

# MONOPHONIC GUITAR SYNTHESIZER SERVICE MANUAL **X-911**

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# 1. SPECIFICATIONS

## 1. INPUT SECTION

Input Volume ..... -20dB, -35dB, -50dB  
 Input Level (Attenuator) ..... A, B  
 Input Polarity .....

## 2. TUNING SECTION

Fine Tune ..... ±100 cent  
 Interval ..... ±1200 cent  
 Octave Switch..... 3 OCT

## 3. PORTAMENTO

## 4. INSTRUMENT SECTION

INSTRUMENT	SCALE	CONTROL
Electric Bass .....	16'	Cutoff Freq.
Tuba .....	16'	Cutoff Freq.
Trumpet .....	8'	Cutoff Freq.
Distortion Guitar .....	8'	Tone
Violin.....	8'	Attack
Flute.....	4'	Tone

## 5. BALANCE VR

Instrument, Synthe Balance

## 6. CANCEL

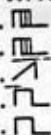
Instrument, Synthe Part All Cancel

## 7. SYNTH SECTION

### ENVELOPE



### WAVE FORM



ENVELOPE	SCALE	CONTROL
.....	16'	Attack
.....	16'	Decay
.....	8'	Attack
.....	8'	Cutoff Freq. Attack
.....	4'	Decay
Signal Select Switch .....		VCO, Guitar, Distortion
VCF Cutoff Freq. ....		Off, 1, 2
Synth WAH Switch .....		

## 8. TOUCH SENSE

Touch Sense Switch..... Off, Weak, Strong

## 9. OUTPUT VOLUME AND POWER SWITCH

## 10. JACK

Input Signal  
 Direct Output  
 Effect

Interval  
 Portamento  
 Hold  
 ON/OFF

Output  
 CV Out Hz/V  
 CV In Hz/V  
 Trig Out  $\rightarrow$  GND  
 Trig In  $\leftarrow$  GND  
 FM In  
 Synthe VCF FcM In

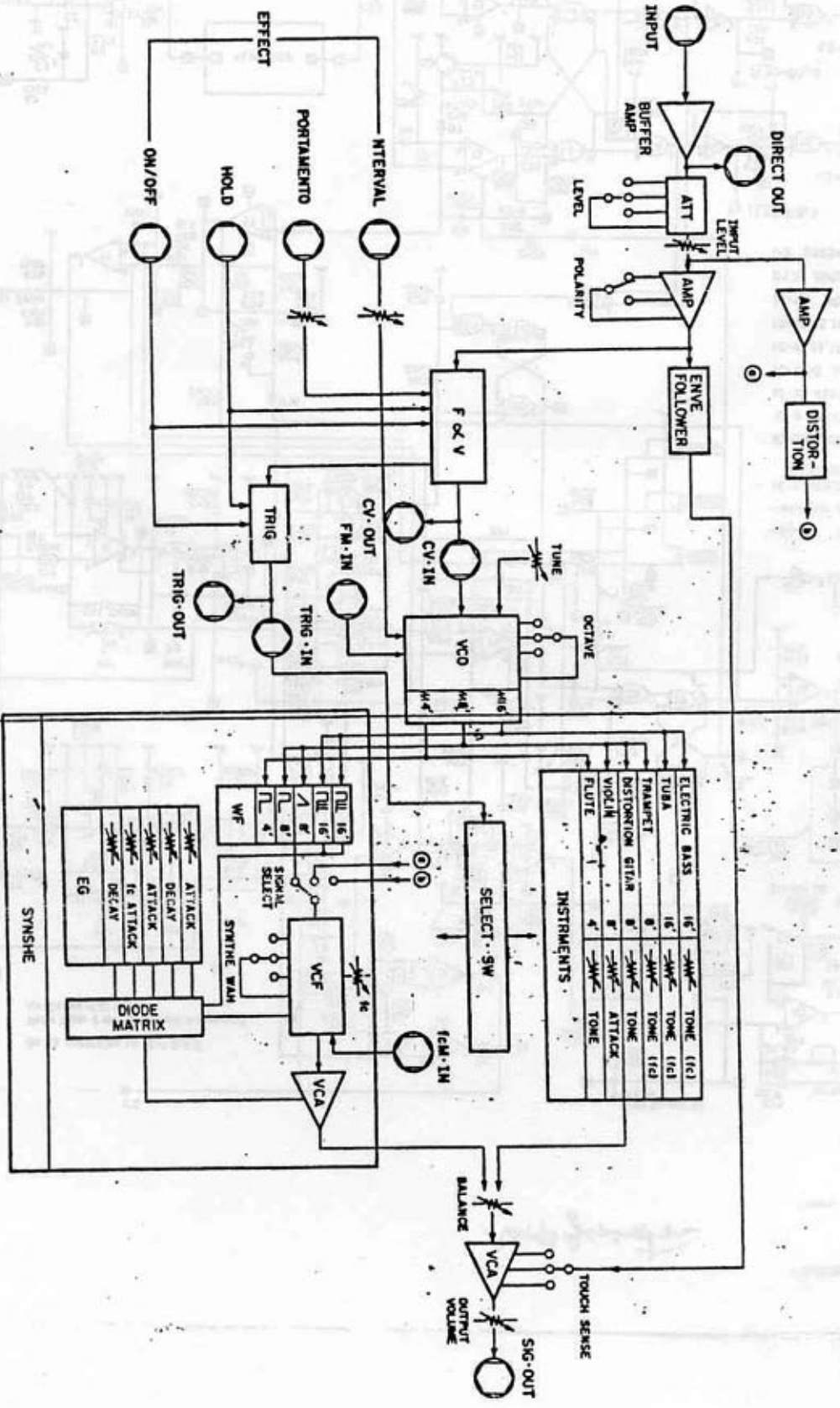
## 11. POWER CONSUMPTION

5 Watts, Local Voltage 50/60 Hz

## 12. DIMENSIONS

336 x 200 x 81.5 (m/m)

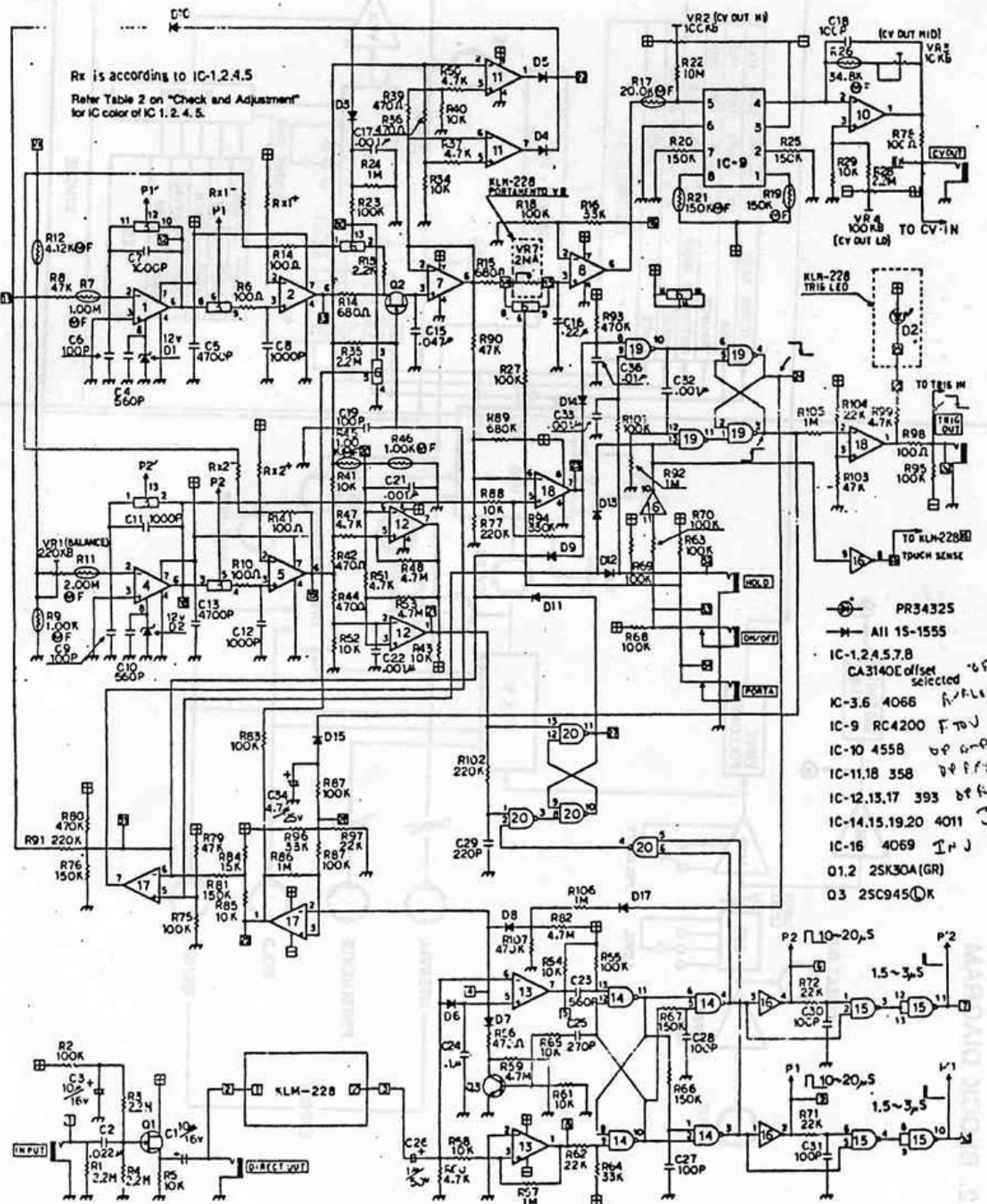
## 2. BLOCK DIAGRAM



ELECTRIC BASS		16'	8'	4'	2'
TUBA	16'	8'	4'	2'	TONE (16)
TRUMPET	16'	8'	4'	2'	TONE (16)
DISTORTION GTR	16'	8'	4'	2'	TONE (16)
VIOLIN	16'	8'	4'	2'	TONE (16)
FLUTE	16'	8'	4'	2'	TONE (16)

SYNSHE		16'	8'	4'	2'
ATTACK	16'	8'	4'	2'	ATTACK
DECAY	16'	8'	4'	2'	DECAY
ATTACK	16'	8'	4'	2'	ATTACK
DECAY	16'	8'	4'	2'	DECAY
EG	16'	8'	4'	2'	EG

*Temp generator*

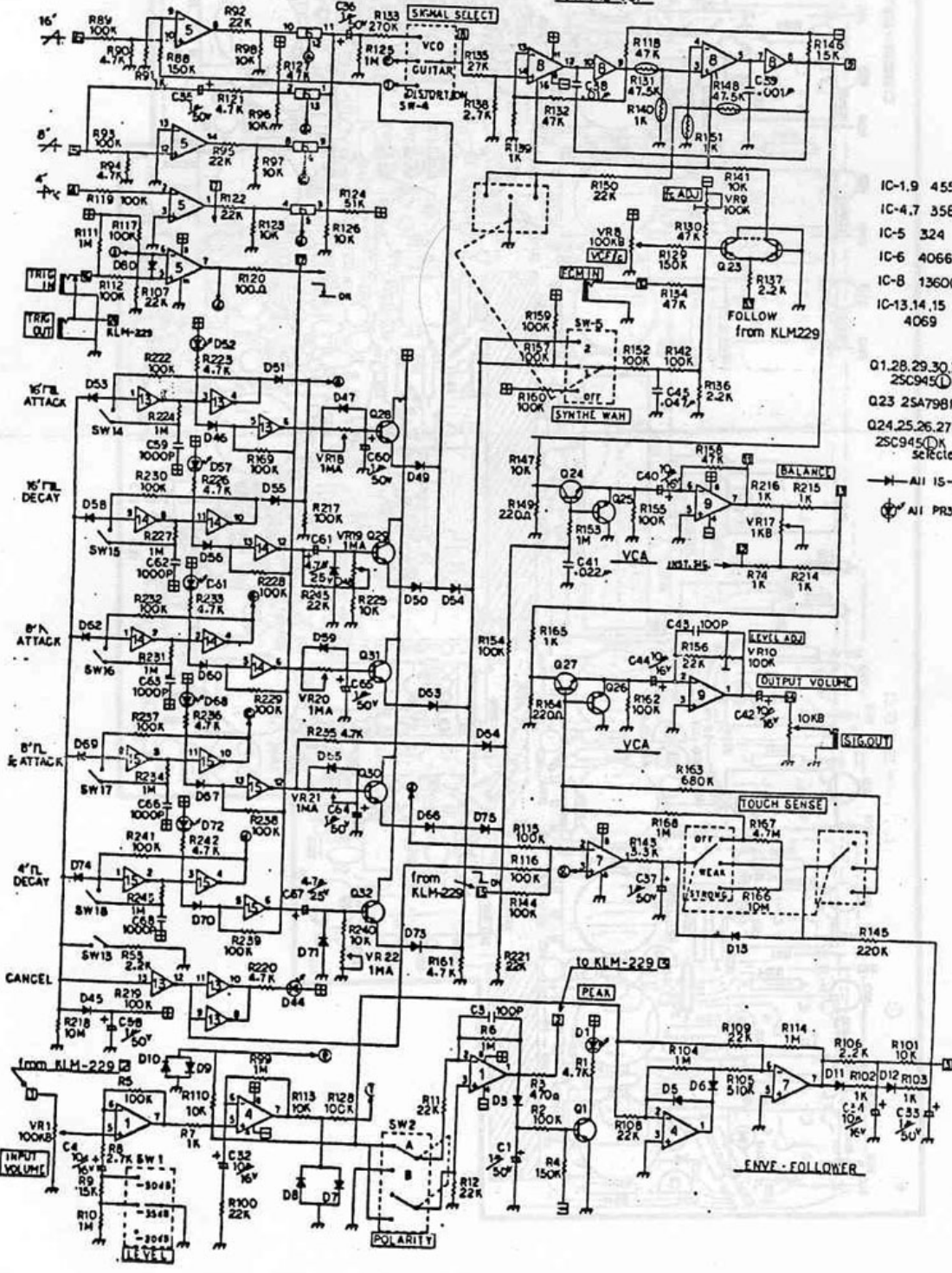


Rx is according to IC-1,2,4,5  
Refer Table 2 on "Check and Adjustment"  
for IC color of IC 1, 2, 4, 5.

- PR34325
- All 1S-1555
- IC-1,2,4,5,7,8 CA3140E of set selected
- IC-3,6 4066 R/PLU selected
- IC-9 RC4200 F to J W/V
- IC-10 4558 W/P
- IC-11,18 358 W/P
- IC-12,13,17 393 W/P
- IC-14,15,19,20 4011 JK
- IC-16 4069 IN J
- O1,2 2SK30A(GR)
- O3 25C945(LK)

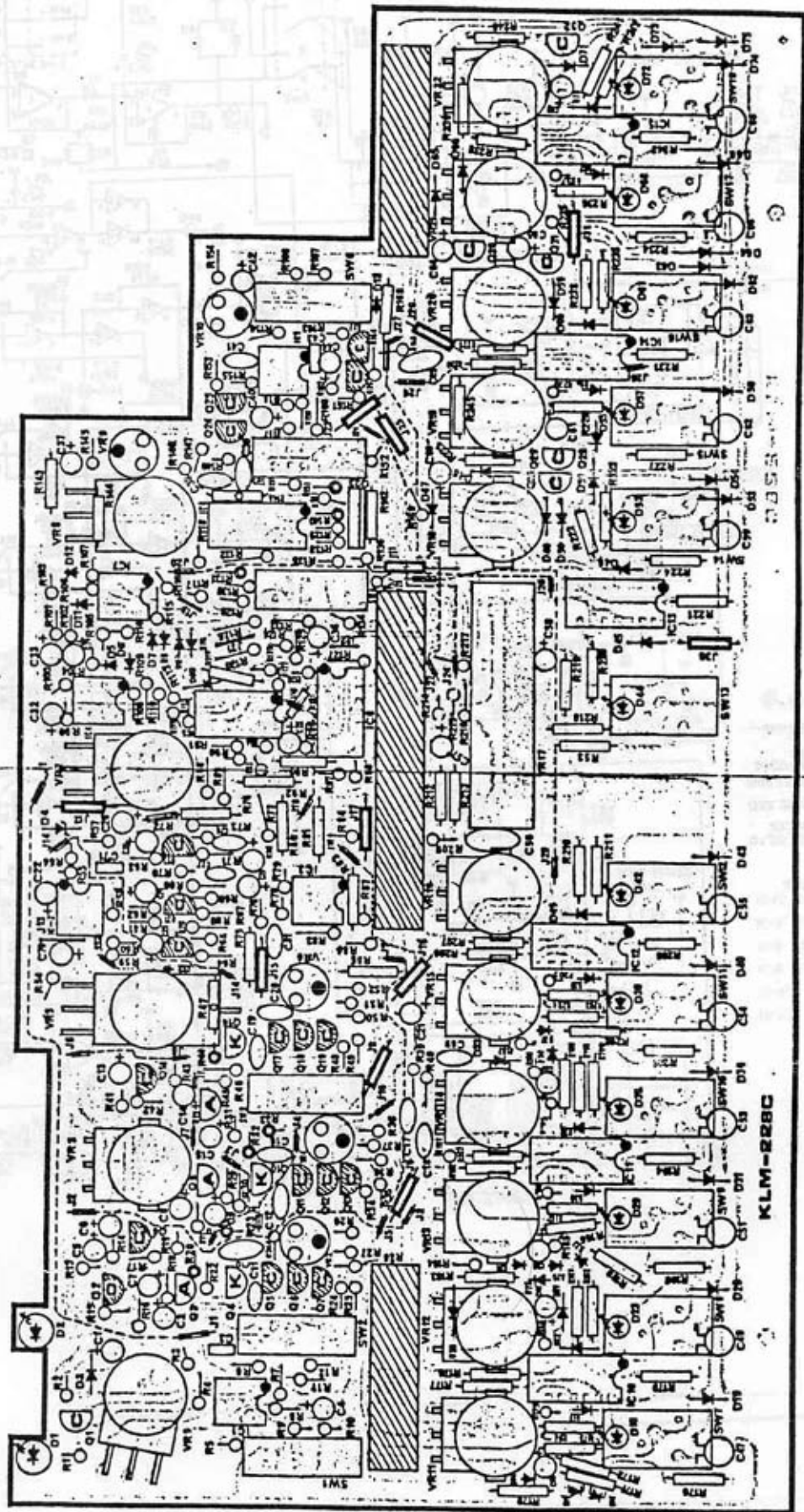
DUFFER AMP

SYNTH-VCF

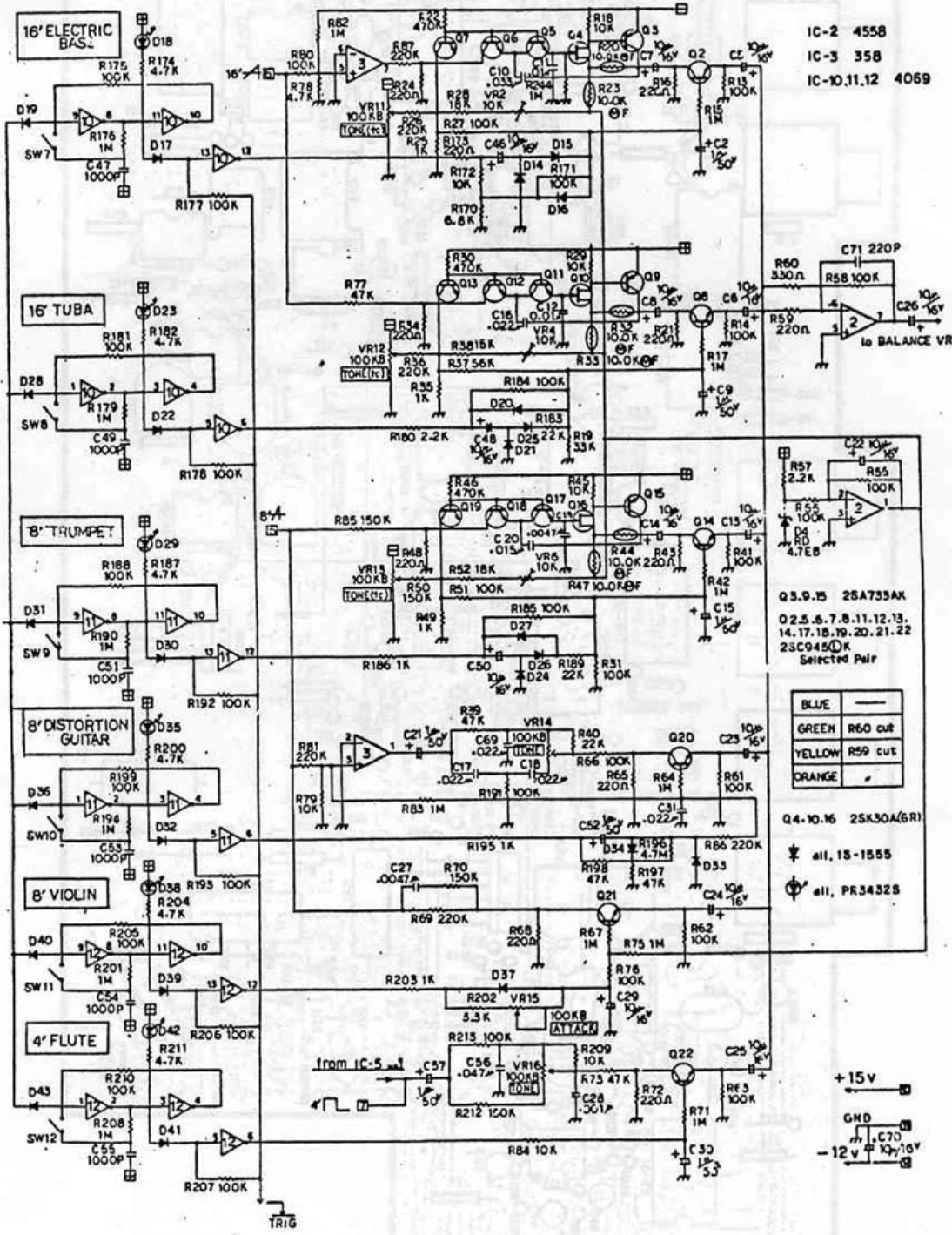


- IC-1.9 4558
- IC-4.7 358
- IC-5 324
- IC-6 4066
- IC-8 13600
- IC-13.14.15 4069
- Q1.28.29.30.31.32 2SC945DK
- Q23 2SA798 For G
- Q24.25.26.27 2SC945DK selected
- All 15-1555
- All PR34325

4. PC BOARD KLM-228



KLM-228C



IC-2 4558  
 IC-3 558  
 IC-10,11,12 4069

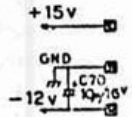
Q3,9,15 2SA733AK  
 Q2,5,6,7,8,11,12,13,  
 14,17,18,19,20,21,22  
 2SC945DK  
 Selected Pair

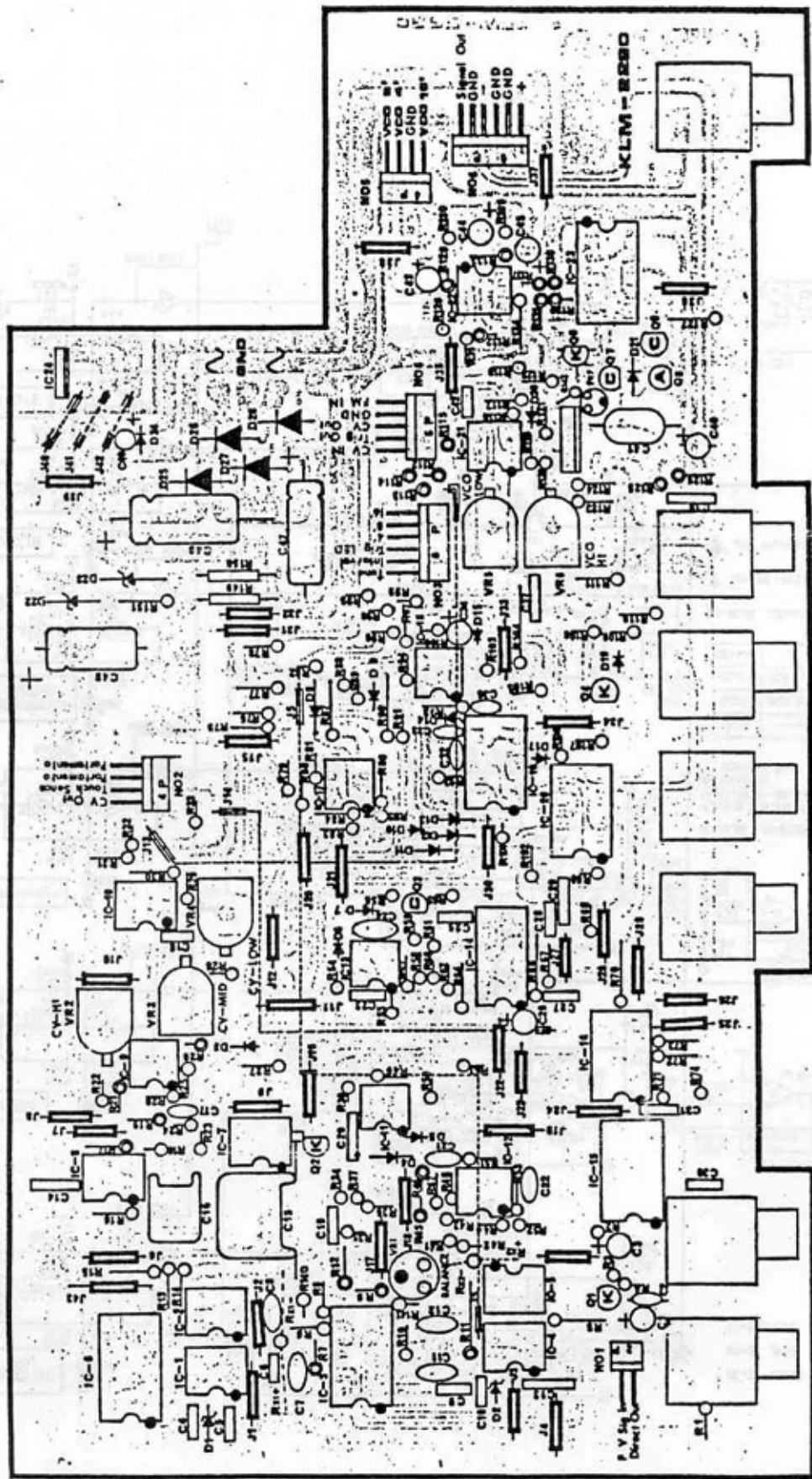
BLUE	—
GREEN	R60 cut
YELLOW	R59 cut
ORANGE	.

Q4,10,16 2SK30A(GR1)

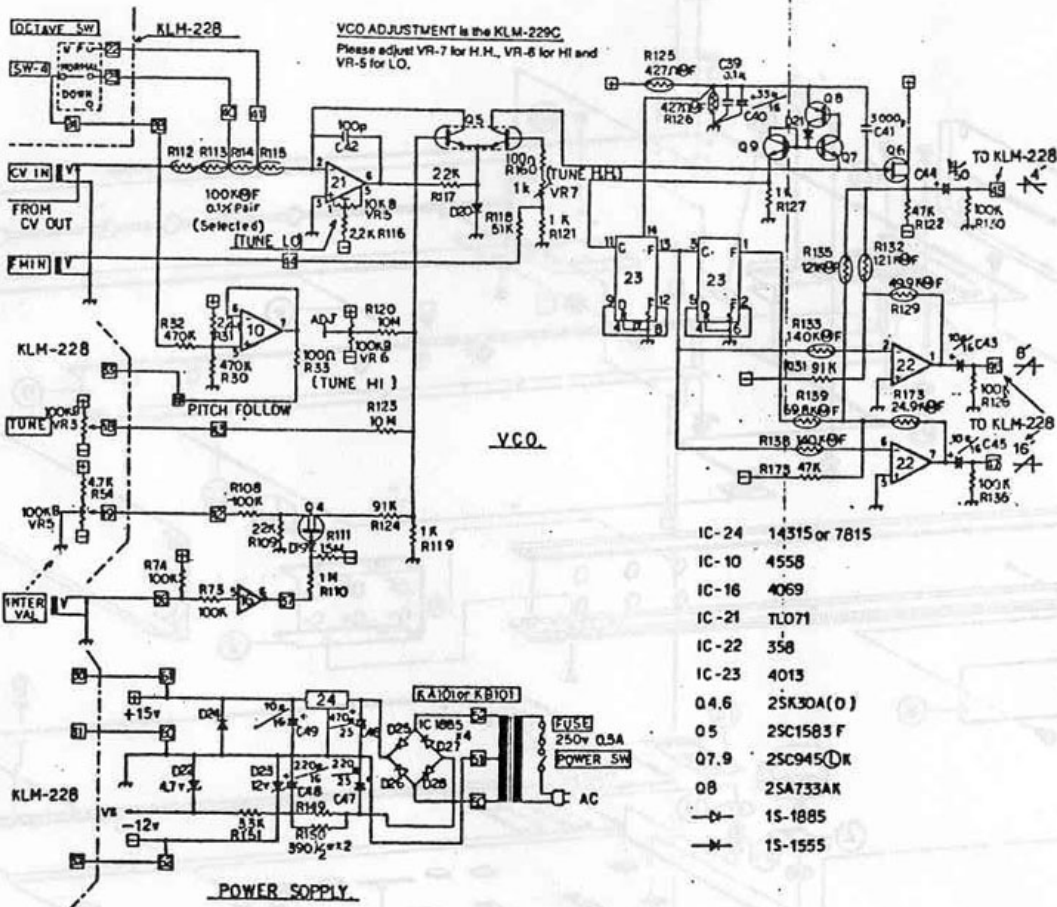
‡ all, IS-1555

⊕ all, PR3432S



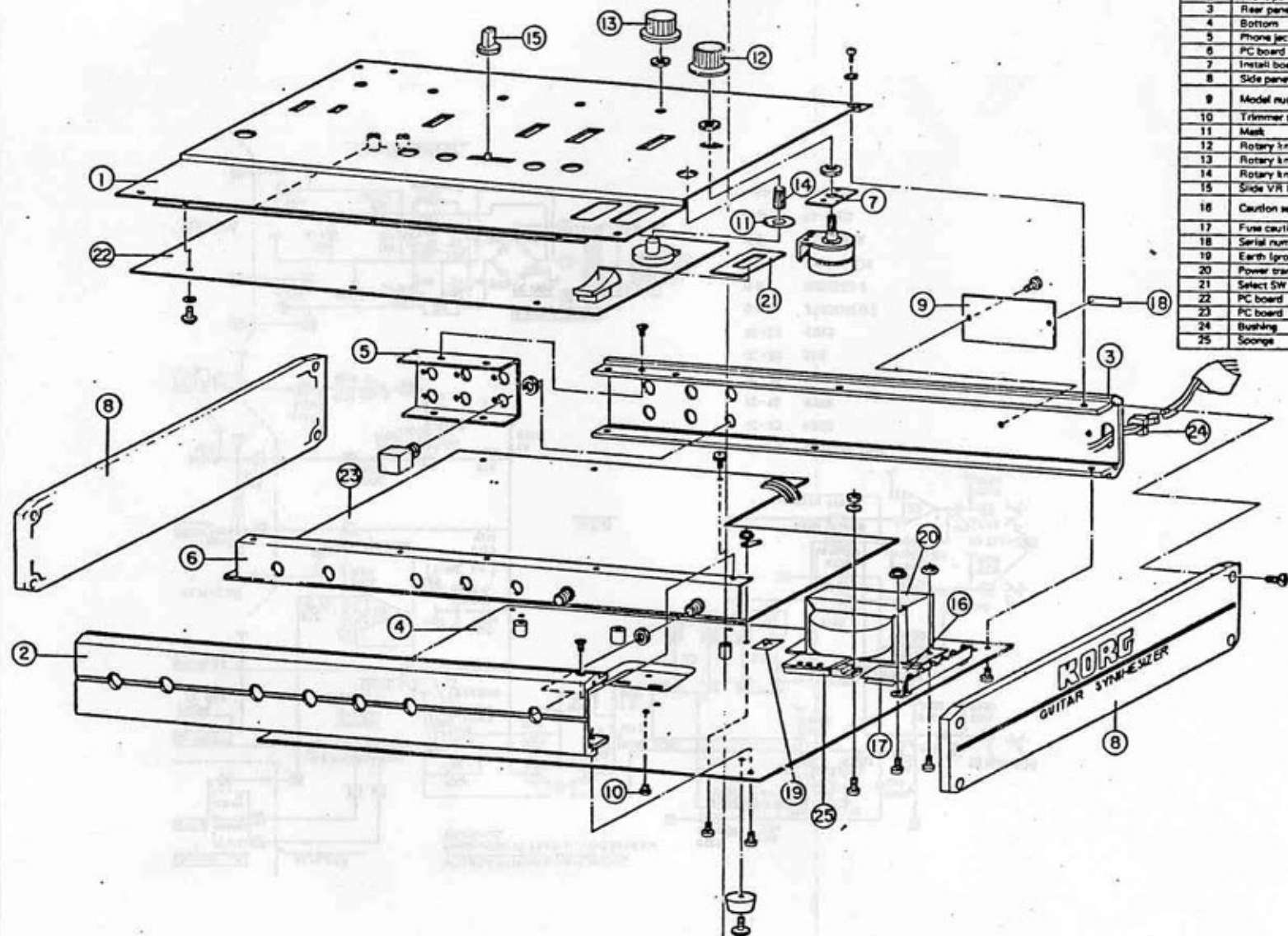






- IC-24 14315 or 7815
- IC-10 4558
- IC-16 4069
- IC-21 TL071
- IC-22 358
- IC-23 4013
- 0.4 25K30A(0)
- 0.5 25C1583 F
- 0.7.9 25C945(L)K
- 0.8 25A733AK
- 15-1885
- 15-1555

## 5. STRUCTURAL DIAGRAM



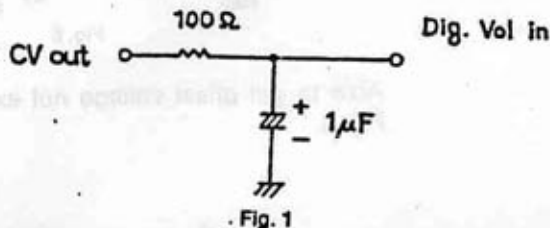
Item	Part Name	Remarks
1	Main panel	KOC-C20080
2	Front panel	KOC-C20078
3	Rear panel	KOC-C20079
4	Bottom	KOC-C30122
5	Phone jack mounting board	KOC-C40247
6	PC board mounting board	KOC-C20248
7	Instali board for potentiometer	KOC-C40249
8	Side panel	KOC-E20020
9	Model number plate	KOC-40145, KOC-40144
10	Trimmer stopper	KOC-F40047
11	Mask	X-0600
12	Rotary knob	X-1009
13	Rotary knob	X-1936
14	Rotary knob (small)	X-1070
15	Side V/R knob	KOC-E40039
16	Caution seal	HAZARD CAUTION
17	Fuse caution seal	KOC-F40057 No.3
18	Serial number plate	KOC-F40050
19	Earth (ground) seal	X-1942
20	Power transformer	KA101, KB101
21	Select SW mask	KOC-F40099
22	PC board	KLM-228
23	PC board	KLM-229
24	Bushing	KOC-F40082 No.1
25	Screws	X-1962

# 6. CHECK AND ADJUSTMENT

## Adjustment No. 1

**N.B.** Add the FG-1 circuit to INPUT of Digital Volt Meter in order to prevent an error which will be caused by direct connection of DIGITAL VOLT METER to CV OUT.

### 1) CV Adjustment



#### Setting No. 1 (X-011)

Sig In.....	WT-10A OUTPUT
Violin.....	On
8'.....	On
Sig Selector.....	VCO
CV Out.....	Dig. Vol 4-1/2

#### Setting No. 2 (WT-10A)

M/S.....	Sound
Chromatic.....	E
Meter.....	0 cent
Octave.....	M

#### Input Level Setting (X-911)

Level.....	-20dB
Polarity.....	A or B (both approval)

Set "Oct Sw" of WT-10A to "H" and adjust "INPUT VOL" and fix TRIG at the point of "ON". Turn "OCT SW" to "L" from "H" in order, and confirm that each voltage indication of DIG VOL changes.

- Slope Adjustment Ref. FIG. 2**  
Adjust to 2.637V by Vr-3 as per above setting.
- Off Set Adjustment**  
Adjust to 1.318V by Vr-4 as per OCT SW to L.
- High Adjustment**  
Adjust to 5.274V by Vr-2 as per OCT SW to H.

Repeat a. b. c. several times and adjust to be same voltage.

Figures should be following listed numbers on each position.

WT-10A OCT SW	DIGITAL VOLT METER	ALLOWANCE
H	5.274	5.271 .....5.277
M	2.637	2.635 .....2.639
L	1.318	1.3172 ..1.3188

### 2) VCO Adjustment

#### Setting

Signal Selector.....	Guitar
Signal Out.....	AMP
Balance.....	Center
Oct Switch.....	Middle
Interval.....	0
Tune.....	Center

#### a. HI Adjust:

Set Oct SW of WT-10A to H and adjust Vr-6 to stop beat.

#### b. LO Adjust:

Set Oct SW of WT-10A to L and adjust Vr-5 to stop beat.

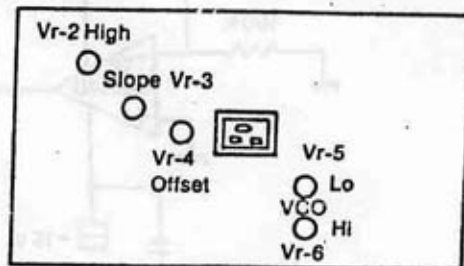


Fig. 2 Rear Pannel

## Adjustment No. 2

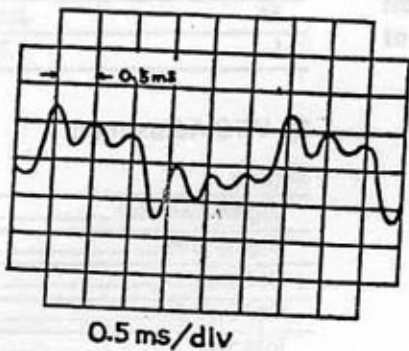
(Adjustment after repair)

- F/V Balance:** Replacement of ICs 1, 2, 4, 5, on KLM-229  
Adjust Vr-1 to half level of voltage test point 19 against test point 13 on KLM-229 by DIG VOL under "INPUT...440 Hz" condition.
- SYNTHE FC** Replacement of IC-8 on KLM-228.

#### Settings

X-911	WT-10A
Synth Wah.....	2 Oct.....
Sig Select.....	VCO M/S.....
VCF Fc.....	5 Chromatic.....
OUT.....	Oscillo Scope Meter.....
Input.....	WT-10A 0 cent
Select SW.....	
8' FC attach 0	

Adjust Vr-9 to be 0.5ms (2 Hz) on above setting.  
Confirm sound itself referring to owner's manual for  
other adjustment.



0.5 ms/div

Fig. 3

### CA 3140E off set select

Fig. 4 is the circuit to simplify of adjustment and to get rid of inoperation by difference of adjustment.

$$VIOs = \frac{VO}{10}$$

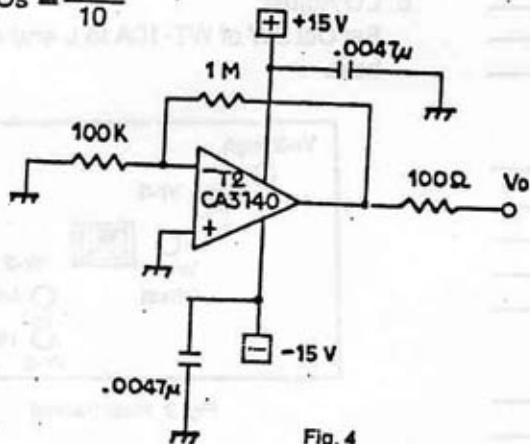


Fig. 4

IC is separated each following mentioned color depends on the value of VIOs.

VIOs (mV)	Color
13.75 ~ 15.00	Purple White
11.25 ~ 13.75	Blue White
8.75 ~ 11.25	Green White
6.25 ~ 8.75	Yellow White
3.75 ~ 6.25	Orange White
1.25 ~ 3.75	Red White
-1.25 ~ +1.25	White
-1.25 ~ -3.75	Red
-3.75 ~ -6.25	Orange
-6.25 ~ -8.75	Yellow
-8.75 ~ -11.25	Green
-11.25 ~ -13.75	Blue
-13.75 ~ -15.00	Purple

Table 1

Taken off by each offset

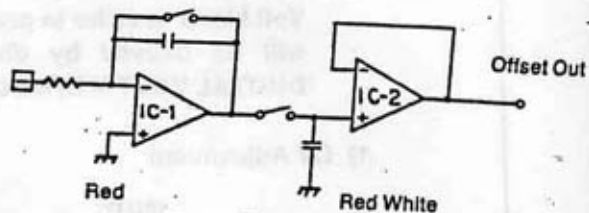


Fig. 5

Able to get offset voltage not exceeding 2.5mV by Fig. 5.

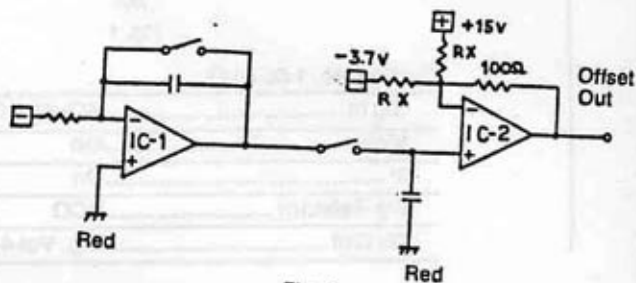


Fig. 6

Able to correct by using RX when you have to use Fig. 6. Namely offset voltage should not be exceeded 2.5mV on output.

Use above method for IC-1, 2, 4, 5.

Small voltage is desirable on IC-7, 8. However, the above voltage not exceed 7mV is allowed.

IC-1 or 4		IC-2 or 5	
Offset V	Color	Offset V	Color
-6mV	Purple	+6mV	Purple White
-5mV	Blue	+5mV	Blue White
-4mV	Green	+4mV	Green White
-3mV	Yellow	+3mV	Yellow White
-2mV	Orange	+2mV	Orange White
-1mV	Red	+1mV	Red White
-0mV	White	+0mV	White

Table 2 IC COLOR LIST

# 7. PARTS LIST

(Refer to structural diagram for parts list)

## ● CARBON RESISTORS not listed

## ● SOLID RESISTORS 1/4W 10MΩ(K) x 5

## ● METAL FILM RESISTORS

- 1/4W 427Ω(F) x 2
- 1.00KΩ(F) x 5
- 4.12KΩ(F) x 1
- 10.0KΩ(F) x 5
- 20.0KΩ(F) x 1
- 24.9KΩ(F) x 1
- 34.8KΩ(F) x 1
- 47.5KΩ(F) x 1
- 49.9KΩ(F) x 1
- 69.8KΩ(F) x 1
- 100KΩ(F) x 4
- 121KΩ(F) x 2
- 140KΩ(F) x 2
- 150KΩ(F) x 2
- 1.00MΩ(F) x 1
- 2.00MΩ(F) x 1
- 10.0KΩ(F) x 1
- 47.5KΩ(F) x 1

## ● MYLAR CAPACITORS

- 50V - 0.001μF(K) x 5
- 0.01μF(K) x 1
- 0.022μF(K) x 1
- 0.1μF(K) x 1
- 0.22μF(K) x 1

## ● CERAMIC CAPACITORS

- 25V - 0.1μF(K)ZfZ x 1
- 50V - 220pF(K) x 1
- 270pF(K) x 1
- 560pF(K) x 3
- 1000pF(K) x 11
- 4700pF(MD) x 5
- 100pF x 11

## ● ELECTROLYTIC CAPACITORS

- 16V-10μF x 5
- 33μF x 1
- 25V - 4.7μF x 1
- 50V - 1μF x 2
- 16V - 220μF x 1
- 25V - 220μF x 1
- 470μF x 1
- 16V - 10μF x 21
- 50V - 1μF x 16
- 25V - 4.7μF x 2

## ● POLYSTYRENE CAPACITORS 50V - 3000pF(G) x 1

## ● POLYPROPYLENE CAPACITORS DC 100V - 1000pF(G) x 4 200V - 0.047μF(M) x 1

## ● MYLAR CAPACITORS

- DC 50V - 0.001μF(K) x 2
- 0.0047μF(K) x 2
- 0.01μF(K) x 3
- 0.015μF(K) x 1
- 0.022μF(K) x 6
- 0.033μF(K) x 1
- 0.047μF(K) x 2

## ● TRANSISTORS

- 2SA - 733AK x 4
- 798F or G x 1
- 945(L)K x 9
- 945(L)K x 19  
(special selected)
- 1583F x 1

## ● FET

- 2SK - 30A TM-GR x 5
- TM-O x 2

## ● DIODES

- 1S - 1555 x 79
- 1885 x 4

## ● LED

- PR - 3432S x 14

## ● ZENER DIODES

- RD - 4.7EB2 x 2
- 12EB2 x 3

## ● IC

- 324 x 1
- 358 x 6
- 393 x 3
- 4011 x 4
- 4013 x 1
- 4066 x 2
- 4069 x 7
- 4558 x 4
- 7815(NEC14315) x 1
- CA - 3140E x 6  
(offset special selected)
- RC - 4200 x 1
- TL - 071 x 1
- LM - 13600N x 1

## ● SELECT SW

- 320.2 White x 6
- Yellow x 5
- Orange x 1

## ● SLIDE SW

- ESD - 32132 x 1
- 32131 x 5

## ● PHONE JACKS

- SG - 7622 x 7
- 7501 x 4
- 7617 x 2

## ● TERMINAL BOARD

- No. 9 - 2L4P x 1

## ● FUSE

- 0.5A - 250V x 1

## ● SEMI-FIXED RESISTORS

- SR19R 10K x 3
- 100K x 2
- 220K x 1
- WHS-512A 1KΩ(B) x 1
- EVL-S6A A00 B14 x 2
- B15 x 3

## ● ROTARY VARIABLE RESISTORS

- Evh-LOA S20 B15 x 7
- A16 x 5
- Evh-5LA 814 B15 x 2
- A26 x 1
- EVC-BQ5P 18 B14 x 1
- Evh-6LA 814 B15 x 1

## ● SLIDE VARIABLE RESISTORS

- LFE - 9R 533 1KB x 1

## ● CONNECTOR

- GS-1101 x 1
- GS-1102 x 1
- GS-1103 x 1
- GS-1104 x 1
- GS-1105-1 x 1
- GS-1106 x 1
- MLR-03 TRC-1 x 1
- TRC-50 x 1
- BS-2P-SHF-1 x 1
- BS-4P-SHF-1 x 2
- BS-5P-SHF-1 x 1
- BS-6P-SHF-1 x 2

## ● PRINTED CIRCUIT BOARD

- KLM-228 x 1
- KLM-229 x 1