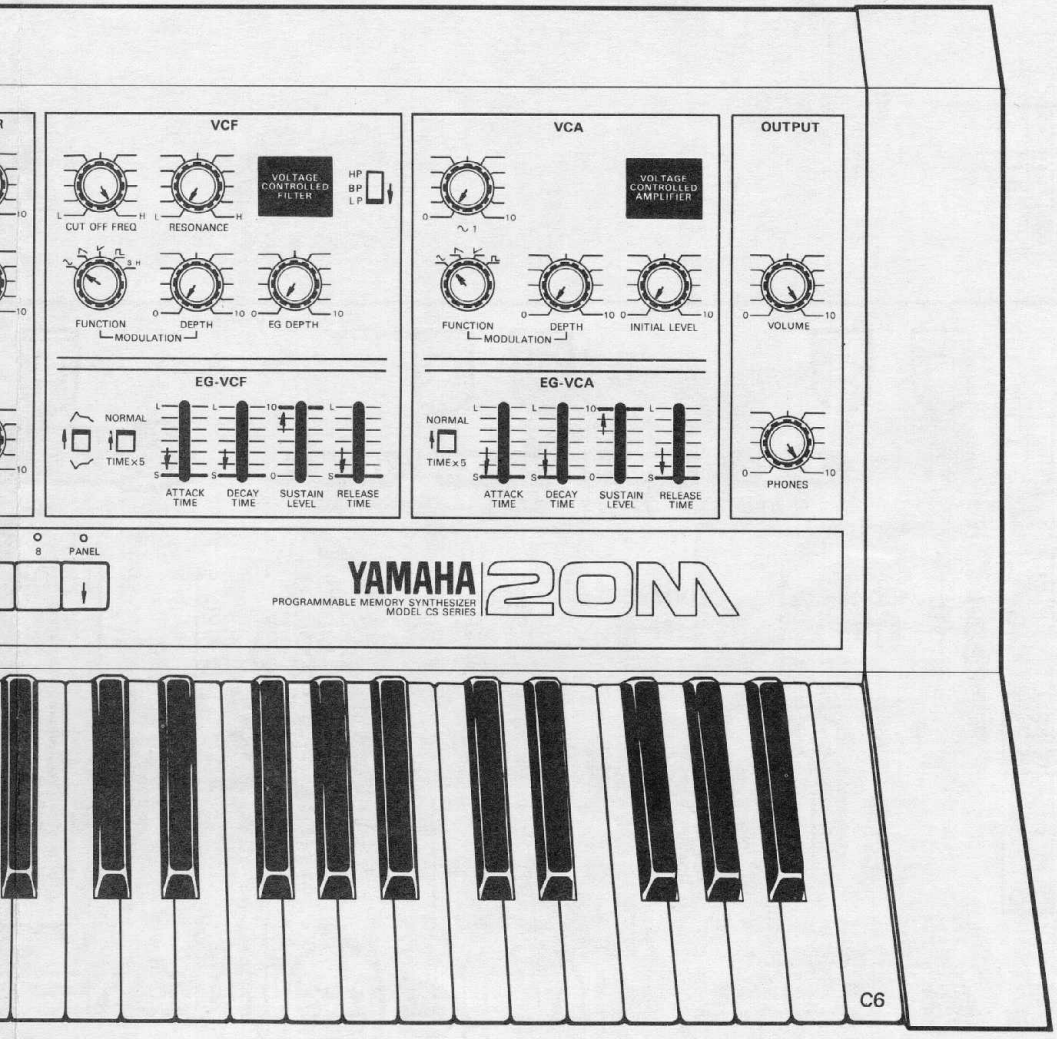


BLOCK	FUNCTION	POSITION
LFO	TRIGGER	OFF
	SPEED	S
GLIDE	TIME	S
VCO1, 2	PITCH	+
	FEET	8′
	WAVE	⋀
	MOD. FUNCTION	∿
	MOD. DEPTH	0
	PW	50%
	PWM (LFO∿)	0
MIXER	VCO1	0
	VCO2	0
	NOISE	0

BLOCK	FUNCTION	POSITION
VCF	CUT OFF FREQ.	H
	RESONANCE	L
	FILTER MODE	LP
	MOD. FUNCTION	∿
	MOD. DEPTH	0
	EG DEPTH	0
EG-VCF	POLARITY	⌒
	TIME EXPAND	NORMAL
	ATTACK TIME	S
	DECAY TIME	S
	SUSTAIN LEVEL	10
	RELEASE TIME	S

BLOCK
VCA
EG-VCA
OUTPUT

PANEL SETTING



BLOCK	FUNCTION	POSITION
VCA	∿1	0
	MOD. FUNCTION	∿
	MOD. DEPTH	0
	INITIAL LEVEL	0
EG-VCA	TIME EXPAND	NORMAL
	ATTACK TIME	S
	DECAY TIME	S
	SUSTAIN LEVEL	10
	RELEASE TIME	S
OUTPUT	VOLUME	10
	PHONES	10

BLOCK	FUNCTION	POSITION
EFFECT	PORT./GLISSAND	PORTA-MENT
	PORT. TIME	S
	BRILLIANCE	0
	PITCH WHEEL	0
	LIMITER	OCTAVE
	MOD. WHEEL	0
	MOD. MODE	VCO
PRO-GRAMMER	SELECT BUTTON	PANEL

TUNING (Do after supply voltage adjustment is completed.)

(The following procedure applies to VCO2 as well.)

1. Set the FEET in VCO1 (VCO2) to "4", then turn the VCO1 (VCO2) VR in the mixer fully clockwise.
2. Adjust the VCO1 HIGH VR on the rear panel until G7 + 12 cents is obtained when C6 key is depressed. Also adjust the VCO1 LOW VR until G4 + 12 cents is obtained when C3 key is depressed. (Observe the signal at the HIGH jack on the rear panel.)
3. Repeat above adjustments for keys C6 and C3 alternately until tuning accuracy of within ±2 cents is obtained.

SK Circuit Board

1. Supply Voltage Adjustment (This adjustment should be done after idling of more than 20 minutes.)

Test Point (SK Circuit Board	Specification	Adjustment
+15 (CT1-2) ⟷ EK (CT1-4)	+15 ± 0.01V	VR1 (DC Circuit Board)
−15 (CT1-3) ⟷ EK (CT1-4)	−15 ± 0.01V	VR2 (DC Circuit Board)
+5 (CT2-3) ⟷ DE (CT2-1)	+5 ± 0.05V	VR3 (DC Circuit Board)
−10 (CT2-2) ⟷ DE (CT2-1)	−10 ± 0.5V	
VR (CT1-5) ⟷ EK (CT1-4)	+2 ± 0.002V	VR3 (PL Circuit Board)
+4 (C3-4) ⟷ E (PB. Circuit Board)	+4 ± 0.004V	VR2 (PB Circuit Board)

2. Clock Circuit for Portamento

Measuring Condition	Test Point	Specification	Adjustment (SK Circuit Board)
PORTAMENTO (PVR-45) ⟶ L	TP1	6 ± 0.6Hz	VR1
⟶ S	TP1	6 ± 0.6KHz	VR2

3. Comparator Circuit for Portamento

Measuring Condition		Test Point		
PORTAMENTO/GLISSAND (PSW-44)	PS (C4-6) terminal voltage	TP2	TP3	TP4
⟶ PORTAMENTO	STATE 1 +5V ~ +3.1V	0	1	1
"	STATE 2 +3.1V ~ +0.3V	1	1	1
"	STATE 3 +0.3V ~ −6.3V	1	0	1
"	STATE 4 −6.3V ~ −10V	1	0	0
⟶ GLISSANDO	"		1	

1 : +5V±0.5V
0 : −10V±0.5V

4. Key Asigner Circuit and Key Volt Circuit

4-1.

Condition	Test Point	Specification	Adjustment
C6 KEY ON	KV (CT1-1) — EK (CT1-4)	+2 ± 0.002V	See the P51, PL Circuit Board adjustment

4-2. After the above adjustment is completed, depressing keys C3 to C6 should provide voltages each corresponding to those keys.

KEY	C3	F3	C4	F4	C5	F5	C6
Voltage	250.0	333.7	500.0	667.4	1000	1334	2000

[mV]

: Each voltage error should be ±0.3%.

4-3. When C6 key is depressed after C5 key is depressed, signal waveforms shown in Figure 1 should be obtained at terminal KV (C3-1).

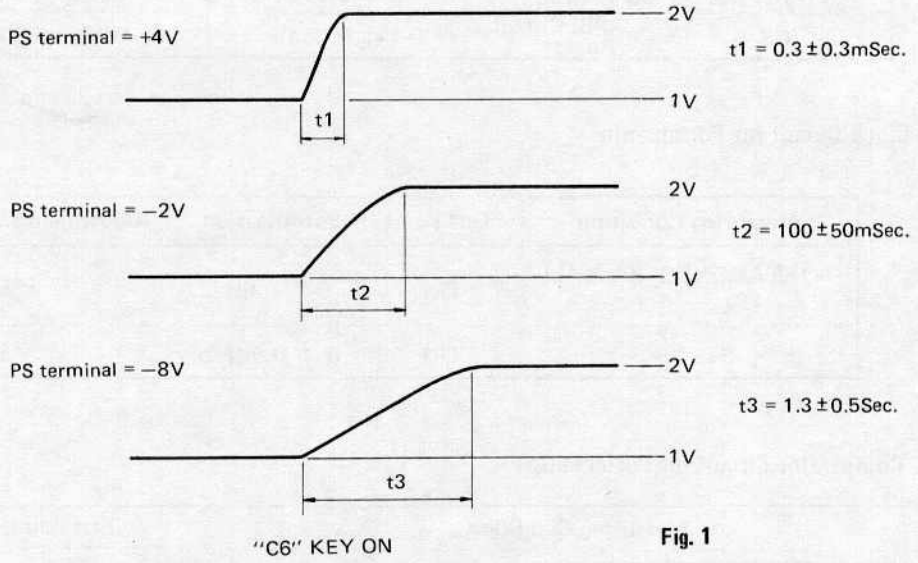


Fig. 1

Note: The specified voltage at terminal PS (C4-6) can be obtained with the PORTAMENT slide adjustment (PVR-45).

4-4. When, in paragraph 4-3, the PORTAMENTO/GLISSANDO switch (PSW-44) is set to GLISSANDO, the signal waveform shown in Fig. 2 should be obtained.

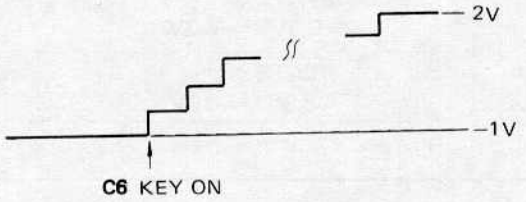


Fig. 2

5. Trigger Buffer

The signal waveform shown in Figure 3 should be obtained at terminal TR (C4-3) when keys C3 and C6 are depressed and released.

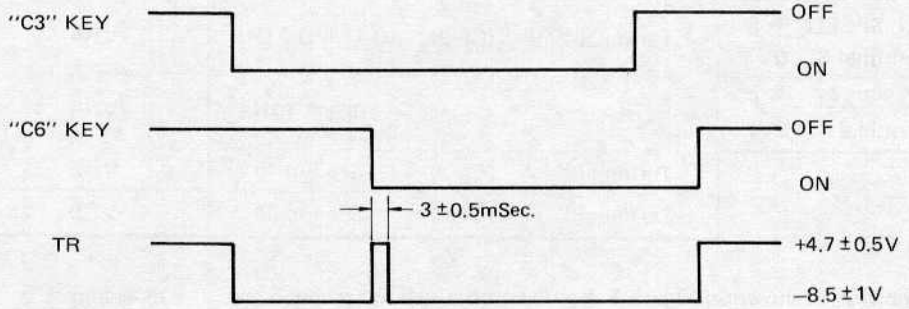


Fig. 3

PA Circuit Board

1. LFO

1-1

Measuring Condition	Test Point	Specification	Adjustment	Remarks
LFO SPEED → S (Terminal S: 0V)	Terminal " ∿ " (C6-2)	0.1 ± 0.01Hz	VR4	See Fig. 1.
LFO SPEED → F (Terminal S: 10V)	"	100 ± 10Hz	VR3	See Fig. 1.
	Terminal " ⋀ " (C6-3)	See Fig. 2	VR5	
	Terminal " ⊓ " (C1-6)	See Fig. 3	VR6	

1-2 Signal waveforms shown in Figure 1 should be obtained at terminals " ⋁ " (C6-4) and " ⊓ " (C1-5).

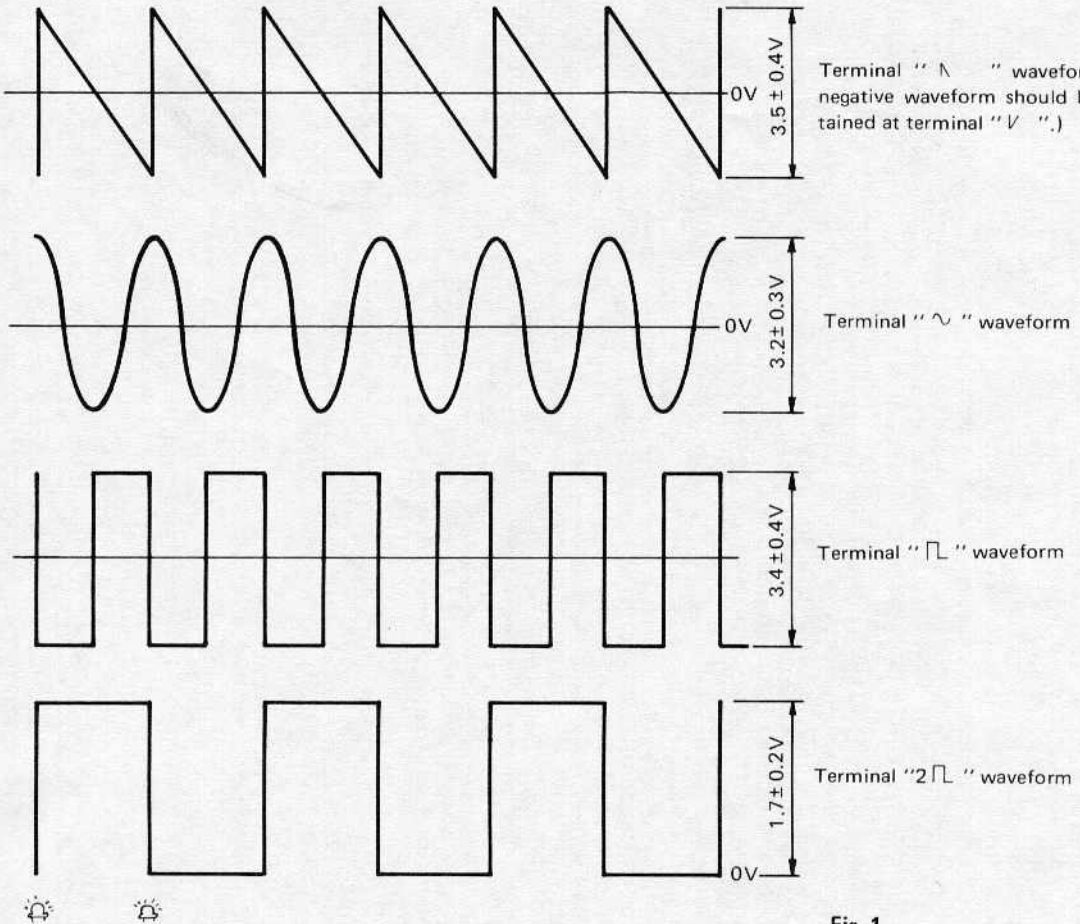


Fig. 1

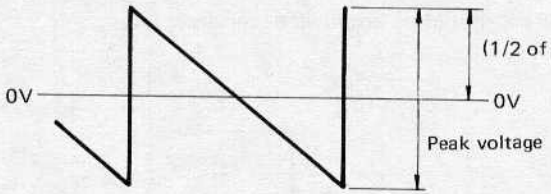


Fig. 2

: Adjust the signal level until the waveform is symmetrical about the ground level.

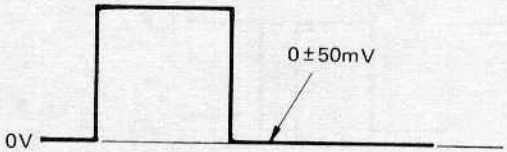


Fig. 3

: Adjust bias voltage as shown in Figure 3.

1-3. When the signal shown in Figure 4 is applied to terminal TR (C7-5), the output at terminal "⌃" should be the one as shown in Figure 5. The signal shown in Figure 6 should be obtained at terminal LT (C7-2).
(LFO SPEED — F)

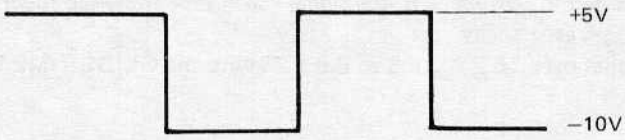


Figure 4 Signal waveform applied to terminal TR (43Hz)

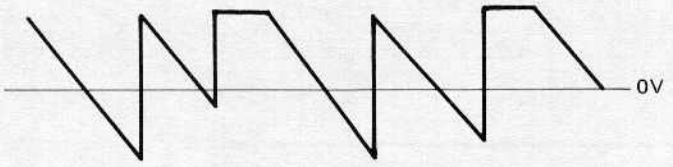


Figure 5 Output signal at terminal "⌃"

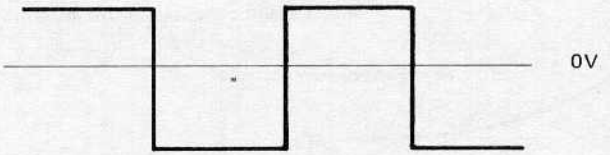


Figure 6 Output signal at terminal LT

1-4. Set the LFO TRIGGER switch (PSW1) to REPEAT. When the signal shown in Figure 7 is applied to terminal TR, the signal waveform shown in Figure 8 should be obtained at terminal LT.

(Force +10V to S terminal)

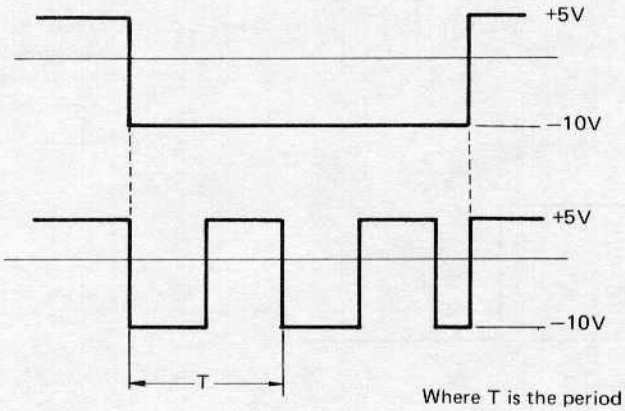


Fig. 7

Fig. 8

Where T is the period of LFO.

2. Noise generator

2-1. Adjust VR7 so that the output of WN terminal is +2 ± 0.5dBm.

3. Glide

a. When the signal shown in Figure 9 is applied to terminal TR, the signal waveforms shown in Figures 10 and 11 should be obtained at terminals G+ and G−respectively.
Time T in the figures should be adjustable over 16.2 ± 3 mS to 6.9 ± 2S with the GLIDE TIME VR (PVR 3).

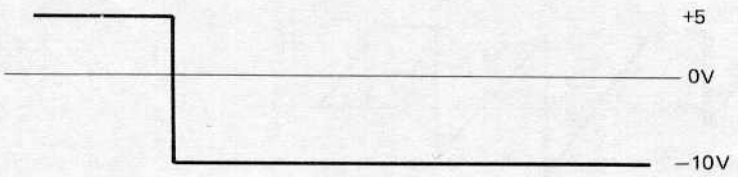


Fig. 9

Output signal waveform at terminal G+

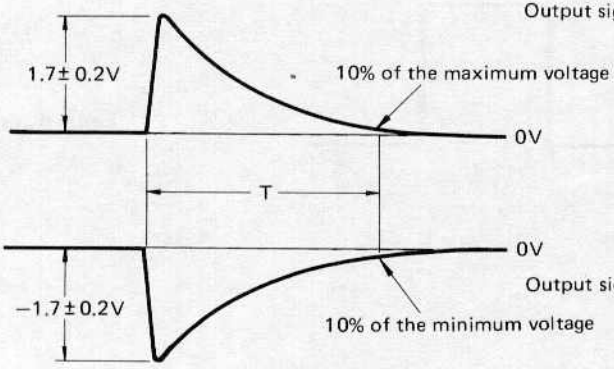


Fig. 10

Output signal waveform at terminal G−

Fig. 11

4. Pitch

4-1. Connect terminal KV with terminal EK. Adjust VR1 and VR2 until the voltage across terminals CV1 and EK, and CV2 and EK is not more than ±0.1mV.

4-2. Depress C6 key to apply a +2V voltage across terminals KV and EK. When the PITCH control (PVR4) is turned fully clockwise, a voltage 3 ± 0.009V should be obtained at terminal CV1. When the PITCH control (PVR11) is turned fully clockwise, a voltage 3 ± 0.009V should be obtained at terminal CV2.

4-3. A voltage 1.45 ± 0.1V should be obtained at terminals CV1 and CV2 when the PITCH controls (PRV4 and PVR11) are turned fully counterclockwise.

PB Circuit Board

1. EXP Circuit, Output Amplifier Circuit, and PHONE Amplifier Circuit:

1-1. (Terminal FC: −15V)
Turn VOLUME control (PVR42) fully clockwise. Apply a sine-wave signal with 1kHz, 1± 0.1Vp-p to terminal I and adjust VR1 until and output of 1kHz, 2 ± 0.2V is obtained at terminal HO (OUTPUT HIGH). At the time, an output of 0.21 ± 0.04Vp-p must be obtained at terminal LO (OUTPUT LOW).

1-2. When the voltage at terminal FC is held to the ground level, the output at terminal HO should vary over more than −36dB.

1-3. When a 2Vp-p output is present at terminal HO, an output of 0.8 ± 0.2Vp-p should be obtained across terminals 0+ and 0− (with 600 Ω load provided across 0+ and 0−).

1-4. An output of 0.38 ± 0.1Vp-p should be obtained at terminals HL and HR when the PHONE level control (PVR43) is turned fully clockwise (with 8 Ω load provided across terminals HL and E, and HR and E).

2. Power Supply Circuit for EXP

−14 ± 1V voltage should be obtained at terminal −15′.

3. FEET Switching Circuit

FEET Switch	FT1 & FT2 terminal voltage	64′ 64″	32′ 32″	16′ 16″	8′ 8″	4′ 4″	2′ 2″
64′	(0 V)	1	0	0	0	0	0
32′	(0.67V)	0	1	0	0	0	0
16′	(1.33V)	0	0	1	0	0	0
8′	(2.00V)	0	0	0	1	0	0
4′	(2.67V)	0	0	0	0	1	0
2′	(3.33V)	0	0	0	0	0	1

1 : +5±0.5V
0 : −10±0.5V

VCO Circuit Board

1. VCO 1

1-1. Set the FEET switch to position4'.
Adjust VR3 until the voltage across terminals TP1 and EK is 0 ± 0.1mV.

64' terminal	−10V
32' terminal	"
16' terminal	"
8' terminal	"
2' terminal	"
4' terminal	+5V

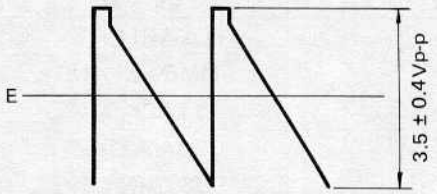


Fig. 1

1-2. While depressing C6 key, adjust VR2 until the signal waveform (4214.6Hz) shown in Figure 1 is obtained at terminal 01. (Voltage across terminals KV and EK: 2 ± 0.001V)

1-3. Set the FEET switch to position 32'. While depressing C6 key, adjust VR1 until a 526.8Hz output is obtained at terminal 01. (Voltage across terminals KV and EK: 250 ± 0.1mV)

1-4. Repeat steps 1-2 and 1-3 alternately until each frequency error is within ±0.1%.

1-5. When a voltage +2V is applied to terminal V1, the output frequency should be 800 ~ 900Hz.

1-6. When C6 key is depressed, frequencies shown in Table 1 should be obtained at terminal 01.

FEET Switch	Terminal 01
2'	8429
4'	4214.6
8'	2107
16'	1053.6
32'	526.8
64'	263.4

1-7. Do the same adjustments for VCO2.

FA Circuit Board

1. EG-VCF

Measuring Condition

BLOCK	FUNCTION	POSITION	Terminal Voltage	
VCF	EG DEPTH	10	Terminal EL	+10V
EG-VCF	POLARITY	⌒	POL	+10V
	TIME EXPAND	NORMAL	T5F	0V
	ATTACK TIME	Note 1	AF	8V
	DECAY TIME	S	DF	+10V
	SUSTAIN LEVEL	0	SF	0V
	RELEASE TIME	S	FRI	+10V
EFFECT	SUSTAIN	S	RF	+10V

Table 1.

Note 1: Adjust ATTACK TIME so the voltage at terminal AF is 8 volts.

1-1. When a key is depressed under the condition shown in Table 1, the signal waveform shown in Fig. 1 should be obtained at TP1.

VR6	Adjusts signal level
VR7	Adjust this until T is 4mS

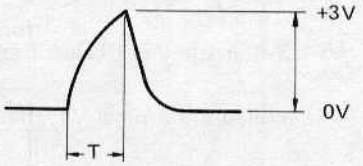


Fig. 1

1-2. Apply +3VDC to terminal AF. Adjust VR9 so period T is much larger than 125mS when it is larger than 125mS, and is much smaller than 125mS when it is smaller than 125mS.

1-3. Repeat steps 1-1 and 1-2 alternately.

1-4. Use VR8 to adjust the ground level of the output signal at terminal TP1.

1-5. When the TIME X5 switch is activated(terminal T5F : 4V)the period of the output signal at TP1 should be multi-plied by 5.5 ± 1.5.

1-6. When the voltage at terminal POL is ground level, the output signal at TP1 should be the inversion of the one shown in Fig. 1, with the level difference within +10%.

2. EG-VCA

Measuring Condition

BLOCK	FUNCTION	POSITION	Terminal Voltage	
VCO	INITIAL LEVEL	0	IL	0V
EG-VCF	TIME EXPAND	NORMAL	T5A	0V
	ATTACK TIME	(Note 2)	AA	8V
	DECAY TIME	S	DA	+10V
	SUSTAIN LEVEL	0	SA	0V
	RELEASE TIME	S	ARI	+10V
EFFECT	SUSTAIN	S	RA	+10V

Note 2: Adjust ATTACK time so the voltage at terminal AA is 8 volts.

2-1. When a Key is depressed, the signal waveform shown in Fig. 2 should be obtained at TP2.

VR16	Adjust signal level
VR11	Adjust this until T is 4mS

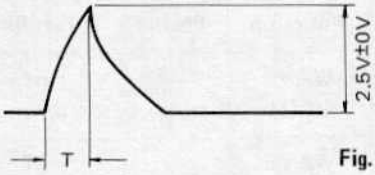


Fig. 2

2-2. Adjust ATTACK TIME, then apply +3VDC to terminal AA.
Adjust VR14 so period T is much larger than 125mS when it is larger than 125mS, and is much smaller than 125mS when it is smaller than 125mS.

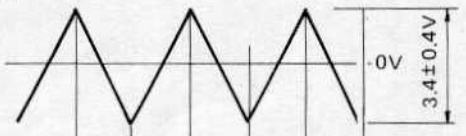
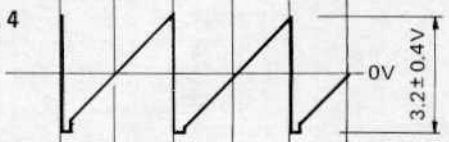
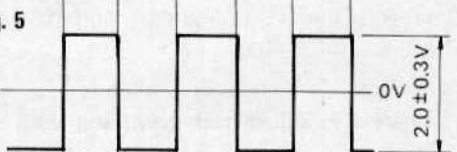
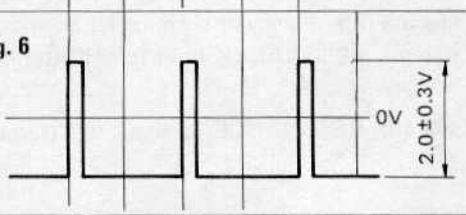
2-3. Repeat steps 2-1 and 2-2 alternately.

2-4. Use VR12 to adjust the ground level of the output signal at terminal TP2.

2-5. When the TIME X5 switch (terminal T5A: 4V) is activated, the period T of the output signal at TP2 should be multi-plied by 5.5 ± 1.5.

3. Wave Shape Converter

WSC1

Block	Function	Position	Terminal Voltage	TP3 Output Signal
VCO	WAVE		Terminal HB1 0V	Fig. 3 
	WAVE		Terminal HB1 1.33V	Fig. 4 
	WAVE		Terminal HB1 2.67V	Fig. 5 
	WAVE PW	90	Terminal P1 1.5V	Fig. 6 

Note: WSC1 FEET 8' key C5.
WSC2 FEET 8' key C4.

4. Mixing Circuit

Block	Function	Position	Terminal Voltage		Adjustment
VCO1 MIXER	WAVE VCO1	∧ 10	HB1 C1	0V +10V	Adjust VR1 until a triangular signal of 3.4 ± 0.4V is obtained at TP5. (See Fig. 3.)
VCO2 MIXER	WAVE VCO2	∧ 10	HB2 C2	0V +10V	Adjust VR2 until a triangular signal of 3.4 ± 0.4V is obtained at TP5.
MIXER	NOISE	10	C3	+10V	* Apply a sine-wave signal of 1kHz, 3Vp-p to terminal NI. Adjust VR3 until a sine-wave signal of 3Vp-p is obtained.
VCA	∿ 1	10	C4	+10V	Adjust VR10 until a sine-wave signal of 3Vp-p is obtained at TP6.

4. VCF

Measuring Condition

Block	Function	Position	Terminal Voltage	
EFFECT	BRILLIANCE	0	BR	0V
VCF	MODULATION DEPTH	0	CM	0V
	EG-DEPTH	0	EL	0V
	FILTER MODE	LP	FC	0V
	CUT OFF FREQ.	Adjust the CUT OFF FREQ. until the voltage at terminal CO is 5V.	CO	5V
	RESONANCE	Adjust the RESONANCE until the voltage at terminal RE is 5V.	RE	5V
MIXER	VCO1	0	C1	0V
	VCO2	0	C2	0V
	NOISE	10	C3	+10V
VCA	∿ 1	0	C4	0V

- Apply a sine-wave signal of 1kHz, 3Vp-p to terminal NI
- Depress C4 key. (Terminal KV: 500mV)

5-1. Use VR4 to adjust peak point and VR5 to adjust peak level until an output of 1kHz, 1.75Vp-p is obtained at TP7.

5-2. Set the voltage at terminal CO to 7V. The peak frequency at TP7 should be 4 ± 1kHz. (Check peak point while the input frequency at terminal NI is varied.)

5-3. Set the RESONANCE level to "H" (terminal RE: 10V). An output of 0.6 ± 0.15Vp-p should be obtained at TP7.

5-4. Set the RESONANCE level to "L" (terminal RE: 0V). An output of 6 ± 1Vp-p should be obtained at TP7.

5-5. Set VCO1 block output waveform to ⊓ wave.
Set MIXER block output noise level to 0.
Adjust VCO1 until a ⊓ wave of 3Vp-p is obtained at TP3.
Signal waveforms shown in Fig. 7 to 9 should be obtained at TP7 in the corresponding positions of the FILTER MODE switch.

FILTER MODE LP
(FC terminal voltage 0V)

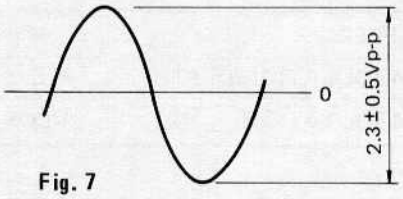


Fig. 7

FILTER MODE BL
(FC terminal voltage 1.33V)

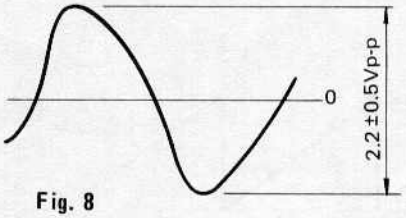


Fig. 8

FILTER MODE HP
(FC terminal voltage 2.67V)

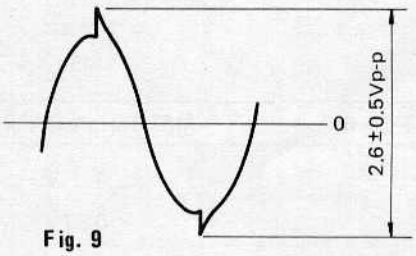


Fig. 9

6. VCA

Measuring Condition

Block	Function	Position	Terminal Voltage
VCA	INITIAL LEVEL	Adjust INITIAL LEVEL until the voltage at terminal IL is 3V.	IL 3V
EG-VCA	ATTACK TIME	S	AA 10V
	DECAY TIME	S	DA 10V
	SUSTAIN LEVEL	0	SA 0V
	RELEASE TIME	S	RA 10V

6-1. After the VCF circuit adjustment in paragraph 4-1 is completed, adjust VR15 until the output at terminal 01 is 0.9Vp-p.

MOD Circuit Board

1. LFO Modulation Function Selector – VCO1

Measuring Condition

Block	Function	Position	Terminal Voltage
LFO	SPEED	F	S +10V
VCO1	MODULATION DEPTH	10	MD1 +10V
EFFECT	MODULATION	VCO	MW 0V

1-1. Set VCO1 block MODULATION FUNCTION to " ◺ ".
Use VR1 to adjust bias level and VR2 to adjust signal level until the signal waveform shown in Fig. 1 is obtained at terminal V1.

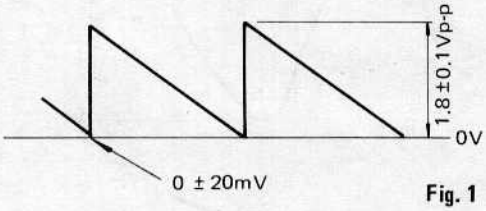
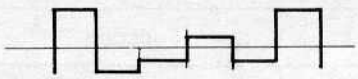


Fig. 1

Modulation Function	MFI Terminal Voltage	V1 Terminal Output
∿	0 V	∿ wave of 3.2Vp-p
◺	0.57V	Wave " ◺ " in Fig. 1
◿	1.14V	
⊓	1.71V	Wave " ⊓ " of 3.0Vp-p
S/H	2.29V	
GL^+	2.86V	
GL^-	3.43V	

2. LFO Modulation Function Selector – VCO2

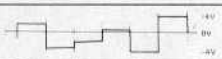
Do the same adjustments as above.

3. LFO Modulation Function Selector – VCF

Measuring Condition

Block	Function	Position	Terminal Voltage
LFO	SPEED	F	S +10V
VCF	MODULATION DEPTH	10	FD +10V
EFFECT	MODULATION	VCO	FW 0V

3-1. Set VCF block MODULATION FUNCTION to "◺".
Adjust VR9 until waveform "◺" of 3.5 +0.2Vp-p is obtained at terminal F.

Modulation Function	MF Terminal Voltage	F Terminal Output
∿	0 V	3.2 ± 0.4Vp-p Waveform "∿"
◺	0.8V	3.5 ± 0.2Vp-p Waveform "◺"
◿	1.6V	" Waveform "◿"
⊓	2.4V	3.0 ± 0.4Vp-p Waveform "⊓"
S/H	3.2V	

4. LFO Modulation Function Selector – VCA

Block	Function	Position	Terminal Voltage
LFO	SPEED	F	S +10V
VCA	MODULATION DEPTH	10	AD +10V

4-1. Set VCA block MODULATION FUNCTION to "∿".
Adjust VR10 until a ∿ wave signal of 2.6 ± 0.1Vp-p is obtained at terminal A.

Modulation Function	MA Terminal Voltage	A Output terminal
∿	0V	2.6 ± 0.1Vp-p Wave "∿"
◺	1V	2.85 ± 0.3Vp-p Wave "◺"
◿	2V	2.85 ± 0.3Vp-p Wave "◿"
⊓	3V	2.5 ± 0.3Vp-p Wave "⊓"

5. Wave Shape Converter

Block	Function	Position	Terminal Voltage
VCO1	MODULATION FUNCTION	∿	
	PWM (LFO ∿)	10	PD1 +4V
	PW	50	P1 0V

5-1. Use VR3 to adjust bias level and VR4 to adjust signal level until the signal waveform shown in Fig. 2 is obtained at terminal PO1.

5-2. The output shown in Fig. 3 should be obtained at terminal PO1 when the PWM is to 0 (terminal PD1: 0V), and the PW is set to 90 (terminal P1: 4V).

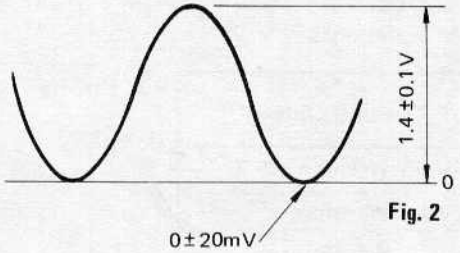


Fig. 2

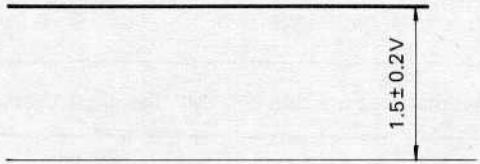


Fig. 3

PGM Circuit

1. Clock Generator

Adjust VR1 until a square wave of 100 ± 0.5kHz is obtained at terminal ϕ.

2. Initial Clear Circuit

When the unit is powered, the signal waveform shown in Fig. 1 should be obtained at TP1.

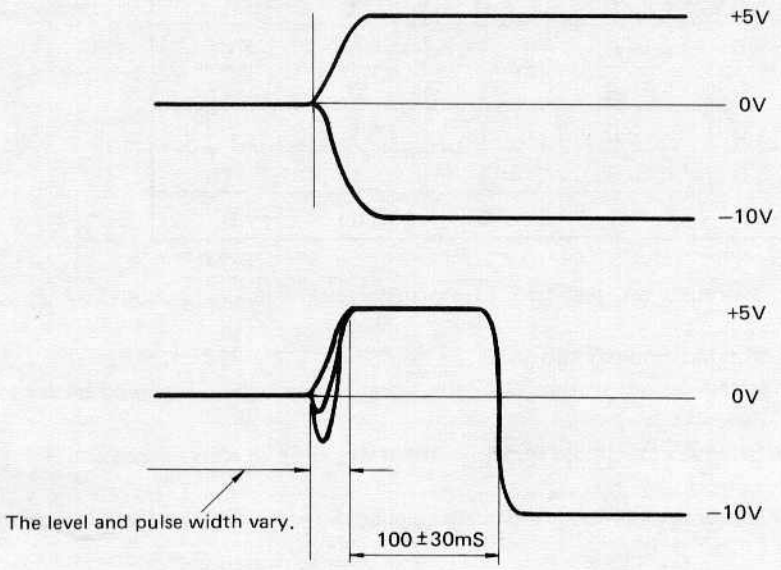


Fig. 1

3. Mode Selector and Mode-Display

3-1. The signal waveform shown in Fig. 1 should be obtained at TP2 and TP3 when Program Selector button "1" is pressed on. At the time, the Program Selector button "1" indicator should be on.
Even when Program Selector button "1" is released to OFF, TP3 should keep its former state with the indicator should be on.

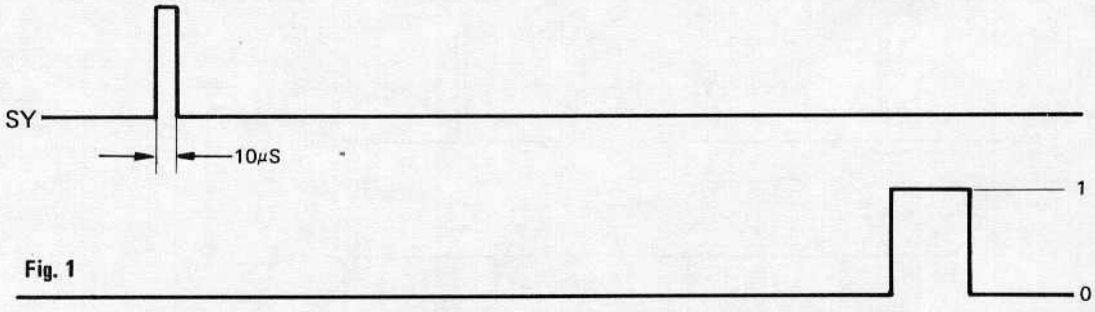


Fig. 1

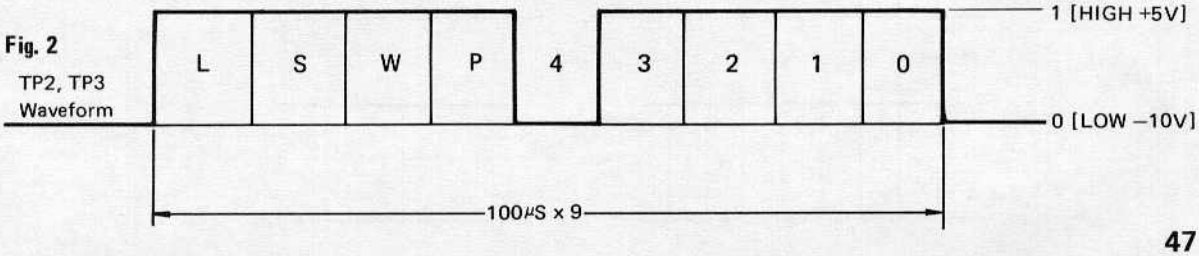


Fig. 2
TP2, TP3
Waveform

3-2. When Program Selector buttons "2" to "8" are pressed on, the following logical levels should be obtained at TP2 and TP3.

Program Selector Button	4	3	2	1	0
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0

Table 1

3-3. When the PANEL button is pressed on, section P of the signal shown in Fig. 2 should be set to "1" and be obtained at TP2 and TP3.
At the time, the PANEL button indicator should go on.

3-4. When the WRITE button is pressed on, section W of the signal shown in Fig. 2 should be set to "1" and be obtained at TP2.
At the time, TP3 and PANEL indicator should remain in the states given in above paragraph 3-3.

3-5. When a +5VDC is applied to terminal S, section S of the signal shown in Fig. 2 should be set to "1" and be obtained at TP2 and TP3.
At the time, the STORE indicator should go on. When the +5VDC is removed from terminal S, the STORE indicator remains on for 31.45 seconds, applying a +5VDC to TP1. At the time, section P of the signal shown in Fig. 2 should be set to "1" and be obtained at TP3; the PANEL indicator should go on.

3-6. When a +5VDC is applied to terminal L, section L of the signal shown in Fig. 2 should be set to "1" and be obtained at TP2. At the time, TP3 and indicators should remain in the states given in above paragraph 3-5.

4. Analog Multiplexer, A/D and D/A Converters

4-1. Set LFO-SPEED to "F". (+4VDC is applied to terminal 1.) Preset each parameter so terminals 2 to 32 are all held to the ground level.
At the time, section 1 of the signal shown in Fig. 3 should be set to "H" (4V) and be obtained at TP4.

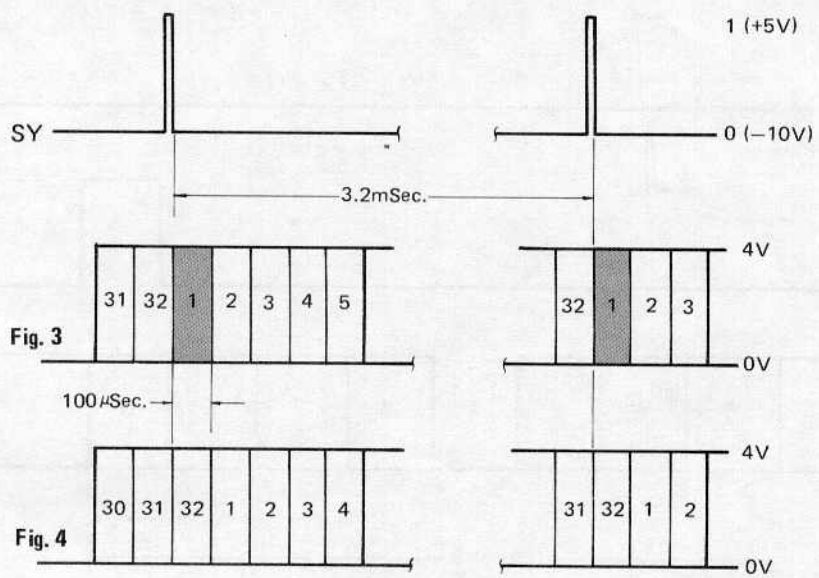


Fig. 3

Fig. 4

4-2. Do the same for other parameters.
4-3. The signal shown in Fig. 4, which is 100S delayed from that at TP4, should be obtained at terminal AO.
4-4. When the LFO-SPEED is varied (the voltage applied to terminal 1 is varied), the voltage at terminal AO should follow the voltage variation at less than 20mV step.

DM Circuit Board

1-1. Each signal shown in Fig. 1 should be obtained at TP1, TP2, and TP3.

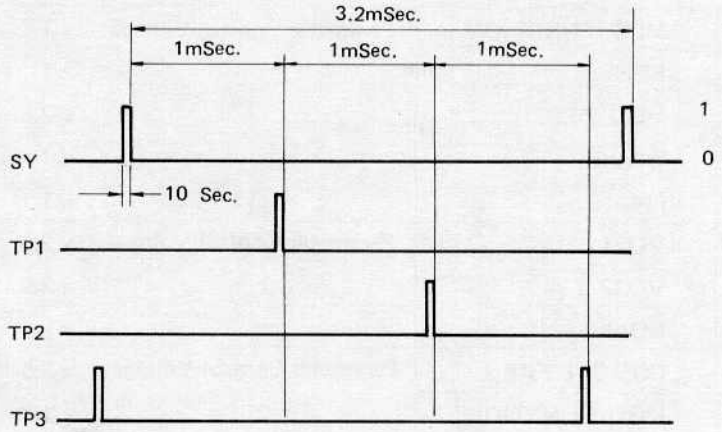


Fig. 1

1-2. The voltages listed in Table 1 should be obtained at terminals 1 to 32.

Table 1

No.	Block	Function	Output Voltage at Terminals 1 to 32 [V]	
1	LFO	SPEED	Parameter Control Voltage	x 2.5
2	VCO1	MOD. FUNCTION		x 1
3	"	FEET		x 1
4	"	MOD. DEPTH		x 2.5
5	"	WAVE		x 1
6	"	PW		x 1
7	VCO2	MOD. FUNCTION	Parameter Control Voltage	x 1
8	"	FEET		x 1
9	"	MOD. DEPTH		x 2.5
10	"	WAVE		x 1
11	"	PW		x 1
12	MIXER	VCO1	Parameter Control Voltage	x 2.5
13	"	VCO2		x 2.5
14	"	NOISE		x 2.5
15	VCF	COT OFF FREQ.	Parameter Control Voltage	x 2.5
16	"	MOD. FUNCTION		x 1
17	"	RESONANCE		x 2.5
18	"	MOD. DEPTH		x 2.5
19	"	EG DEPTH		x 2.5
20	"	HP/BP/LP		x 1
21	VCA	∿ 1	Parameter Control Voltage	x 2.5
22	"	MOD. FUNCTION		x 1
23	"	DEPTH		x 2.5
24	EG-VCF	EG/POLE	Parameter Control Voltage	x 1
25	"	ATTACK TIME		x 2.5
26	"	DECAY TIME		x 2.5
27	"	SUSTAIN LEVEL		x 2.5
28	"	RELEASE TIME		x 2.5
29	EG-VCA	ATTACK TIME	Parameter Control Voltage	x 2.5
30		DECAY TIME		x 2.5
31		SUSTAIN LEVEL		x 2.5
32		RELEASE TIME		x 2.5

Eg. 1. The LFO-SPEED terminal voltage is given as follows:
Parameter control voltage x 2.5 = 4 x 2.5 = 10(V)

* The parameter control voltage for the LFO-SPEED is variable from 0 to 4V.
* The above example shows the condition where the SPEED control is set to "F".

PL Circuit Board

1. Key Volt Generator

EFFECT Block PITCH (PSW48)	Test Point	Specification	Adjustment
OCTAVE	Terminal PP	−2 ± 0.001	VR1
FIFTH	Terminal PP	−0.997 ± 0.003	
THIRD	Terminal PP	−0.520 ± 0.003	
OCTAVE	Terminal PN	+1 ± 0.001	VR2
FIFTH	Terminal PN	+0.665 ± 0.003	
THIRD	Terminal PN	+0.413 ± 0.003	

EFFECT Block PITCH BEND (PVR49)	Test Point	Specification	Adjustment
0 (Terminal PO 0V)	Terminal VR	+2 ± 0.001	VR3
+ ▲ (Terminal PO −2 ± 0.001V)	Terminal VR	+4 ± 0.005	

Set the PITCH switch (PSW48) to OCTAVE.

2. Modulation Buffer

EFFECT Block MODULATION (PSW50)	Test Point	Specification [Note 1] [V]	Specification [Note 2] [V]
VCO	Terminal MO Terminal MF	+10.4 ± 0.5 0	+0.61 ± 0.05 0
VCO + VCF	Terminal MO Terminal MF	+10.4 ± 0.5 +10.4 ± 0.5	+0.61 ± 0.05 +0.61 ± 0.05
VCF	Terminal MO Terminal MF	0 +10.4 ± 0.5	0 +0.61 ± 0.05

Note 1: The Modulation wheel (PVR51) is turned fully upward.

Note 2: The Modulation wheel (PVR51) is turned fully downward.

3. Portamento Control

Connect the foot switch to the PORTAMENT FOOT SW jack.
Set PORTAMENTO (PRV45) to "L".
When the foot switch is released off, a -10^{+1}_{0} volts should be obtained at terminal POR.
When the foot switch is pressed on, a $+5^{+0}_{-1}$ volts should be obtained at terminal POR.
When the PORTAMENTO/GLISSAND switch (PSW44) is set to GLISSAND, a $+5 \pm 0.1$VDC should be obtained at terminal PG.

4. Sustain Control

Connect the foot switch to the SUSTAIN FOOT SW jack.
Set the RELEASE TIME switch for EG-VCF and EG-VCA to "S'. (Terminals FRI and ARI: +10V)
Set the SUSTAIN switch (PVR47) to "S".
When the foot switch is released off, a $+10 \pm 1$VDC should be obtained at terminals FRO and ARO.
When the SUSTAIN switch is set to "L", a 0 ± 1VDC should be obtained at terminals FRO and ARO.
When the foot switch is pressed on, a $+10 \pm 1$VDC should be obtained at terminals FRO and ARO.

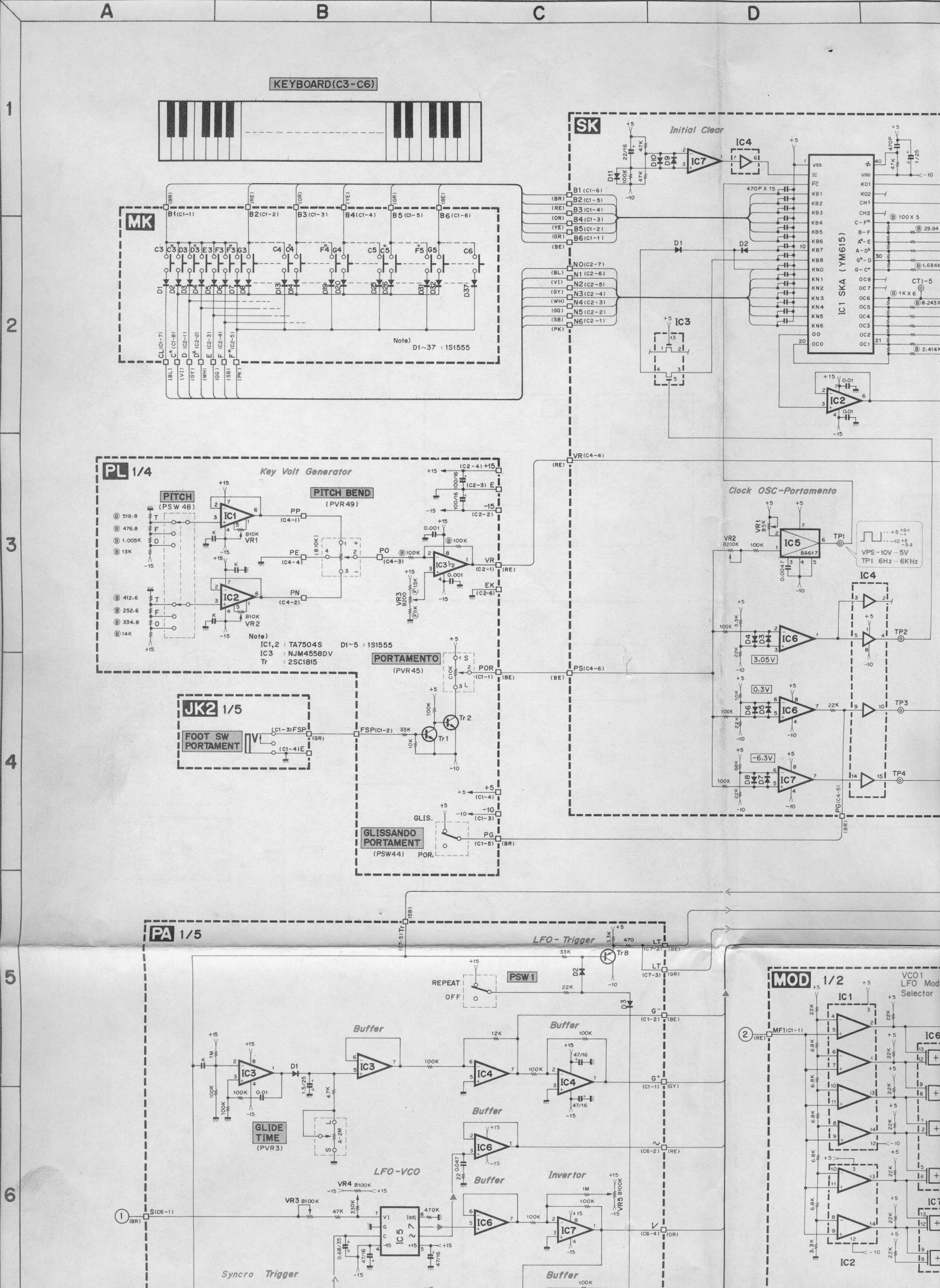
5. Brilliance Control

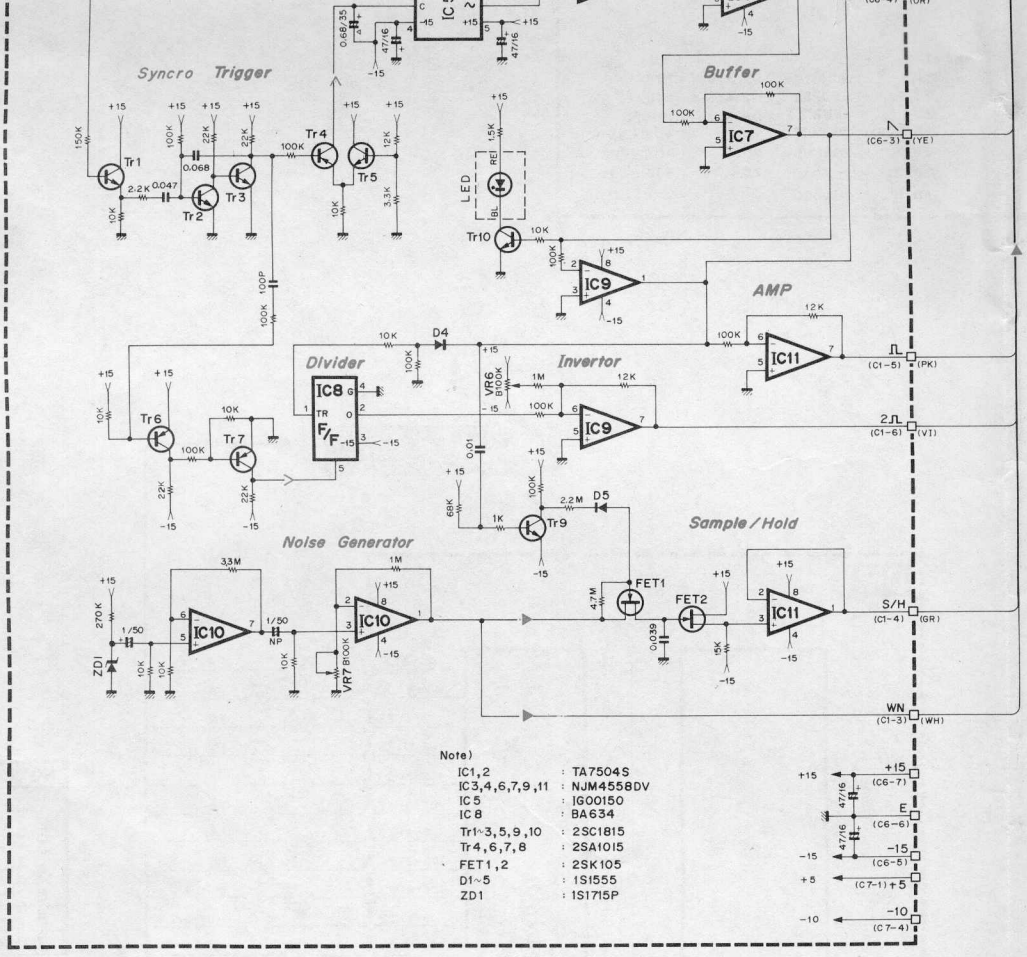
When the BRILLIANCE switch (PVR46) is set to "+" position, a $+15 \pm 0.1$VDC should be obtained at terminal BR.
When the BRILLIANCE switch is set to the "−" position, a -15 ± 0.1VDC should be obtained at terminal BR.

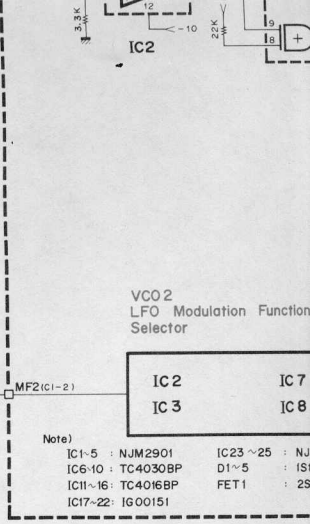
Parameter Control Voltage List

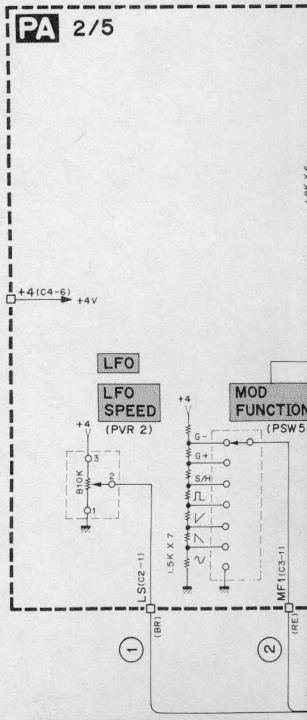
Circuit Board	Block	Function	Position	Voltage [V]	Remarks
PA	VCO1, 2	FEET	64′	0	Measure the voltage across terminals FV1 (C3-3) and FV2 (C5-2).
			32′	0.67	
			16′	1.33	
			8′	2.00	
			4′	2.67	
			2′	3.33	± 10%
		WAVE	∧	0	Terminal WV1 (C3-6)
			◸	1.33	Terminal WV2 (C5-5)
			⊓	2.67	± 10%
		MODULATION FUNCTION	∿	0	Terminal MF1 (C3-1)
			◸	0.57	Terminal MF2 (C4-7)
			◺	1.14	
			⊓	1.71	
			S/H	2.29	
			G^+	2.86	
			G^-	3.43	± 10%
		MODULATION DEPTH	0 ~ 10	0 ~ 4	Terminal MD1 (C3-2) Terminal MD2 (C5-1)
		PW (PULSE WIDTH)	50 ~ 90	0 ~ 4	Terminal P1 (C3-5) Terminal P2 (C5-4)
	LFO	SPEED	S ~ F	0 ~ 4	Terminal LS (C6-1)
PB	MIXER	VCO1	0 ~ 10	0 ~ 4	Terminal VO1 (C2-3)
		VCO2	0 ~ 10	0 ~ 4	Terminal VO2 (C2-1)
		NOISE	0 ~ 10	0 ~ 4	Terminal WN (C8-1)
	VCF	CUT OFF FREQ.	L ~ H	0 ~ 4	Terminal (C2-4)
		RESONANCE	L ~ H	0 ~ 4	Terminal RE (C2-5)
		FILTER MODE	LP	0	Terminal FM (C3-5)
			BP	1.33	
			HP	2.67	± 10%
		MODULATION FUNCTION	∿	0	Terminal MF (C3-6)
			◸	0.8	
			◺	1.6	
			⊓	2.4	
			S/H	3.2	± 10%

Circuit Board	Block	Function	Position	Voltage [V]	Remarks
PB	VCF	MODULATION DEPTH	0 ~ 10	0 ~ 4	Terminal MD (C3-8)
		EG DEPTH	0 ~ 10	0 ~ 4	Terminal ED (C2-7)
	EG-VCF	POLARITY	⌒	4	Terminal PL (C8-7)
			⌣	0	
		TIME EXPAND	NORMAL	0	Terminal X5 (C8-6)
			TIME X5	4	
		ATTACK TIME	S ~ L	4 ~ 0	Terminal FA (C8-2)
		DECAY TIME	S ~ L	4 ~ 0	Terminal FD (C8-3)
		SUSTAIN LEVEL	0 ~ 10	0 ~ 3.4 ± 0.4	Terminal FS (C8-4)
		RELEASE TIME	S ~ L	4 ~ 0	Terminal FR (C8-5)
	VCA	∿ 1	0 ~ 10	0 ~ 4	Terminal 1 (C3-7)
		MODULATION FUNCTION	∿	0	Terminal MF (C3-6)
			◺	1	
			◿	2	
			⊓	3	± 10%
		MODULATION DEPTH	0 ~ 10	0 ~ 4	Terminal MD (C3-8)
		INITIAL LEVEL	0 ~ 10	0 ~ 4	Terminal IL (C3-9)
	EG-VCA	TIME EXPAND	NORMAL	0	Terminal X5 (C5-5)
			TIME X5	4	
		ATTACK TIME	S ~ L	4 ~ 0	Terminal AA (C5-1)
		DECAY TIME	S ~ L	4 ~ 0	Terminal AD (C5-2)
		SUSTAIN LEVEL	0 ~ 10	0 ~ 3.4 ± 0.4	Terminal AS (C5-3)
		RELEASE TIME	S ~ L	4 ~ 0	Terminal AR (C5-4)


KEYBOARD(C3-C6)
MK
SK
Initial Clear
IC1 SKA (YM615)
IC4
IC7
IC3
IC2
PL 1/4
Key Volt Generator
PITCH
(PSW 48)
PITCH BEND
(PVR49)
PORTAMENTO
(PVR45)
GLISSANDO
PORTAMENT
(PSW44)
JK2 1/5
FOOT SW
PORTAMENT
Note)
IC1,2 : TA7504S
IC3 : NJM4558DV
Tr : 2SC1815
D1~5 : 1S1555
D1~37 : 1S1555
Clock OSC-Portamento
IC5
BA617
VPS-10V—5V
TP1 6Hz—6KHz
IC6
3.05V
0.3V
-6.3V
TP2
TP3
TP4
PA 1/5
LFO-Trigger
Tr8
PSW1
REPEAT
OFF
Buffer
GLIDE
TIME
(PVR3)
LFO-VCO
Invertor
Syncro Trigger
MOD 1/2
VCO1
LFO Mod
Selector
IC1
IC2
IC6
IC7







SK

C1

Pin No.	Pin Name	Wire Color	Destination
1	B6	BE	MK-B6 (C1-6)
2	B5	GR	MK-B5 (C1-5)
3	B4	YE	MK-B4 (C1-4)

PA

C1

Pin No.	Pin Name	Wire Color	Destination
1	G^+	GY	MOD-G^+ (C2-8)
2	G^-	BE	MOD-G^- (C2-6)
3	WN	SWH	FA-NI (C6-1)

C5

Pin No.	Pin Name	Wire Color	Destination
1	MD2	WH	PGM-9 (C6-4)
2	FV2	GY	PGM-8 (C6-3)
3	PD2	RE	MOD-PD2 (C3-4)

C1

Pin No.	Pin Name	Wire Color	Destination
1	−10	BE	DC-−10 (C1-10)
2	−10	BE	PA-−10 (C7-4)
3	E	BL	DC-DE (C1-8)

SK

C1

Pin No.	Pin Name	Wire Color	Destination
1	B6	BE	MK-B6 (C1-6)
2	B5	GR	MK-B5 (C1-5)
3	B4	YE	MK-B4 (C1-4)
4	B3	OR	MK-B3 (C1-3)
5	B2	RE	MK-B2 (C1-2)
6	B1	BR	MK-B1 (C1-1)

C2

Pin No.	Pin Name	Wire Color	Destination
1	N6	PK	MK-F#(C2-5)
2	N5	SB	MK-F (C2-4)
3	N4	GG	MK-E (C2-3)
4	N3	WH	MK-D#(C2-2)
5	N2	GY	MK-D (C2-1)
6	N1	VI	MK-C#(C1-8)
7	N0	BL	MK-CL (C1-7)

C3

Pin No.	Pin Name	Wire Color	Destination
1	KV	OR	JK2-KV (C2-1)
2	+15	BR	DC-+15 (C4-1)
3	−15	BR	DC-−15 (C4-5)
4	DE	BL	DC-DE (C4-8)
5	−10	BE	DC-−10 (C4-10)
6	−10	BE	PL-−10 (C1-3)
7	+5	GR	DC-+5 (C4-7)
8	+5	GR	PL-+5 (C1-4)

C4

Pin No.	Pin Name	Wire Color	Destination
1	EK	BL	DC-AE (C4-3)
2	EK	BL	PL-EK (C2-6)
3	TR	BE	JK1-TRF (C2-7)
4	VR	RE	PL-VR (C2-1)
5	PG	BR	PL-PG (C1-5)
6	PS	BR	PL-POR (C1-1)

PA

C1

Pin No.	Pin Name	Wire Color	Destination
1	G+	GY	MOD-G+ (C2-8)
2	G-	BE	MOD-G- (C2-6)
3	WN	SWH	FA-NI (C6-1)
4	S/H	GR	MOD-S/H (C2-5)
5	⊓	WH	MOD-⊓ (C2-3)
6	2⊓	VI	MOD-2⊓ (C2-7)

C2

Pin No.	Pin Name	Wire Color	Destination
1	LS	BR	PGM-1 (C6-10)
2	+15	BR	PA-+15 (C4-2)
3	CV1	SOR	VCO-KV (C2-2)
4	−15	YE	PA-−15 (C4-5)
5	KV	SRE	JK1-KV (C2-1)
6	EK	SRES	
7	EK	BL	JK2-EK (C2-4)
8	EK	BL	VCO-EK (C1-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	MF1	RE	PGM-2 (C6-9)
2	MD1	YE	PGM-4 (C6-7)
3	FV1	OR	PGM-3 (C6-8)
4	PD1	BR	MOD-PD1 (C3-3)
5	P1	BE	PGM-6 (C6-1)
6	WV1	GR	PGM-5 (C6-6)

C4

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DC-+15 (C3-1)
2	+15	BR	PA-+15 (C2-2)
3	CV2	RE	VCO-KV (C1-2)
4	−15	YE	DC-−15 (C3-5)
5	−15	YE	PA-−15 (C2-4)
6	+4	VI	PB-+4 (C3-4)
7	MF2	VI	PGM-7 (C6-2)

C5

Pin No.	Pin Name	Wire Color	Destination
1	MD2	WH	PGM-9 (C6-4)
2	FV2	GY	PGM-8 (C6-3)
3	PD2	RE	MOD-PD2 (C3-4)
4	P2	BR	PGM-11 (C8-1)
5	WV2	PK	PGM-10 (C6-5)

C6

Pin No.	Pin Name	Wire Color	Destination
1	S	BR	DM-1 (C5-9)
2	∿	RE	MOD-∿ (C2-1)
3	⋀	YE	MOD-⋀ (C2-4)
4	⋁	OR	MOD-⋁ (C2-2)
5	−15	YE	DC-−15 (C1-5)
6	E	BL	DC-AE (C1-3)
7	+15	BR	DC-+15 (C1-1)

C7

Pin No.	Pin Name	Wire Color	Destination
1	+5	GR	PB-+5 (C1-5)
2	LT	BE	JK2-TR (C2-5)
3	LT	GR	FA-T1 (C3-6)
4	−10	BE	PB-−10 (C1-2)
5	TR	SB	JK1-TR (C2-6)

C1

Pin No.	Pin Name	Wire Color	Destination
1	−10	BE	DC-−10 (C1-10)
2	−10	BE	PA-−10 (C7-4)
3	E	BL	DC-DE (C1-8)
4	+5	GR	DC-+5 (C1-7)
5	+5	GR	PA-+5 (C7-1)
6	FT1	OR	DM-3 (C5-7)
7	FT2	GY	DM-8 (C5-2)

C2

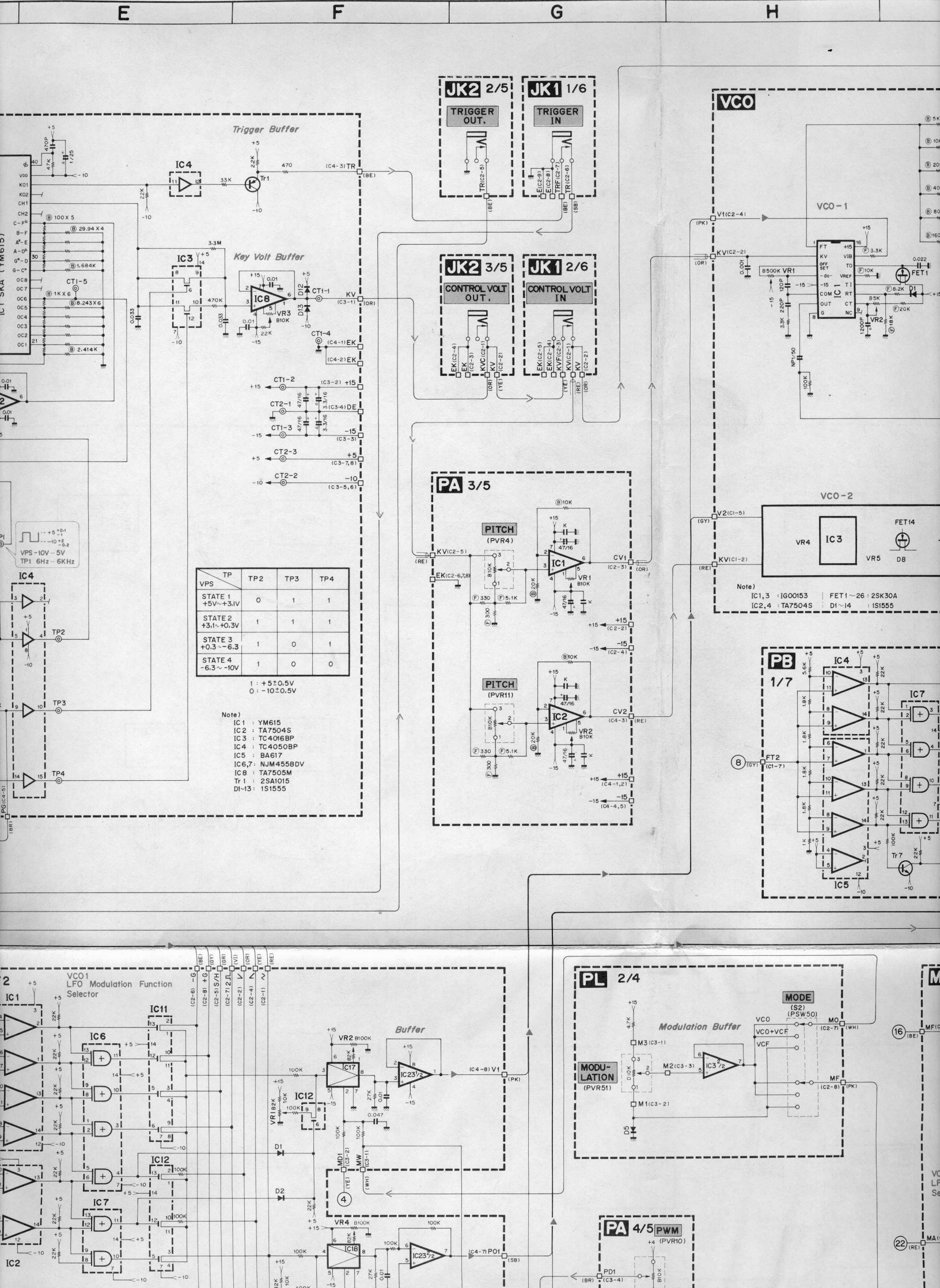
Pin No.	Pin Name	Wire Color	Destination
1	VO2	OR	PGM-13 (C7-8)
2	MF	BE	PGM-16 (C7-5)
3	VO1	RE	PGM-12 (C7-9)
4	CO	GR	PGM-15 (C7-6)
5	RE	VI	PGM-17 (C7-4)
6	MD	GY	PGM-18 (C7-3)
7	ED	WH	PGM-19 (C7-2)
8	−15'	YE	JK1-−15' (C1-7)

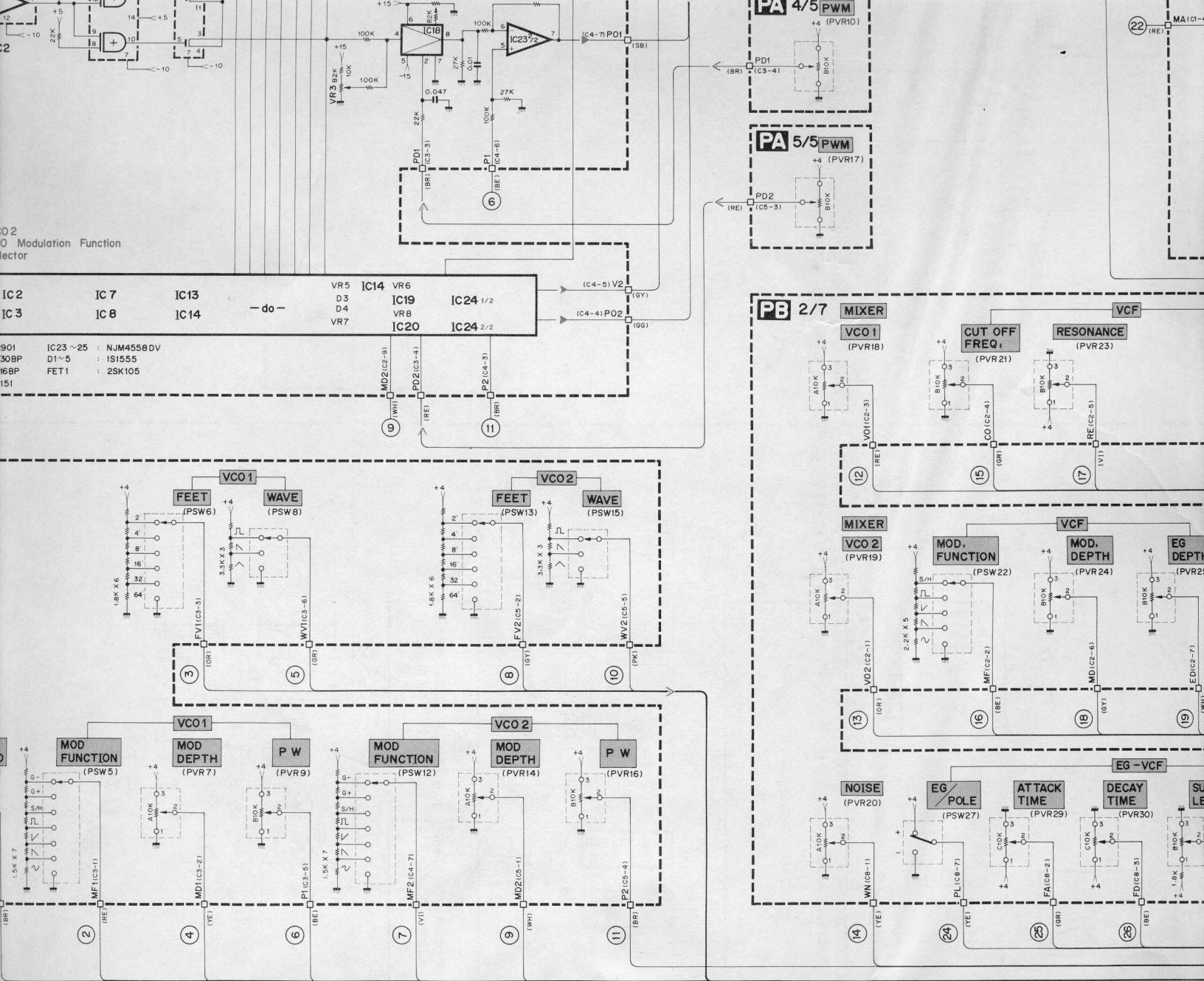
C3

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	DC-−15 (C1-6)
2	E	BL	DC-AE (C1-4)
3	+15	BR	DC-+15 (C1-2)
4	+4	VI	PA-+4 (C4-6)
5	FM	PK	PGM-20 (C7-1)
6	MF	RE	PGM-22 (C9-3)
7	1	BR	PGM-21 (C9-4)
8	MD	OR	PGM-23 (C9-2)
9	IL	GG	FA-IL (C3-2)
10	I	SRE	FA-O1 (C5-1)
11	FC	OR	JK1-PC (C1-6)

C4

Pin No.	Pin Name	Wire Color	Destination
1	HR	RE	HP-HR
2	HL	OR	HP-HL
3	HO	SBE	JK1-HO (C1-1)
4	E	SBES	
5	E	SVIS	
6	LO	SVI	SK2-LO (C1-1)
7	E	BL	JK1-E (C1-4)
8	E	BL	FA-E (C5-3)
9	O-	RE	XLR-3
10	O+	WH	XLR-2


JK2 2/5
TRIGGER OUT.
JK1 1/6
TRIGGER IN
JK2 3/5
CONTROL VOLT OUT.
JK1 2/6
CONTROL VOLT IN
Trigger Buffer
Key Volt Buffer
IC4
IC3
IC8
VR3 B10K
CT1-5
CT1-1 KV (C3-1)
CT1-4 (C4-1)EK (C4-2)EK
CT1-2 +15 (C3-2)
CT2-1 (C3-4)DE
CT1-3 -15 (C3-3)
CT2-3 +5 (C3-7,8)
CT2-2 -10 (C3-5,6)
(C4-3)TR
VPS-10V-5V
TP1 6Hz-6KHz
TP2
TP3
TP4
PG(C4-5)
STATE 1 +5V~+3.1V
STATE 2 +3.1V~+0.3V
STATE 3 +0.3V~-6.3V
STATE 4 -6.3V~-10V
1 : +5±0.5V
0 : -10±0.5V
Note)
IC1 : YM615
IC2 : TA7504S
IC3 : TC4016BP
IC4 : TC4050BP
IC5 : BA617
IC6,7 : NJM4558DV
IC8 : TA7505M
Tr1 : 2SA1015
D1~13 : 1S1555
PA 3/5
PITCH (PVR4)
PITCH (PVR11)
IC1
IC2
VR1 B10K
VR2 B10K
KV(C2-5)
EK(C2-6,7,8)
CV1 (C2-3)
CV2 (C4-3)
+15 (C2-2)
-15 (C2-4)
+15 (C4-1,2)
-15 (C4-4,5)
VCO
VCO-1
VCO-2
V1(C2-4)
KV(C2-2)
V2(C1-5)
KV(C1-2)
VR1 B500K
VR2
FET1
FET14
D1
D8
Note)
IC1,3 : IG00153
IC2,4 : TA7504S
FET1~26 : 2SK30A
D1~14 : 1SI555
PB 1/7
IC4
IC5
IC7
Tr7
FT2 (C1-7)
VCO1 LFO Modulation Function Selector
IC1
IC2
IC6
IC7
IC11
IC12
Buffer
VR1 B2K
VR2 B100K
VR4 B100K
IC17
IC18
(C4-8)V1
(C4-7)PO1
MD1 (C3-2)
MW (C3-1)
PL 2/4
MODE (S2) (PSW50)
Modulation Buffer
MODULATION (PVR51)
VCO
VCO+VCF
VCF
MO (C2-7)
MF (C2-8)
M3 (C3-1)
M2 (C3-3)
M1 (C3-2)
PA 4/5 PWM (PVR10)
PD1 (C3-4)



PB	VCO	FA
C1 C5	C1	C1 C4

PB

C1

Wire Color	Destination
BE	DC- −10 (C1-10)
BE	PA- −10 (C7-4)
BL	DC-DE (C1-8)
GR	DC-+5 (C1-7)
GR	PA-+5 (C7-1)
OR	DM-3 (C5-7)
GY	DM-8 (C5-2)

C2

Wire Color	Destination
OR	PGM-13 (C7-8)
BE	PGM-16 (C7-5)
RE	PGM-12 (C7-9)
GR	PGM-15 (C7-6)
VI	PGM-17 (C7-4)
GY	PGM-18 (C7-3)
WH	PGM-19 (C7-2)
YE	JK1- −15' (C1-7)

C3

Wire Color	Destination
YE	DC- −15 (C1-6)
BL	DC-AE (C1-4)
BR	DC-+15 (C1-2)
VI	PA-+4 (C4-6)
PK	PGM-20 (C7-1)
RE	PGM-22 (C9-3)
BR	PGM-21 (C9-4)
OR	PGM-23 (C9-2)
GG	FA-IL (C3-2)
BRE	FA-O1 (C5-1)
OR	JK1-PC (C1-6)

C4

Wire Color	Destination
RE	HP-HR
OR	HP-HL
SBE	JK1-HO (C1-1)
BES	
SVI	
SVI	SK2-LO (C1-1)
BL	JK1-E (C1-4)
BL	FA-E (C5-3)
RE	XLR-3
WH	XLR-2

C5

Pin No.	Pin Name	Wire Color	Destination
1	AA	WH	PGM-29 (C8-5)
2	AD	PK	PGM-30 (C8-6)
3	AS	BR	PGM-31 (C9-6)
4	AR	RE	PGM-32 (C9-5)
5	X5	BR	FA-T5A (C3-4)

C6

Pin No.	Pin Name	Wire Color	Destination
1	2"	BR	VCO-2" (C4-6)
2	4"	RE	VCO-4" (C4-5)
3	8"	OR	VCO-8" (C4-4)
4	16"	YE	VCO-16" (C4-3)
5	32"	GR	VCO-32" (C4-2)
6	64"	BE	VCO-64" (C4-1)

C7

Pin No.	Pin Name	Wire Color	Destination
1	2'	BR	VCO-2' (C3-6)
2	4'	RE	VCO-4' (C3-5)
3	8'	OR	VCO-8' (C3-4)
4	16'	YE	VCO-16' (C3-3)
5	32'	GR	VCO-32' (C3-2)
6	64'	BE	VCO-64' (C3-1)

C8

Pin No.	Pin Name	Wire Color	Destination
1	WN	YE	PGM-14 (C7-7)
2	FA	GR	PGM-25 (C8-7)
3	FD	BE	PGM-26 (C8-2)
4	FS	VI	PGM-27 (C8-3)
5	FR	GY	PGM-28 (C8-4)
6	X5	RE	FA-T5F (C3-5)
7	PL	YE	PGM-24 (C9-1)

VCO

C1

Pin No.	Pin Name	Wire Color	Destination
1	EK	BL	PA-EK (C2-8)
2	KV	RE	PA-CV2 (C4-3)
3	−15	YE	DC- −15 (C3-6)
4	−15	YE	VCO- −15 (C2-3)
5	V2	GY	MOD-V2 (C4-5)
6	E	BL	DC-AE (C3-4)
7	E	BL	VCO-E (C2-5)
8	+15	BR	DC-+15 (C3-2)
9	+15	BR	VCO-+15 (C2-6)
10	O2	RE	FA-SI2 (C1-3)

C2

Pin No.	Pin Name	Wire Color	Destination
1	EK	SORS	
2	KV	SOR	PA-CV1 (C2-3)
3	−15	YE	VCO- −15 (C1-4)
4	V1	PK	MOD-V1 (C4-8)
5	E	BL	VCO-E (C1-7)
6	+15	BR	VCO-+15 (C1-9)
7	O1	BR	FA-SI1 (C1-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	64'	BE	PB-64' (C7-6)
2	32'	GR	PB-32' (C7-5)
3	16'	YE	PB-16' (C7-4)
4	8'	OR	PB-8' (C7-3)
5	4'	RE	PB-4' (C7-2)
6	2'	BR	PB-2' (C7-1)

C4

Pin No.	Pin Name	Wire Color	Destination
1	64"	BE	PB-64" (C6-6)
2	32"	GR	PB-32" (C6-5)
3	16"	YE	PB-16" (C6-4)
4	8"	OR	PB-8" (C6-3)
5	4"	RE	PB-4" (C6-2)
6	2"	BR	PB-2" (C6-1)

FA

C1

Pin No.	Pin Name	Wire Color	Destination
1	SI1	BR	VCO-O1 (C2-7)
2	P1	SB	MOD-PO1 (C4-7)
3	SI2	RE	VCO-O2 (C1-10)
4	P2	GG	MOD-PO2 (C4-4)
5	−15	YE	DC- −15 (C2-6)
6	−15	YE	MOD- −15 (C3-9)
7	E	BL	DC-DE (C3-9)
8	E	BL	MOD-E (C3-8)
9	+15	BR	DC-+15 (C2-2)
10	+15	BR	MOD-+15 (C3-10)

C2

Pin No.	Pin Name	Wire Color	Destination
1	+5	GR	MOD-+5 (C1-8)
2	+5	GR	FA-+5 (C4-9)
3	−10	BE	MOD- −10 (C1-6)
4	−10	BE	FA- −10 (C4-10)
5	E	—	—
6	HB2	PK	DM-10 (C4-9)
7	HB1	GR	DM-5 (C5-5)
8	POL	YE	DM-24 (C3-5)
9	FC	PK	DM-20 (C3-9)

C3

Pin No.	Pin Name	Wire Color	Destination
1	EL	WH	DM-19 (C3-10)
2	IL	GG	PB-IL (C3-9)
3	A	SB	MOD-A (C4-1)
4	T5A	BR	PB-X5 (C5-5)
5	T5F	RE	PB-X5 (C8-6)
6	T1	GR	PA-LT (C7-3)

C4

Pin No.	Pin Name	Wire Color	Destination
1	AF	GR	DM-25 (C3-4)
2	DF	BE	DM-26 (C3-3)
3	RF	YE	PL-FRO (C1-8)
4	SF	VI	DM-27 (C3-2)
5	AA	WH	DM-29 (C2-7)
6	DA	PK	DM-30 (C2-6)
7	RA	OR	PL-ARO (C1-9)
8	SA	BR	DM-31 (C2-5)
9	+5	GR	FA-+5 (C2-2)
10	−10	BE	FA- −10 (C2-4)

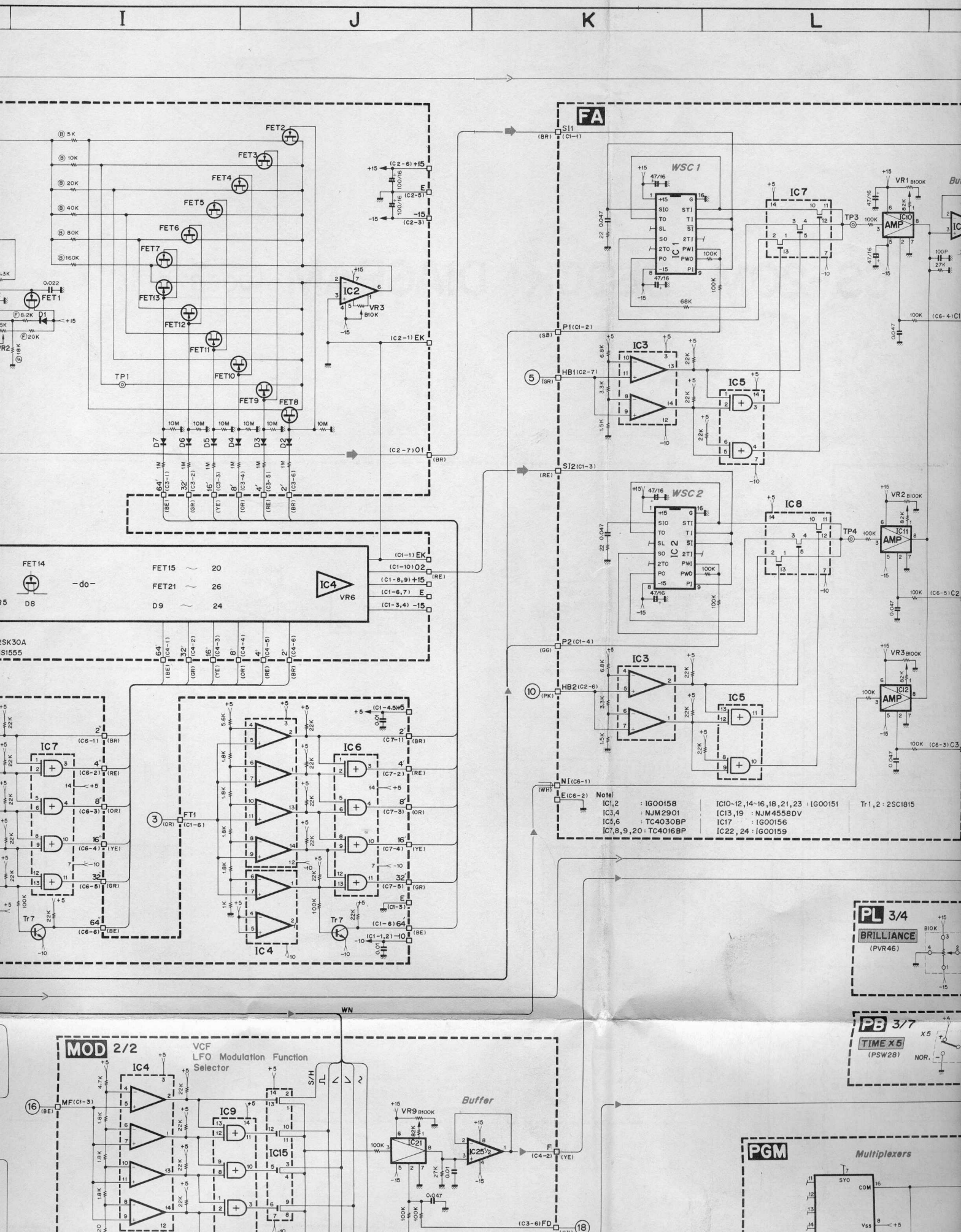
C5

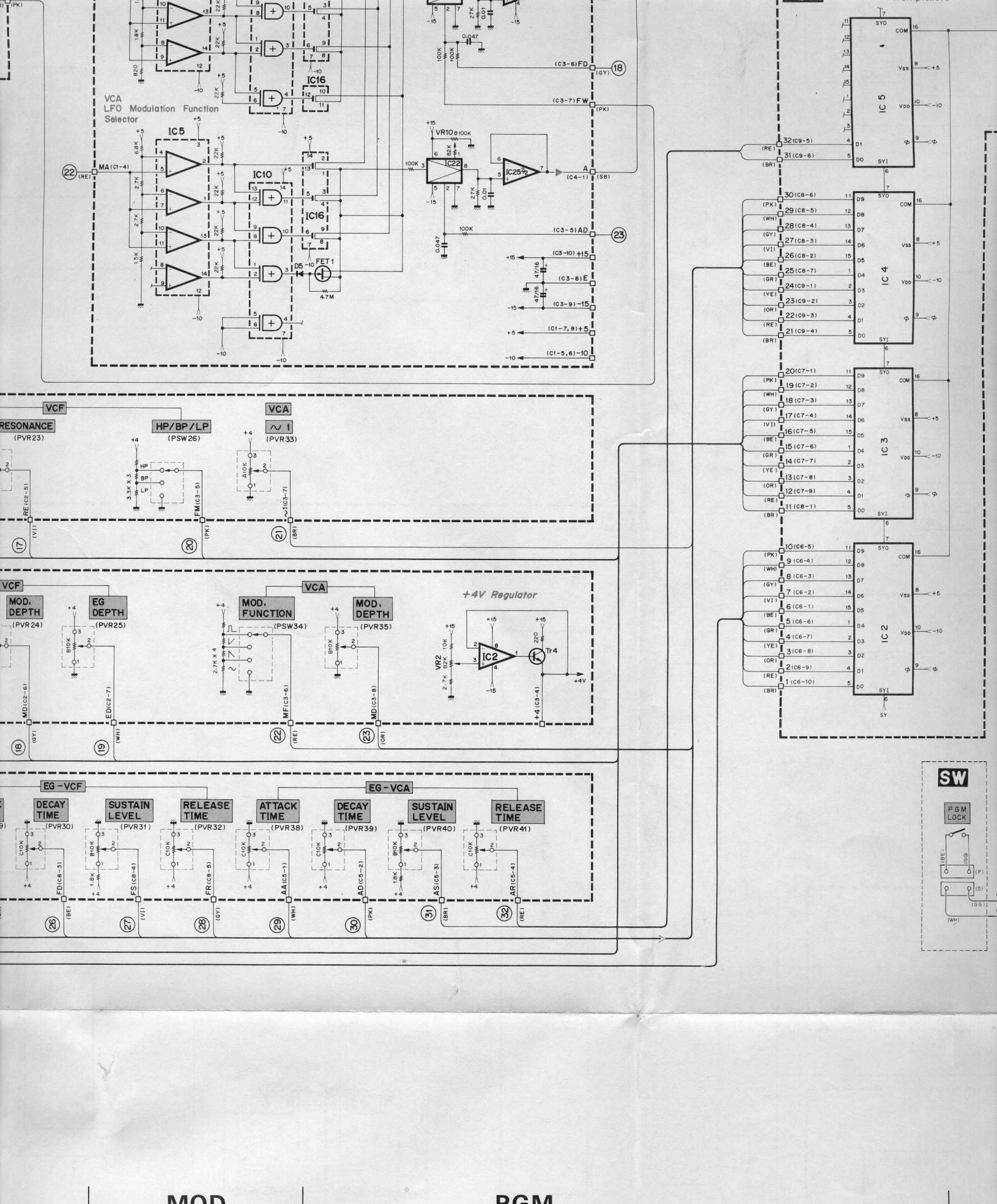
Pin No.	Pin Name	Wire Color	Destination
1	O1	SRE	PB-I (C3-10)
2	E	SRES	
3	E	BL	PB-E (C4-8)
4	C4	BR	DM-21 (C3-8)
5	KV	OR	JK1-KV (C2-2)
6	CO	GR	DM-15 (C4-4)
7	CM	YE	MOD-F (C4-2)
8	BR	BE	PL-BR (C2-5)
9	RE	VI	DM-17 (C4-2)

C6

Pin No.	Pin Name	Wire Color	Destination
1	NI	SWH	PA-WN (C1-3)
2	E	SWHS	
3	C3	YE	DM-14 (C4-5)
4	C1	RE	DM-12 (C4-7)
5	C2	OR	DM-13 (C4-6)

CS-20M OVERALL CIRCUIT DIAGRAM




VCA
LFO Modulation Function
Selector
IC5
IC10
IC16
IC22
IC25
FET1
VR10
MA(C1-4)
(C3-6)FD
(C3-7)FW
(C3-5)AD
(C3-10)+15
(C3-8)E
(C3-9)-15
(C1-7,8)+5
(C1-5,6)-10
VCF
RESONANCE
(PVR23)
HP/BP/LP
(PSW26)
VCA
~1
(PVR33)
MOD. DEPTH
(PVR24)
EG DEPTH
(PVR25)
MOD. FUNCTION
(PSW34)
MOD. DEPTH
(PVR35)
+4V Regulator
EG-VCF
DECAY TIME
(PVR30)
SUSTAIN LEVEL
(PVR31)
RELEASE TIME
(PVR32)
EG-VCA
ATTACK TIME
(PVR38)
DECAY TIME
(PVR39)
SUSTAIN LEVEL
(PVR40)
RELEASE TIME
(PVR41)
IC 5
IC 4
IC 3
IC 2
SW
PGM LOCK

MOD

PGM

MOD

C4

Wire Color	Destination
GR	DM-25 (C3-4)
BE	DM-26 (C3-3)
YE	PL-FRO (C1-8)
VI	DM-27 (C3-2)
WH	DM-29 (C2-7)
PK	DM-30 (C2-6)
OR	PL-ARO (C1-9)
BR	DM-31 (C2-5)
GR	FA-+5 (C2-2)
BE	FA- −10 (C2-4)

C5

Wire Color	Destination
SRE	PB-I (C3-10)
SRES	
BL	PB-E (C4-8)
BR	DM-21 (C3-8)
OR	JK1-KV (C2-2)
GR	DM-15 (C4-4)
YE	MOD-F (C4-2)
BE	PL-BR (C2-5)
VI	DM-17 (C4-2)

C6

Wire Color	Destination
SWH	PA-WN (C1-3)
SWHS	
YE	DM-14 (C4-5)
RE	DM-12 (C4-7)
OR	DM-13 (C4-6)

C1

Pin No.	Pin Name	Wire Color	Destination
1	MF1	RE	DM-2 (C5-8)
2	MF2	VI	DM-7 (C5-3)
3	MF	BE	DM-16 (C4-3)
4	MA	RE	DM-22 (C3-7)
5	−10	BE	DC-10 (C3-10)
6	−10	BE	FA- −10 (C2-3)
7	+5	GR	DC-+5 (C3-7)
8	+5	GR	FA-+5 (C2-1)

C2

Pin No.	Pin Name	Wire Color	Destination
1	∿	RE	PA- ∿(C6-2)
2	⩗	OR	PA- ⩗ (C6-4)
3	⊓	WH	PA-⊓ (C1-5)
4	⩘	YE	PA- ⩘ (C6-3)
5	S/H	GR	PA-S/H (C1-4)
6	G^-	BE	PA-G^- (C1-2)
7	2 ⊓	VI	PA-2 ⊓ (C1-6)
8	G^+	GY	PA-G^+ (C1-1)
9	MD2	WH	DM-9 (C5-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	MW	WH	PL-MO (C2-7)
2	MD1	YE	DM-4 (C5-6)
3	PD1	BR	PA-PD1 (C3-4)
4	PD2	RE	PA-PD2 (C5-3)
5	AD	OR	DM-23 (C3-6)
6	FD	GY	DM-18 (C4-1)
7	FW	PK	PL-MF (C2-8)
8	E	BL	FA-E (C1-8)
9	−15	YE	FA- −15 (C1-6)
10	+15	BR	FA-+15 (C1-10)

C4

Pin No.	Pin Name	Wire Color	Destination
1	A	SB	FA-A (C3-3)
2	F	YE	FA-CM (C5-7)
3	P2	BR	DM-11 (C4-8)
4	PO2	GG	FA-P2 (C1-4)
5	V2	GY	VCO-V2 (C1-5)
6	P1	BE	DM-6 (C5-4)
7	PO1	SB	FA-P1 (C1-2)
8	V1	PK	VCO-V1 (C2-4)

PGM

C1

Pin No.	Pin Name	Wire Color	Destination
1	1B	BR	BL-1B (C2-1)
2	2B	RE	BL-2B (C2-2)
3	3B	OR	BL-3B (C2-3)
4	4B	YE	BL-4B (C2-4)
5	5B	GG	BL-5B (C2-5)
6	6B	SB	BL-6B (C3-5)
7	7B	VI	BL-7B (C3-6)
8	8B	GY	BL-8B (C3-7)

C2

Pin No.	Pin Name	Wire Color	Destination
1	8L	GY	BL-8L (C3-2)
2	2L	RE	BL-2L (C2-9)
3	4L	YE	BL-4L (C2-7)
4	3L	OR	BL-3L (C2-8)
5	1L	BR	BL-1L (C2-10)
6	5L	GR	BL-5L (C2-6)
7	7L	VI	BL-7L (C3-3)

C3

Pin No.	Pin Name	Wire Color	Destination
1	WL	WH	BL-WL (C2-11)
2	PL	GG	BL-PL (C3-1)
3	GL	BE	BL-6L (C3-4)
4	LL	PK	BL-LL1 (C1-2)
5	SL	SB	BL-SL (C1-1)

C4

Pin No.	Pin Name	Wire Color	Destination
1	+5	GR	DC-+5 (C2-7)
2	+5	GR	DM-+5 (C1-2)
3	−10	BE	DC- −10 (C2-10)
4	−10	BE	DM- −10 (C1-5)
5	LI	OR	BL-LL2 (C1-3)
6	E	SWHS	
7	CO	SWH	JK1-PGT (C2-10)
8	E	SVIS	
9	CI	SVI	JK2-PGF (C2-6)
10	E	BL	DC-DE (C3-8)

C5

Pin No.	Pin Name	Wire Color	Destination
1	AE	BL	DC-AE (C2-3)
2	AE	BL	DM-E (C2-3)
3	AO	BR	DM-AI (C2-1)
4	+15	BR	DC-+15 (C2-1)
5	+15	BR	DM-+15 (C2-2)
6	−15	YE	DC- −15 (C2-5)
7	−15	YE	DM- −15 (C2-4)

C6

Pin No.	Pin Name	Wire Color	Destination
1	6	BE	PA-P1 (C3-5)
2	7	VI	PA-MF2 (C4-7)
3	8	GY	PA-FV2 (C5-2)
4	9	WH	PA-MD2 (C5-1)
5	10	PK	PA-WV2 (C5-5)
6	5	GR	PA-WV1 (C3-6)
7	4	YE	PA-MD1 (C3-2)
8	3	OR	PA-FV1 (C3-3)
9	2	RE	PA-MF1 (C3-1)
10	1	BR	PA-LS (C2-1)

C7

Pin No.	Pin Name	Wire Color	Destination
1	20	PK	PB-FM (C3-5)
2	19	WH	PB-ED (C2-7)
3	18	GY	PB-MD (C2-6)
4	17	VI	PB-RE (C2-5)
5	16	BE	PB-MF (C2-2)
6	15	GR	PB-CO (C2-4)
7	14	YE	PB-WN (C8-1)
8	13	OR	PB-VO2 (C2-1)
9	12	RE	PB-VO1 (C2-3)

C8

Pin No.	Pin Name	Wire Color	Destination
1	11	BR	PA-P2 (C5-4)
2	26	BE	PB-FD (C8-3)
3	27	VI	PB-FS (C8-4)
4	28	GY	PB-FR (C8-5)
5	29	WH	PB-AA (C5-1)
6	30	PK	PB-AD (C5-2)
7	25	GR	PB-FA (C8-2)

C9

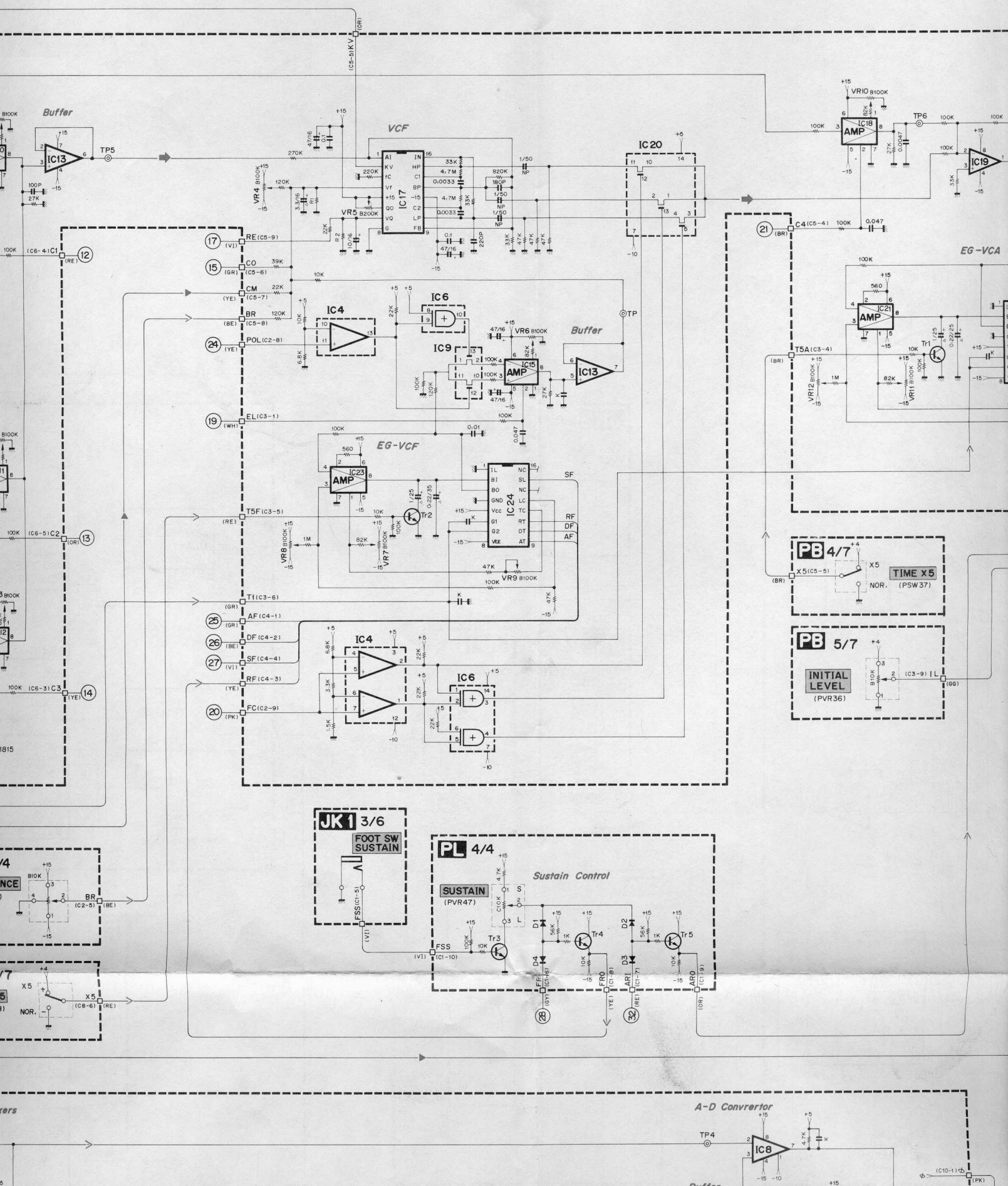
Pin No.	Pin Name	Wire Color	Destination
1	24	YE	PB-PL (C8-7)
2	23	OR	PB-MD (C3-8)
3	22	RE	PB-MF (C3-6)
4	21	BR	PB-∿1 (C3-7)
5	32	RE	PB-AR (C5-4)
6	31	BR	PB-AS (C5-3)

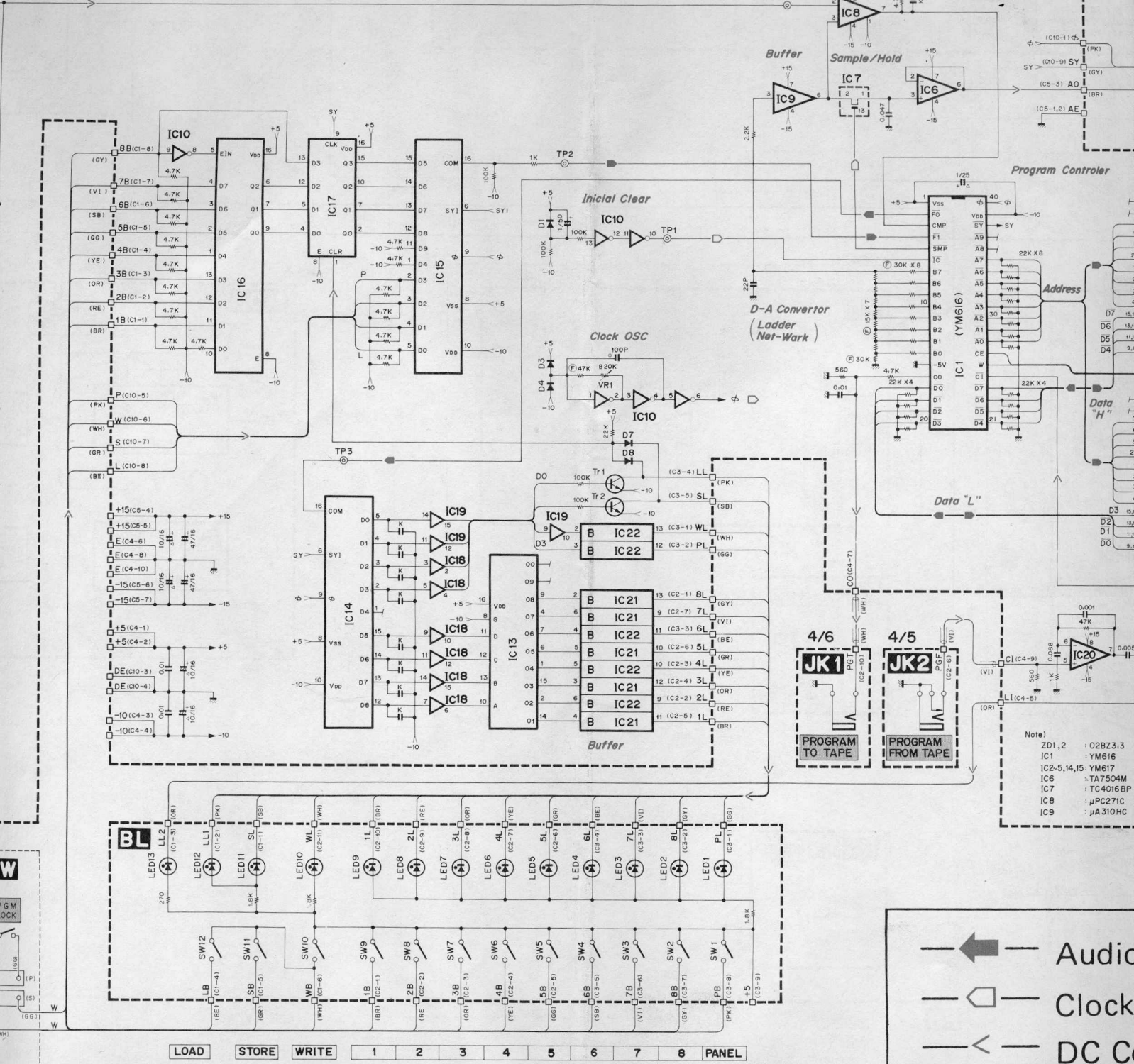
C10

Pin No.	Pin Name	Wire Color	Destination
1	∅	PK	DM-∅ (C1-4)
2	VB	OR	VE-BB
3	DE	BL	DC-DE (C2-8)
4	DE	BL	E-BB
5	P	PK	BL-PB (C3-8)
6	W	WH	BL-WB (C1-6)
7	S	GR	BL-SB (C1-5)
8	L	BE	BL-LB (C1-4)
9	SY	GY	DM-SY (C1-1)

AM 006878

M	N	O	P




IC10
IC16
IC17
IC15
IC14
IC13
IC19
IC18
IC22
IC21
IC1 (YM616)
IC8
IC7
IC6
IC9
IC20
Buffer
Sample/Hold
Program Controler
Inicial Clear
Clock OSC
D-A Convertor
(Ladder Net-Wark)
Address
Data "H"
Data "L"
TP1
TP2
TP3
JK1
PROGRAM TO TAPE
JK2
PROGRAM FROM TAPE
4/6
4/5
BL
LED13
LED12
LED11
LED10
LED9
LED8
LED7
LED6
LED5
LED4
LED3
LED2
LED1
SW12
SW11
SW10
SW9
SW8
SW7
SW6
SW5
SW4
SW3
SW2
SW1
LOAD
STORE
WRITE
1
2
3
4
5
6
7
8
PANEL
Note)
ZD1,2 : 02BZ3.3
IC1 : YM616
IC2-5,14,15 : YM617
IC6 : TA7504M
IC7 : TC4016BP
IC8 : μPC271C
IC9 : μA310HC
Audio
Clock
DC C
Low
Modu
Progr
Data

DM	PL	JK1	JK2

DM

C1

Pin No.	Pin Name	Wire Color	Destination
1	SY	GY	PGM-SY (C10-9)
2	+5	GR	PGM-+5 (C4-2)
3	+5	GR	BL-+5 (C3-9)
4	∅	PK	PGM-∅ (C10-1)
5	−10	BE	PGM-−10 (C4-4)

C2

Pin No.	Pin Name	Wire Color	Destination
1	AI	BR	PGM-AO (C5-3)
2	+15	BR	PBM-+15 (C5-5)
3	E	BL	PGM-AE (C5-2)
4	−15	YE	PGM-−15 (C5-7)
5	31	BR	FA-SA (C4-8)
6	30	PK	FA-DA (C4-6)
7	29	WH	FA-AA (C4-5)

C3

Pin No.	Pin Name	Wire Color	Destination
1	28	GY	PL-FPI (C1-6)
2	27	VI	FA-SF (C4-4)
3	26	BE	FA-DF (C4-2)
4	25	GR	FA-AF (C4-1)
5	24	YE	FA-POL (C2-8)
6	23	OR	MOD-AD (C3-5)
7	22	RE	MOD-MA (C1-4)
8	21	BR	FA-C4 (C5-4)
9	20	PK	FA-FC (C2-9)
10	19	WH	FA-EL (C3-1)

C4

Pin No.	Pin Name	Wire Color	Destination
1	18	GY	MOD-FD (C3-6)
2	17	VI	FA-RE (C5-9)
3	16	BE	MOD-MF (C1-3)
4	15	GR	FA-C0 (C5-6)
5	14	YE	FA-C3 (C6-3)
6	13	OR	FA-C2 (C6-5)
7	12	RE	FA-C1 (C6-4)
8	11	BR	MOD-P2 (C4-3)
9	10	PK	FA-HB2 (C2-6)

C5

Pin No.	Pin Name	Wire Color	Destination
1	9	WH	MOD-MD2 (C2-9)
2	8	GY	PB-FT2 (C1-7)
3	7	VI	MOD-MF2 (C1-2)
4	6	BE	MOD-P1 (C4-6)
5	5	GR	FA-HB1 (C2-7)
6	4	YE	MOD-MD1 (C3-2)
7	3	OR	PB-FT1 (C1-6)
8	2	RE	MOD-MF1 (C1-1)
9	1	BR	PA-S (C6-1)
10	32	RE	PL-ARI (C1-7)

PL

C1

Pin No.	Pin Name	Wire Color	Destination
1	POR	BE	SK-PS (C4-6)
2	FSP	GR	JK2-FSP (C1-3)
3	−10	BE	SK-−10 (C3-6)
4	+5	GR	SK-+5 (C3-8)
5	PG	BR	SK-PG (C4-5)
6	FRI	GY	DM-28 (C3-1)
7	ARI	RE	DM-32 (C5-10)
8	FRO	YE	FA-RF (C4-3)
9	ARO	OR	FA-RA (C4-7)
10	FSS	VI	JK1-FSS (C1-5)

C2

Pin No.	Pin Name	Wire Color	Destination
1	VR	RE	SK-VR (C4-4)
2	−15	YE	DC-−15 (C4-6)
3	E	BL	DC-AE (C3-3)
4	+15	BR	DC-+15 (C4-2)
5	BR	BE	FA-BR (C5-8)
6	EK	BL	SK-EK (C4-2)
7	MO	WH	MOD-MW (C3-1)
8	MF	PK	MOD-FW (C3-7)

C3

Pin No.	Pin Name	Wire Color	Destination
1	M3	RE	W1-3
2	M1	BL	W1-1
3	M3	BR	W1-2

C4

Pin No.	Pin Name	Wire Color	Destination
1	PP	BR	W2-1
2	PN	OR	W2-3
3	PO	RE	W2-2
4	PE	BL	W2-4

JK1

C1

Pin No.	Pin Name	Wire Color	Destination
1	HO	SBE	PB-HO (C4-3)
2	E	SBES	
3	E	BL	DC-DE (C2-9)
4	E	BL	PB-E (C4-7)
5	FSS	VI	PL-FSS (C1-10)
6	FC	OR	PB-FC (C3-11)
7	−15′	YE	PB-−15′ (C2-8)

C2

Pin No.	Pin Name	Wire Color	Destination
1	KV	SRE	PA-KV (C2-5)
2	KV	OR	FA-KV (C5-5)
3	KVF	YE	JK2-KV (C2-2)
4	EK	BL	DC-AE (C4-4)
5	EK	BL	JK2-KE (C2-3)
6	TR	SB	PA-TR (C7-5)
7	TRF	BE	SK-TR (C4-3)
8	E	BL	DC-DE (C1-9)
9	E	BL	JK2-E (C1-4)
10	PGT	SWH	PGM-CO (C4-7)

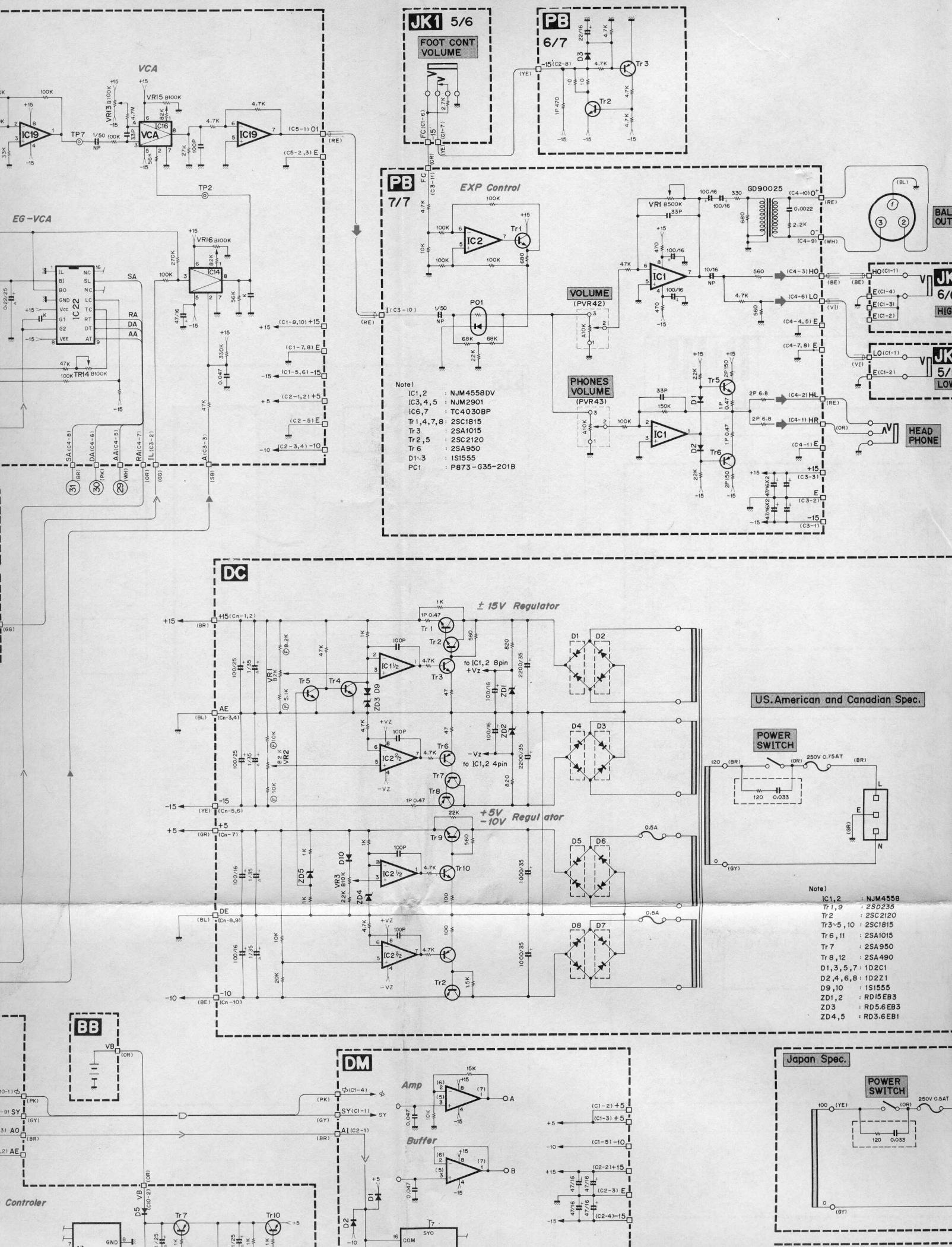
JK2

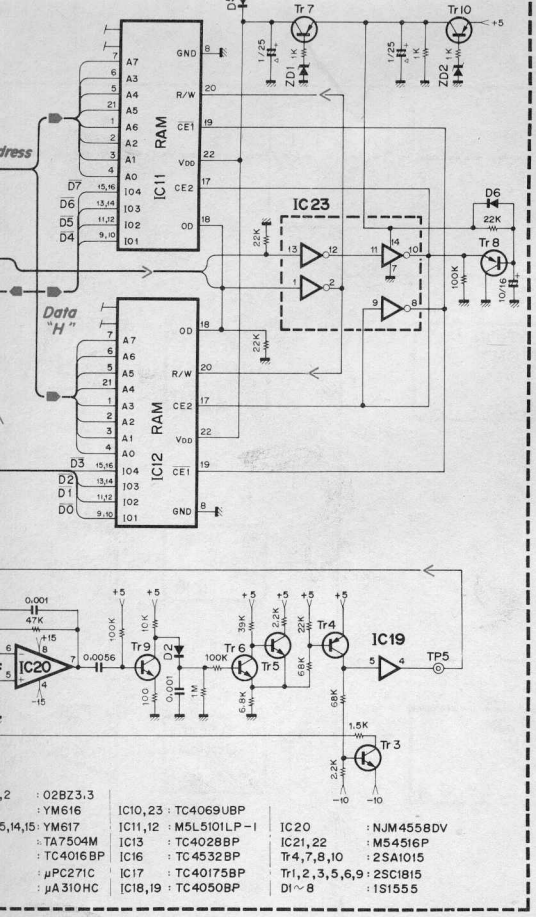
C1

Pin No.	Pin Name	Wire Color	
1	LO	SVI	PB-L
2	E	SVIS	
3	FSP	GR	PL-F
4	E	BL	JK1

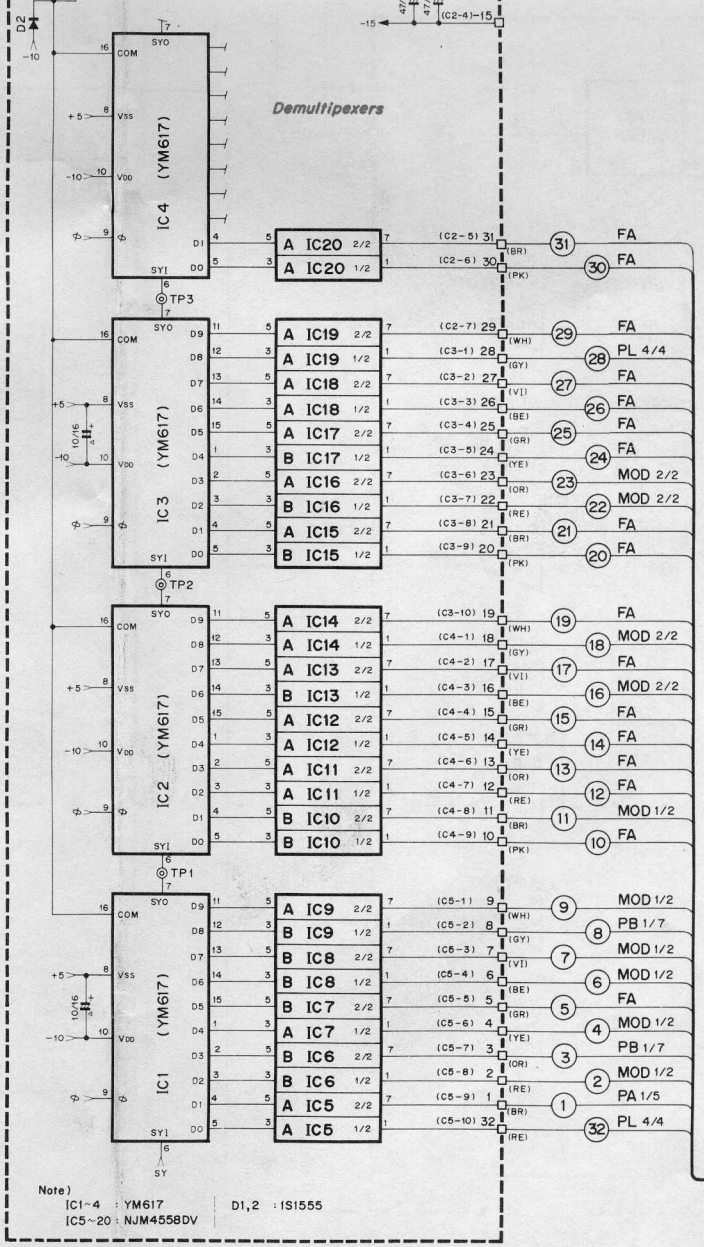
C2

Pin No.	Pin Name	Wire Color	
1	KV	OR	SK-
2	KV	YE	JK'
3	EK	BL	JK'
4	EK	BL	PA-
5	TR	BE	PA-
6	PGF	SVI	PG


JK1 5/6
FOOT CONT VOLUME
PB 6/7
PB 7/7
EXP Control
VCA
EG-VCA
VOLUME (PVR42)
PHONES VOLUME (PVR43)
HEAD PHONE
Note)
IC1,2 : NJM4558DV
IC3,4,5 : NJM2901
IC6,7 : TC4030BP
Tr1,4,7,8 : 2SC1815
Tr3 : 2SA1015
Tr2,5 : 2SC2120
Tr6 : 2SA950
D1~3 : 1S1555
PC1 : P873-G35-201B
DC
± 15V Regulator
+5V −10V Regulator
US.American and Canadian Spec.
POWER SWITCH
Note)
IC1,2 : NJM4558
Tr1,9 : 2SD235
Tr2 : 2SC2120
Tr3~5,10 : 2SC1815
Tr6,11 : 2SA1015
Tr7 : 2SA950
Tr8,12 : 2SA490
D1,3,5,7 : 1D2C1
D2,4,6,8 : 1D2Z1
D9,10 : 1S1555
ZD1,2 : RD15EB3
ZD3 : RD5.6EB3
ZD4,5 : RD3.6EB1
BB
Controler
DM
Amp
Buffer
Japan Spec.
POWER SWITCH

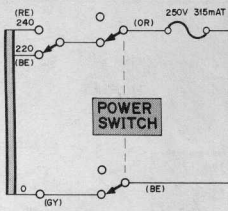


,2 : 02BZ3.3			
: YM616	IC10,23 : TC4069UBP		
5,14,15: YM617	IC11,12 : M5L5101LP-I	IC20	: NJM4558DV
: TA7504M	IC13 : TC4028BP	IC21,22	: M54516P
: TC4016BP	IC16 : TC4532BP	Tr4,7,8,10	: 2SA1015
: μPC271C	IC17 : TC40175BP	Tr1,2,3,5,6,9	: 2SC1815
: μA310HC	IC18,19 : TC4050BP	D1~8	: 1S1555



Note)
IC1~4 : YM617 | D1,2 : 1S1555
IC5~20 : NJM4558DV

Other Spec



NO	BLOCK	FUNCTION
1	LFO	SPEED
2	VCO 1	MOD. FUNC
3	-do-	FEET
4	-do-	MOD. DEPTH
5	-do-	WAVE
6	-do-	PW
7	VCO 2	MOD. FUNC
8	-do-	FEET
9	-do-	MOD. DEPTH
10	-do-	WAVE
11	-do-	PW
12	MIXER	VCO 1
13	-do-	VCO 2
14	-do-	NOISE
15	VCF	CUT OFF FREQ.
16	-do-	MOD. FUNC
17	-do-	RESONANCE
18	-do-	MOD. DEPTH
19	-do-	EG DEPTH
20	-do-	HP/BP/LP
21	VCA	∼1
22	-do-	MOD. FUNC
23	-do-	DEPTH
24	EG-VCF	EG/POLE
25	-do-	ATTACK TIME
26	-do-	DECAY TIME
27	-do-	SUSTAIN LEVEL
28	-do-	RELEASE TIME
29	EG-VCA	ATTACK TIME
30	-do-	DECAY TIME
31	-do-	SUSTAIN LEVEL
32	-do-	RELEASE TIME

To the same terminal No indicated on each circuit

Audio Signal
Clock Pulse
DC Control
Low Frequency
Modulation Data
Program Control
Data

JK2	MK	BL	DC

JK2

C1

Wire Color	Destination
SVI	PB-LO (C4-6)
SVIS	
GR	PL-RSP (C1-2)
BL	JK1-E (C2-9)

C2

Wire Color	Destination
OR	SK-KV (C3-1)
YE	JK1-KVF (C2-3)
BL	JK1-EK (C2-5)
BL	PA-EK (C2-7)
BE	PA-LT (C7-2)
SVI	PGM-CI (C4-9)

MK

C1

Pin No.	Pin Name	Wire Color	Destination
1	B1	BR	SK-B1 (C1-6)
2	B2	RE	SK-B2 (C1-5)
3	B3	OR	SK-B3 (C1-4)
4	B4	YE	SK-B4 (C1-3)
5	B5	GR	SK-B5 (C1-2)
6	B6	BE	SK-B6 (C1-1)
7	CL	BL	SK-NO (C2-7)
8	C	VI	SK-N1 (C2-6)

C2

Pin No.	Pin Name	Wire Color	Destination
1	D	GY	SK-N2 (C2-5)
2	D	WH	SK-N3 (C2-4)
3	E	GG	SK-N4 (C2-3)
4	F	SB	SK-N5 (C2-2)
5	F	PK	SK-N6 (C2-1)

BL

C1

Pin No.	Pin Name	Wire Color	Destination
1	SL	SB	PGM-SL (C3-5)
2	LL1	PK	PGM-LL (C3-4)
3	LL2	OR	PGM-LI (C4-5)
4	LB	BE	PGM-L (C10-8)
5	SB	GR	PGM-S (C10-7)
6	WB	WH	PGM-W (C10-6)

C2

Pin No.	Pin Name	Wire Color	Destination
1	1B	BR	PGM-1B (C1-1)
2	2B	RE	PGM-2B (C1-2)
3	3B	OR	PGM-3B (C1-3)
4	4B	YE	PGM-4B (C1-4)
5	5B	GG	PGM-5B (C1-5)
6	5L	GR	PGM-5L (C2-6)
7	4L	YE	PGM-4L (C2-3)
8	3L	OR	PGM-3L (C2-4)
9	2L	RE	PGM-2L (C2-2)
10	1L	BR	PGM-1L (C2-5)
11	WL	WH	PGM-WL (C3-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	PL	GG	PGM-PL (C3-2)
2	8L	GY	PGM-8L (C2-1)
3	7L	VI	PGM-7L (C2-7)
4	6L	BE	PGM-6L (C3-3)
5	6B	SB	PGM-6B (C1-6)
6	7B	VI	PGM-7B (C1-7)
7	8B	GY	PGM-8B (C1-8)
8	PB	PK	PGM-P (C10-5)
9	+5	GR	DM-+5 (C1-3)

DC

C1

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	PA-+15 (C6-7)
2	+15	BR	PB-+15 (C3-3)
3	AE	BL	PA-E (C6-6)
4	AE	BL	PB-E (C3-2)
5	−15	YE	PA- −15 (C6-5)
6	−15	YE	PB- −15 (C3-1)
7	+5	GR	PB-+5 (C1-4)
8	DE	BL	PB-E (C1-3)
9	DE	BL	JK1-E (C2-8)
10	−10	BE	PB- −10 (C1-1)

C2

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	PGM-+15 (C5-4)
2	+15	BR	FA-+15 (C1-9)
3	AE	BL	PGM-AE (C5-1)
4	AE	–	–
5	−15	YE	PGM- −15 (C5-6)
6	−15	YE	FA- −15 (C1-5)
7	+5	GR	PGM-+5 (C4-1)
8	DE	BL	PGM-DE (C10-3)
9	DE	BL	JK1-DE (C1-3)
10	−10	BE	PGM- −10 (C4-3)

C3

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	PA-+15 (C4-1)
2	+15	BR	VCO-+15 (C1-8)
3	AE	BL	PL-E (C2-3)
4	AE	BL	VCO-E (C1-6)
5	−15	YE	PA- −15 (C4-4)
6	−15	YE	VCO- −15 (C1-3)
7	+5	GR	MOD-+5 (C1-7)
8	DE	BL	PGM-E (C4-10)
9	DE	BL	FA-E (C1-7)
10	−10	BE	MOD- −10 (C1-5)

C4

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	SK-+15 (C3-2)
2	+15	BR	PL-+15 (C2-4)
3	AE	BL	SK-EK (C4-1)
4	AE	BL	JK1-EK (C2-4)
5	−15	YE	SK- −15 (C3-3)
6	−15	YE	PL- −15 (C2-2)
7	+5	GR	SK-+5 (C3-7)
8	DE	BL	SK-DE (C3-4)
9	DE	–	–
10	−10	BE	SK- −10 (C3-5)

HP

Pin No.	Pin Name	Wire Color	Destination
1	HR	RE	PB-HR (C4-1)
2	HL	OR	PB-HL (C4-2)
3	E	GR	MK-SE

XLR

Pin No.	Pin Name	Wire Color	Destination
	1	–	–
	2	RE	PB-O^+ (C4-10)
	3	WH	PB-O^- (C4-9)

BB

Pin No.	Pin Name	Wire Color	Destination
	E	BLX2	PGM-DE (C10-4)
			BC-2 (C1-2)
	VB	ORX2	PGM-VB (C10-2)
			BC-1 (C1-1)

BC

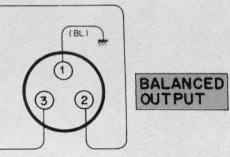
Pin No.	Pin Name	Wire Color	Destination
1	1	OR	BB-VB
2	2	BL	BB-E

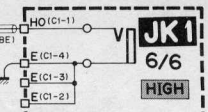
W1

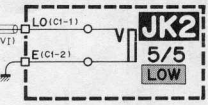
Pin No.	Pin Name	Wire Color	Destination
1	1	BL	PL-M1 (C3-2)
2	2	BR	PL-M2 (C3-3)
3	3	RE	PL-M3 (C3-1)

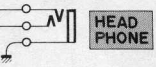
W2

Pin No.	Pin Name	Wire Color	Destination
1	1	BR	PL-PP (C4-1)
2	2	RE	PL-PO (C4-3)
3	3	OR	PL-PN (C4-2)
4	4	BL	PL-PE (C4-4)

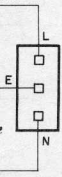








anadian Spec.



: NJM4558
: 2SD235
: 2SC2120
: 2SC1815
: 2SA1015
: 2SA950
: 2SA490
7 : 1D2C1
8 : 1D2Z1
: 1S1555
: RD15EB3
: RD5.6EB3
: RD3.6EB1