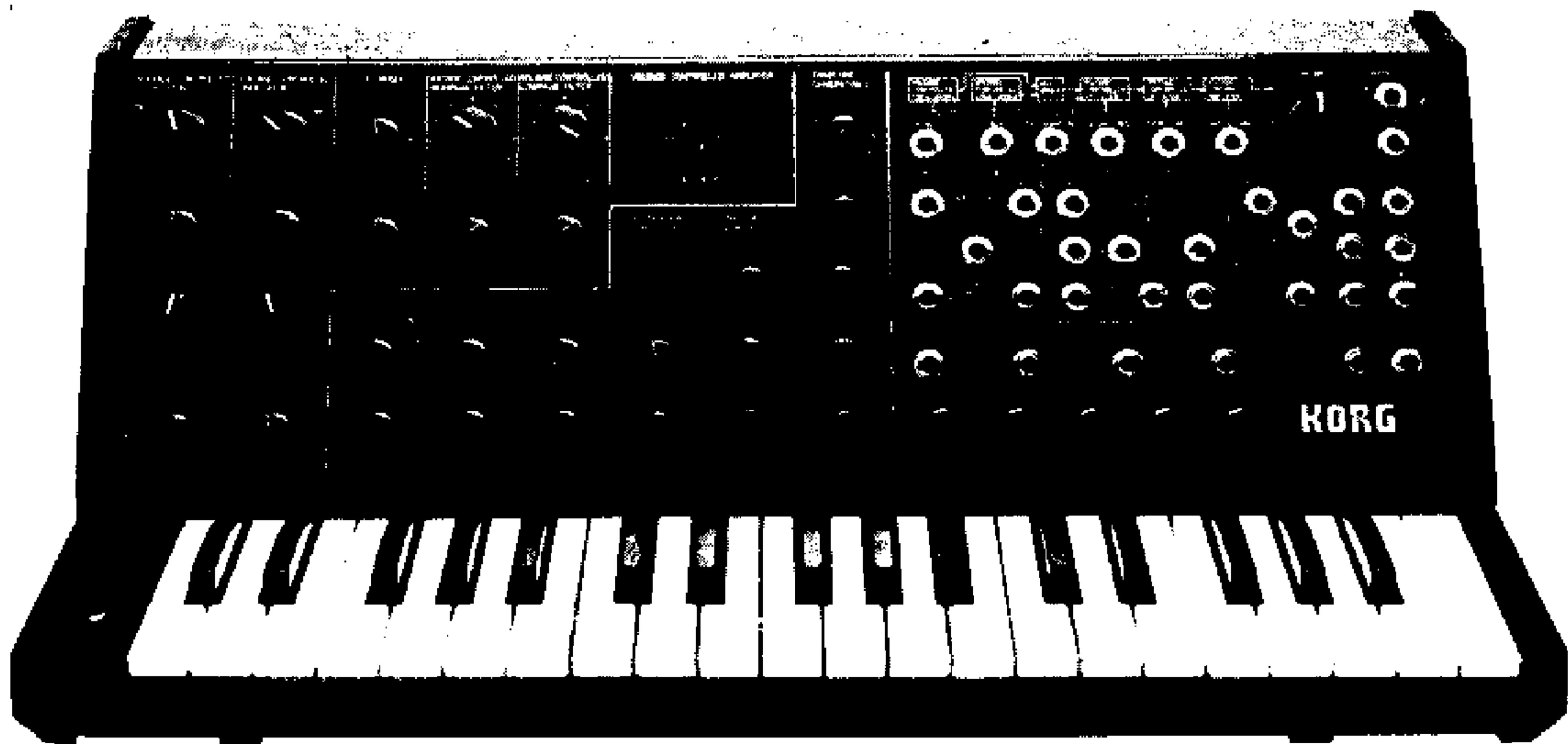


# KORG



## MONOPHONIC SYNTHESIZER SERVICE MANUAL **MS-20**

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**KEIO ELECTRONIC LABORATORY CORPORATION  
TOKYO/JAPAN**

# 1. SPECIFICATIONS

## < CONTROL SECTION >

1. Keyboard
  - C~C 37 keys (3 octaves)
2. Voltage controlled oscillator 1
  - Scale (32', 16', 8', 4') (6 octaves, + cent, - cent)
  - Wave form (  $\wedge$ ,  $\searrow$ , PW (  $\square$  ~  $\square$  ), white noise) (4 modes)
  - Pulse width adjust 1:1 ~ 1:∞
3. V.C.O.2
  - Scale (16', 8', 4', 2') (6 octaves, + cent, - cent)
  - Wave form (  $\searrow$ ,  $\square$ ,  $\square$ , ring modulator) (4 modes)
  - Pitch ( $\pm 1$  OCTAVES)
4. V.C.O. master control
  - Master tune ( $\pm 100$  cent)
  - Portamento (max. 00 sec)
  - Frequency modulation intensity by MG/T. EXT ( $\pm 5V$ )
  - Frequency modulation intensity by EG1/EXT (+5V)
5. V.C.O. mixer
  - V.C.O.-1 level
  - V.C.O.-2 level
6. Voltage controlled high pass filter
  - Cutoff frequency (50Hz ~ 15,000Hz)
  - Peak (flat ~ self OSC)
  - Cutoff frequency modulation intensity by MG/T.EXT (-5V ~ +5V)
  - Cutoff frequency modulation intensity by EG2/EXT (-5V ~ +5V)
7. Voltage controlled low pass filter
  - Cutoff frequency (50Hz ~ 15,000Hz)
  - Peak (flat ~ self OSC)
  - Cutoff frequency modulation intensity by MG/T.EXT (-5V ~ +5V)
  - Cutoff frequency modulation intensity by EG2/EXT (-5V ~ +5V)
8. Envelope generator 1
  - Delay time (10 sec)
  - Attack time (10 sec)
  - Release time (10 sec)
9. Envelope generator 2
  - Hold time (20 sec)
  - Attack time (10 sec)
  - Decay time (10 sec)
  - Sustain level (0 ~ 5V)
  - Release time (10 sec)
10. Modulation generator
  - Wave form (  $\searrow$  ~  $\wedge$  ~  $\nearrow$ ,  $\square$  ~  $\square$  ~  $\square$  )
  - Frequency (1:1 ~ 1:80)
11. Manual controller
  - Control wheel (center click) (0.1Hz ~ 20Hz)
  - Momentary switch  $\overline{\text{GND}}$
12. P. Switch and volume
  - Volume
13. Indicator
  - LED (KBD trigger, MG rate)

## < EXTERNAL SIGNAL PROCESSOR >

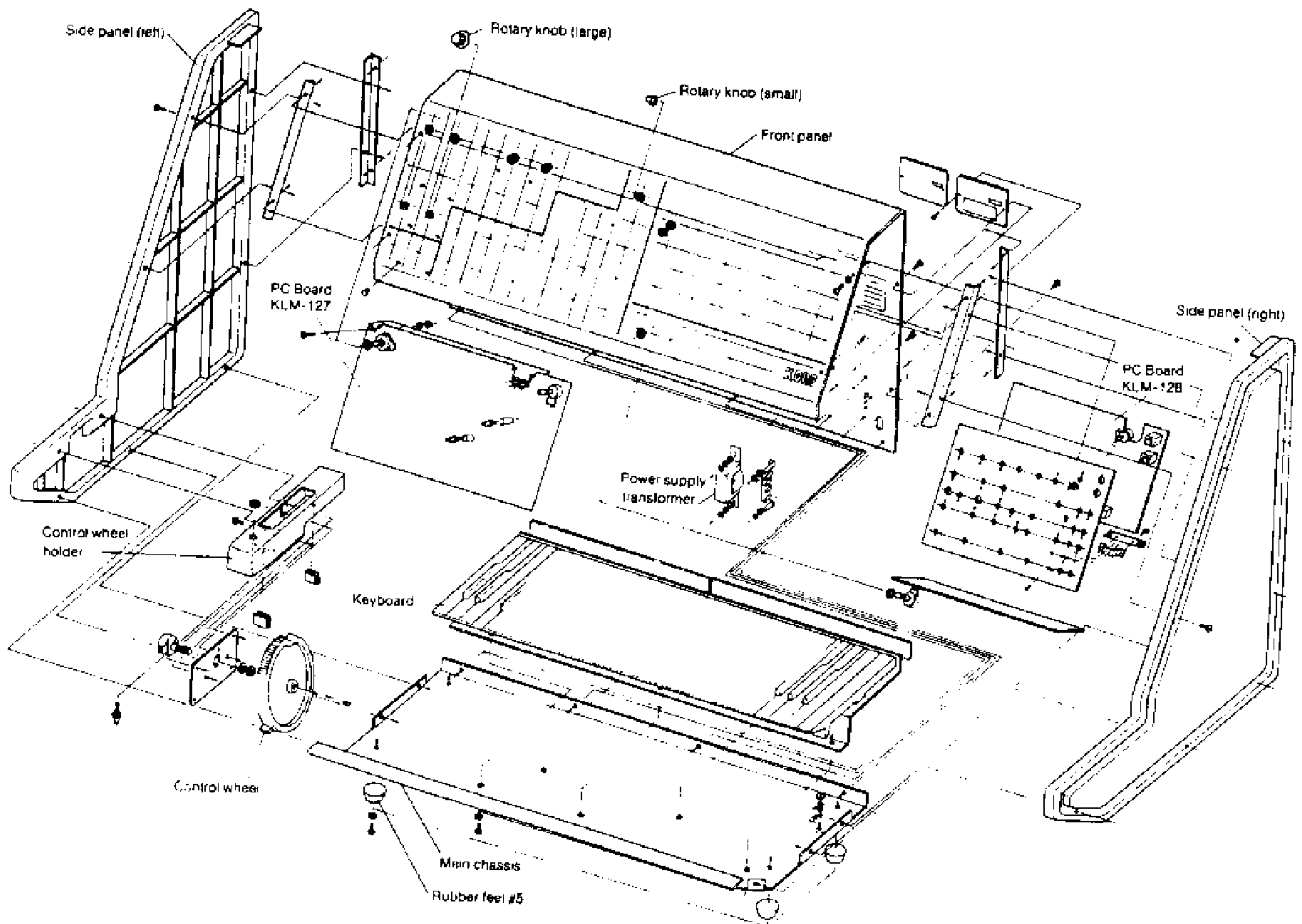
1. Control section
  - Input signal level (0dB max.)
  - Low cut frequency (50 ~ 2,500Hz)
  - High cut frequency (100 ~ 5,000Hz)
  - CV adjust
  - Threshold level
2. Input and output
  - Signal In (auto pad system) (1.0 ~ +14.0V)
  - Amplifier Out
  - Band pass filtered Out
  - CV Out ( $F \infty V$ ) (0 ~ +8.4V)
  - ENV Out (0 ~ +5V)
  - Trig Out (+5V  $\overline{\text{GND}}$ )
3. Indicator (LED)
  - Peak indicator
  - Trigger indicator

## < PATCH PANEL >

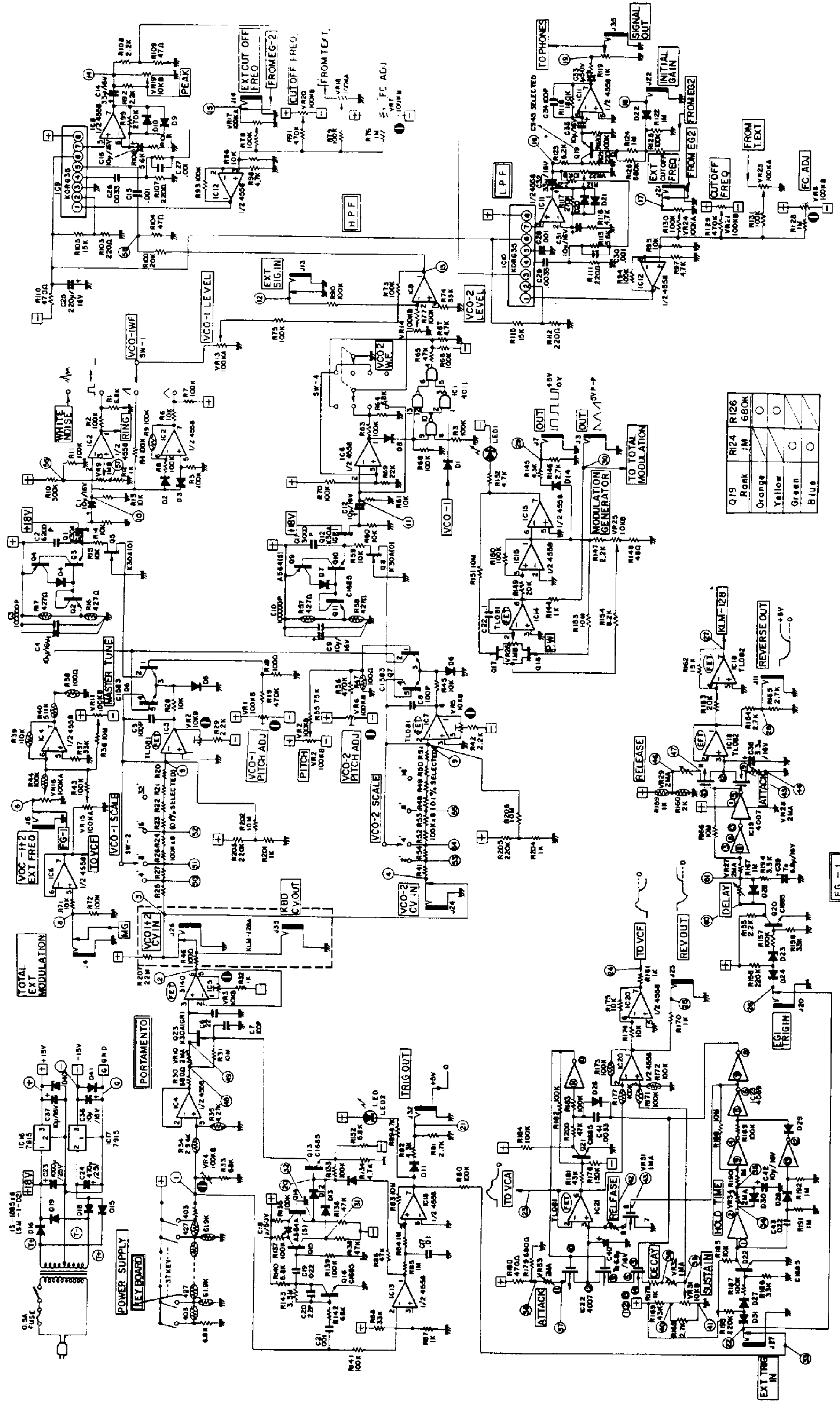
1. Keyboard
  - Keyboard control voltage output (exponential) (0 ~ +8V)
  - Keyboard trigger output (+5V  $\overline{\text{GND}}$ )
  - VCO-1 + VCO-2 control voltage input (linear response) (0 ~ +8V)
  - VCO-2 control voltage input (linear response) (0 ~ 8V)
2. VCO
  - VCO-1 + VCO-2 external frequency control input (OCT/V) (+5V -5V)
3. VCF
  - External signal input (3Vp-p max.)
  - External HP filter cutoff frequency control input (2OCT/V) (-5V ~ +5V)
  - External LP filter cutoff frequency control input (2OCT/V) (-5V ~ +5V)
4. VCO + VCF
  - Total external modulation input (T. ext) (-5 ~ +5V)
5. VCA
  - External initial gain control input (0 ~ +5V)
6. EG
  - EG 1 envelope signal normal output (-5V  $\overline{\text{GND}}$  0V)
  - EG 1 envelope signal reverse output (+5V  $\overline{\text{GND}}$  0V)
  - EG 1 + EG 2 trigger input ( $\overline{\text{GND}}$ )
  - EG 1 trigger input ( $\overline{\text{GND}}$ )
  - EG 2 envelope signal reverse output ( $\overline{\text{GND}}$  0V)
7. MG
  - Triangle output ( $\searrow$  ~  $\wedge$  ~  $\nearrow$ ) (5Vp-p  $\overline{\text{GND}}$  0V)
  - Rectangle output ( $\square$  ~  $\square$  ~  $\square$ ) ( $\overline{\text{GND}}$   $\frac{5V}{2}$ )

- |                       |   |                        |   |
|-----------------------|---|------------------------|---|
| 8. Noise generator    | <ul style="list-style-type: none"> <li>• Pink noise output (5Vp-p <math>\pm 20</math>)</li> <li>• White noise output (5Vp-p <math>\pm 20</math>)</li> </ul>   | 12. Signal out         | • Signal output (2Vp-p output impedance 3.5k $\Omega$ ) |
| 9. Sample and hold    | <ul style="list-style-type: none"> <li>• Clock trigger input (<math>\overline{\text{GND}}</math>)</li> <li>• Sample signal input (5Vp-p max.)</li> <li>• S/H output (5Vp-p max.)</li> </ul>                     | 13. Head phones        | • Head phones output ((8 $\Omega$ ) 120m watts 5.6)     |
| 10. Modulation VCA    | <ul style="list-style-type: none"> <li>• Control voltage input (0 ~ +5V)</li> <li>• Signal input (-5V ~ +5V)</li> <li>• Signal output (-5V ~ +5V)</li> </ul>  | 14. Power consumption* | 10 watts  |
| 11. Manual controller | <ul style="list-style-type: none"> <li>• Control wheel output (-5V <math>\rightarrow</math> 0V <math>\rightarrow</math> +5V)</li> <li>• Momentary switch output (<math>\overline{\text{GND}}</math>)</li> </ul> | 15. Dimensions         | • 569(W) x 309(D) x 249(H) mm                           |
|                       |   | 16. Weight             | • 7.7 kgs   |
|                       |   | 17. Accessories        | • Patch cord, connection cord (35 cm x 2, 3 m x 1)      |
|                       |   | 18. Options            | • Stand, hard case, foot pedal (MS-01)                  |
|                       |   |                        | • Junction box (MS-02)                                  |

## 2. STRUCTURAL DIAGRAM



### 3. CIRCUIT DIAGRAM (1)



Q19	R124	R126
Orange	IM	580K
Yellow		
Green		
Blue		

EG-1

EG-2



