

# CE-1

# SERVICE NOTES

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	 (SERIAL NO. 665600 AND HIGHER)	
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First published December 1976.

# 1. SPECIFICATIONS

- Input Sensitivity .....80mV/10mV
- Output Level ..... 200mV
- Signal-to-Noise Ratio .....60dB (over 75dB when Noise Killer operates)
- Control:    Level Control  
              Chorus Intensity  
              Vibrato Depth  
              Vibrato Rate
- Switch:     Power Switch  
              Input Sensitivity (High/Low)  
              Normal/Effect  
              Chorus/Vibrato
- Indicator:  Peak Level  
              Chorus/Vibrato/Normal
- Jack:       Input ..... 1  
              Output ..... 2
- Dimensions and Weight:  
              Overall Dimensions .....260(W) x 64(H) x 180(D)mm  
              Net Weight .....1.8kg
- AC Mains ..... 100/117/220/240V, 50/60Hz
- Power Consumption..... 3W max.

## 2. CIRCUIT DESCRIPTION

CE-1 adds chorus or vibrato effect to various input music signals by means of a BBD (bucket brigade device), which produces a signal with delayed pitch from the straight signal. The chorus or vibrato effect is produced by modulating, with triangular or sine wave, respectively, the clock pulse that drives the BBD gate.

### 2-1. MIC AMP

When using small output sources like microphone, the MIC AMP amplifies the input signal by 20dB (10 times).

### 2-2. PEAK LEVEL DRIVE

When input signal to the BBD goes beyond 3Vp-p, this circuit is actuated to light up the peak level lamp.

### 2-3. CLOCK GENERATOR

This circuit oscillates clock pulse (60KHz – 200KHz) that functions to open or close the BBD gate.

### 2-4. CHORUS/VIBRATO GENERATOR

This is a low frequency oscillator that functions to modulate the clock pulse to drive the BBD gate.

It generates a triangular wave of 2.4sec – 325msec for chorus effect and a sine wave of 325msec – 90msec for vibrato effect.

### 2-5. LOW-PASS FILTER

This is one-transistor, active low pass filter (Q10) to eliminate clock pulse leakage (over 60KHz) that is superposed on the output from BBD.

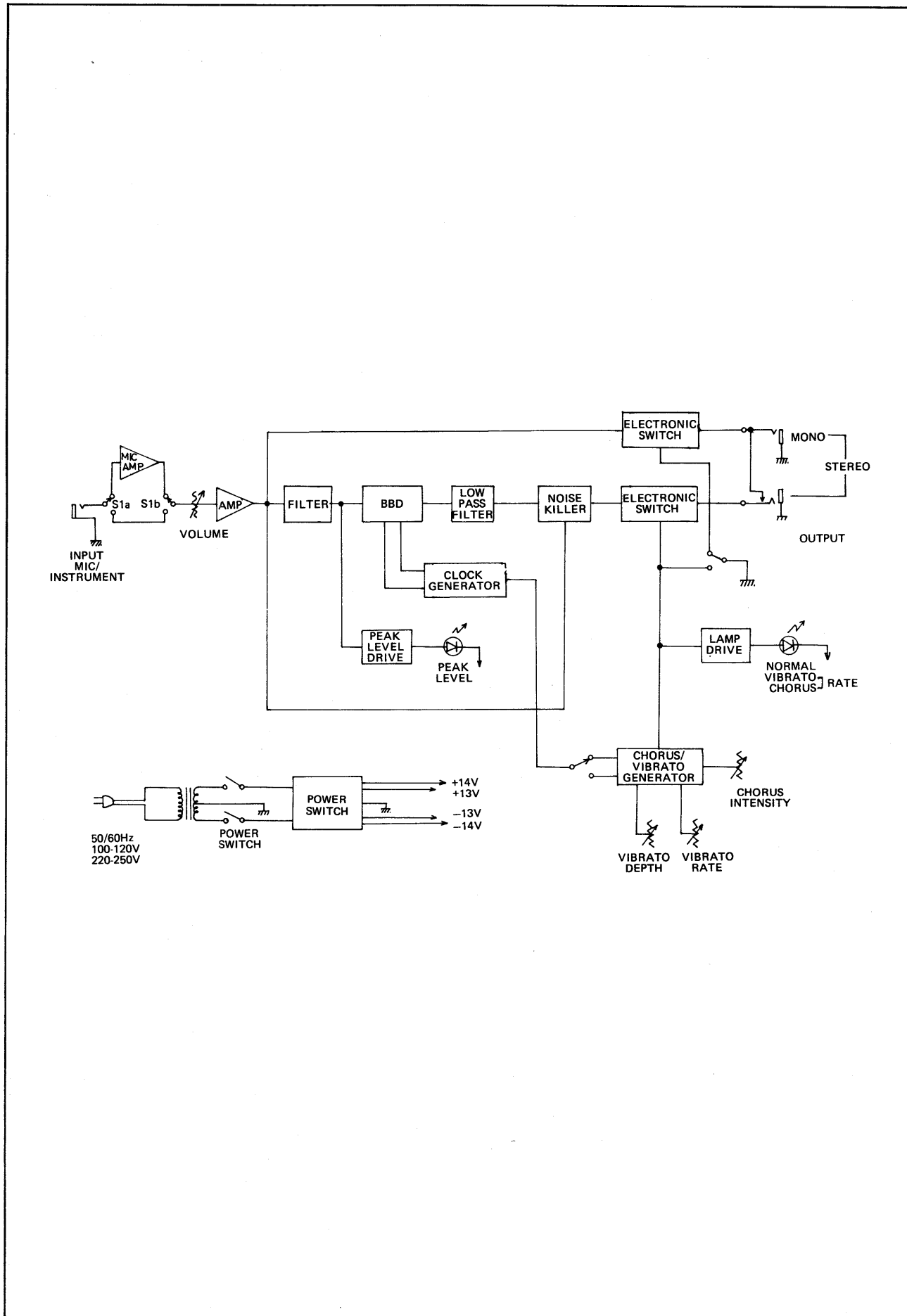
### 2-6. NOISE KILLER

This circuit functions to eliminate the noise generated in BBD. When the input signal is so small that the output level from IC1 is less than 10mV, FET, Q12, conducts to pass the noise to ground.

### 2-7. ELECTRONIC SWITCH

Two FET's compose an electronic switch. When NORMAL/EFFECT switch is set to NORMAL, FET, Q13, non-conducts to cancel the effect signal.

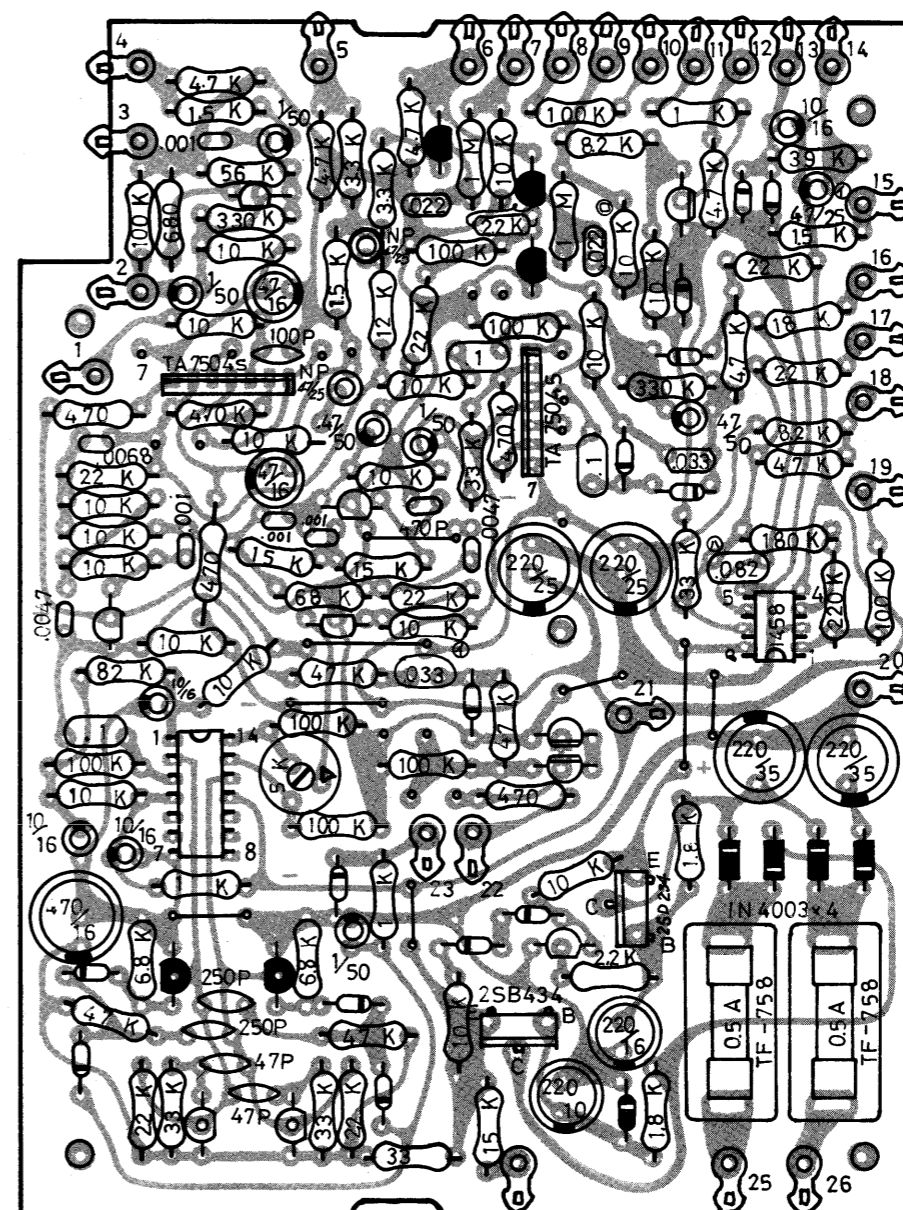
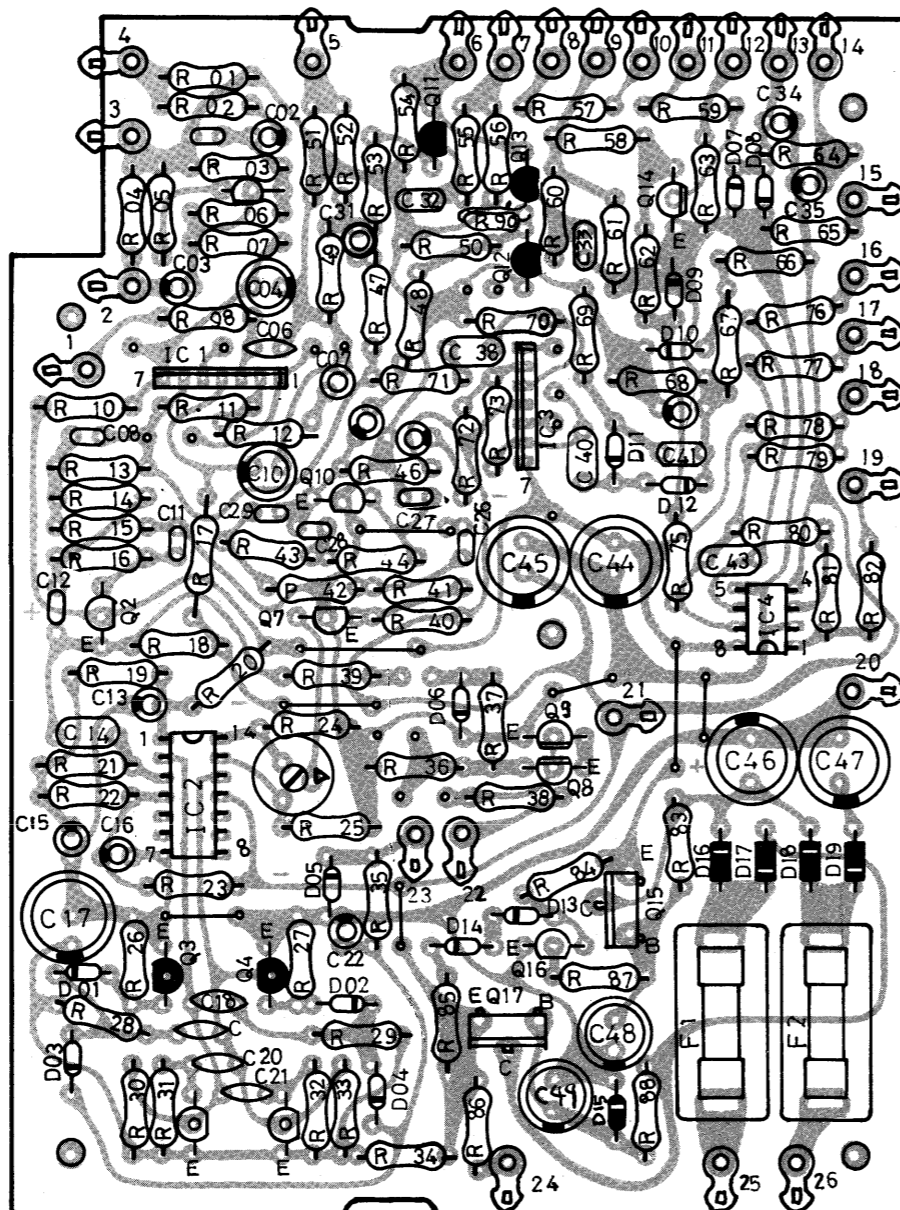
### 3. BLOCK DIAGRAM



### 4. PC BOARD

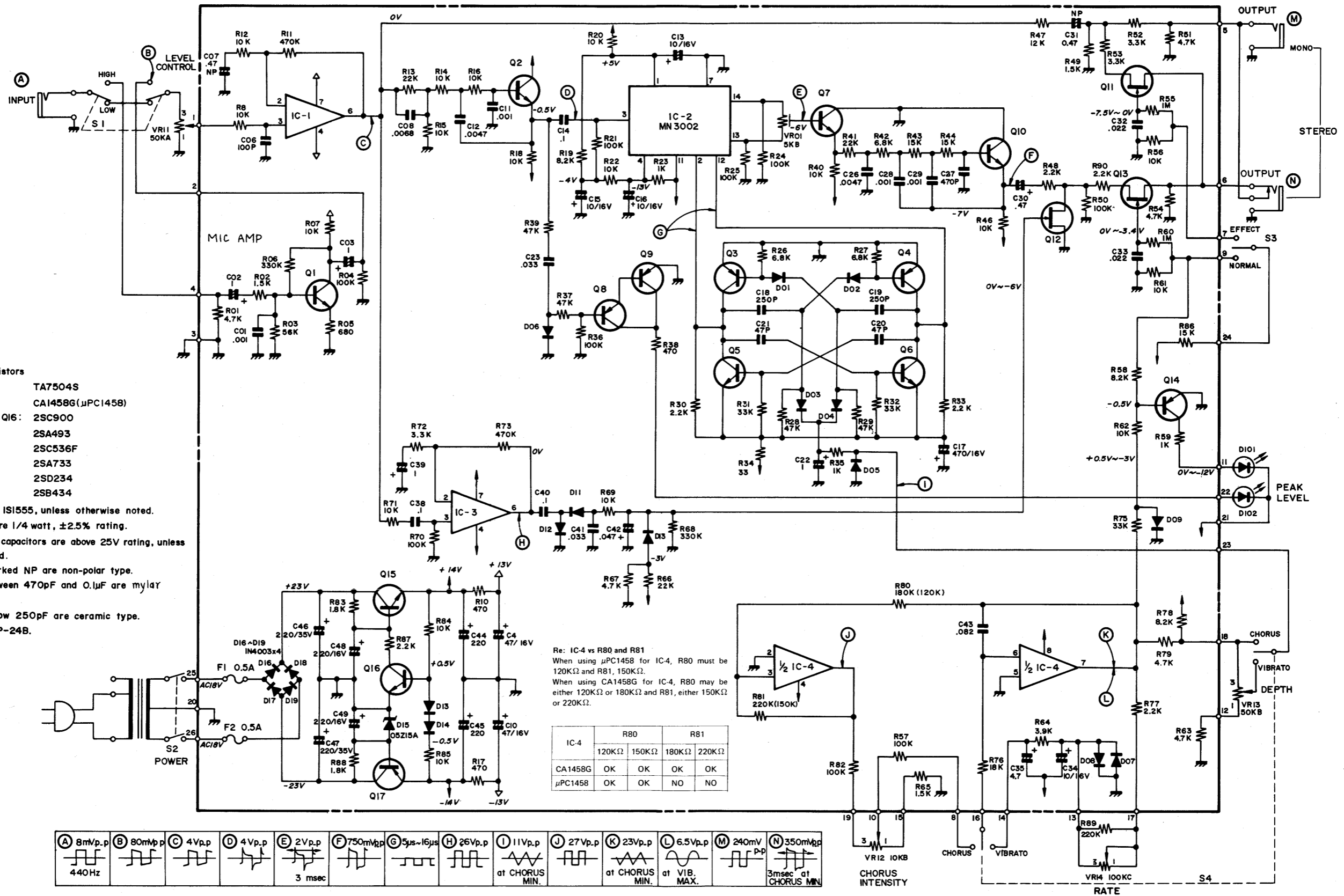
ET-10D (PCB ASSEMBLY: 151-010D; PCB LESS PARTS: 052-145D)

- ⊖ ⊕ ELECTROLYTIC
- ⊙ NON-POLAR, .47/25
- ▭ MYLAR, 50VK
- ◊ CERAMIC, 50VK
- ⌞ 1/4 RJ
- ⊙<sup>B</sup> ⊖<sup>E</sup> 2SC536 F
- ⊙<sup>B</sup> ⊖<sup>E</sup> 2SA493 GR
- ⊙<sup>E</sup> ⊖<sup>D</sup> 2SK30A Y
- ⊙<sup>B</sup> ⊖<sup>S</sup> 2SA733 Q
- ⊙<sup>E</sup> ⊖<sup>B</sup> 2SC900 F
- ⊖ 1S1555
- ⊖ 05Z15A



5. CIRCUIT DIAGRAM

ET-10D (PCB ASSEMBLY: 151-010D; PCB LESS PARTS: 052-145D)

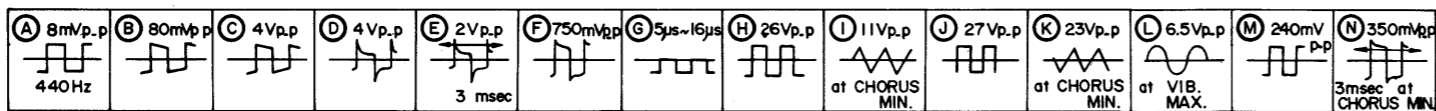


- IC's and Transistors
- IC1, IC3: TA7504S
- IC4: CA1458G(μPC1458)
- Q1, Q2, Q7, Q10, Q16: 2SC900
- Q3, Q4: 2SA493
- Q5, Q6: 2SC536F
- Q8, Q9, Q14: 2SA733
- Q15: 2SD234
- Q17: 2SB434

- All diodes are 1S1555, unless otherwise noted.
- All resistors are 1/4 watt, ±2.5% rating.
- All electrolytic capacitors are above 25V rating, unless otherwise noted.
- Capacitors marked NP are non-polar type.
- Capacitors between 470pF and 0.1μF are mylar film type.
- Capacitors below 250pF are ceramic type.
- LED's are SLP-24B.

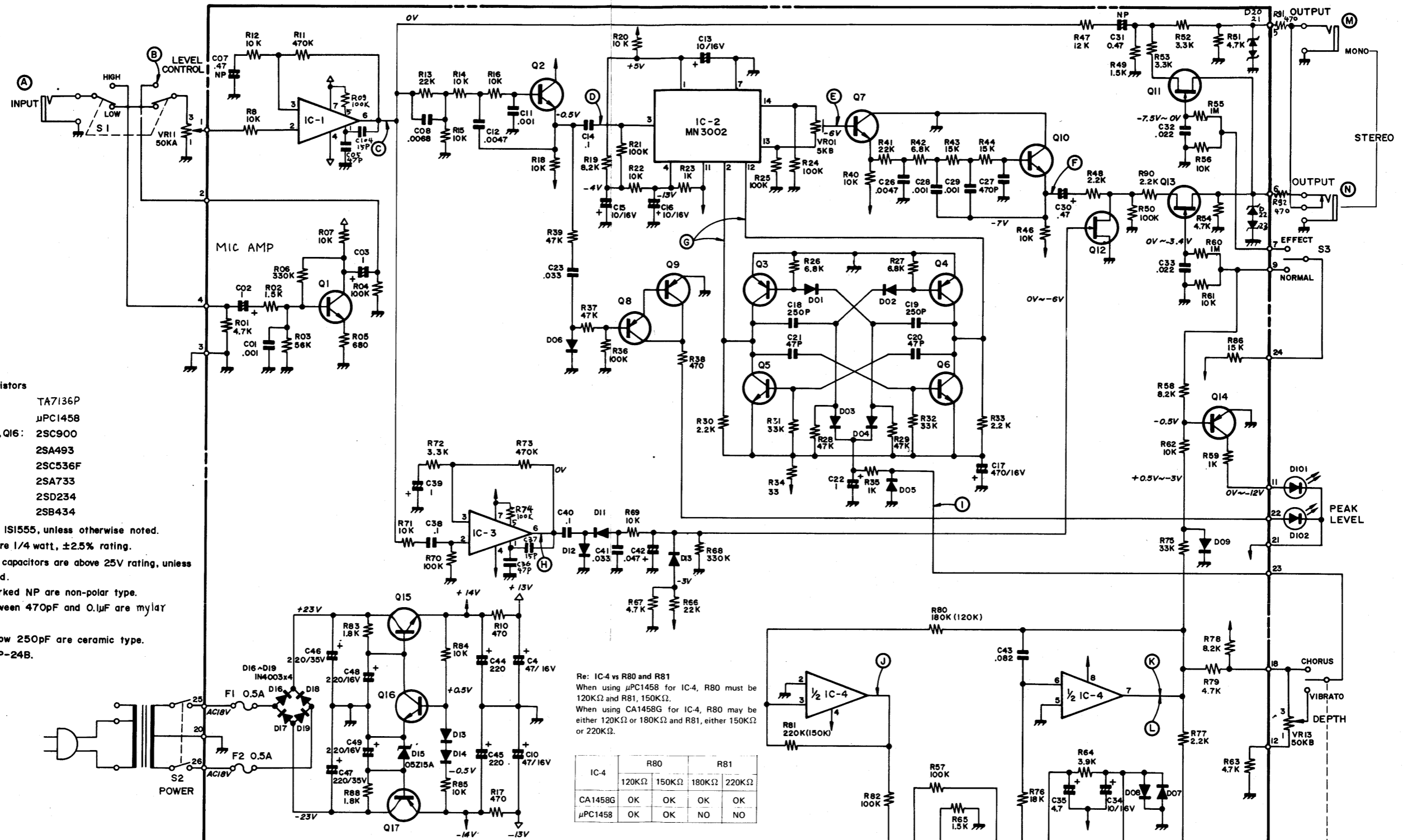
Re: IC-4 vs R80 and R81  
 When using μPC1458 for IC4, R80 must be 120KΩ and R81, 150KΩ.  
 When using CA1458G for IC-4, R80 may be either 120KΩ or 180KΩ and R81, either 150KΩ or 220KΩ.

IC-4	R80	R81
	120KΩ	150KΩ
	180KΩ	220KΩ
CA1458G	OK	OK
μPC1458	OK	NO



ET-10C (PCB ASSEMBLY: 151-010C; PCB LESS PARTS: 052-145C)

D20-23: 05Z15A

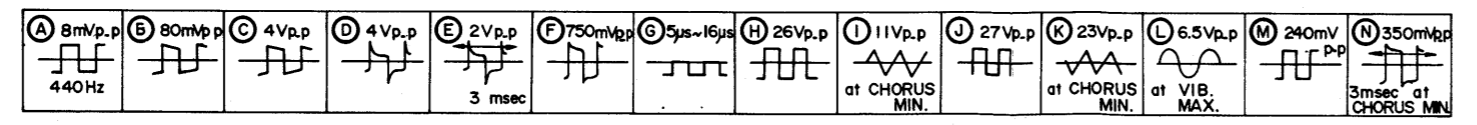


- IC's and Transistors
- IC1, IC3: TA7136P
- IC4:  $\mu$ PC1458
- Q1, Q2, Q7, Q10, Q16: 2SC900
- Q3, Q4: 2SA493
- Q5, Q6: 2SC536F
- Q8, Q9, Q14: 2SA733
- Q15: 2SD234
- Q17: 2SB434

- All diodes are 1S1555, unless otherwise noted.
- All resistors are 1/4 watt,  $\pm 2.5\%$  rating.
- All electrolytic capacitors are above 25V rating, unless otherwise noted.
- Capacitors marked NP are non-polar type.
- Capacitors between 470pF and 0.1 $\mu$ F are mylar film type.
- Capacitors below 250pF are ceramic type.
- LEDs are SLP-24B.

Re: IC-4 vs R80 and R81  
 When using  $\mu$ PC1458 for IC-4, R80 must be 120K $\Omega$  and R81, 150K $\Omega$ .  
 When using CA1458G for IC-4, R80 may be either 120K $\Omega$  or 180K $\Omega$  and R81, either 150K $\Omega$  or 220K $\Omega$ .

IC-4	R80		R81	
	120K $\Omega$	150K $\Omega$	180K $\Omega$	220K $\Omega$
CA1458G	OK	OK	OK	OK
$\mu$ PC1458	OK	OK	NO	NO



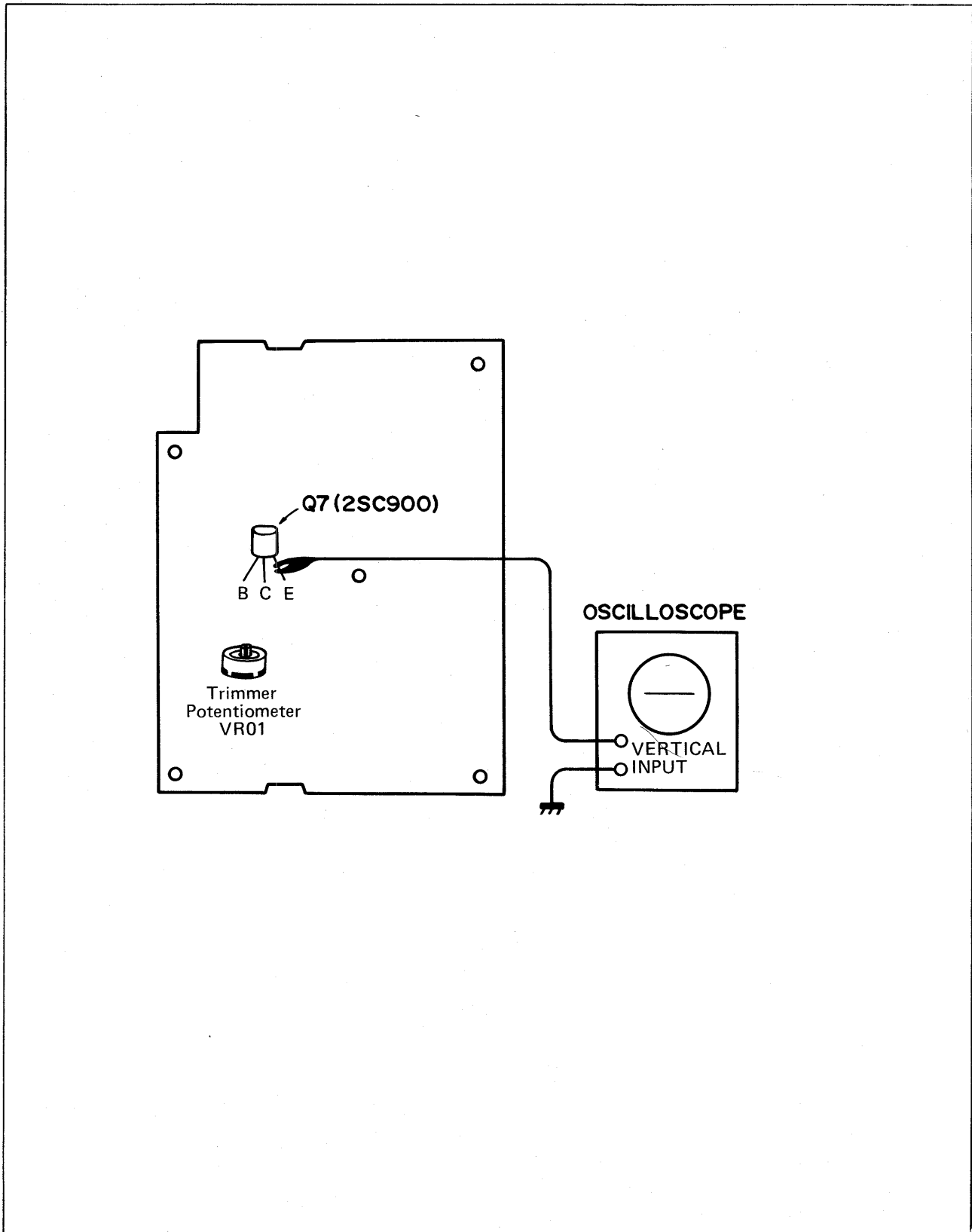




## 6. ADJUSTING PROCEDURES

### ADJUSTING BBD OUTPUT WAVEFORMS

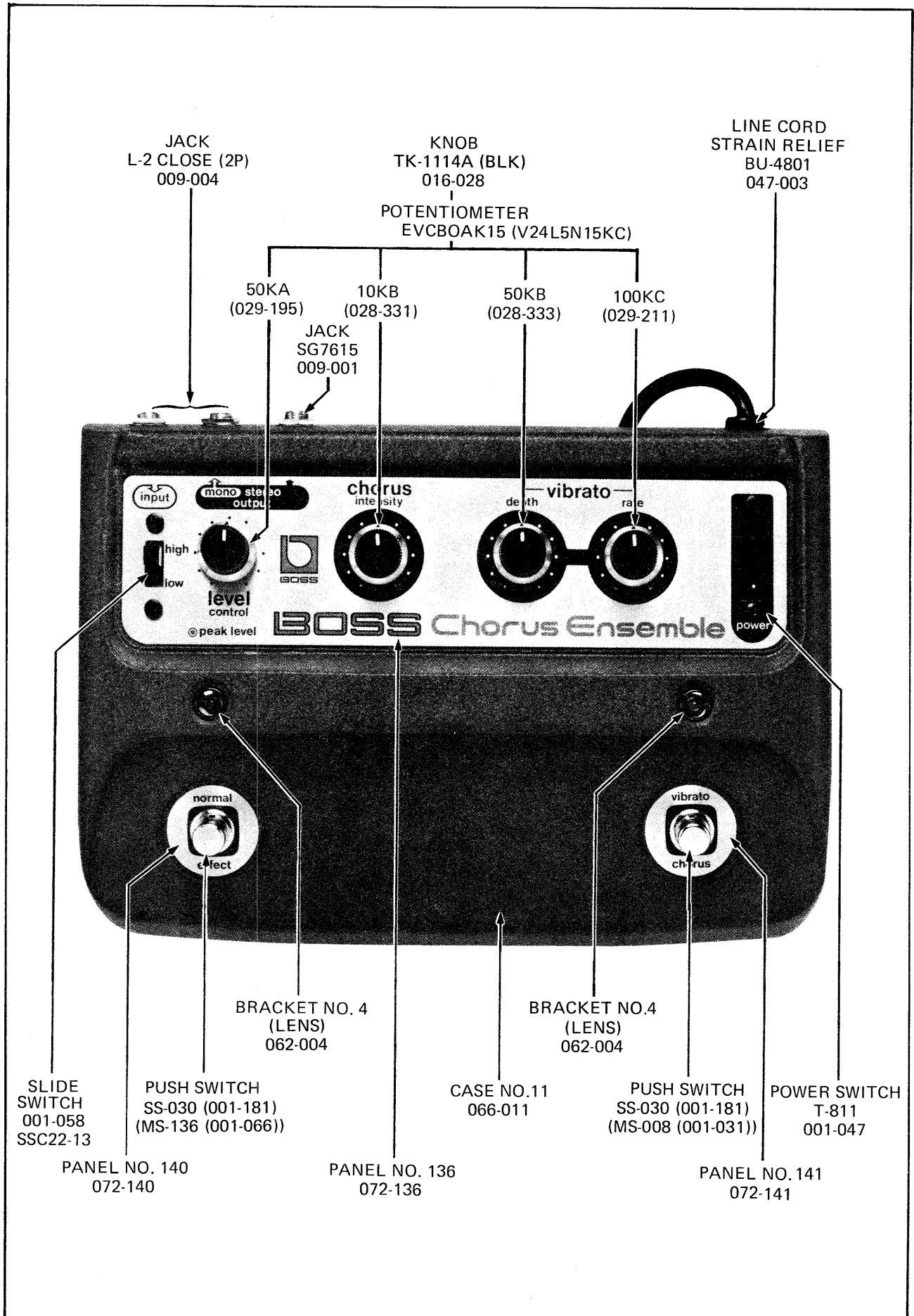
Connect Vertical Input lead of an oscilloscope to emitter of Q7 (2SC900). Adjust trimmer potentiometer, VR01, so that the waveforms of two outputs come as close as possible each other.



## 7. PARTS LIST

PARTS NO.	PARTS NAME AND DESCRIPTION
052-145D	Printed Circuit Board No. 145D (less parts) → No. 145C
020-030	IC, MN3002
020-061	IC, TA7504S → TA7136P (020-027)
020-062	IC, $\mu$ PC1458
017-014	FET, 2SK30A Y
017-012	Transistor, 2SA733 Q
017-021	Transistor, 2SC900 F
017-009	Transistor, 2SA493 GR
017-037	Transistor, 2SC536 F
017-022	Transistor, 2SB434
017-010	Transistor, 2SD234
018-005	Diode, 1S1555
018-022	Diode, 1N4003
018-024	Diode, 05Z15A
	*Carbon film resistors of 1/4W, $\pm$ 5% rating are omitted.
037-002	Capacitor, 50V, 15pF, $\pm$ 10%, Ceramic
037-005	Capacitor, 50V, 47pF, $\pm$ 10%, Ceramic
037-006	Capacitor, 50V, 100pF, $\pm$ 10%, Ceramic
037-007	Capacitor, 50V, 250pF, $\pm$ 10%, Ceramic
035-001	Capacitor, 50V, 470pF, $\pm$ 10%, Mylar
035-005	Capacitor, 50V, 0.001 $\mu$ F, $\pm$ 10%, Mylar
035-012	Capacitor, 50V, 0.0047 $\mu$ F, $\pm$ 10%, Mylar
035-014	Capacitor, 50V, 0.0068 $\mu$ F, $\pm$ 10%, Mylar
035-020	Capacitor, 50V, 0.022 $\mu$ F, $\pm$ 10%, Mylar
035-022	Capacitor, 50V, 0.033 $\mu$ F, $\pm$ 10%, Mylar
035-027	Capacitor, 50V, 0.082 $\mu$ F, $\pm$ 10%, Mylar
035-028	Capacitor, 50V, 0.1 $\mu$ F, $\pm$ 10%, Mylar
032-070	Capacitor, 50V, 0.47 $\mu$ F, Electrolytic
032-071	Capacitor, 50V, 1 $\mu$ F, Electrolytic
032-046	Capacitor, 25V, 4.7 $\mu$ F, Electrolytic
032-033	Capacitor, 16V, 10 $\mu$ F, Electrolytic
032-036	Capacitor, 16V, 47 $\mu$ F, Electrolytic
032-040	Capacitor, 16V, 470 $\mu$ F, Electrolytic
032-052	Capacitor, 25V, 220 $\mu$ F, Electrolytic
032-066	Capacitor, 35V, 220 $\mu$ F, Electrolytic
032-038	Capacitor, 16V, 220 $\mu$ F, Electrolytic
032-193	Capacitor, 50V, 0.47 $\mu$ F, Non-polar
028-003	Trimmer Potentiometer, 5K $\Omega$ (B) EVL-R4XA00
008-024	Fuse (Midget), 0.5A, SGA-0500
012-003	Fuse Holder, TF-758

# 8. PANEL PARTS



# 9. WIRING ILLUSTRATION

#88C (022-88C)	#88D (022-88D)
117V GRN 100V BLU 0 WHT	240V RED 220V BRN 0 WHT
YEL BLK YEL	YEL BLK YEL

RUBBER FOOT G-14  
(111-025)

