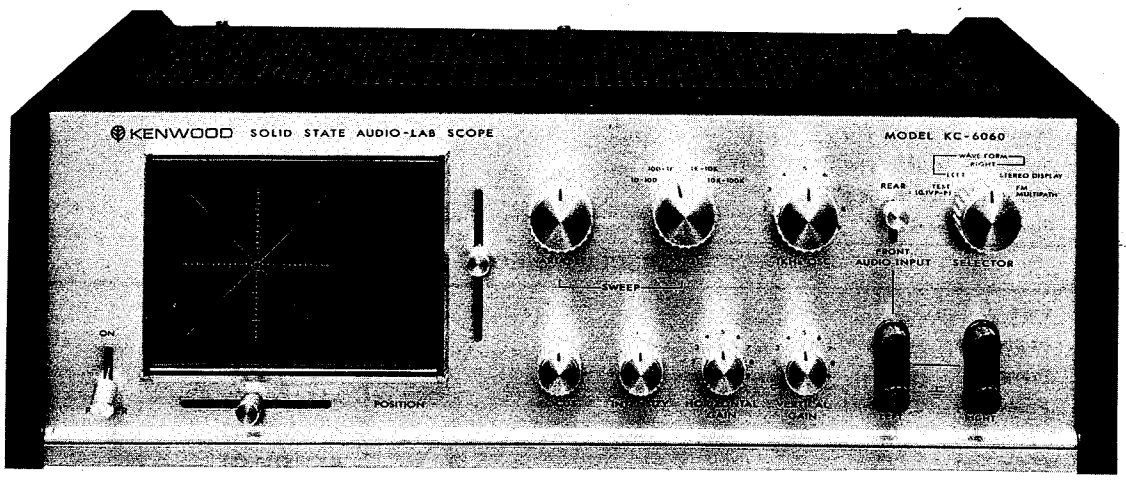
KENWOOD

HI/FI STEREO COMPONENTS

SERVICE MANUAL

KC-6060



SOLID STATE AUDIO-LAB SCOPE

PARTS DESCRIPTION LIST

MAIN CHASSIS (RC2JK) SECTION

PRINTED CIRCUIT

–	Oscillation Block (UM1302J)
–	Vertical and Horizontal Deflection Block (UM1508J)
–	Power and High-tension Block (UM1008J)

Symbol No.	Description				Part No.	Remarks
CAPACITORS						
C101, 102	Polyester	0.47μF	40WV			
C103, 104	Ceramic	10pF	±5pF			
C105, 106	Ceramic	30pF	±5%			
C107	Mylar	0.1μF	±20%			
C108	Mylar	0.47μF	±10%			
C109	Mylar	0.047μF	±10%			
C110	Mylar	0.0039μF	±10%			
C111	Mica	300pF	±10%			
C112, 113	Electrolytic Tubular	47μF	315WV			
C114	Oil Impregnated Paper	0.1μF	±20%			
C115a, b	Oil Impregnated Block	0.2μF	±10%	1.5kV		
C116	Ceramic	0.01μF	+100%,	−0%		
RESISTORS						
R101, 102	Fixed Carbon Composition	220kΩ	±5%	1/2W		
R103, 104	Fixed Carbon Composition	27kΩ	±5%	1/2W		
R105	Fixed Carbon Composition	1MΩ	±5%	1/2W		
POTENTIOMETERS						
R101, 102	250kΩ (B)				R03-6001-05	
R103	10kΩ (B)				R03-3001-05	
R104	1MΩ (B)				R16-8001-05	
R105, 106	50kΩ (B)				R13-3002-05	
R107	250kΩ (B)				R03-6002-05	
R108	1MΩ (B)				R03-8001-05	
SWITCHES						
S101a, b	Signal (Lever S.W.)				S36-2002-15	
S102	Selector (Rotary S.W.)				S04-4001-15	
S103	Sweep Range (M Type Rotary S.W.)				S29-1004-05	
S104	Voltage Select (Slide S.W.)				S60-22D	
S105	Power (Lever S.W.)					
MISCELLANEOUS						
–	Case				A01-CB1J	
–	Frame (1)				A13-0007-03	
–	Frame (2)				A13-0008-03	
–	Frame (3)				A13-0009-02	
–	Frame (4)				A13-0010-03	
–	Frame (5)				A13-0011-03	
–	Panel				A20-0020-02	
–	Sub-Panel				A22-0011-12	
–	Back Panel				A23-0008-02	
–	Sole Panel				A40-0006-03	
–	Amp. Holder				A3882	
–	Name Plate (LA Standard)				B09-192	
–	Dial Scale				B20-0023-04	

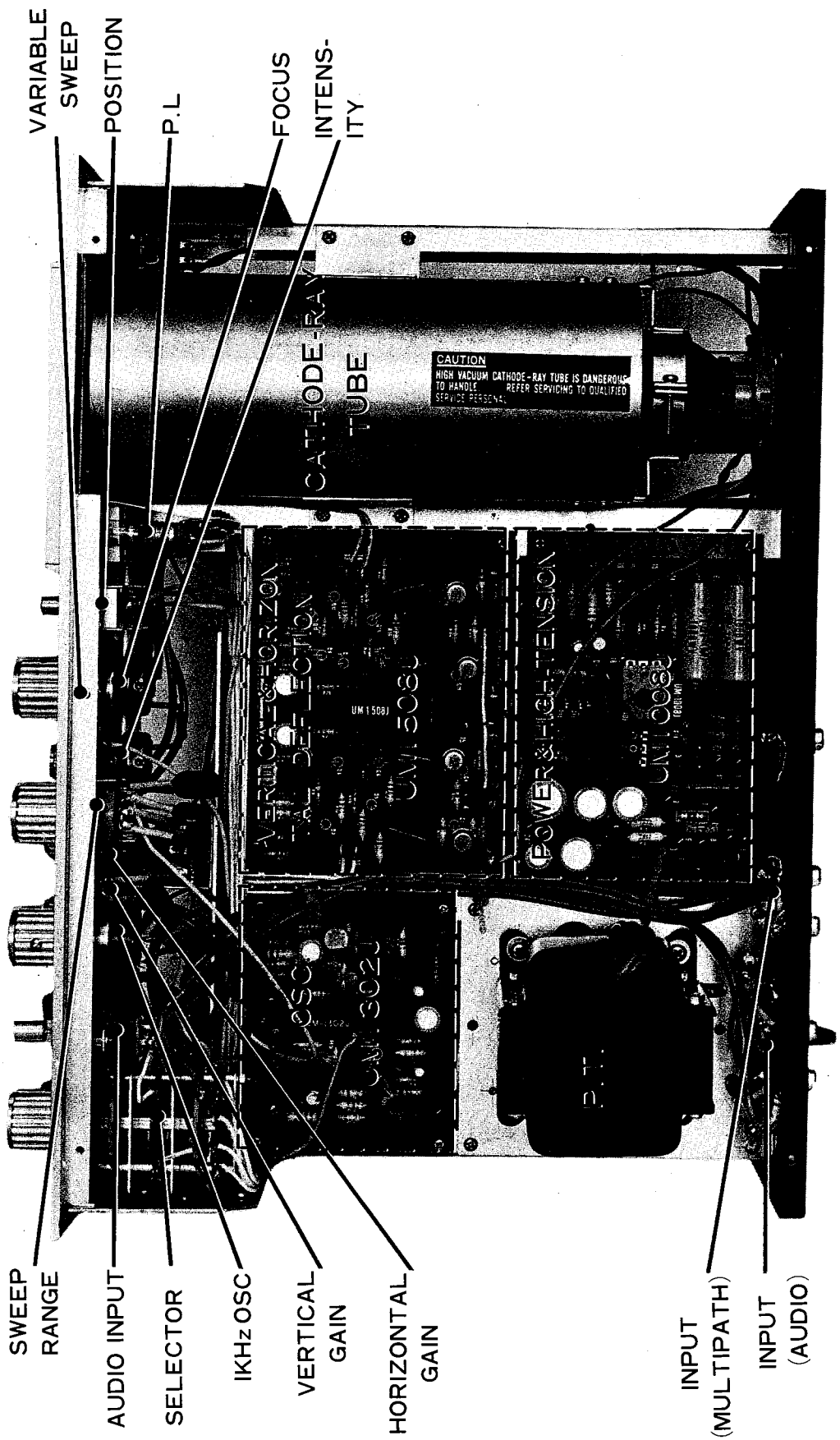
PARTS DESCRIPTION LIST

Symbol No.	Description	Part No.	Remarks
—	A Certificate	B42-0009-04	
—	Name Plate (for Cathode-ray Tube)	B42-0026-04	
—	A Warranty Card	B46-0002-00	
—	Instruction Manual	B50-0034-00	
—	Schematic Diagram	B52-0005-00	
—	14P Cathode-ray Tube Socket	E01-1401-05	
—	Pilot Lamp Socket	E03-01B	
—	Lug x 4	E04-101B	
—	1P Pin Jack	E08-11C	
—	2P Pin Jack	E08-12J	
—	Terminal x 2	E11-26	
—	Cord with Pins	E30-0015-05	
—	T Type Lug Terminal	E40-76	
—	Snap Beaded Band x 7	E4097	
—	Beaded Band x 3	E4099	
—	Shielding Board	F10-0013-04	
—	Shielding Board (for Cathode-ray Tube)	F11-0017-02	
—	Dust Sheet x 2	F15-0007-04	
—	Rubber Bushing x 3	G02-018	
—	Legs x 4	G10-02	
—	AC Cord Bushing	G11-25	
—	Cushion (20 x 130 x 3t)	G13-0006-25	
—	Rubber Sheet	G16-0002-04	
—	Corrugated Cardboard Case	H01-0058-03	
—	Corrugated Cardboard Case	H02-0029-03	
—	Accessory Bag	H08-04B	
—	Accessory Bag	H08-09	
—	Polystyrene Form (for Fixture)	H10-0048-03	
—	Polystyrene Form (for Fixture)	H10-0049-03	
—	Fixture	H10-0052-03	
—	Protective Board	H10-0053-04	
—	Protective Bag	H13-22	
—	Protective Cover	H20-0010-03	
—	Instruction (for Corrugated Cardboard Case)	H4068	
—	Instruction (for AC Power Supply)	H4190	
—	Instruction (for AC Power Supply)	H4191	
—	Bezel (for Observation)	J10-0004-03	
—	Bezel Framework (for Observation)	J10-0005-04	
—	Transformer Holder	J21-0007-04	
—	Cathode-ray Tube Holder	J21-0051-03	
—	Lamp Holder	J21-0052-03	
—	Collar (1) x 2	J31-0004-04	
—	Collar (2) x 4	J31-0005-04	
—	Boss x 4	J32-0015-04	
—	Case Patch	K10-09	
—	Case Patch	K10-10	
—	Knob 16ϕ x 4	K20-0020-04	
—	Knob (for Lever, 8.5ϕ) x 4	K29-0015-04	
P.T.	Power Transformer	L03-0005-05	
—	GND Terminal	N08-0002-04	
—	Decorative Screw x 4	N08-0003-04	
—	Decorative Screw x 6	N08-0008-04	
—	Knob 23ϕ x 4	S14-268	

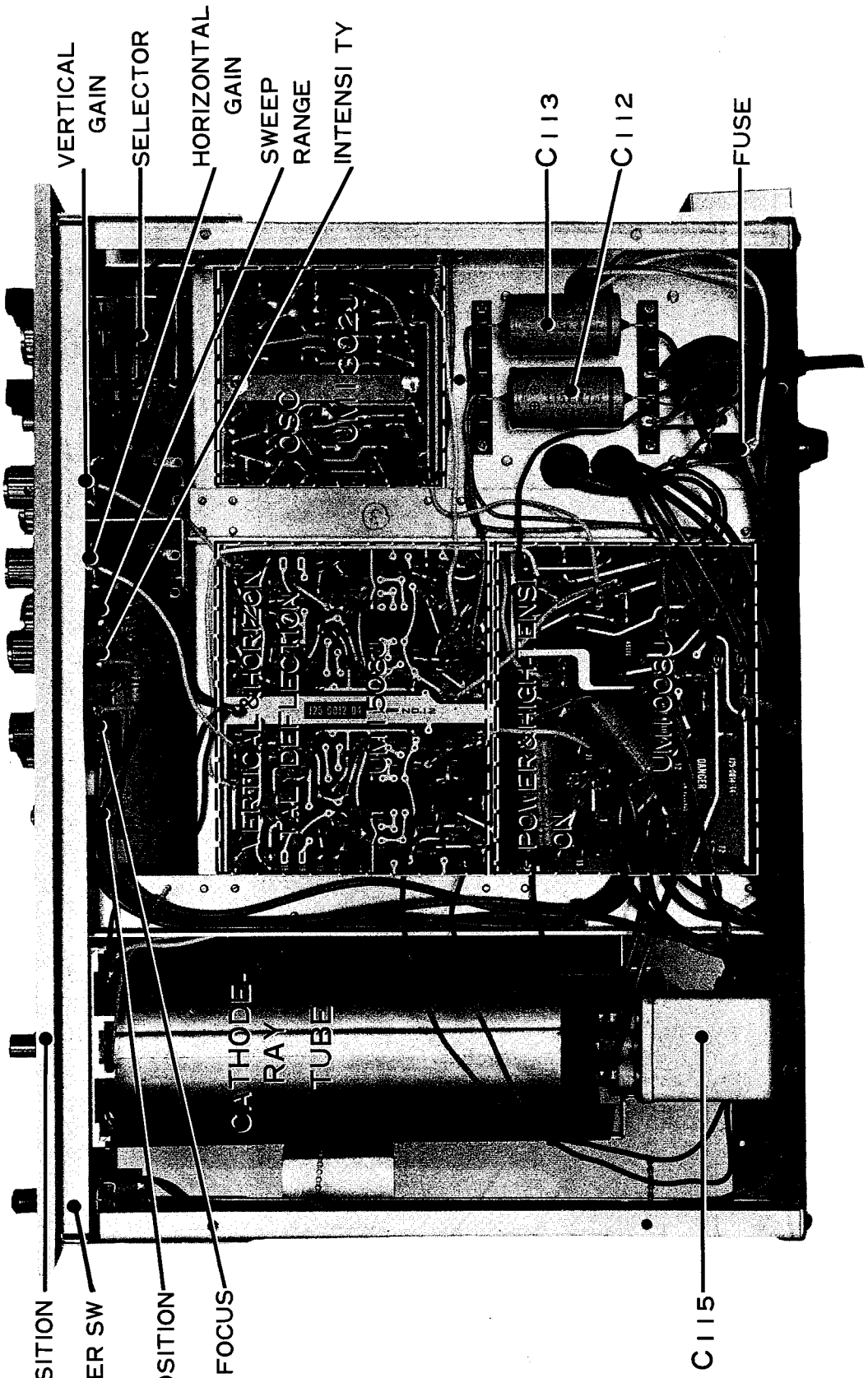
PARTS DESCRIPTION LIST

Symbol No.	Description	Part No.	Remarks
–	Fuse Holder	S15-13	
P.L.	Pilot Lamp	S16-11	
–	Insulating Washer (for Shaft) x 2	S21-07	
–	Insulating Washer (for Shaft) x 2	S21-08	
–	Felt (Black 15 x 240 x 38)	S4073	
–	Switch Stopper	S4136	
–	Tinned Wire 0.1m	W03-08	
–	Tinned Wire 0.1m	W03-12	
–	Insulating Sleeve 0.6m	W06-154	
–	AC Cord (with Plug)	W09-012	
–	Single-Core Shielded Wire 2.8m	W11-012	
–	P.V.C. Insulated Wire 0.5/s 2.5m	W32-50	
–	P.V.C. Insulated Wire 0.5/s 1.2m	W32-51	
–	P.V.C. Insulated Wire 0.5/s 3.4m	W32-52	
–	P.V.C. Insulated Wire 0.5/s 1.2m	W32-53	
–	P.V.C. Insulated Wire 0.5/s 1.5m	W32-54	
–	P.V.C. Insulated Wire 0.5/s 0.5m	W32-56	
–	P.V.C. Insulated Wire 0.5/s 0.4m	W32-57	
–	P.V.C. Insulated Wire (Red, 0.8ϕ) 0.6m	W32-82	
–	P.V.C. Insulated Wire (Yellow, 0.8ϕ) 0.7m	W32-84	
–	Flat Head Screw (⊕S3 x 6 – F – ISO) x 14		
–	Flat Head Screw (⊕S3 x 4 – F – ISO) x 4		
–	Flat Head Screw (⊕S2 x 4 – F) x 2		
–	Black Screw (⊕P3 x 8 – F·K – ISO) x 25		
–	Tapping Screw (⊕TM4 x 10 – F) x 11		
–	Flat Head Washer (W3 – F) x 9		
–	Flat Head Washer (W4 – F) x 10		
–	Spring Washer (SW4 – S) x 4		
–	Nut (N3 – F – ISO) x 13		
–	High-tension P.V.C. Insulated Wire (Gray UL, 3ϕ) 1.2m	021-8881-05	
–	High-tension P.V.C. Insulated Wire (Black, 3ϕ) 1.8m	021-8001	
–	Pan Head Screw (⊕P3 x 4 – F – ISO) x 5		
–	Pan Head Screw (⊕P3 x 6 – F – ISO) x 32		
–	Pan Head Screw (⊕P3 x 8 – F – ISO) x 4		
–	Pan Head Screw (⊕P3 x 16 – F – ISO) x 1		
–	Pan Head Screw (⊕P4 x 10 – F – ISO) x 4		

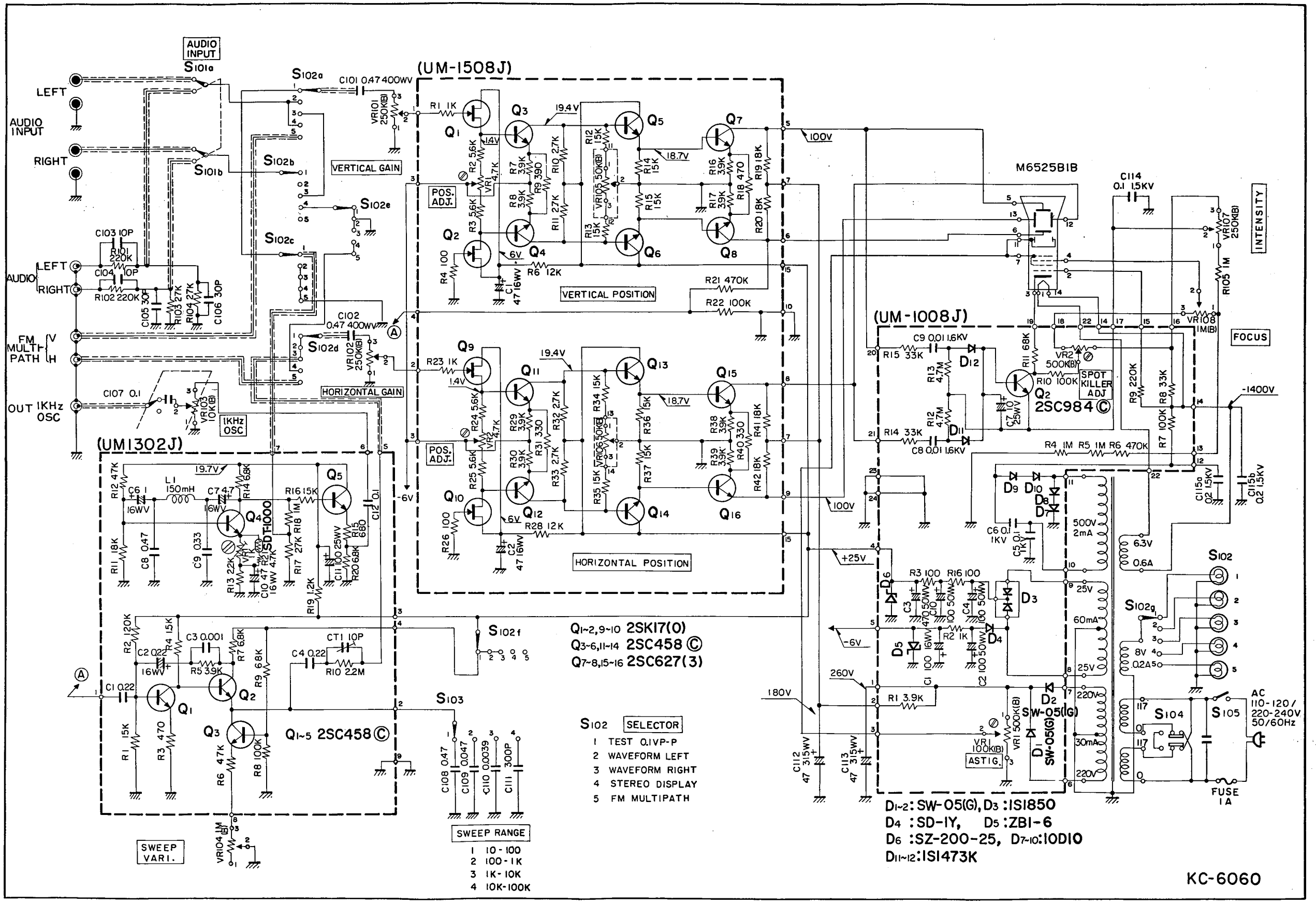
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW



SCHEMATIC DIAGRAM



ALIGNMENT PROCEDURE

I. General

This manual contains the descriptions for alignment of the model KC-6060 Solid State Audio-Lab Scope.

II. Measuring Instruments and Tools Required

1. Measuring instruments

1) Sine wave oscillator
   Frequency: 10 Hz to 500 kHz or more
   Distortion factor: 1% or less
   Output: Shall provide least level variation
2) Square wave oscillator
   Frequency requirement: Shall be capable of delivering a frequency of 50 Hz
   Output: Shall be such that its waveform suffers from least sag
3) Square-wave voltage calibrator
   Shall be a square wave oscillator which is capable of delivering the square wave voltage (P-P) with precision at 1 kHz. Not required specifically if the square wave oscillator given in item 2) meets the above requirement.
4) AC voltmeter
   Frequency: 5 Hz to 500 kHz
   Accuracy: 3% or less (10 Hz to 200 kHz)
5) Oscilloscope
   This oscilloscope is intended to use as a monitor for the output level of the sine wave oscillator given in item 1) above. If the sine wave oscillator is highly stable, therefore, it is unnecessary to prepare this oscilloscope specifically.
6) Distortion factor meter

2. Tools

1) Regulating rod
2) Phillips screwdriver

III. Adjustment of Bright Spot and Line

1. Purpose

The purpose of this adjustment is to position the bright spot at the center of the cathode-ray tube scope when controls POSITION "V" & "H" are set to the centers of their movable ranges.
The another purpose is to make the astigmatism adjustment of the bright spot and the horizontal adjustment of the cathode-ray tube scale to the bright line.

2. Position adjustment

1) Set the operating controls on the front panel as follows:

POSITION (V & H):	Mechanical center
FOCUS:	Center
INTENSITY:	3 o'clock position
SWEEP VARIABLE:	Center
SWEEP RANGE:	100 – 1K
SELECTOR:	TEST (0.1 Vp-p)

2) Vertical center adjustment
   With control HORIZONTAL GAIN set at the center position and control VERTICAL GAIN set at the extreme counterclockwise position, adjust variable resistor VR1 on printed circuit board UM1508J until the bright line is centered on the cathode-ray tube scope with respect to its vertical position.
3) Horizontal center adjustment
   With control HORIZONTAL GAIN set at the extreme counterclockwise position and control VERTICAL GAIN at the center position, adjust variable resistor VR2 on printed circuit board UM1508J until the bright line is centered on the cathode-ray tube scope with respect to its horizontal position.

3. Astigmatism adjustment

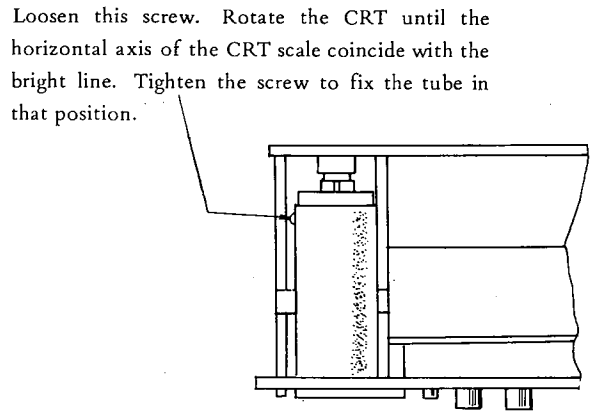
1) Set controls HORIZONTAL GAIN and VERTICAL GAIN at their extreme counterclockwise position. Check to see that other controls are set as given in item 2, 1) above.
2) With variable resistor VR2 on printed circuit board UM1008J set at the extreme counterclockwise position, adjust variable resistor VR1 on the same printed circuit board until the bright spot becomes a round, small spot at the center of the cathode-ray tube scope.

4. Spot killer adjustment

With all operating controls set as described in item 3 above, turn variable resistor VR2 on printed circuit board UM1008J until the bright spot on the cathode-ray tube scope goes out. Fix the variable resistor at that position.

5. Horizontal adjustment of cathode-ray tube scale to bright line

Set control VERTICAL GAIN at the extreme counterclockwise position and control HORIZONTAL GAIN at the center position. Adjust the screw of the cathode-ray tube mounting bracket as illustrated below until the horizontal axis of the cathode-ray tube scale coincides with the bright line.



6. Check of performance INTENSITY control

With the VERTICAL GAIN control set at the center position, check to see that the bright line increases its intensity as the INTENSITY control is turned clockwise. Also, check under the above condition to see that the bright line decreases its intensity uniformly until it goes out as the INTENSITY control is turned counterclockwise.

IV. Check of Deflection Sensitivity

1. Purpose

The purpose of this check is to make sure that the cathode-ray tube scope provides a vertical and a horizontal deflection sensitivities of 25 mV/cm or more.

2. Check of Vertical Deflection Sensitivity

1) Set the operating controls on the front panel as follows:

POSITION (V & H)	Mechanical center
INTENSITY:	3 o'clock position
FOCUS:	Any position for which bright spot is focused properly
SWEEP RANGE:	100 – 1K
HORIZONTAL GAIN:	Center
VERTICAL GAIN:	Extreme clockwise
SELECTOR:	WAVEFORM LEFT
AUDIO INPUT:	FRONT

2) Set up the square-wave voltage calibrator for an output of 0.1 Vp-p at 1 kHz. Connect the output of the calibrator to the LEFT input terminal on the front panel. Check that the input signal is vertically deflected more than 40 mm as measured on the cathode-ray tube scope. In this case, adjust the SWEEP VARIABLE control so as to prevent the waveform running in the horizontal direction over the scope.
3) Set the SELECTOR switch at the WAVEFORM RIGHT position. With the output of the calibrator connected to the RIGHT input terminal, check to see that the input signal is vertically deflected more than 40 mm as in item 2) above.
4) Connect the output of the calibrator to the LEFT input terminal with the SELECTOR switch set at the STEREO DISPLAY position and check to see that the input signal is deflected just in the same manner as mentioned above.
5) With the operating controls set as follows, check to see that the terminals on the rear panel provide a deflection sensitivity of more than 40 mm respectively against their inputs.
   AUDIO INPUT: REAR

SELECTOR's position	Input terminal	Calibrator's output
WAVEFORM LEFT	AUDIO INPUT "L"	1 Vp-p
WAVEFORM RIGHT	AUDIO INPUT "R"	1 Vp-p
STEREO DISPLAY	AUDIO INPUT "L"	1 Vp-p
FM MULTI-PATH	FM MULTIPATH "V"	0.1 Vp-p

3. Horizontal Deflection Sensitivity Check

1) Set the operating controls on the front panel in the same manner as in the vertical deflection sensitivity check given in item IV 2 above., excepting those controls which should be set as follows:

SELECTOR:	STEREO DISPLAY
HORIZONTAL GAIN:	Extreme clockwise
VERTICAL GAIN:	Extreme counterclockwise

2) Apply the 0.1 Vp-p output from the square-wave voltage calibrator to the RIGHT input terminal on the front panel and check to see that the input signal is horizontally deflected more than 40 mm, as measured on the cathode-ray tube scope.

3) With the operating controls set as follows, check to see that the terminals on the rear panel provide a horizontal deflection sensitivity of more than 40 mm respectively against their inputs.

AUDIO INPUT:	REAR
SELECTOR's position	Input terminal Calibrator's output
STEREO DISPLAY	AUDIO INPUT "R" 1Vp-p
FM MULTIPATH	FM MULTIPATH "H" 0.1Vp-p

V. Frequency Response Check

1. Purpose

The purpose of this frequency response check is to check the audio-lab scope for proper vertical and horizontal frequency responses.

2. Set the operating controls on the front panel as follows:

SELECTOR:	STEREO DISPLAY
AUDIO INPUT	FRONT
HORIZONTAL GAIN:	Center
VERTICAL GAIN:	Center
INTENSITY:	3 o'clock position
FOCUS:	Any position for which bright spot is focused properly

3. Vertical frequency response

1) With the 1 kHz sine wave output from the sine wave oscillator applied to the LEFT terminal on the front panel adjust the output of the oscillator until the input signal to the audio-lab scope is vertically deflected 40 mm, as measured on the scope.
Monitor the output level of the oscillator using an AC voltmeter or an oscilloscope under the above condition.

2) Set the oscillator frequency at 200 kHz and make sure that the output level of the oscillator remains as monitored in item 1) above. If not, adjust the output level to the same level as monitored in item 1).
Check to see under the above condition that the input signal to the audio-lab scope is deflected vertically more than 28 mm.

4. Horizontal frequency response check

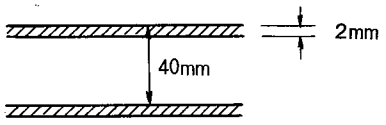
Proceed just in the same manner as described in item 3 above with the output signal from the sine wave oscillator applied to the RIGHT input terminal on the front panel.

5. Check of SAG

Set the operating controls on the front panel as follows:

SELECTOR:	WAVEFORM RIGHT
SWEEP RANGE:	10K – 100K
SWEEP VARIABLE:	Center

Apply the 50 Hz square wave output from the square wave oscillator to the RIGHT input terminal on the front panel. Adjust the output of the oscillator until the input signal is deflected 40 mm as measured on the scope. Check to see under the above condition that the upper and lower horizontal bands offer a vertical width of 2 mm or less.



VI. Sweep Oscillator Frequency Check

1. Purpose

The purpose of this sweep oscillator frequency check is to check the sweep oscillator frequency of the model KC-6060 for proper continuity.

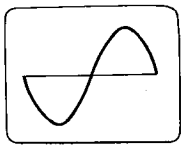
2. Set the operating controls on the front panel as follows:

SELECTOR:	WAVEFORM LEFT
SWEEP RANGE:	10 – 100
SWEEP VERIABLE:	Extreme counterclockwise
VERTICAL GAIN:	Center
HORIZONTAL GAIN:	The position for which the input signal is horizontally deflected approx. 40 mm

Apply the 10 Hz sine wave output from the sine wave oscillator to the LEFT input terminal. Then, adjust the output of the oscillator until the waveform on the cathode-ray scope provides an appropriate vertical amplitude.

Check the sweep oscillator frequency for normal continuity by carrying out the following steps:

1) While turning the SWEEP VARIABLE control clockwise, check to see that one cycle of the input signal frequency waveform comes to a standstill on the scope to indicat its synchronization to the sweep oscillator frequency.



2) Set the oscillator frequency at 100 Hz.
While turning the SWEEP VARIABLE control clockwise, check to see taht one cycle of the input signal frequency waveform comes to a standstill.
3) Set the SWEEP RANGE switch at the 100 – 1K position.
While turning the SWEEP VARIABLE control counterclockwise, check to see that one cycle of the input signal frequency waveform comes to a standstill.
4) Set the oscillator frequency at 1 kHz.
While turning the SWEEP VARIABLE control clockwise, check to see that one cycle of the input signal frequency waveform comes to a standstill.
5) Set the SWEEP RANGE switch at the 1K – 100K position.
While turning the SWEEP VARIABLE control counterclockwise, check to see that one cycle of the input signal frequency waveform comes to a standstill.
6) Set the oscillator frequency at 10 kHz.
While turning the SWEEP VARIABLE control clockwise, check to see that one cycle of the input signal frequency waveform comes to a standstill.
7) Set the SWEEP RANGE switch at the 10K – 100K position.
While turning the SWEEP VARIABLE control counterclockwise, check to see that one cycle of the input signal frequency waveform comes to a standstill.
8) Set the oscillator frequency at 100 kHz.
While turning the SWEEP VARIABLE control clockwise, check to see that one cycle of the input signal frequency waveform comes to a standstill.

Note: If the input oscillator frequency fails to synchronize with the sweep oscillator frequency at a frequency range, perform the check with the SWEEP RANGE switch set at the next or preceding frequency range. If the check is performed successfully, then it may be considered that the continuity of the sweep oscillator frequency is normal.

VII. Sweep Linearity Adjustment

1) Purpose

The purpose of this adjustment is to adjust the sweep oscillator of the model KC-6060 for normal sweep linearity within a sweep range of 10K – 100K.

2) Set the operating controls on the front panel as follows:

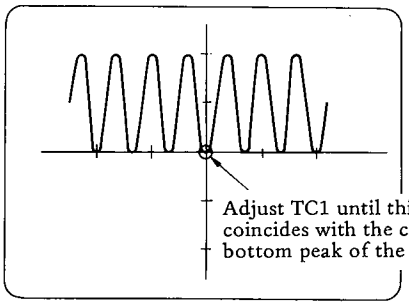
SELECTOR:	RIGHT
SWEEP RANGE:	10K – 100K

3) Apply the 100 kHz sine wave output from the sine wave oscillator to the RIGHT input terminal,

adjust the SWEEP VARIABLE control until 7 cycles of the input signal waveform appear on the cathode-ray tube scope.

Adjust the HORIZONTAL GAIN control until the above-mentioned 7 cycles of waveform start and terminate respectively at the points 20 mm away from the center line of the CRT scope as shown in the figure below.

Adjust trimmer capacitor TC1 on printed circuit board UM1302J until the center bottom peak of the waveform coincide with the center of the horizontal line of CRT scale.



VIII. Check of Input Signal Sycnchronization

1) Purpose

The purpose of this check is to make sure that the input signal frequency is synchronized normally with the sweep oscillator frequency of model KC-6060.

2) Set the operating controls on the front panel as follows:

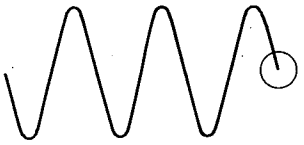
SELECTOR:	RIGHT
SWEEP RANGE:	10K – 100K

With the 200 kHz sine wave applied to the RIGHT input terminal, adjust the VERTICAL GAIN control until the input signal is vertically deflected 10 mm, as measured on the cathode-ray tube scope.

Check under the above condition to see that the waveform on the scope can be brought in a standstill by turning the SWEEP VARIABLE control.

3) With the SWEEP RANGE switch set at the 100-1K position and the 1 kHz sine wave applied to the RIGHT input terminal, proceed just in the same manner as described in item 2) above to make sure that the waveform on the scope can be brought in a standstill.

4) Also, check that the input signal frequency is synchronized with the sweep oscillator frequency with its trailing edge swinging downward as shown below.



IX. Calibration of Test Signal and Its Check

1. Purpose

The purpose of this calibration is to calibrate the 1 kHz calibrator for its peak-to-peak voltage.

2. Set the operating controls on the front panel as follows:

SELECTOR:	LEFT
SWEEP RANGE:	100 – 1K
HORIZONTAL GAIN:	Center

3. Apply the 1 kHz, 0.1 Vp-p square wave to the LEFT input terminal.

Turn the VERTICAL GAIN control until the waveform on the cathode-ray tube scope provides an amplitude of 40 mm.

4. With the SELECTOR switch turned to the TEST (0.1 Vp-p) position, adjust variable resistor VR1 on printed circuit board UM1302J until the sine waves provide a peak-to-peak value of 40 mm, as measured on the cathode-ray tube scope.

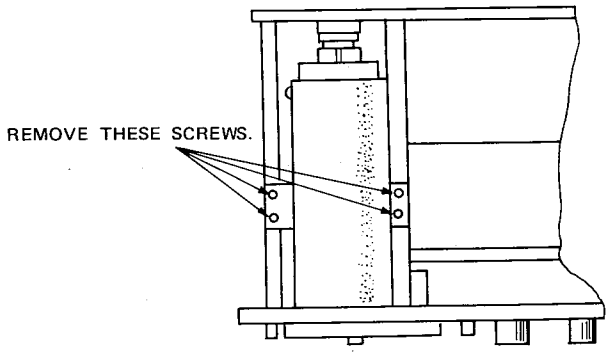
5. Connect the AC voltmeter to the 1 kHz OSC OUTPUT on the rear panel. While observing the voltmeter, check to see that the meter increases its indication from 0 up to 0.9 V r.m.s or more as the 1 kHz OSC control on the front panel is turned clockwise from the extreme counterclockwise to

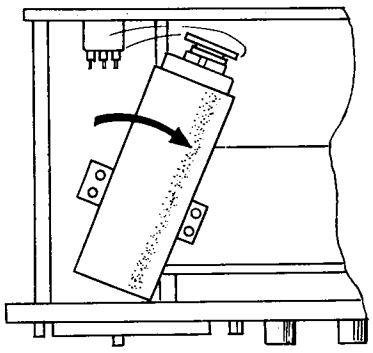
the extreme clockwise positions.

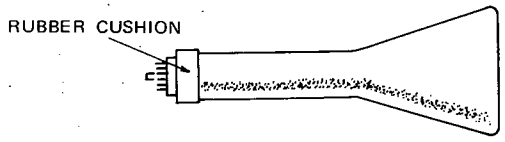
6. Then connect the distortion meter to the terminal on the rear panel mentioned above. Check to see that the meter indicates a distortion factor of 2% or less and a frequency reading of 1 kHz ±10%.

(1) REPLACEMENT OF CATHODE-RAY TUBE

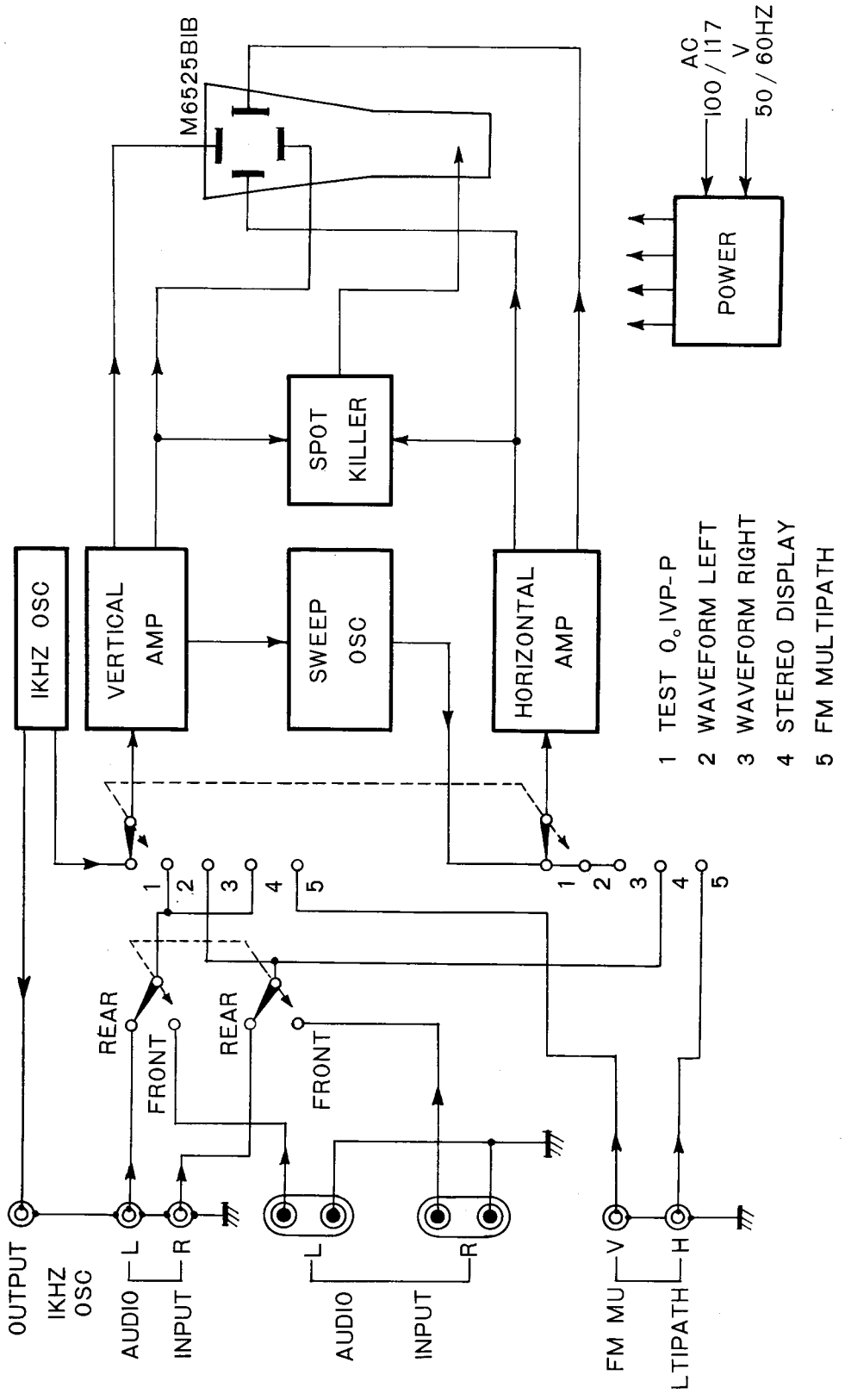
1. Remove the screws, which hold the cathode-ray tube shielding case in position as shown the followings.
2. Turn the cathode-ray tube shielding case clockwise and lift it up out of the cabinet case.
3. Loosen the clamper screw holding the cathode-ray tube in its shielding case and pull the tube out of the case.
4. Remove the rubber cushion from the neck of the removed cathode-ray tube. Apply the cushion to a new cathode-ray tube. Then, mount the new cathode-ray tube in the cabinet case by carrying out steps 1, 2, and 3 reversely both in sequence and operations.







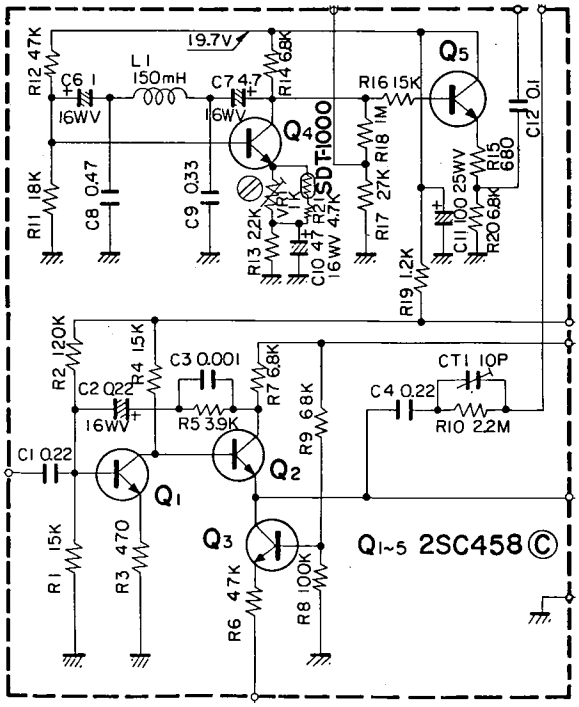
BLOCK DIAGRAM



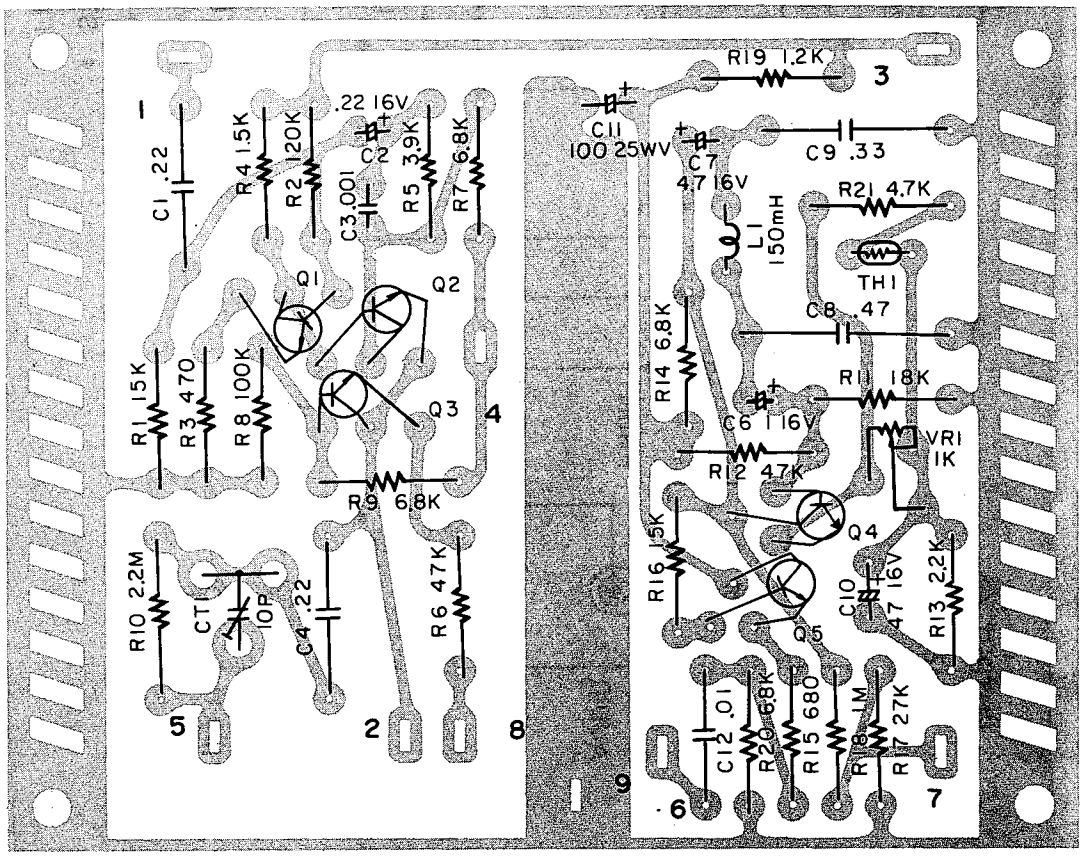
SCHEMATIC DIAGRAM

BOTTOM VIEW OF TRANSISTOR

2SC458B, C



SEALED CIRCUIT ASSEMBLIES-PHANTOM VIEWS



Q1~5 2SC458(C) TH1 SDT-1000

PARTS DESCRIPTION LIST

Symbol No.	Description				Part No.	Remarks
	CAPACITORS					
C1	Mylar	0.22μF	±20%			
C2	Solid Aluminum	0.22μF	16WV			
C3	Ceramic	0.001μF	±20%			
C4	Mylar	0.22μF	±20%			
C6	Electrolytic Tubular	1μF	16WV			
C7	Electrolytic Tubular	4.7μF	16WV			
C8	Mylar	0.47μF	±10%			
C9	Mylar	0.33μF	±10%			
C10	Electrolytic Tubular	47μF	16WV			
C11	Electrolytic Tubular	100μF	25WV			
C12	Mylar	0.1μF	±20%			
CT1	Ceramic Trimmer	10pF			C4036	
	RESISTORS					
R1	Fixed Carbon Composition	15kΩ	±5%	1/4W		
R2	Fixed Carbon Composition	120kΩ	±5%	1/4W		
R3	Fixed Carbon Composition	470Ω	±5%	1/4W		
R4	Fixed Carbon Composition	1.5kΩ	±5%	1/4W		
R5	Fixed Carbon Composition	3.9kΩ	±5%	1/4W		
R6	Fixed Carbon Composition	47kΩ	±5%	1/4W		
R7	Fixed Carbon Composition	6.8kΩ	±5%	1/4W		
R8	Fixed Carbon Composition	100kΩ	±5%	1/4W		
R9	Fixed Carbon Composition	68kΩ	±5%	1/4W		
R10	Fixed Carbon Composition	2.2MΩ	±5%	1/2W		
R11	Fixed Carbon Composition	18kΩ	±5%	1/4W		
R12	Fixed Carbon Composition	47kΩ	±5%	1/4W		
R13	Fixed Carbon Composition	2.2kΩ	±5%	1/4W		
R14	Fixed Carbon Composition	6.8kΩ	±5%	1/4W		
R15	Fixed Carbon Composition	680Ω	±5%	1/4W		
R16	Fixed Carbon Composition	15kΩ	±5%	1/4W		
R17	Fixed Carbon Composition	27kΩ	±5%	1/4W		
R18	Fixed Carbon Composition	1MΩ	±5%	1/2W		
R19	Fixed Carbon Composition	1.2kΩ	±5%	1/4W		
R20	Fixed Carbon Composition	6.8kΩ	±5%	1/4W		
R21	Fixed Carbon Composition	4.7kΩ	±5%	1/4W		
	TRANSISTOR/THERMISTOR					
Q1～5	2SC458 (C)					
TH1	SDT-1000					
	POTENTIOMETER					
VR1	1kΩ (B)					
	MISCELLANEOUS					
—	Printed Circuit Board				J25-0013-04	
L1	Ferri-Inductor (FL11H-154J)					
—	Terminal	x 9			N4085	
—	Vinyl Tube	0.1m			W06-014	

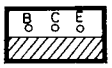
SCHEMATIC DIAGRAM

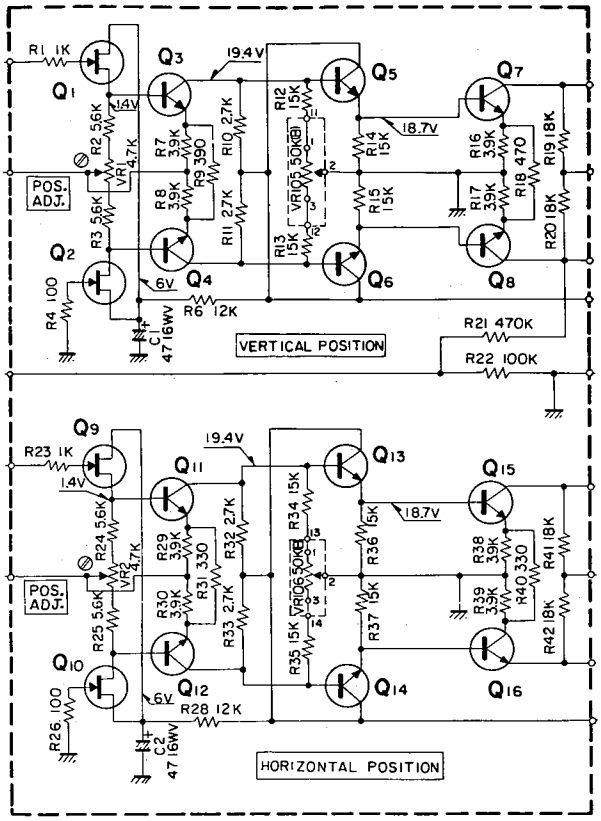
BOTTOM VIEW OF TRANSISTOR

2SK-17

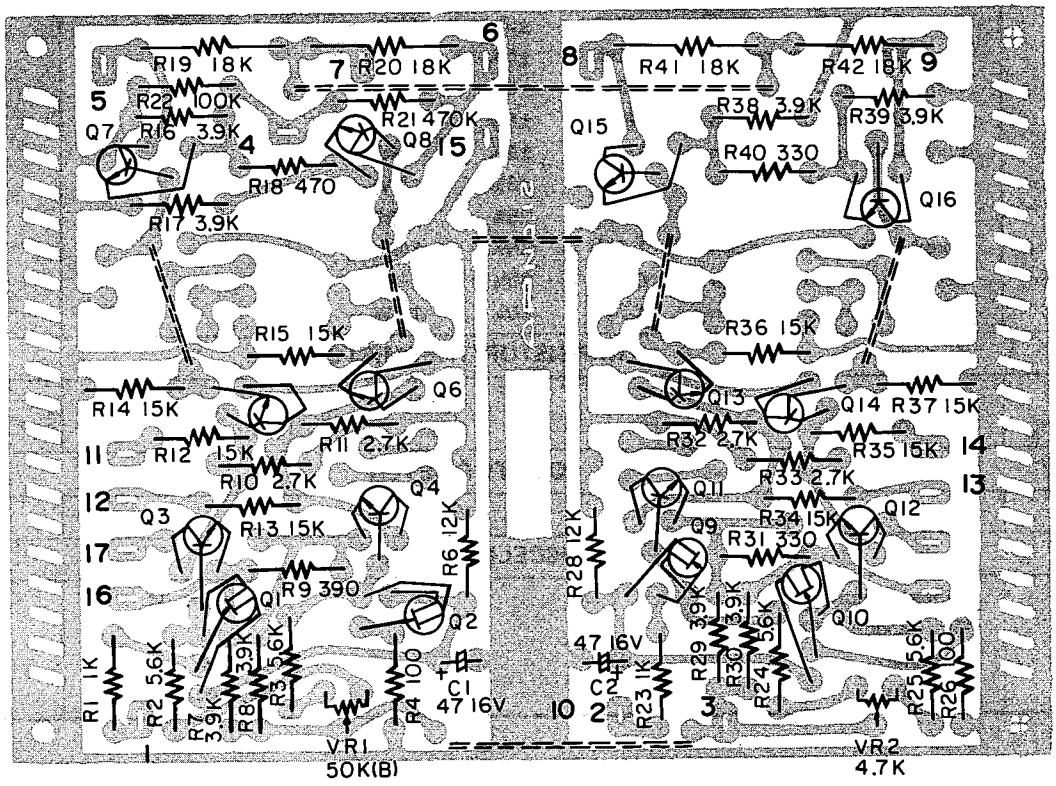
2SC627

2SC458(B)





SEALED CIRCUIT ASSEMBLIES-PHANTOM VIEWS

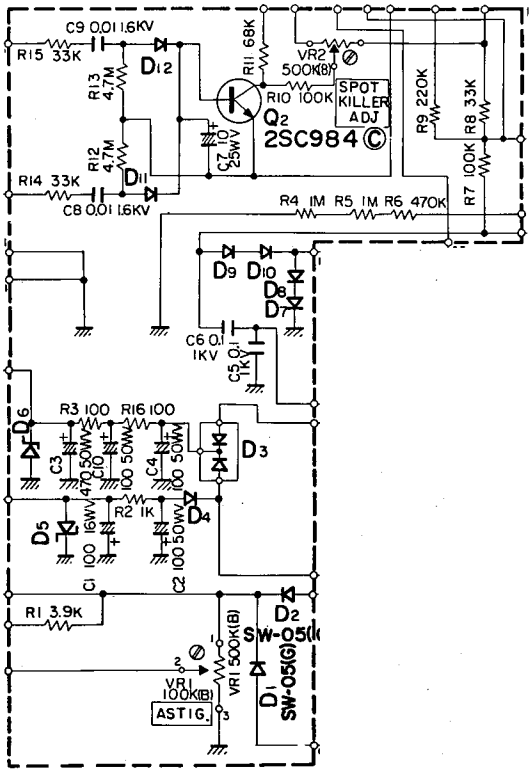


Q1,2,9,10 2SK17(O) Q3~6, 11~14 2SC458(C), Q2,8,15,16 2SC627(3)

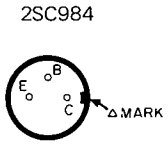
PARTS DESCRIPTION LIST

Symbol No.	Description				Part No.	Remarks
	CAPACITORS					
C1, 2	Electrolytic Tubular	47μF		16WV		
	RESISTORS					
R1	Fixed Carbon Composition	1kΩ	±5%	1/4W		
R2, 3	Fixed Carbon Composition	5.6kΩ	±5%	1/4W		
R4	Fixed Carbon Composition	100Ω	±5%	1/4W		
R6	Fixed Carbon Composition	12kΩ	±5%	1/4W		
R7, 8	Fixed Carbon Composition	3.9kΩ	±5%	1/4W		
R9	Fixed Carbon Composition	390Ω	±5%	1/4W		
R10, 11	Fixed Carbon Composition	27kΩ	±5%	1/4W		
R12～15	Fixed Carbon Composition	15kΩ	±5%	1/4W		
R16, 17	Fixed Carbon Composition	3.9kΩ	±5%	1/4W		
R18	Fixed Carbon Composition	470Ω	±5%	1/4W		
R19, 20	Metal Film	18kΩ	±5%	1W		
R21	Fixed Carbon Composition	470kΩ	±5%	1/4W		
R22	Fixed Carbon Composition	100kΩ	±5%	1/4W		
R23	Fixed Carbon Composition	1kΩ	±5%	1/4W		
R24, 25	Fixed Carbon Composition	5.6kΩ	±5%	1/4W		
R26	Fixed Carbon Composition	100Ω	±5%	1/4W		
R28	Fixed Carbon Composition	12kΩ	±5%	1/4W		
R29, 30	Fixed Carbon Composition	3.9kΩ	±5%	1/4W		
R31	Fixed Carbon Composition	330Ω	±5%	1/4W		
R32, 33	Fixed Carbon Composition	2.7kΩ	±5%	1/4W		
R34～37	Fixed Carbon Composition	15kΩ	±5%	1/4W		
R38, 39	Fixed Carbon Composition	3.9kΩ	±5%	1/4W		
R40	Fixed Carbon Composition	330Ω	±5%	1/4W		
R41, 42	Metal Film	18kΩ	±5%	1W		
	TRANSISTORS/FET					
Q1, 2	2SK17(0)					
Q3～6	2SC373					
Q7, 8	2SC627(3)					
Q9, 10	2SK17					
Q11～14	2SC373					
Q15, 16	2SC627					
	POTENTIOMETER					
VR1, 2	4.7kΩ (B)				R12-1004-05	
	MISCELLANEOUS					
–	Printed Circuit Board				J25-0012-04	
–	Terminal x 15				N4085	
–	Tinned Wire	0.1m			W03-05	
–	Insulating Sleeve	0.1m			W06-154	
–	Vinyl Tube	0.2m			W07-014	
–	P.V.C. Insulated Wire	0.5φ	0.2m		W32-54	

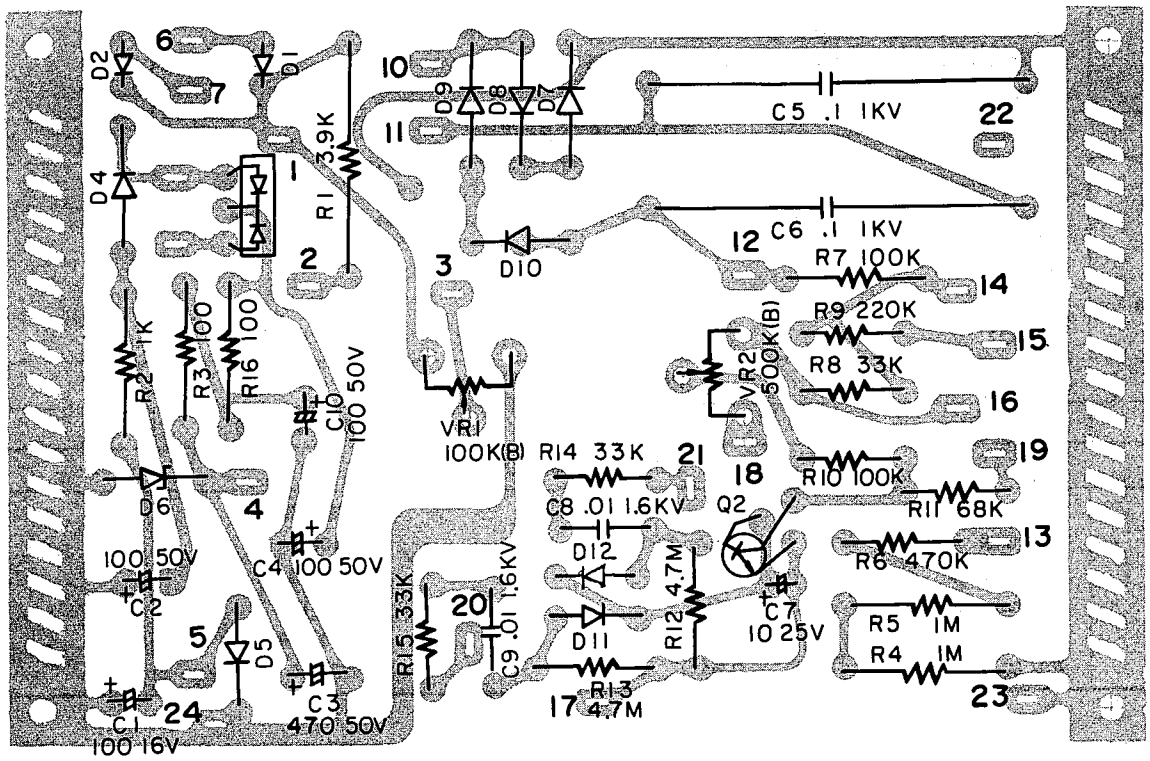
SCHEMATIC DIAGRAM



BOTTOM VIEW OF TRANSISTOR



SEALED CIRCUIT ASSEMBLIES-PHANTOM VIEWS



Q2 2SC984(C) D1,2 SW-05(G) D3 1S1850 D4 SD-1Y, D5 2B1-6
D6 SZ-200-25, D7~10 10D10 D11,12 1S1473K

PARTS DESCRIPTION LIST

Symbol No.	Description				Part No.	Remarks
			CAPACITORS			
C1	Electrolytic Tubular	100μF	16WV			
C2	Electrolytic Tubular	100μF	50WV			
C3	Electrolytic Tubular	470μF	25WV			
C4	Electrolytic Tubular	100μF	50WV			
C5, 6	Oil Impregnated Paper	0.1μF	±20%			
C7	Electrolytic Tubular	10μF	25WV			
C8, 9	Ceramic	0.01μF	±20%			
C10	Electrolytic Tubular	100μF	50WV			
			RESISTORS			
R1	Metal Film	3.9kΩ	±5%	3W		
R2	Metal Film	1kΩ	±5%	1W		
R3	Fixed Carbon Composition	100Ω	±5%	1/2W		
R4, 5	Fixed Carbon Composition	1MΩ	±5%	1/2W		
R6	Fixed Carbon Composition	470kΩ	±5%	1/2W		
R7	Fixed Carbon Composition	100kΩ	±5%	1/2W		
R8	Fixed Carbon Composition	33kΩ	±5%	1/4W		
R9	Fixed Carbon Composition	220kΩ	±5%	1/4W		
R10	Fixed Carbon Composition	100kΩ	±5%	1/4W		
R11	Fixed Carbon Composition	68kΩ	±5%	1/4W		
R12, 13	Fixed Carbon Composition	4.7MΩ	±5%	1/2W		
R14, 15	Fixed Carbon Composition	33kΩ	±5%	1/4W		
R16	Fixed Carbon Composition	100Ω	±5%	1/2W		
			POTENTIOMETER			
VR1, 2	500kΩ (B)				R12-7001-25	
			TRANSISTOR/DIODES			
Q1	2SC984(C)					
D1, 2	SW-05 (Gray)					
D3	1S1850					
D4	SD-1Y					
D5	ZB1-6					
D6	SZ-200-25					
D7～10	10D10					
D11, 12	1S1473(K)					
			MISCELLANEOUS			
–	Printed Circuit Board				J25-0014-14	
–	Terminal	x 24			N4085-14	
–	Vinyl Tube	0.1m			W07-014	
–	Insulating Sleeve	0.1m			W06-154	

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