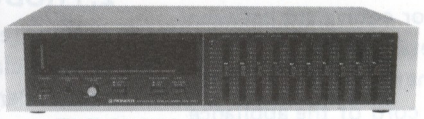
PIONEER

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS



THE PHOTO SHOWS SG-750

ORDER NO.
ARP-486-0

GRAPHIC EQUALIZER

SG-750
SG-705

MODEL SG-750 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC120V only	U.S.A model
HEM	AC220V, 240V (Switchable)	European continent model
S	AC110V, 120V, 220V, 240V (Switchable)	General export model
S/G	AC110V, 120V, 220V, 240V (Switchable)	U.S. Military model
YP	AC240V only	Australia model

- **This service manual is applicable to the SG-750/HEM, KU, S, S/G, YP and SG-705/S.**
- **As to the SG-750/KU, S, S/G, YP, please refer to pages 30, 31.**
- **As to the SG-705/S, please refer to page 32.**
- **SG-705 is the same as the SG-750 except for the design (color) only.**
- **Ce manual d'instruction se refère au mode de réglage, en français.**
- **Este manual de servicio trata del metode ajuste escrito en español.**

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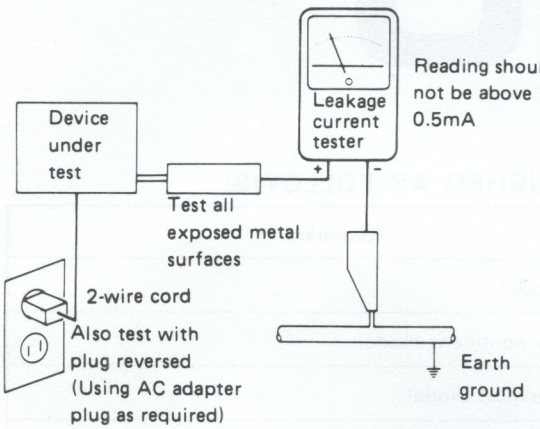
1. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by : Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.

2. SPECIFICATIONS

Graphic Equalizer Section

Equalizer Range
- Individual channel controls ..... ±10 dB
- Center frequencies .....
- 32 Hz, 64 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz

Total Harmonic Distortion
- (All controls at flat position, 2 V output) 1 kHz 0.003%
- 20 Hz to 20 kHz 0.003%

Gain (all controls at flat position) ..... 0 dB

Maximum Output Voltage
- 1 kHz, 0.01% THD, 50 kΩ RL ..... 6 V

Frequency Response ..... 5 Hz to 100 kHz $^{+0}_{-3}$ dB

Signal-to-Noise Ratio
(IHF A network, short-circuited, 2V output)..... 116 dB

Input terminal (Sensitivity/Impedance)
- INPUT ..... 150 mV/50 kΩ
- TAPE PLAY ..... 150 mV/50 kΩ

Output terminal (Level/Impedance)
- OUTPUT ..... 150 mV/1 kΩ
- TAPE REC. ..... 150 mV

Spectrum Analizer Section

Center frequencies .....
32 Hz, 64 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz

Resolution ..... 3 dB step, 8 point

Power Supply Section/Miscellaneous

Power Requirements
- KU model ..... AC 120 Volts, 60 Hz
- S, S/G models .....
- ~AC 110 V/120 V/220 V/240 V switchable, 50/60 Hz
- YP model ..... 240 Volts ~, 50/60 Hz
- HEM model ..... a.c. 220 Volts ~, 50/60Hz

Power Consumption ..... 16 Watts

Dimensions ..... 420 (W) x 98 (H) x 266 (D) mm
16-9/16 (W) x 3-7/8 (H) x 10-1/2 (D) in

Weight ..... 4.4 kg (9 lb 11 oz)

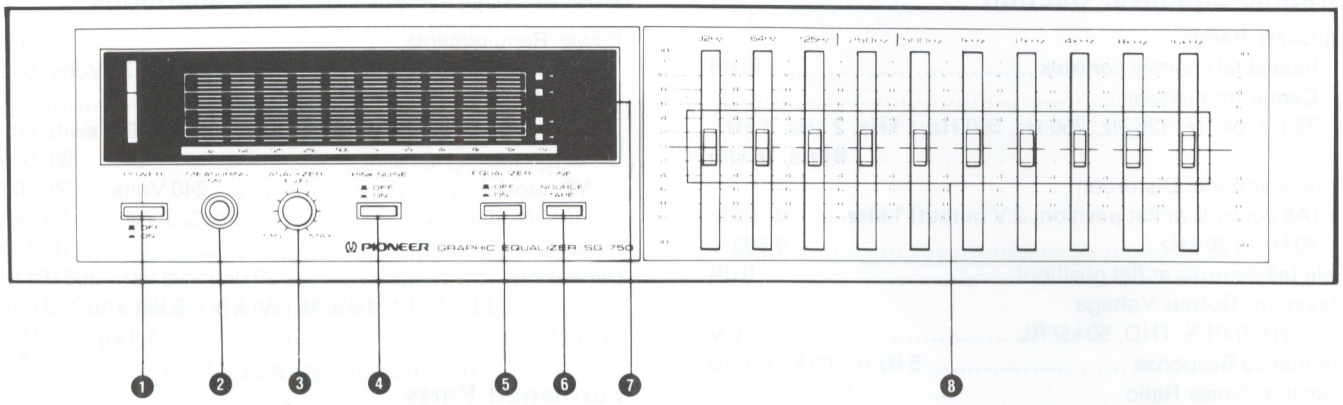
Furnisned Parts

Connection cords with pin plugs 2

Operating Instructions 1

NOTE:
Specifications and design subject to possible modification without notice due to improvements.

3. FRONT PANEL FACILITIES



❶ POWER SWITCH

When this switch is set to the ON position, power is supplied to the unit's main circuits.
Disconnect the power cord from the power outlet when you do not plan to use the unit for a long period of time.

❷ MEASURING MIC JACK

Connect the room acoustics monitor microphone CM-75M to this jack. Plug the miniplug of the connecting cord into the back of the CM-75M, and the 6 mm standard plug into the MIC JACK of the unit. For microphone installation, refer to the operating instructions for the CM-75M.

❸ ANALYZER LEVEL CONTROL

This control adjusts the sensitivity of the analyzer. Adjust as follows so that the amplitude of the analyzer indicator is satisfactory.

When measuring room acoustics

Adjust such that the average amplitude level is near 0 dB on the indicator.
When compensating for room acoustics, adjust the octave control such that the amplitude of the analyzer indicator is flat overall.

When compensating for the program source (broadcasts, records)

Adjust such that the overall amplitude is near 0 dB.

❹ PINK NOISE SWITCH

Use this switch for measuring the room acoustics. When the CM-75M is connected and installed, and this switch is set to ON, a pink noise used for measurements is generated and emitted by the speakers. This noise is picked up by the microphone and displayed on the analyzer indicator.
The pink noise has flat characteristics over the entire frequency range, and the indicator therefore shows how this changes with the room conditions.

❺ EQUALIZER SWITCH

This switch is pressed to compensate for the frequency response of the signals entering the EQUALIZER INPUT and TAPE PLAY terminals. The compensated signals are then output as the output signals from the EQUALIZER OUTPUT terminals, and the compensated signals are output from both the EQUALIZER OUTPUT terminals and TAPE REC terminals.

❻ LINE (SOURCE/TAPE) SWITCH

Press this switch (TAPE position) when using a stereo component connected to the rear panel TAPE terminals. At all other times, ensure that the switch is at the released position (SOURCE position).

❼ ANALYZER INDICATOR

Shows the variation of signal level over each frequency band by means of an F.L. tube.
This can be used to check frequencies during ordinary playback of the program source, or when measuring or compensating for room acoustics.

❽ OCTAVE CONTROLS

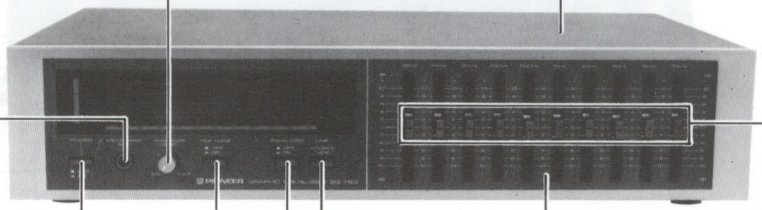
Move these controls above or below the center (zero) position to boost or attenuate the corresponding frequency band. The ten frequency bands are centered at 32 Hz, 64 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz and 16 kHz.
The indicator of each control serves as a guideline for the changes in the frequency response.

4. PARTS LOCATION

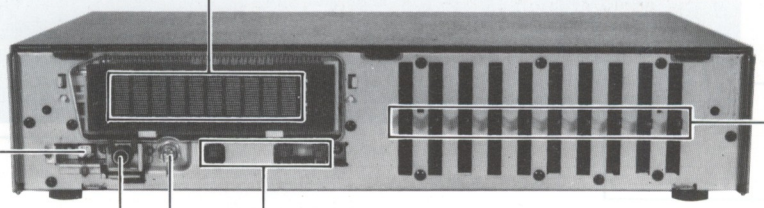
NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

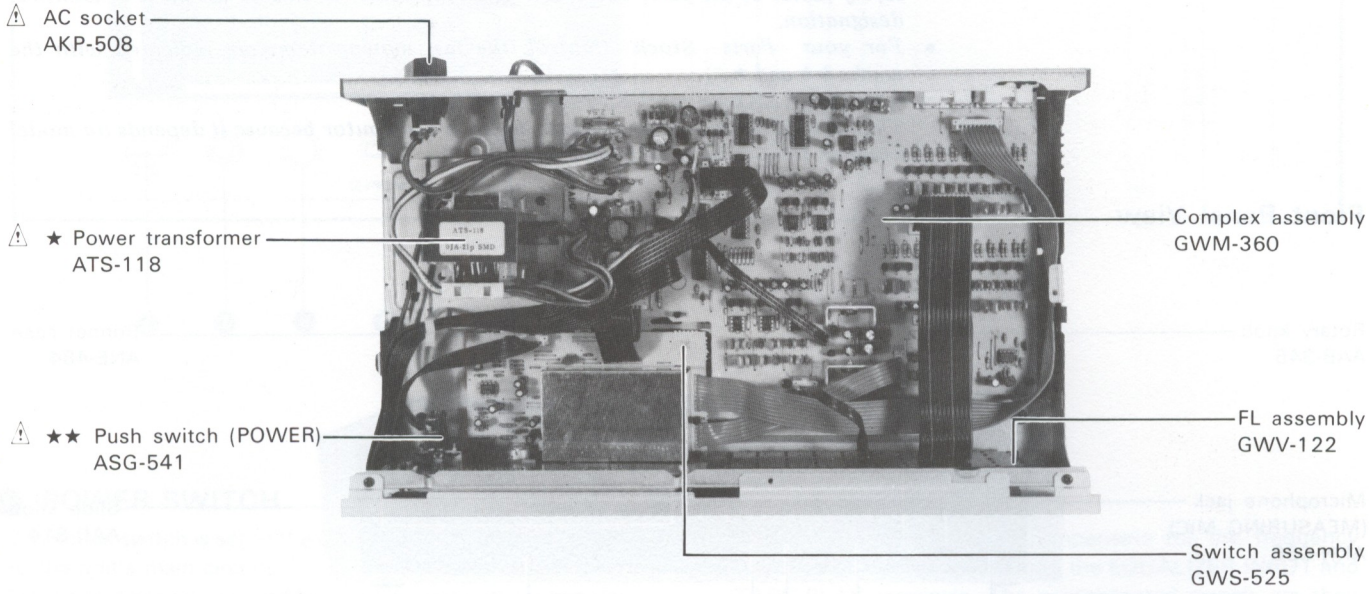
Front Panel View



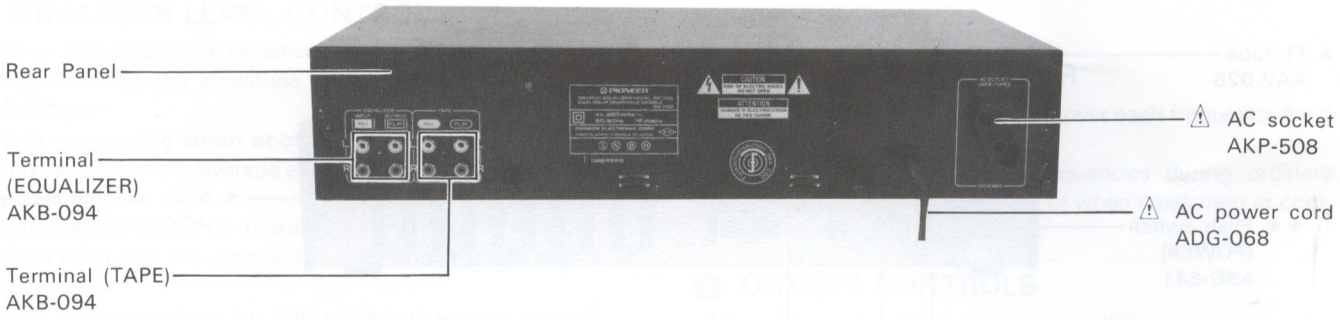
Front View with Panel Removed



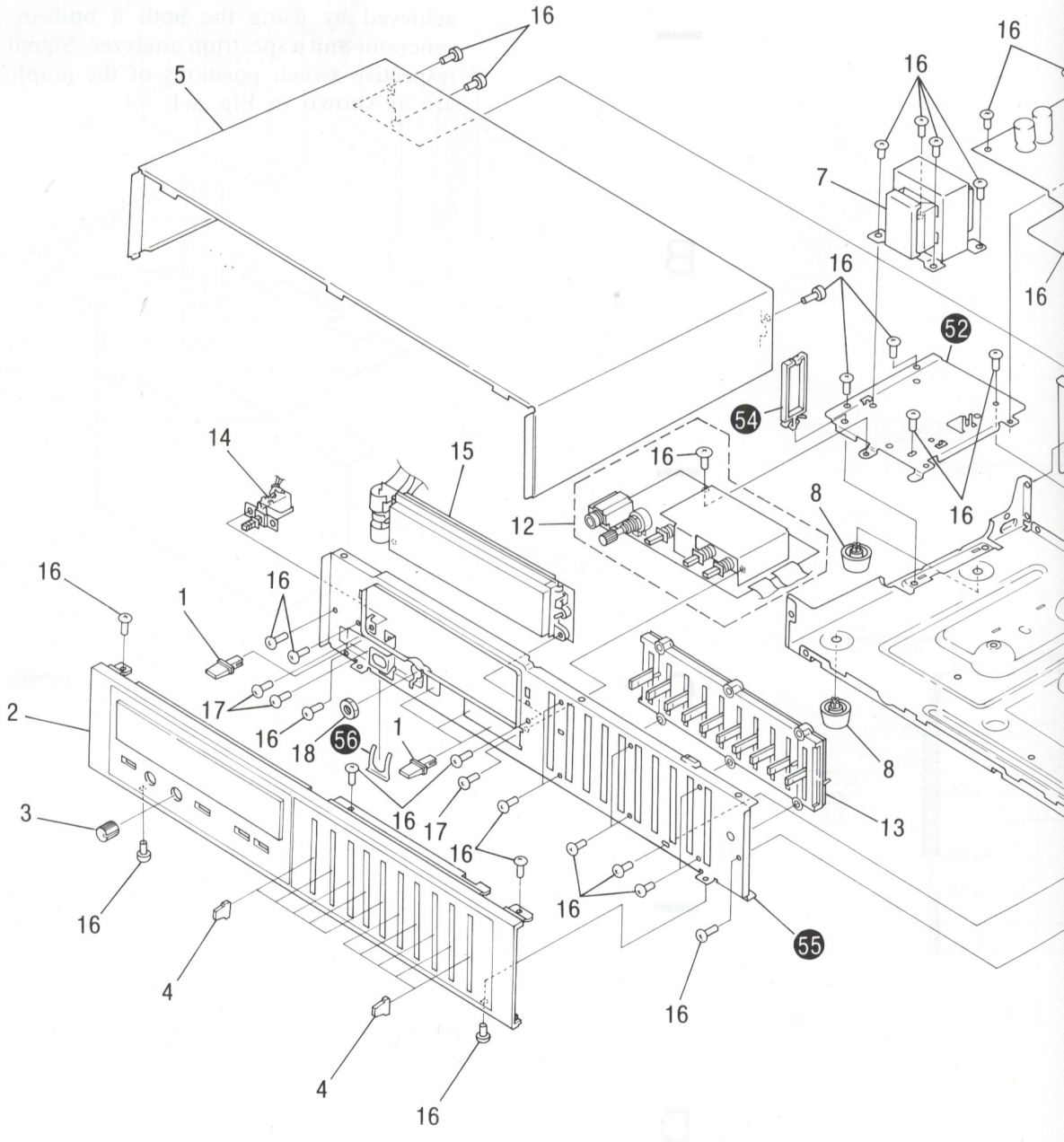
Top View



Rear Panel View

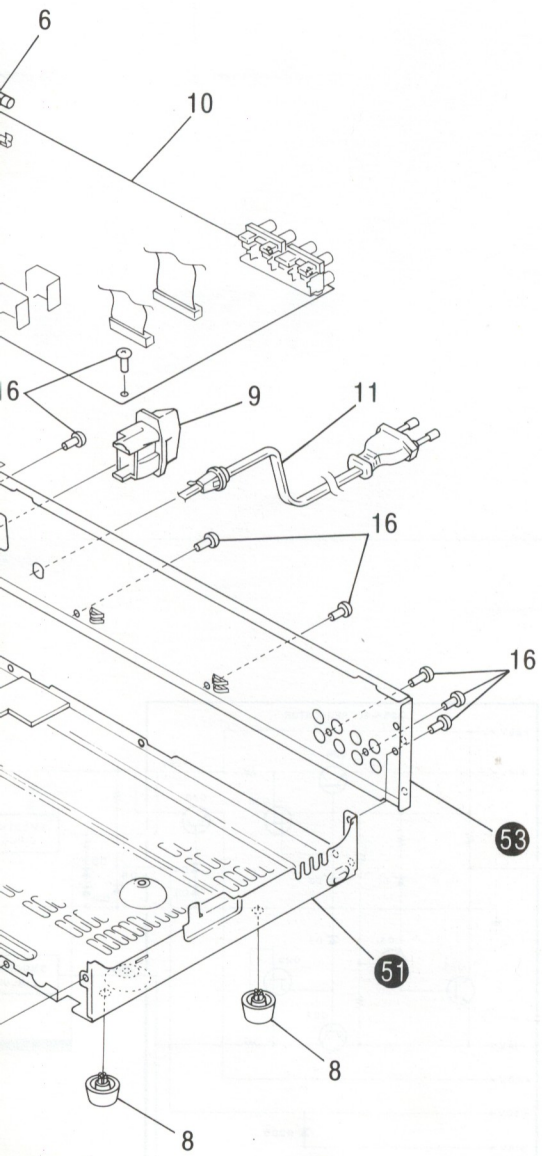


5. EXPLODED VIEW



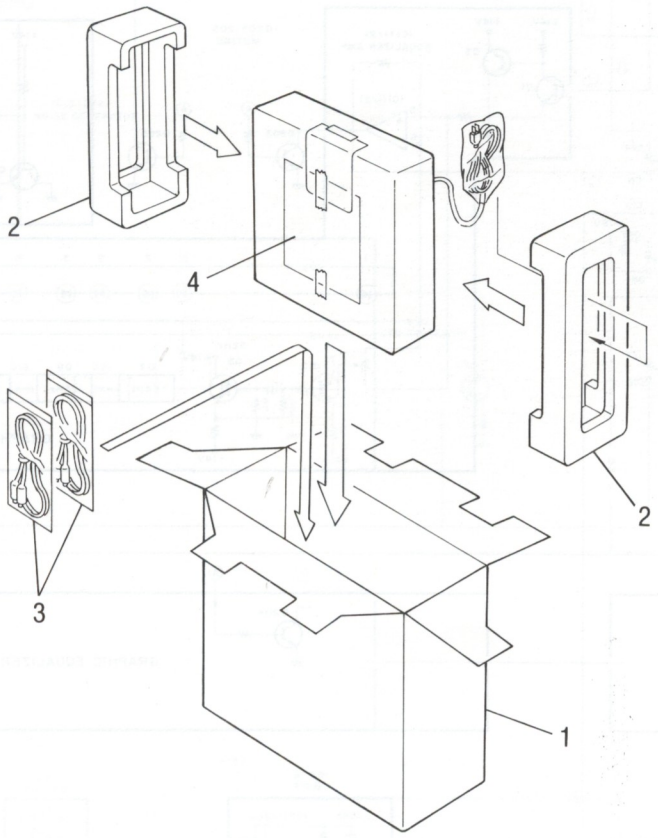
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.



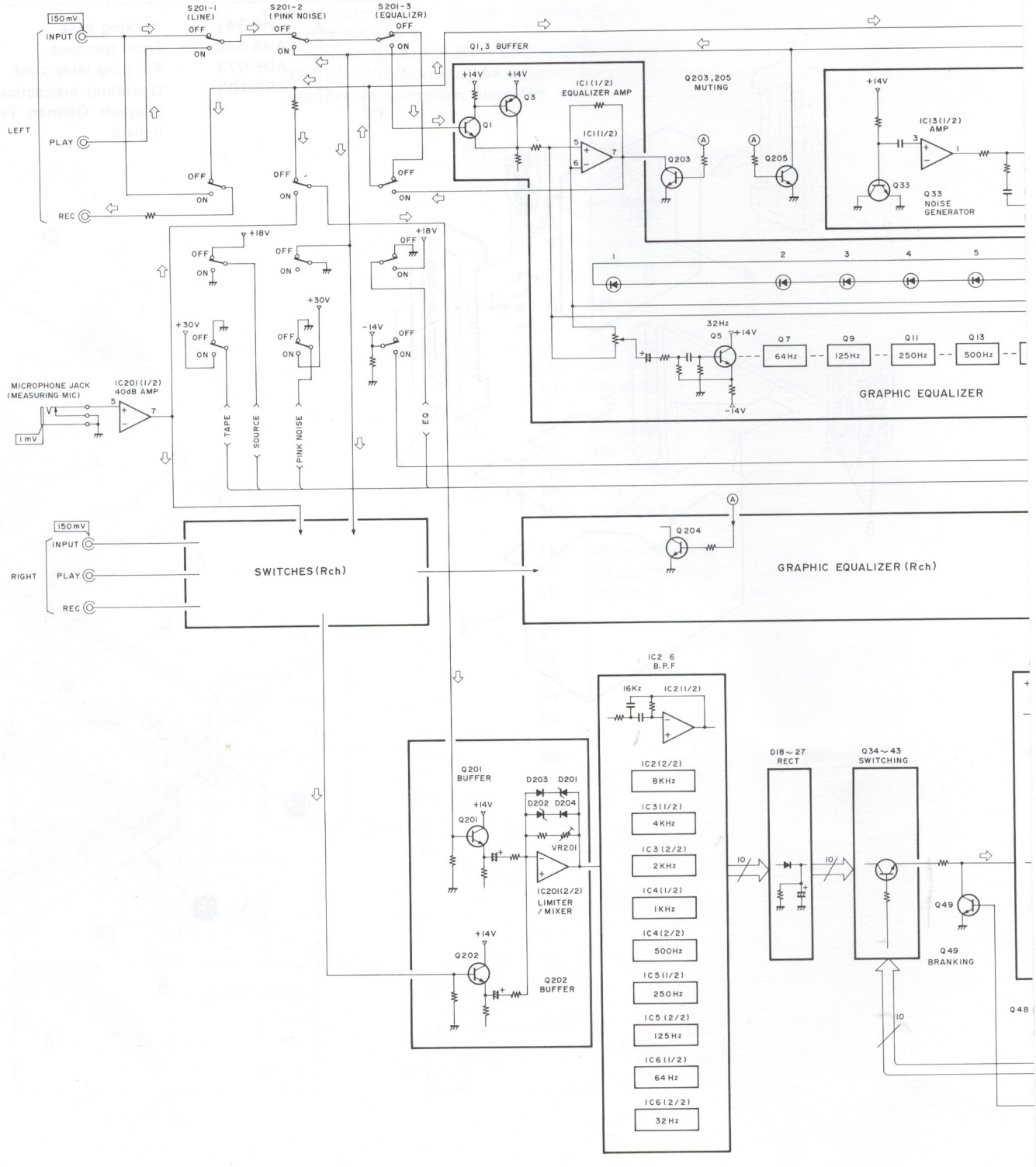
Mark	No.	Part No.	Description
	1.	AAD-396	Push knob
	2.	ANM-608	Front panel assembly
	3.	AAB-345	Rotary knob
	4.	AAD-814	Slide knob assembly
	5.	ANE-484	Bonnet case
⚠ ★★	6.	AEK-403	Fuse (T2.5A)
⚠ ★	7.	ATS-118	Power transformer (220/240V)
	8.	AEP-016	Leg assembly
⚠	9.	AKP-508	AC socket
	10.	GWM-360	Complex assembly
⚠	11.	ADG-068	AC power cord
	12.	GWS-525	Switch assembly
★	13.	ACX-304	Slide variable resistor
⚠ ★★	14.	ASG-541	Push switch (POWER)
	15.	GWV-122	FL assembly
	16.	BBZ30P080FZK	Screw (3 x 8)
	17.	VMZ30P060FMC	Screw (3 x 6)
	18.	NK90FUC	Nut
	51.		Chassis
	52.		Transformer frame
	53.		Rear panel
	54.		Cable holder
	55.		Panel stay
	56.		Mounting plate

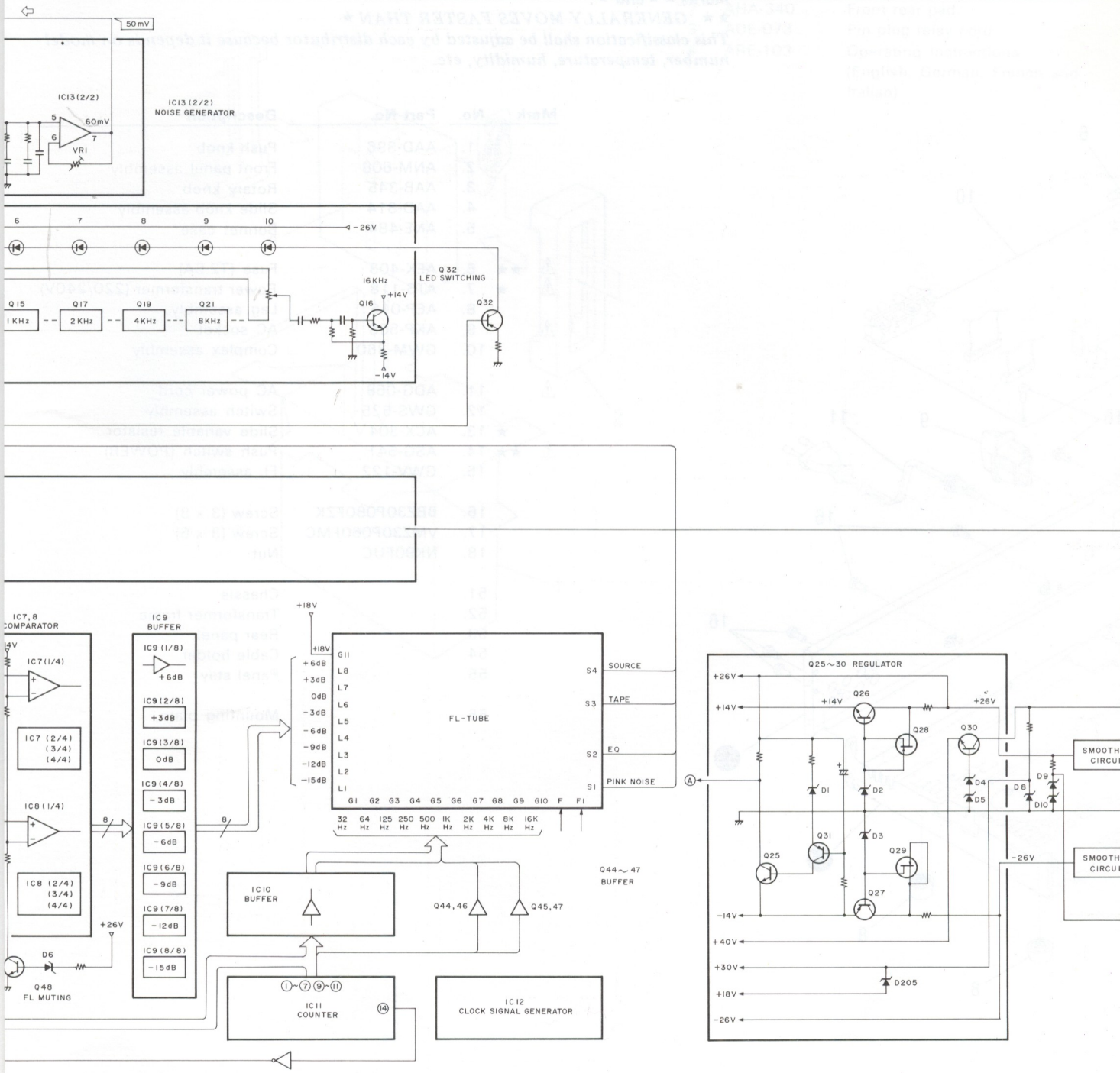
6. PACKING



Mark	No	Part No	Description
	1	AHE-347	Packing case
	2	AHA-340	Front rear pad
	3	ADE-073	Pin plug relay cord
	4	ARE-103	Operating instructions (English, German, French and Italian)

7. BLOCK DIAGRAM

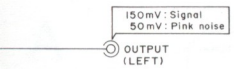


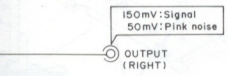

50mV
IC13(2/2)
IC13 (2/2)
NOISE GENERATOR
60mV
VR1
6 7 8 9 10
-26V
Q15 Q17 Q19 Q21
1KHz 2KHz 4KHz 8KHz
16KHz
Q16
+14V
-14V
Q32
Q32
LED SWITCHING
IC7,8
COMPARATOR
IC7(1/4)
IC8(1/4)
IC7 (2/4) (3/4) (4/4)
IC8 (2/4) (3/4) (4/4)
IC9
BUFFER
IC9(1/8)
+6dB
IC9(2/8)
+3dB
IC9(3/8)
0dB
IC9(4/8)
-3dB
IC9(5/8)
-6dB
IC9(6/8)
-9dB
IC9(7/8)
-12dB
IC9(8/8)
-15dB
+18V
+6dB
+3dB
0dB
-3dB
-6dB
-9dB
-12dB
-15dB
G11
L8
L7
L6
L5
L4
L3
L2
L1
FL-TUBE
S4
S3
S2
S1
SOURCE
TAPE
EQ
PINK NOISE
G1 G2 G3 G4 G5 G6 G7 G8 G9 G10 F F1
32 Hz 64 Hz 125 Hz 250 Hz 500 Hz 1K Hz 2K Hz 4K Hz 8K Hz 16K Hz
IC10
BUFFER
Q44,46
Q45,47
Q44~47
BUFFER
+26V
D6
Q48
FL MUTING
IC11
COUNTER
IC12
CLOCK SIGNAL GENERATOR
Q25~30 REGULATOR
+26V
+14V
Q26
Q28
Q30
D1
D2
D3
D4
D5
D8
D9
D10
Q25
Q31
Q29
Q27
-14V
+40V
+30V
+18V
-26V
D205
SMOOTH CIRCU
SMOOTH CIRCU

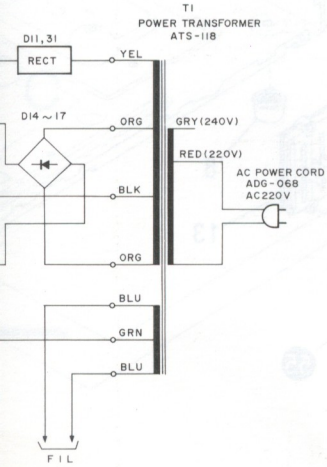
8. CIRCUIT DESCRIPTION

8.1 OUTLINES OF SG-750

The SG-750 is a graphic equalizer, mounting a spectrum analyzer which is used to observe frequency distribution of signals. Point frequencies of this equalizer are 10 frequencies such as, 32 Hz, 64 Hz, 125 Hz, 250 Hz, 500 Hz, 1kHz, 2kHz, 4kHz, 8kHz and 16kHz. Output level variable range of the equalizer is ±10dB with L and R interlocked. Correction of room frequency characteristics can be achieved by using the both a built-in pink noise generator and a spectrum analyzer. Signal route of the respective switch positions of the graphic equalizer are as shown in Fig. 8-1.







S201-1: LINE S201-2: PINK NOISE S201-3: EQUALIZER

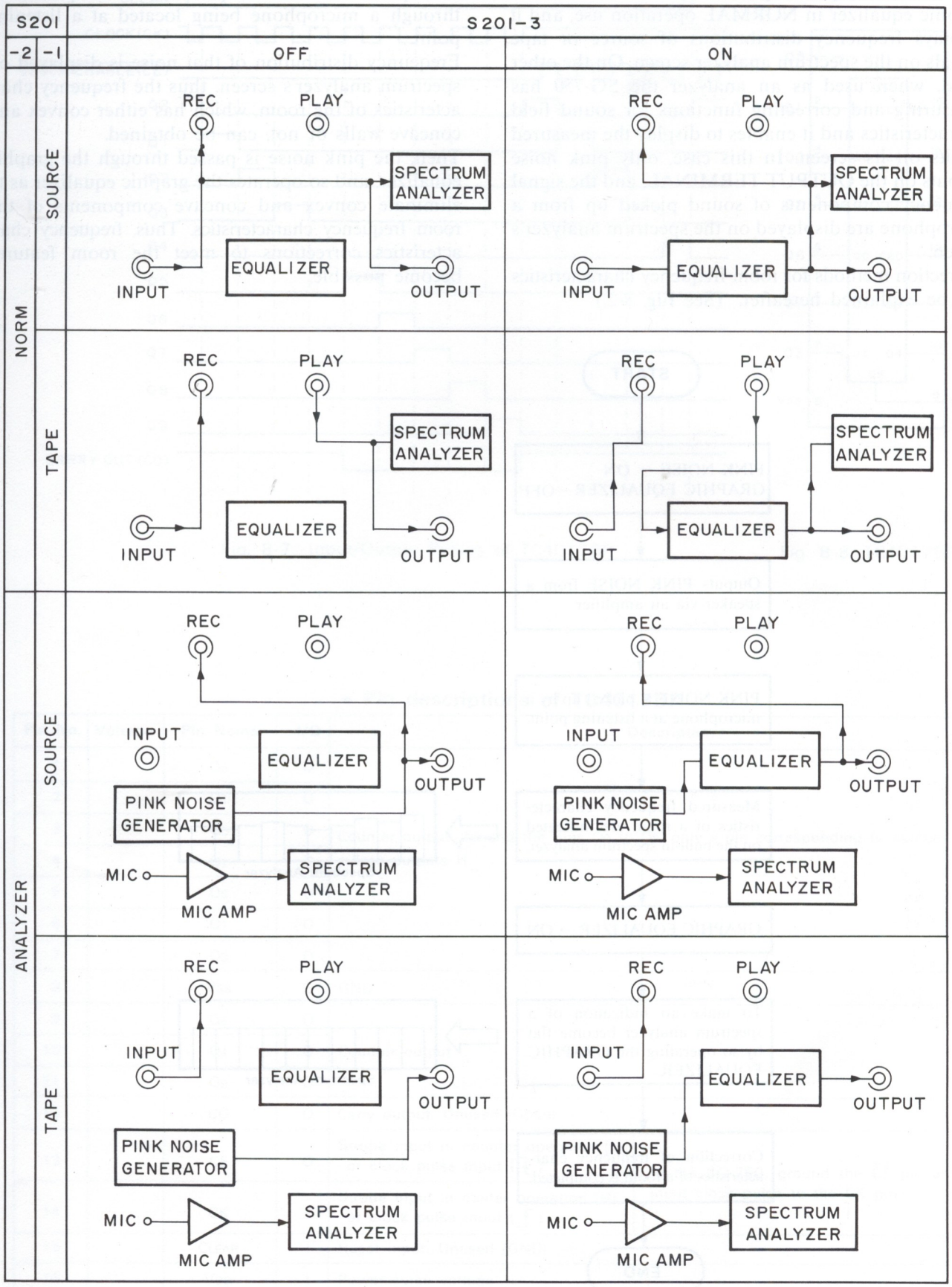


Fig. 8-1. Block Diagram Description

The SG-750 Graphic Equalizer operates as a normal graphic equalizer in NORMAL operation use, and it displays frequency distributions of source or tape signals on the spectrum analyzer screen. On the other hand, when used as an analyzer the SG-750 has measuring and correcting functions for sound field characteristics and it enables to display the measured results on its screen. In this case, only pink noise outputs on the OUTPUT TERMINAL, and the signal frequency components of sound picked up from a microphone are displayed on the spectrum analyzer's screen.

Correction methods for room frequency characteristics will be explained hereafter. (See Fig. 8-2.)

Emit pink noise from a speaker and it is picked up through a microphone being located at a listening point.

Freqeuncy distribution of that noise is displayed on spectrum analyzer's screen, thus the frequency characteristics of the room, which has either convex and concave walls or not, can be obtained.

Then, the pink noise is passed through the graphic equalizer, and so operates the graphic equalizer as to eliminate convex and concave components of the room frequency characteristics. Thus, frequency characteristics corrections to meet the room features become possible.

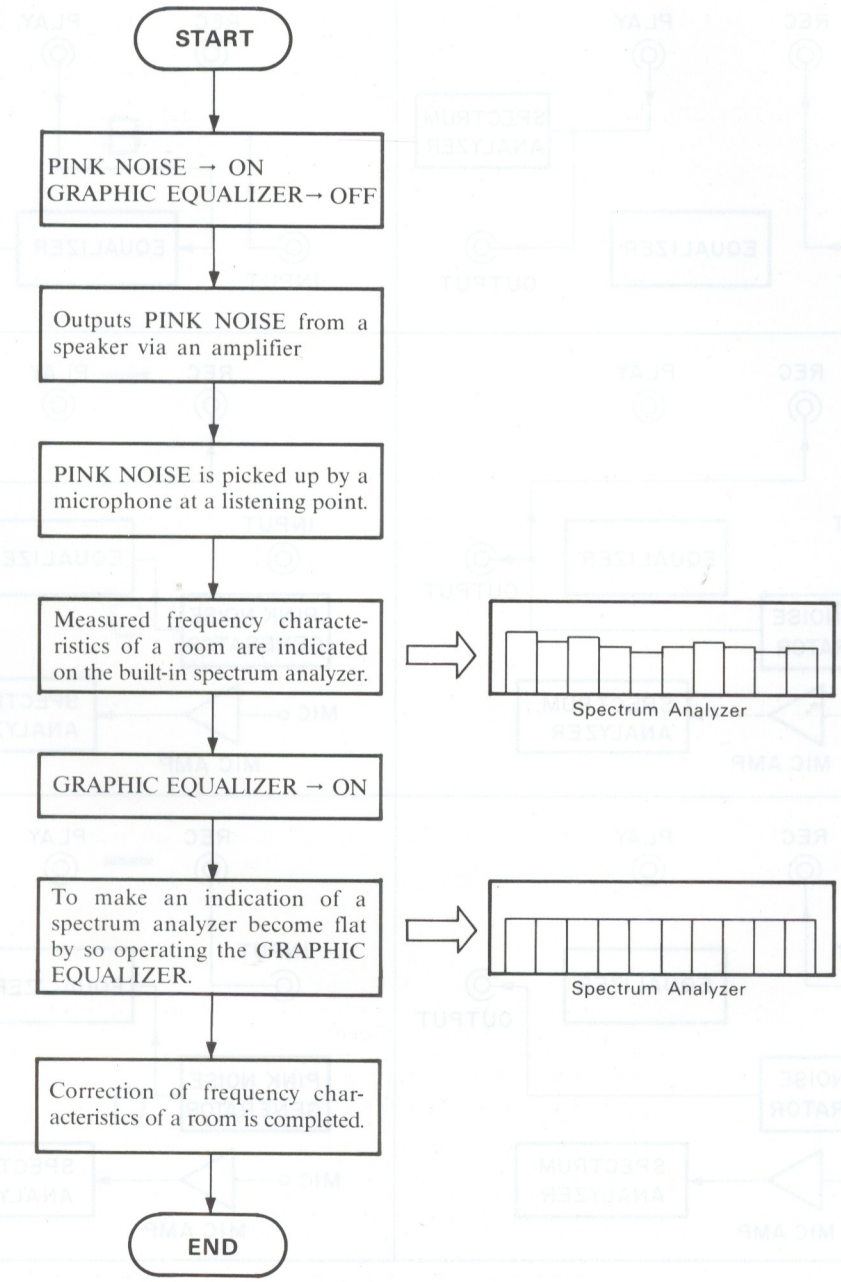


Fig. 8-2. Correction of Room Frequency Characteristics

8.2 CIRCUIT DESCRIPTION

Graphic Equalizer

Circuits of the SG-750 Graphic Equalizer are as shown in Fig. 8-3. An LC series resonance circuit adopting semi-conductor inductance is used as an equalizer element. An operational amplifier gain at the point frequency is varied by turning the volume control knob, thus cutting off or boosting of the signals can be carried out.

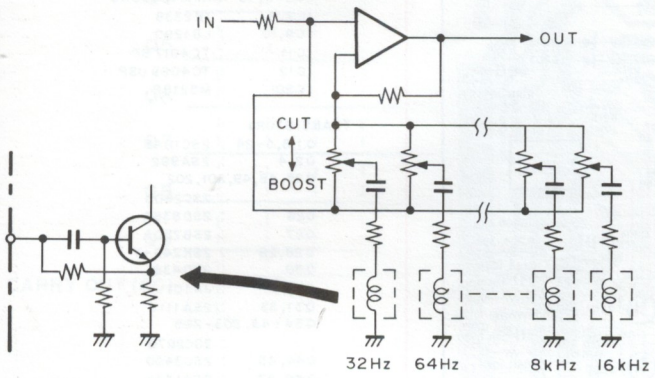


Fig. 8-3. Graphic Equalizer

Pink Noise Generator

For pink noise generation, white noise is picked up from the base of a transistor whose base and emitter are being inversely biased, and obtained frequency characteristics of the white noise are tilted with −6dB/oct by a filter.

Spectrum Analyzer

Circuits of the spectrum analyzer are as shown in Fig. 8-4. Signals are sent to a bandpass filter using an operational amplifier, and the same point frequency components as that of the equalizing amplifier can be obtained.

An output of point frequency components are rectified by a diode and a signal envelope is detected. The signal envelope voltage is sent to a voltage comparison circuit passing through a transistor switch, and turns a comparator and an FL tube on in accordance with the level intensity.

The level indications are 8 points with 3dB steps, so that setting of each comparison voltage of the eight comparators ranging from 10V to 0.89V is in geometrical progression (approximately 1.4 times).

For circuit simplification, the voltage comparison circuit is to be a single system, and a dynamic light up system, that is, the frequency points are switched by every 0.2mS in order, is adopted.

The Q0 to Q9 terminals of the IC11 (TC4017BP), are synchronized to the clock, and each of the terminals is designed at one step higher level than the preceding terminal. The signal output level taken out from 10 pin terminals changes the indicated frequency on an FL tube and turns the transistor switches (Q34 to Q43) ON/OFF simultaneously, and sends only one frequency component to the voltage comparison circuit.

Clock is generated by a CR oscillator using the C-MOS inverter, and its oscillation frequency is about 5kHz.

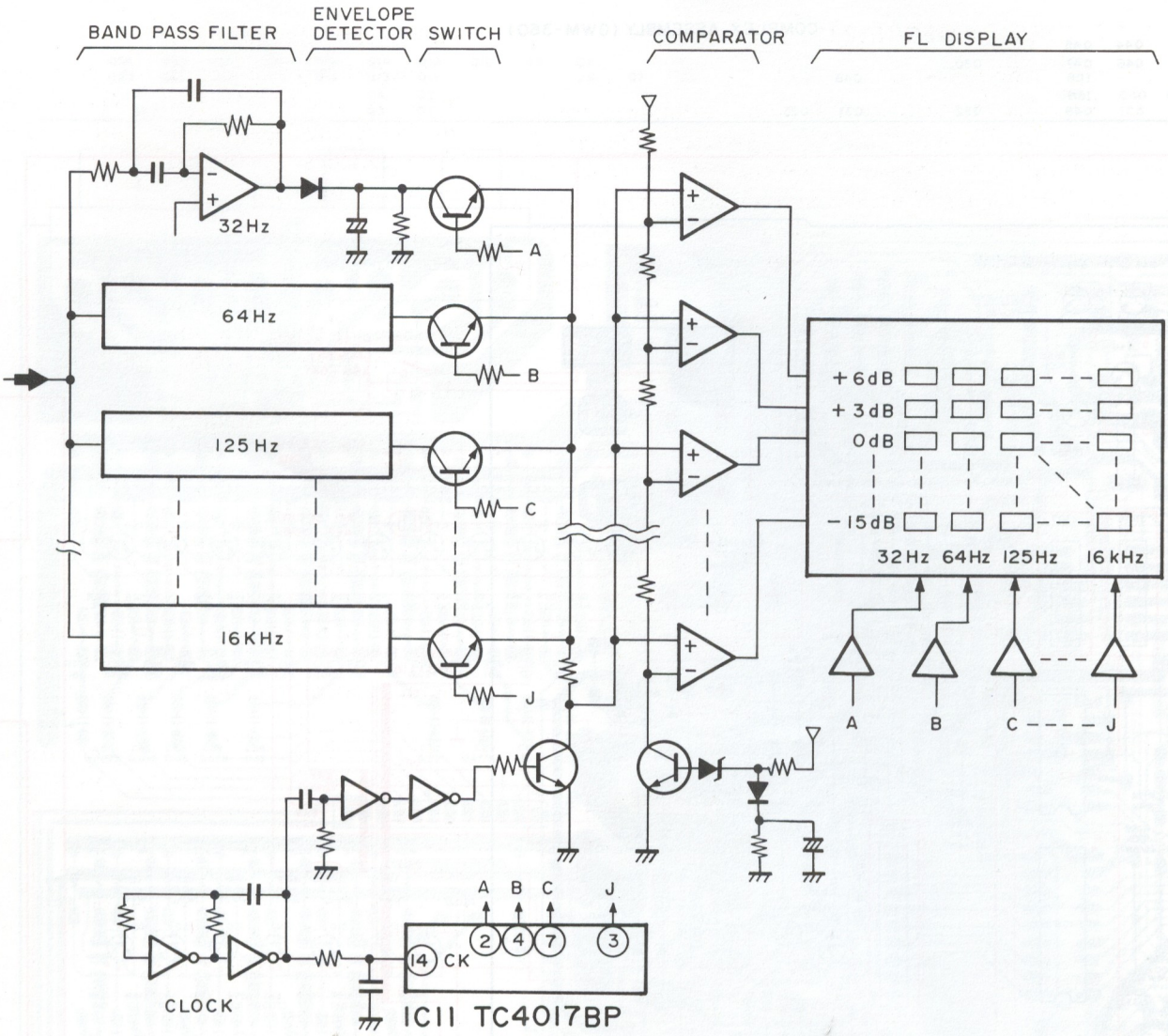


Fig. 8-4. Spectrum Analyzer

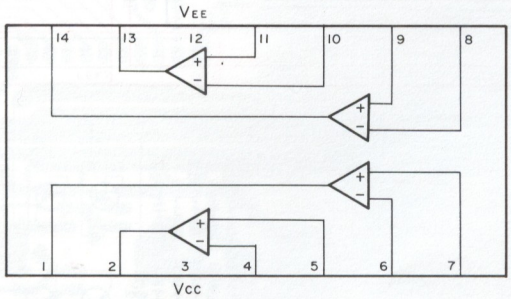


Fig. 8-5. IR2339

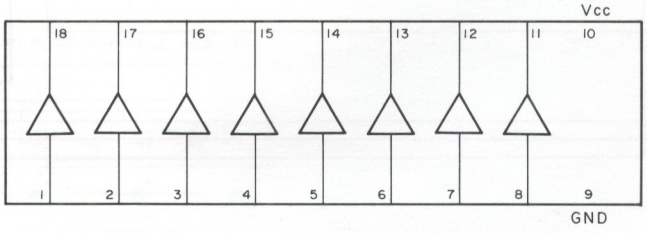


Fig. 8-6. LB1290

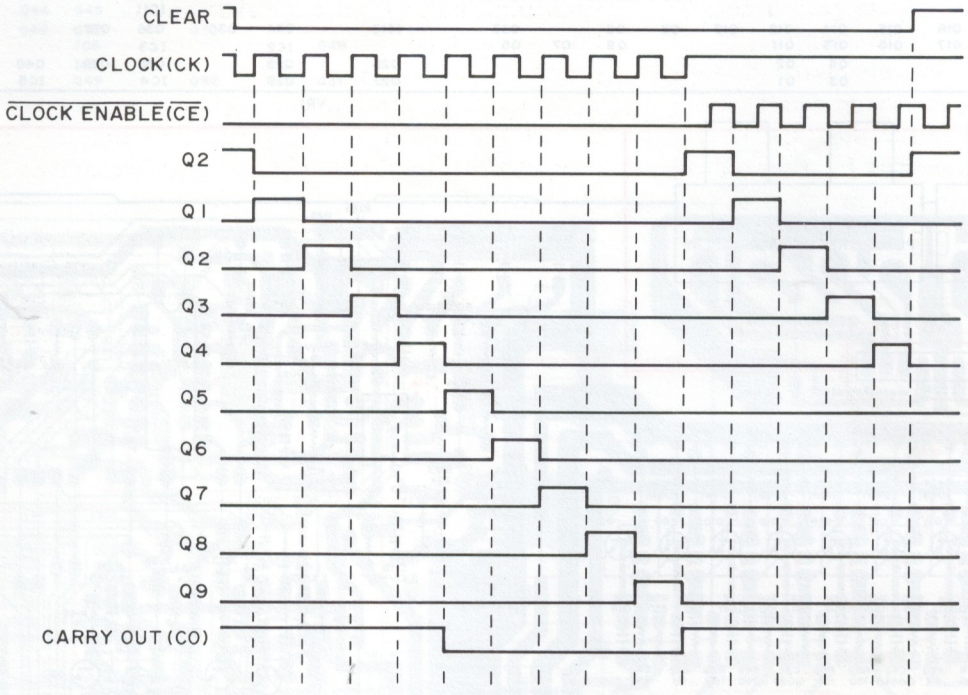


Fig. 8-7. Input/Output Pulses of TC4017BP

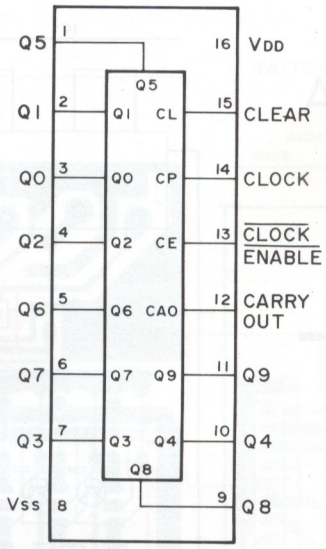
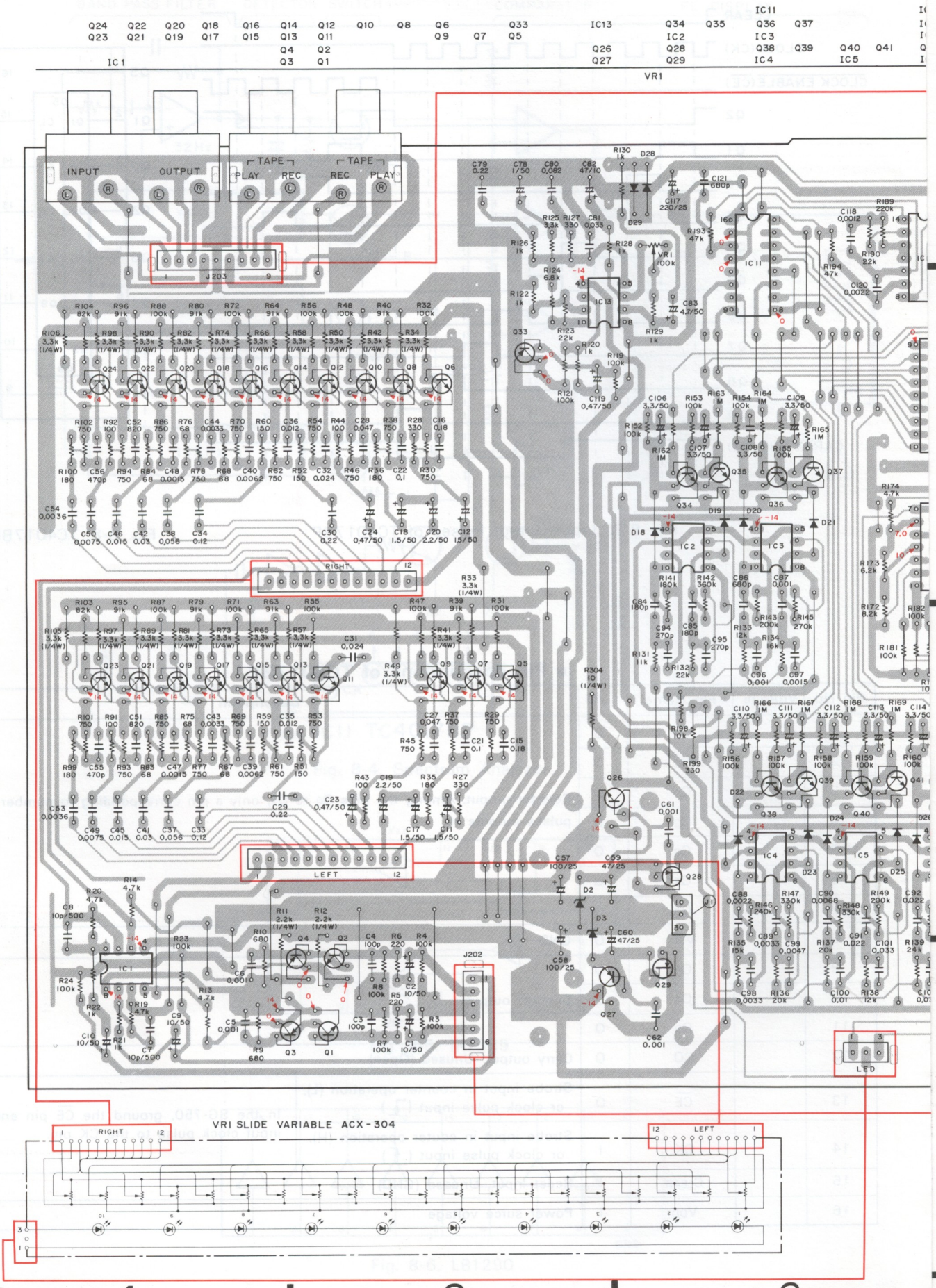


Fig. 8-8. TC4017BP

• Pin descriptions of TC4017BP

Pin No.	Voltage	Pin Name	I/O	Description	
1		Q_5	O	Counter output. Among the pins Q_0 to Q_9, only a pin corresponding to number of clock pulses outputs H.	
2		Q_1	O		
3		Q_0	O		
4		Q_2	O		
5		Q_6	O		
6		Q_7	O		
7		Q_3	O		
8		Vss	O	GND	
9		Q_8	O	Counter output	
10		Q_4	O		
11		Q_9	O		
12		CO	O	Carry output. Unused (Open)	
13		$\overline{CE}$	O	Strobe input in counter operation (L), or clock pulse input (↓)	In the SG-750, ground the $\overline{CE}$ pin and input clock pulse to the CK pin.
14		CK	I	Strobe input in couter operation (H), or clock pulse input (↑)	
15		CLEAR	I	Reset input. Unused (GND)	
16		VDD	I	Power surce voltage	

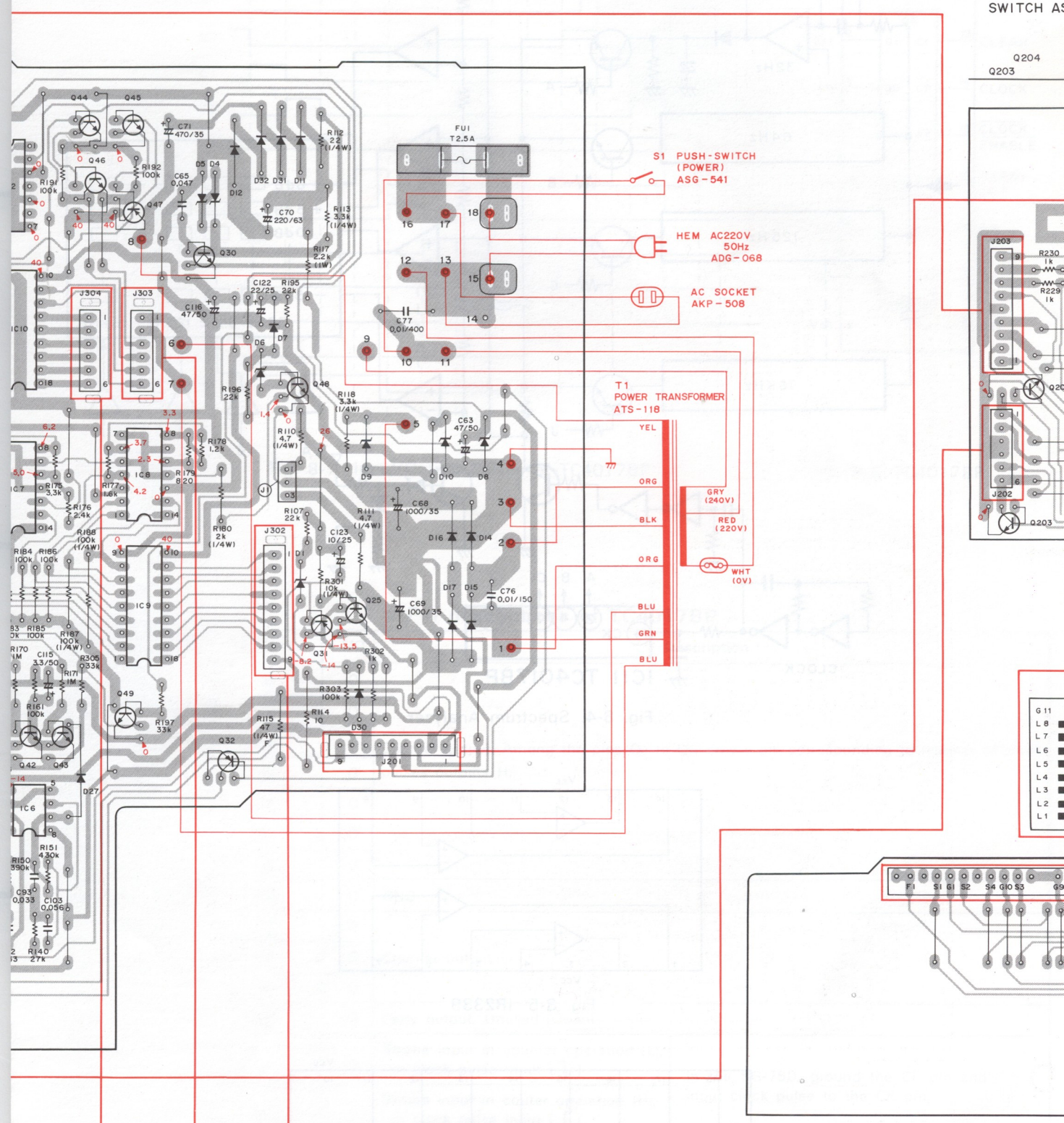
9. P.C.BOARDS CONNECTION DIAGRAM



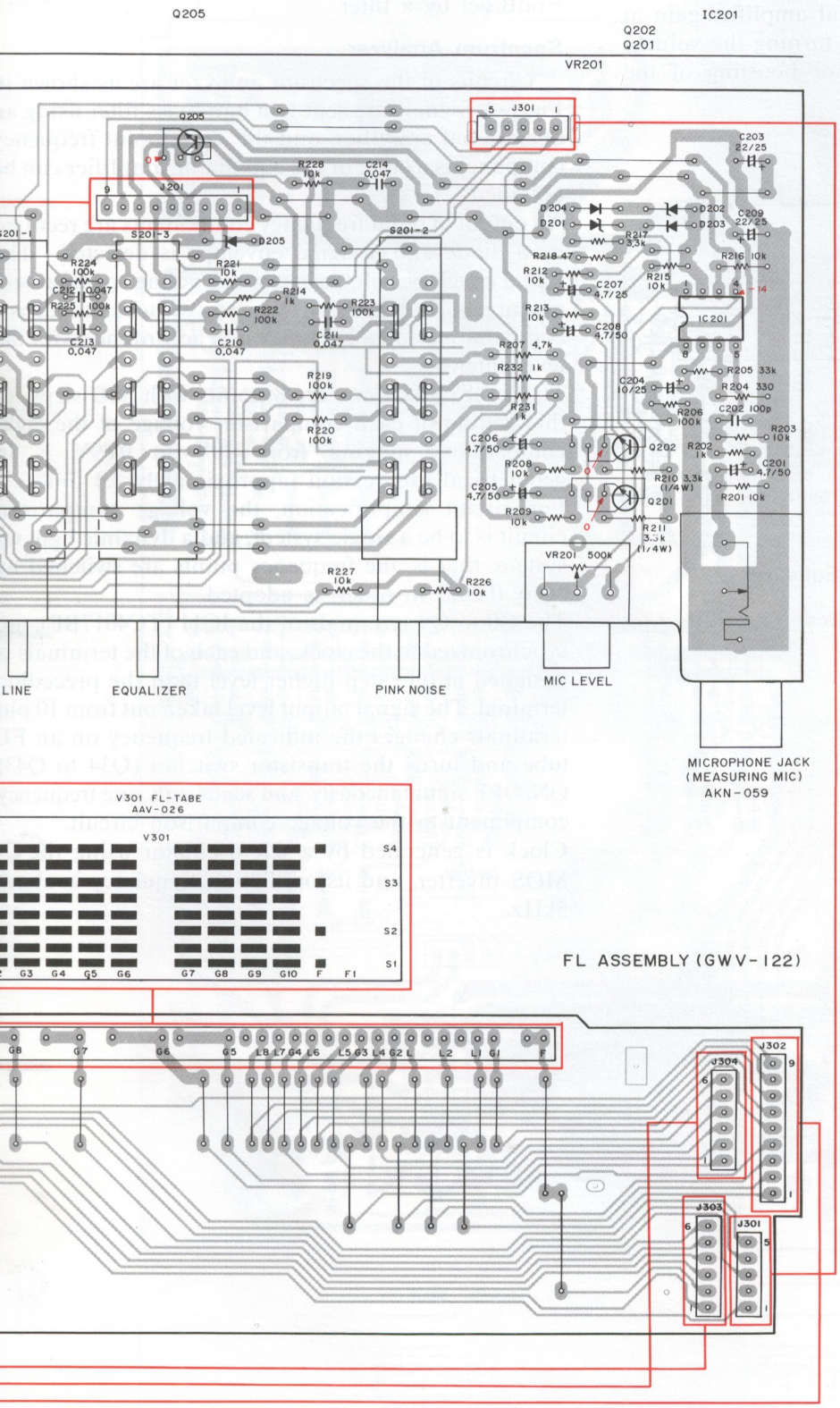
COMPLEX ASSEMBLY (GWM-360)

C12 Q44 Q45
C10 Q46 Q47 Q30
C7 IC8 Q48
42 Q43 IC9
C6 Q49 Q32 Q31 Q25

SWITCH AS



BLY (GWS-525)



FL ASSEMBLY (GWV-122)

ICs

IC1	: M5220P
IC2~6, 13	: NJM4558DXC
IC7, 8	: IR2339
IC9, 10	: LB1290
IC11	: TC4017BP
IC12	: TC4069UBP
IC201	: M5218P

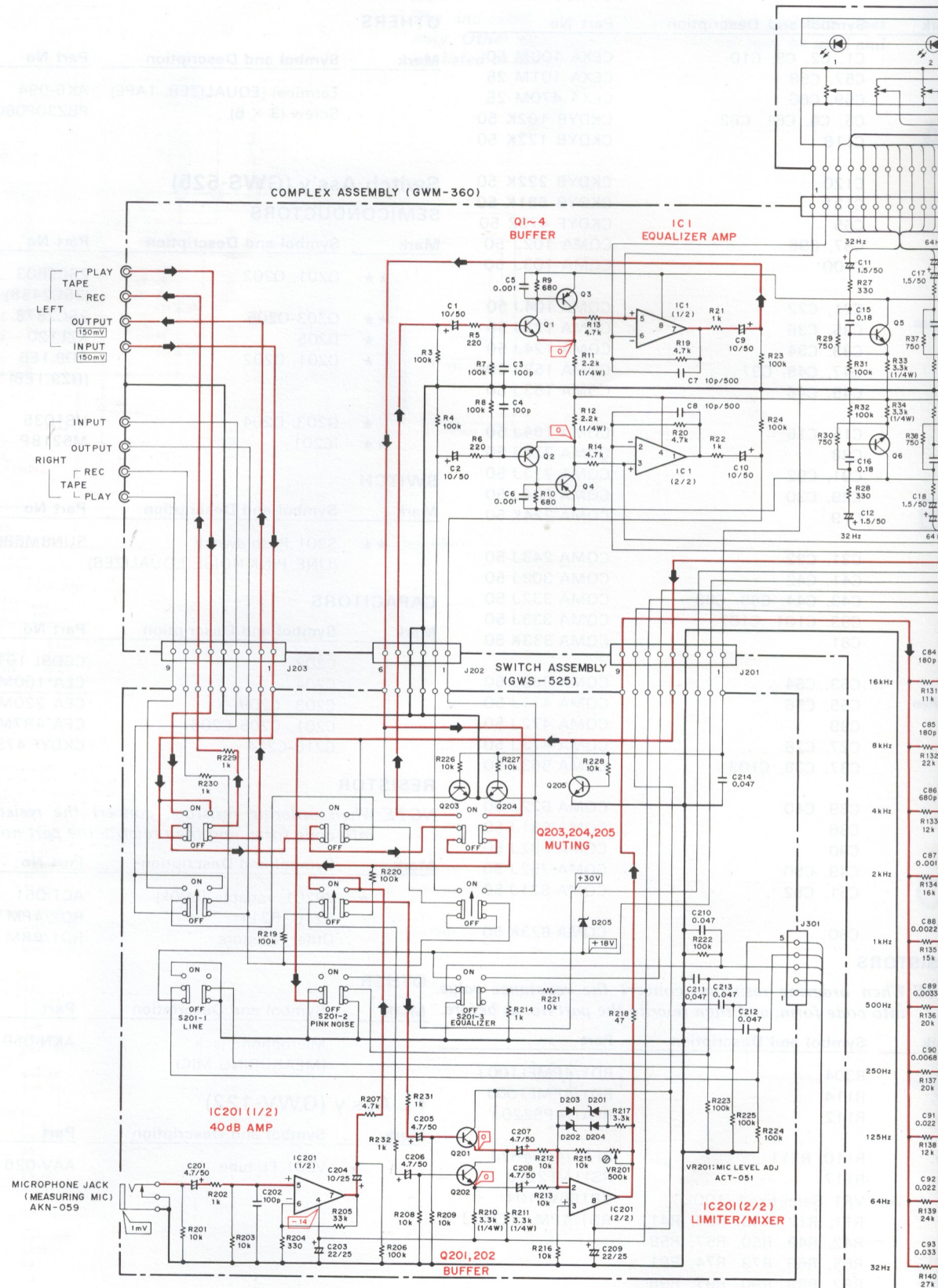
TRANSISTORs

Q1, 3, 5~24	: 2SC1845
Q2, 4	: 2SA992
Q25, 48, 49, 201, 202	: 2SC2603
Q26	: 2SD836A
Q27	: 2SB750A
Q28, 29	: 2SK246-Y
Q30	: 2SD438
Q32	: JA101
Q31, 33	: 2SA1115
Q34~43, 203~205	: 2SC2878
Q44, 45	: 2SC3400
Q46, 47	: 2SA1346

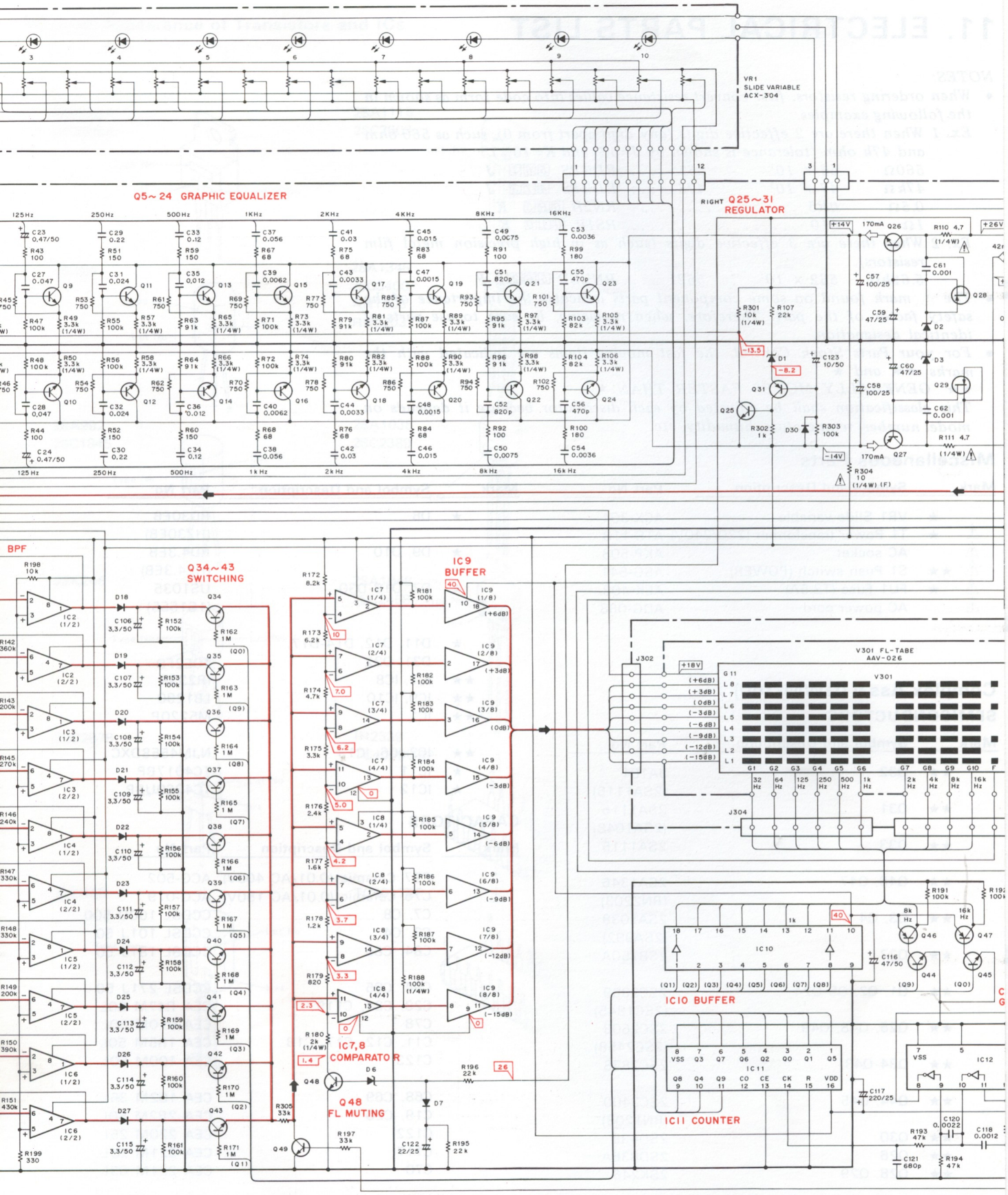
DIODEs

D1, 4	: RD20EB
D2, 3	: KZL150
D5	: RD22EB
D8	: RD30EB
D9, 10	: RD4.3EB
D11, 12, 14~17, 31, 32	: 10E2FD
D18~30, 7, 203, 204	: 1S1555
D201, 202	: RD9.1EB
D205	: KZL120
D6	: KZL083

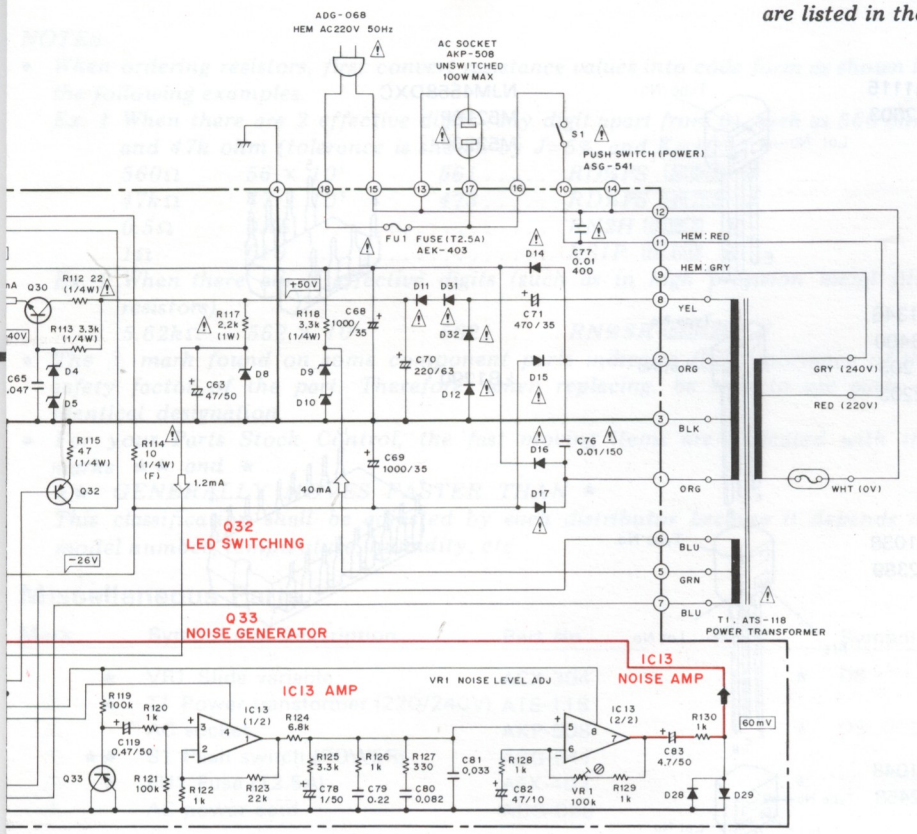
10. SCHEMATIC DIAGRAM

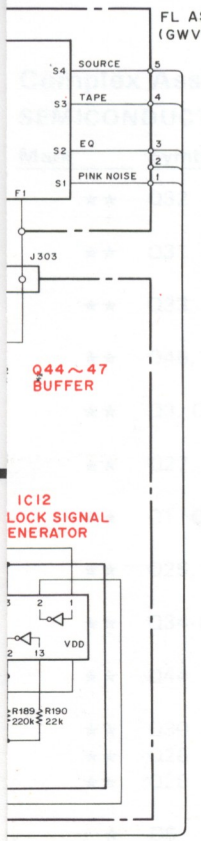


ITEM	NO.	VACANT
R	3~199, 201~232, 301~305	1,2,15~18,25,26,108,109,116
C	1~123, 201~214	13,14,25,26,64,66,67,72~75,104,105
Q	1~49, 201~205	
IC	1~13, 201	
D	1~32, 201~205	13


VR1
SLIDE VARIABLE
ACX-304
Q5~24 GRAPHIC EQUALIZER
125Hz
250Hz
500Hz
1KHz
2KHz
4KHz
8KHz
16KHz
RIGHT Q25~31
REGULATOR
+14V
-14V
+26V
170mA
-13.5
-8.2
BPF
Q34~43
SWITCHING
IC9
BUFFER
IC7,8
COMPARATOR
Q48
FL MUTING
IC10 BUFFER
IC11 COUNTER
V301 FL-TABE
AAV-026
J302
J304
+18V
(+6dB)
(+3dB)
(0dB)
(-3dB)
(-6dB)
(-9dB)
(-12dB)
(-15dB)

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.





ICs

IC1	: M5220P
IC2~6,13	: NJM4558DXC
IC7,8	: IR2339
IC9,10	: LB1290
IC11	: TC4017BP
IC12	: TC4069UBP
IC201	: M5218P

TRANSISTORs

Q1,3,5~24	: 2SC1845
Q2,4	: 2SA992
Q25,48,49,201,202	: 2SC2603
Q26	: 2SD836A
Q27	: 2SB750A
Q28,29	: 2SK246-Y
Q30	: 2SD438
Q32	: JA101
Q31,33	: 2SA1115
Q34~43,203~205	: 2SC2878
Q44,45	: 2SC3400
Q46,47	: 2SA1346

DIODEs

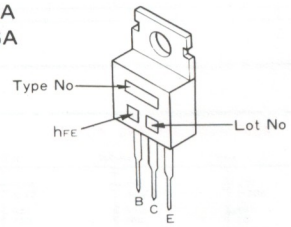
D1,4	: RD20EB
D2,3	: KZL150
D5	: RD22EB
D8	: RD30EB
D9,10	: RD4.3EB
D11,12,14~17,31,32	: 10E2FD
D18~30,7,203,204	: 1S1555
D201,202	: RD9.1EB
D205	: KZL120
D6	: KZL083

1. RESISTORS:
INDICATED IN Ω, 1/4W & 1/8W, ±5% TOLERANCE UNLESS OTHERWISE NOTED K; kΩ, M; MΩ, (F); ±1%, (G); ±2% (K); ±10%, (M); ±20% TOLERANCE.
2. CAPACITORS:
INDICATED IN CAPACITY (μF)/VOLTAGE (V) UNLESS OTHERWISE NOTED P; pF.
INDICATION WITHOUT VOLTAGE IS 50V EXCEPT ELECTROLYTIC CAPACITOR.
3. VOLTAGE, CURRENT:
: DC VOLTAGE (V) AT NO INPUT SIGNAL.
VALUE IN ( ) IS DC VOLTAGE AT RATED POWER.
⇦mA; DC CURRENT AT NO INPUT SIGNAL
4. OTHERS:
➡ : SIGNAL ROUTE.
Ø : ADJUSTING POINT.
THE ⚠ MARK FOUND ON SOME COMPONENT PARTS INDICATES THE IMPORTANCE OF THE SAFETY FACTOR OF THE PART. THEREFORE, WHEN REPLACING, BE SURE TO USE PARTS OF IDENTICAL DESIGNATION.
* MARKED CAPACITORS AND RESISTORS HAVE PARTS NUMBERS.
THE UNDERLINED INDICATES THE SWITCH POSITION.
THIS IS THE BASIC SCHEMATIC DIAGRAM, BUT THE ACTUAL CIRCUIT MAY VARY DUE TO IMPROVEMENTS IN DESIGN.

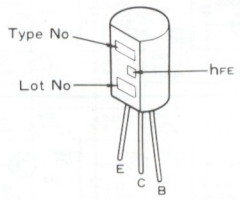
SWITCHES:
OUTSIDE OF P.C. BOARDS
S1: POWER ON-OFF
SWITCH ASSEMBLY
S201-1: LINE ON-OFF
S201-2: PINK NOISE ON-OFF
S023-3: EQUALIZER ON-OFF

External Appearance of Transistors and ICs

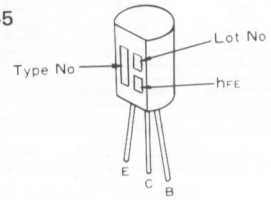
2SB750A
2SD836A



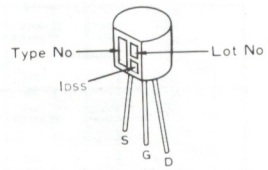
JA101



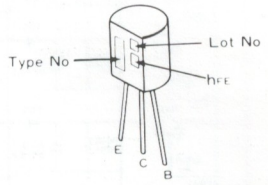
2SA992
2SC1845



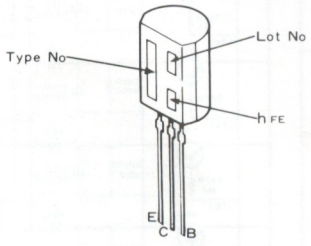
2SK246



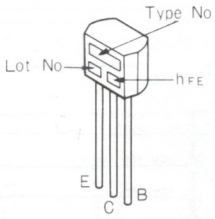
2SC2878



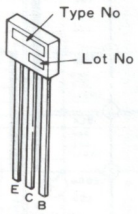
2SD438



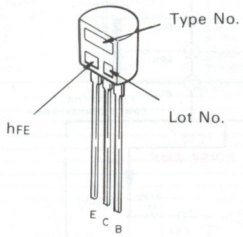
2SA1115
2SC2603



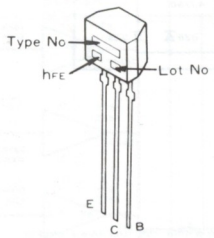
2SA1346
2SC3400
RN1203
RN2203



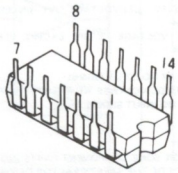
2SA1038
2SC2389



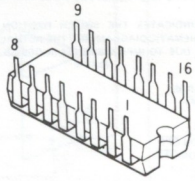
2SA1048
2SC2458



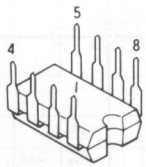
IR2339
TC4069UBP



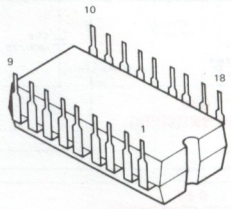
TC4017BP



NJM4558DXC
M5218P
M5220P



LB1290



11. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561*	*RD¼PS* 5 6 1	*J*
47kΩ	*47 × 10³*	*473*	*RD¼PS* 4 7 3	*J*
0.5Ω	*0R5*		*RN2H* 0 R 5	*K*
1Ω	*010*		*RS1P* 0 1 0	*K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR* 5 6 2 1	*F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★*

  ★★ GENERALLY MOVES FASTER THAN ★

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Symbol and Description	Part No
★	VR1 Slide variable	ACX-304
⚠ ★	T1 Power transformer (220/240V)	ATS-118
⚠	AC socket	AKP-508
⚠ ★★	S1 Push switch (POWER)	ASG-541
⚠ ★	FU1 Fuse (T2.5A)	AEK-403
⚠	AC power cord	ADG-068

Complex Ass'y (GWM-360)

SEMICONDUCTORS

Mark	Symbol and Description	Part No
★★	Q32	JA101 (2SA1115)
★★	Q31	2SA1115 (2SA1048)
★★	Q33	2SA1115
★★	Q46, Q47	2SA1346 (RN2203)
★★	Q3, Q4	2SA1038 (2SA992)
★★	Q27	2SB750A
★★	Q1, Q2, Q5-Q24	2SC2389 (2SC1845)
★★	Q25, Q48, Q49	2SC2603 (2SC2458)
★★	Q34-Q43	2SC2878
★★	Q44, Q45	2SC3400 (RN1203)
★★	Q30	2SD438
★★	Q26	2SD836A
★★	Q28, Q29	2SK246
★	D6	KZL083
★	D2, D3	KZL150
★	D1, D4	RD20EB (HZ20EB)
★	D5	RD22EB (HZ22EB)
★	D8	RD30EB (HZ30EB)
★	D9, D10	RD4.3EB (HZ4.3EB)
★	D7, D18-D30	US1035 (1S1555)
⚠ ★	D11, D12, D14-D17, D31, D32	10E2FD
★★	IC7, IC8	IR2339
★★	IC9, IC10	LB1290
★★	IC1	M5220P
★★	IC2-IC6, IC13	NJM4558DXC
★	IC11	TC4017BP
★	IC12	TC4069UBP

CAPACITORS

Mark	Symbol and Description	Part No
⚠	C77 Ceramic (0.01/AC 400V)	ACG-502
⚠	C76 Ceramic (0.01/AC 150V)	ACG-019
	C7, C8	CCDSL 100D 500
	C3, C4	CCDSL 101J 50
	C84, C85	CCDSL 181J 50
	C94, C95	CCDSL 271J 50
	C23, C24, C119	CEA R47M 50L
	C78	CEA 010M 50L
	C11, C12, C17, C18	CEA 1R5M 50L
	C123	CEA 100M 50L
	C68, C69	CEA 102M 35L
	C19, C20	CEA 2R2M 50L
	C122	CEA 220M 25L
	C117	CEA 221M 25L
	C70	CEA 221M 63L
	C106-C115	CEA 3R3M 50L
	C83	CEA 4R7M 50L
	C82	CEA 470M 10L
	C63, C116	CEA 470M 50L
	C71	CEA 471M 35L

Mark	Symbol and Description	Part No
	C1, C2, C9, C10	CEXA 100M 50
	C57, C58	CEXA 101M 25
	C59, C60	CEXA 470M 25
	C5, C6, C61, C62	CKDYB 102K 50
	C118	CKDYB 122K 50
	C120	CKDYB 222K 50
	C121	CKDYB 681K 50
	C65	CKDYF 473Z 50
	C87, C96	CQMA 102J 50
	C100	CQMA 103J 50
	C21, C22	CQMA 104J 50
	C35, C36	CQMA 123J 50
	C33, C34	CQMA 124J 50
	C47, C48, C97	CQMA 152J 50
	C45, C46	CQMA 153J 50
	C15, C16	CQMA 184J 50
	C88	CQMA 222J 50
	C91, C92	CQMA 223J 50
	C29, C30	CQMA 224J 50
	C79	CQMA 224K 50
	C31, C32	CQMA 243J 50
	C41, C42	CQMA 303J 50
	C43, C44, C89, C98	CQMA 332J 50
	C93, C101, C102	CQMA 333J 50
	C81	CQMA 333K 50
	C53, C54	CQMA 362J 50
	C55, C56	CQMA 471J 50
	C99	CQMA 472J 50
	C27, C28	CQMA 473J 50
	C37, C38, C103	CQMA 563J 50
	C39, C40	CQMA 622J 50
	C86	CQMA 681J 50
	C90	CQMA 682J 50
	C49, C50	CQMA 752J 50
	C51, C52	CQMA 821J 50
	C80	CQMA 823K 50

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol and Description	Part
⚠	R304	RD1/4PMFL100J
⚠	R114	RD1/4PMF100J
⚠	R112	RFA1/4PS220J
⚠	R110, R111	RFA1/4PS4R7J
⚠	R117	RS1LMF222J
★	VR1 Semi-fixed (100k)	VRTB6VS104
	R11, R12, R33, R34, R41 R42, R49, R50, R57, R58 R65, R66, R73, R74, R81 R82, R89, R90, R97, R98 R105, R106, R113, R115 R118, R180, R187, R188 R301	RD1/4PM □□□J
	Other resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol and Description	Part No
	Terminal (EQUALIZER, TAPE)	AKB-094
	Screw (3 × 6)	PBZ30P060FMC

Switch Ass'y (GWS-525)

SEMICONDUCTORS

Mark	Symbol and Description	Part No
★★	Q201, Q202	2SC2603 (2SC2458)
★★	Q203-Q205	2SC2878
★	D205	KZL120
★	D201, D202	RD9.1EB (HZ9.1EB)
★	D203, D204	US1035
★★	IC201	M5218P

SWITCH

Mark	Symbol and Description	Part No
★★	S201 Push switch (LINE, PINK NOISE, EQUALIZER)	SUN8M6B66SF

CAPACITORS

Mark	Symbol and Description	Part No
	C202	CCDSL 101J 50
	C204	CEA 100M 25L
	C203, C209	CEA 220M 25L
	C201, C205-C208	CEA 4R7M 50L
	C210-C214	CKDYF 473Z 50

RESISTOR

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol and Description	Part No
★	VR201 variable (500k)	ACT-051
	R210, R211	RD1/4PM □□□J
	Other resistors	RD1/8RM □□□J

OTHER

Mark	Symbol and Description	Part
	Microphone jack (MEASURING MIC)	AKN-059

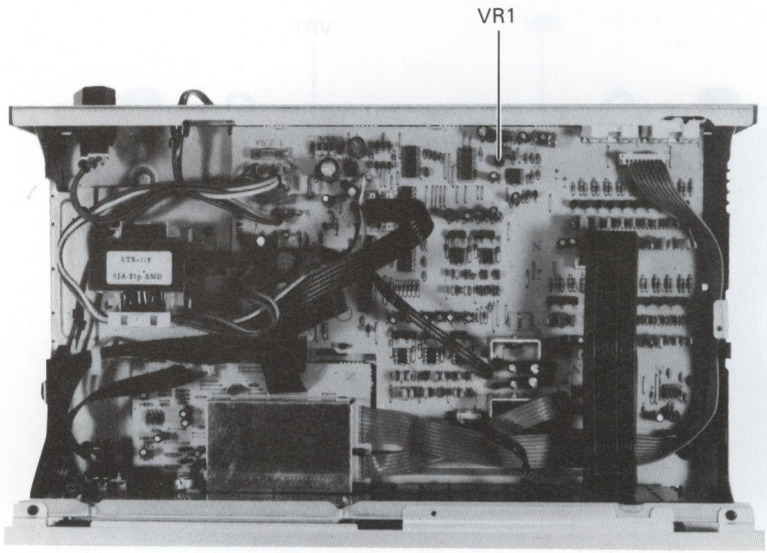
FL Ass'y (GWV-122)

Mark	Symbol and Description	Part
★	V301 FL tube	AAV-026

12. ADJUSTMENTS

- **Noise level adjustment**

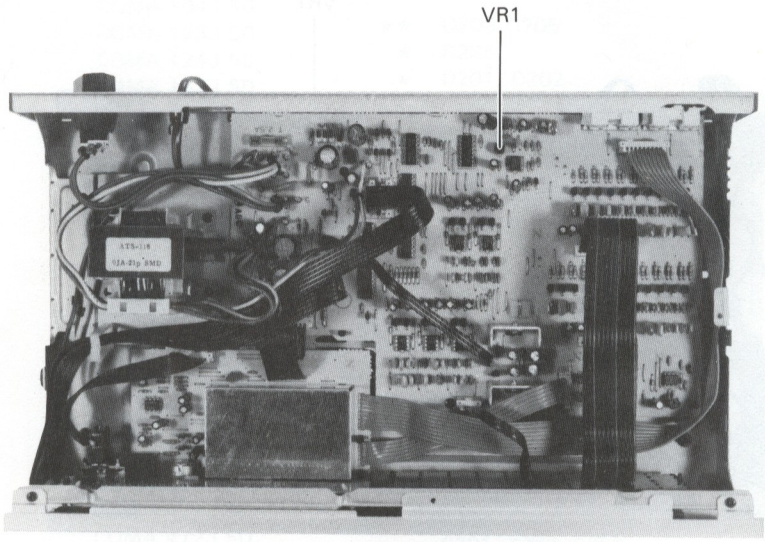
1. Turn the PINK NOISE SWITCH ON and turn the EQUALIZER SWITCH OFF.
2. Adjust VR1 so that the noise output of 60 mVrms ± 20mV will generate on the EQUALIZER OUTPUT TERMINAL.



12. RÉGLAGE

- **Réglage du niveau de bruit**

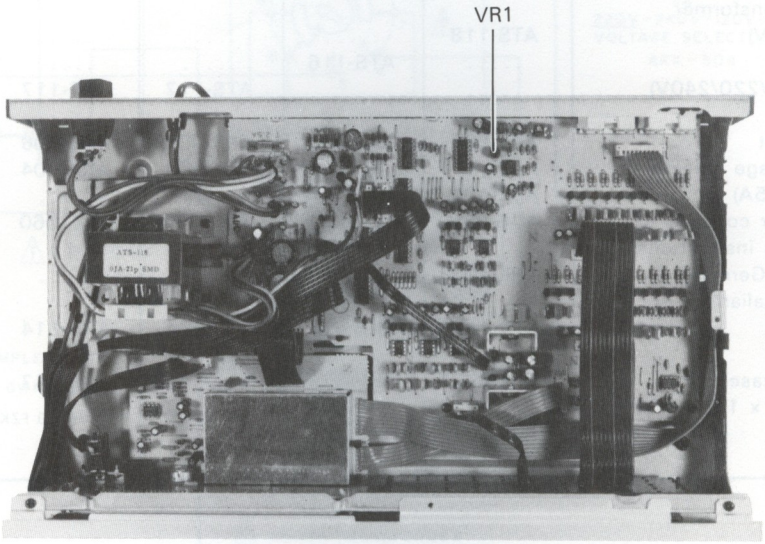
1. Mettez le commutateur de niveau de bruit rose sur ON et le commutateur du compensateur sur OFF.
2. Réglez VR1 de sorte que la puissance à la borne de sortie du compensateur soit de 60 mVrms ± 20mV.



12. AJUSTE

- **Ajuste del nivel de ruido**

1. Conecte (posición ON) el interruptor de ruido rosado (PINK NOISE) y desconecte (posición OFF) el interruptor del ecualizador (EQUALIZER).
2. Ajuste VR1 de forma que la salida de ruido del terminal de salida del ecualizador (EQUALIZER) sea de 60mV (rms) ± 20mV.



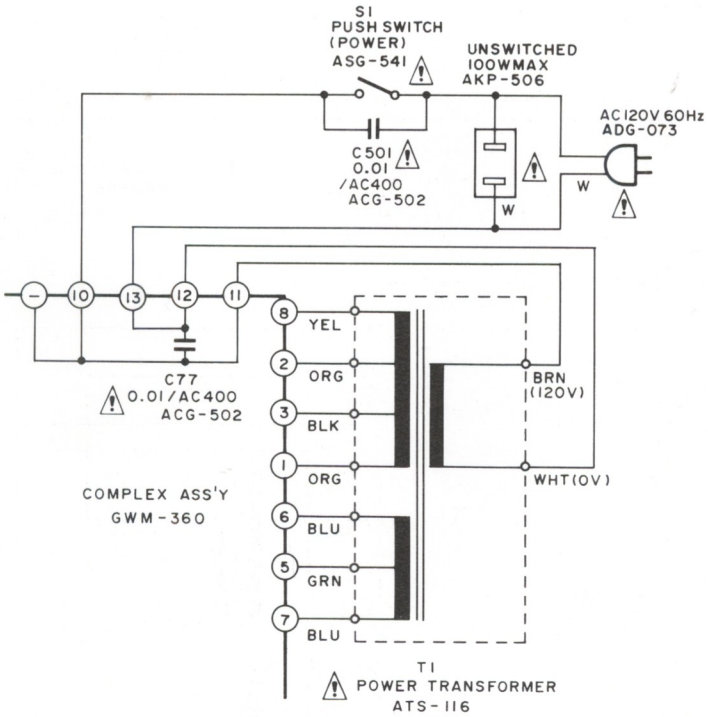
13. FOR KU, S, S/G AND YP TYPES

The KU, S, S/G and YP types are the same as the HEM type with the exception of the following sections.

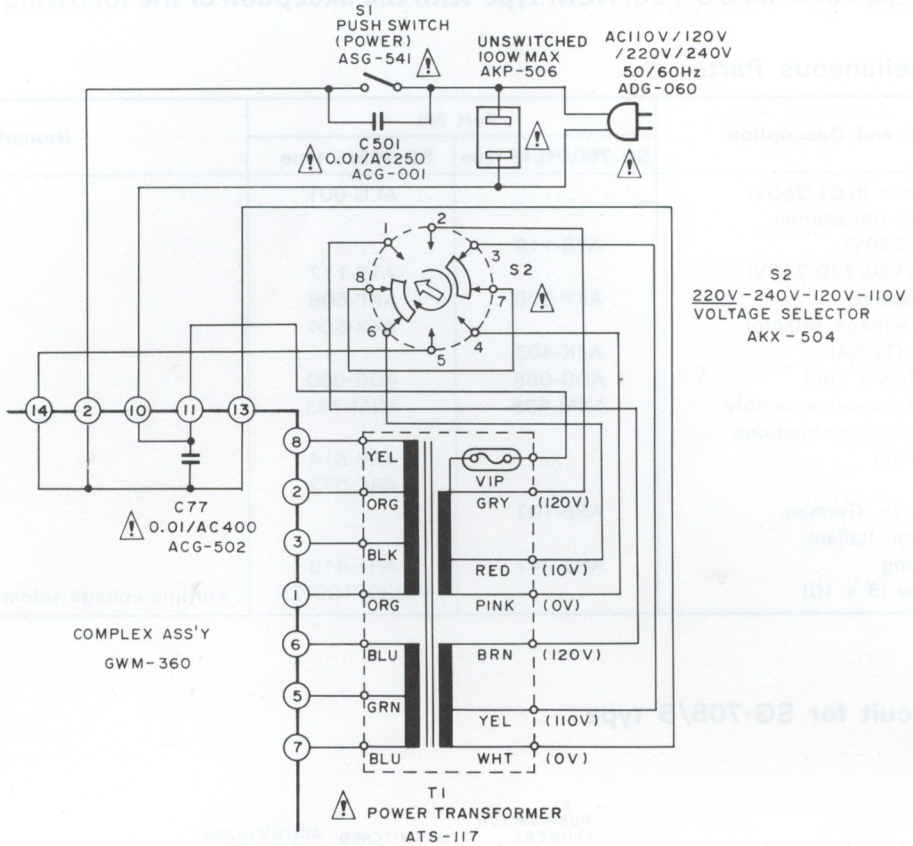
Contrast of Miscellaneous Parts

Mark	Symbol and Description	Part No.					Remark
		HEM type	KU type	S type	S/G type	YP type	
⚠	C501 Ceramic (0.01/400V)	.....	ACG-502	.....	.....	.....	
	Ceramic (0.01/250V)	.....	.....	ACG-001	ACG-001	.....	
⚠ ★	T1 Power transformer						
	(220/240V)	ATS-118	.....	.....	.....	.....	
	(120V)	.....	ATS-116	.....	.....	.....	
	(110/120/220/240V)	.....	.....	ATS-117	ATS-117	.....	
	(240V)	.....	.....	.....	.....	ATS-118	
⚠	AC socket	AKP-508	AKP-506	AKP-506	AKP-506	.....	
⚠ ★★	S2 Line Voltage selector	.....	.....	AKX-504	AKX-504	.....	
⚠ ★★	FU1 Fuse (T2.5A)	AEK-403	.....	.....	.....	AEK-403	
⚠	AC Power cord	ADG-068	ADG-073	ADG-060	ADG-060	ADG-064	
	Operating instructions (English, German, French, Italian)	ARE-103	.....	.....	.....	.....	
	(English)	.....	ARB-614	ARB-614	ARB-614	ARB-614	
	(Spanish)	.....	.....	ARC-072	.....	.....	
	Packing case	AHE-347	AHE-375	AHE-347	AHE-347	AHE-347	
	Screw (3 x 10)	.....	.....	VTZ30P100 FZK	VTZ30P100 FZK	.....	For line voltage selector

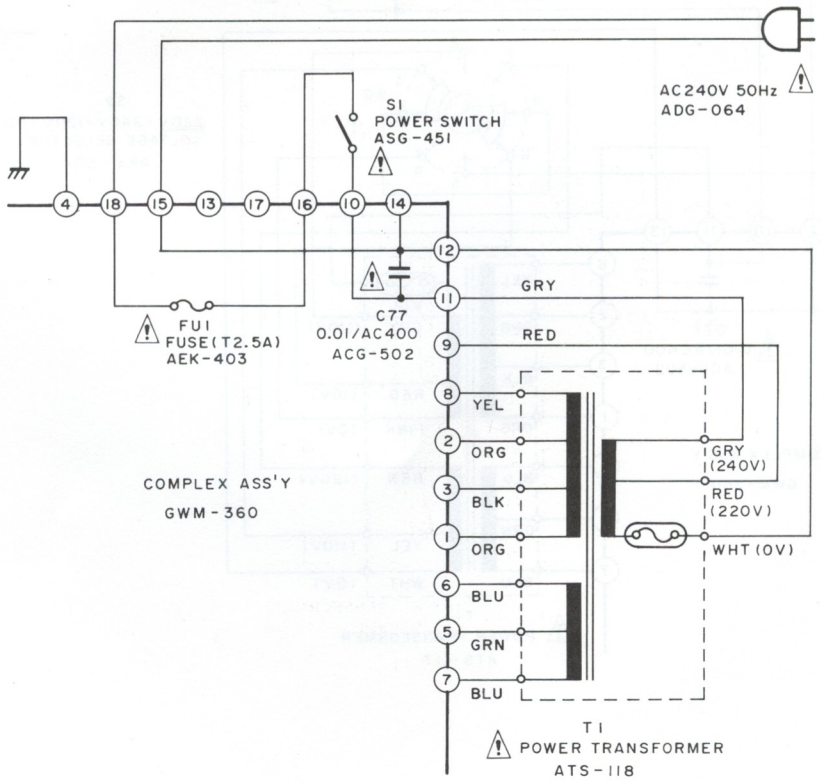
Power supply circuit for KU type.



Power supply circuit for S and S/G types.



Power supply circuit for YP type.



14. FOR SG-705/S TYPE

SG-705/S type is the same as SG-750/HEM type with the exception of the following sections.

Contrast of Miscellaneous Parts

Mark	Symbol and Description	Part No.		Remark
		SG-750/HEM type	SG-705/S type	
⚠	C501 Ceramic (0.01/250V)	.....	ACG-001	
⚠ ★	T1 Power transformer			
	(220/240V)	ATS-118	.....	
	(110/120/220/240V)	.....	ATS-117	
⚠	AC socket	AKP-508	AKP-506	
⚠ ★★	S2 Line voltage selector	.....	AKX-504	
⚠ ★★	FU1 Fuse (T2.5A)	AEK-403	.....	
⚠	AC Power cord	ADG-068	ADG-060	
	Front pannel assembly	ANM-608	ANM-763	
	Operating instructions			
	(English)	.....	ARB-614	
		.....	ARC-072	
	(English, German, French, Italian)	ARE-103	.....	
	Packing	AHE-347	AHE-419	
	Screw (3 x 10)	.....	VTZ30P100FZK	For line voltage selector

Power supply circuit for SG-705/S type.