

TA-D900

*AEP Model
UK Model*



ELECTRONIC CROSSOVER NETWORK

SPECIFICATIONS

GENERAL

Power Requirements: 110 V, 120 V, 220 V, or 240 V ac, 50/60 Hz
AEP model: 220 V factory preset
UK model: 240 V factory preset

Power Consumption: 15 watts

Dimensions: Approx. 480(w) x 80(h) x 400(d) mm
(18⁷/₈ (w) x 3¹/₈ (h) x 15⁷/₈ (d) inches)
Including projecting parts and controls

Weight: Approx. 8.5 kg (18 lbs 12 oz), net
Approx. 9.5 kg (20 lbs 15 oz), in shipping carton

System: Filter characteristics: 24 dB-per-octave
Bessel function high-pass and low-pass
Buffer amp: DC amp

Crossover Frequency: UNIT 0: 50 Hz, 80 Hz, 100 Hz
UNIT 1: 140 Hz, 225 Hz, 280 Hz
UNIT 2: 500 Hz, 800 Hz, 1 kHz
UNIT 3: 1.25 kHz, 2 kHz, 2.5 kHz
UNIT 4: 5 kHz, 8 kHz, 10 kHz

Bandpass Gain: 0 dB

Inputs: 1 volt rated/7 volts maximum, 50 k Ω

Outputs: 1 volt rated/7 volts maximum, 100 Ω

Harmonic Distortion: Less than 0.05 % at 1 volt output

Signal-to-noise-ratio: Better than 110 dB (1 volt rated input, short-circuited input, A weighting)

Frequency Response: DC-100 kHz $\begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$ dB

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.



SONY[®]

SERVICE MANUAL

ELECTROLYTIC CAPACITORS

CAP. (μ F)	RATING					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47					→	1-121-726-00
1.0					→	1-121-391-00
2.2					→	1-121-450-00
3.3	→	→	→	1-121-392-00	→	1-121-393-00
4.7	→	→	→	1-121-395-00	→	1-121-396-00
10	→	→	1-121-651-00	1-121-398-00	→	1-121-738-00
22	→	→	1-121-479-00	1-121-480-00	1-121-662-00	1-121-152-00
33	→	→	1-121-403-00	1-121-404-00	1-121-652-00	1-121-405-00
47	→	1-121-352-00	1-121-409-00	1-121-410-00	1-121-653-00	1-121-411-00
100	→	1-121-414-00	1-121-415-00	1-121-416-00	1-121-357-00	1-121-417-00
220	1-121-419-00	1-121-420-00	1-121-421-00	1-121-422-00	1-121-261-00	1-121-423-00
330	1-121-751-00	1-121-805-00	1-121-521-00	1-121-654-00	1-121-655-00	1-121-656-00
470	1-121-424-00	1-121-425-00	1-121-426-00	1-121-733-00	1-121-361-00	1-121-810-00
1000	—	1-121-736-00	1-121-245-00	1-121-657-00	1-121-388-00	1-123-061-00
2200	1-121-658-00	1-121-659-00	1-121-660-00	1-123-067-00	1-121-984-00	—
3300	1-121-661-00	1-123-075-00	1-123-071-00	—	—	—

CAP. (μ F)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47		—		—
1.0	1-123-249-00	1-123-252-00	1-123-003-00	1-121-168-00
2.2	1-123-250-00	1-123-026-00	—	1-123-028-00
3.3	1-121-995-00	—	1-123-004-00	1-123-006-00
4.7	1-123-255-00	1-121-246-00	1-121-759-00	1-123-007-00
10	1-121-126-00	1-121-999-00	1-123-254-00	1-123-008-00
22	1-121-996-00	1-123-253-00	1-123-005-00	1-123-022-00
33	1-121-997-00	1-121-757-00	—	—
47	1-123-251-00	1-121-919-00	—	—
100	1-123-084-00	—	—	—

CERAMIC CAPACITORS

RATING							
CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μ F)	50 VOLT.
	PART No.		PART No.		PART No.		PART No.
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001	1-102-074-00
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012	1-102-118-00
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015	1-102-119-00
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018	1-102-120-00
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022	1-102-121-00
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027	1-102-122-00
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033	1-102-123-00
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039	1-102-124-00
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047	1-102-125-00
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056	1-102-126-00
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068	1-102-127-00
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082	1-102-128-00
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01	1-102-129-00
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022	1-101-005-00
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047	1-101-006-00
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00		
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00		
16	1-102-952-00	110	1-102-815-00				
18	1-102-953-00	120	1-102-816-00				
20	1-102-958-00	130	1-101-081-00				

0.001 μ F = 1,000pF

CERAMIC (SEMICONDUCTOR) CAPACITORS

RATING					
CAP. (μ F)	25 VOLT.	50 VOLT.	CAP. (μ F)	25 VOLT.	50 VOLT.
	PART No.	PART No.		PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00	1-161-054-00
0.0012	→	1-161-040-00	0.022	1-161-017-00	1-161-055-00
0.0015		1-161-041-00	0.027	1-161-018-00	1-161-056-00
0.0018		1-161-042-00	0.033	1-161-019-00	1-161-057-00
0.0022		1-161-043-00	0.039	1-161-010-00	1-161-058-00
0.0027	→	1-161-044-00	0.047	1-161-021-00	1-161-059-00
0.0033	→	1-161-045-00	0.056	→	1-161-060-00
0.0039	→	1-161-046-00	0.068	→	1-161-061-00
0.0047	→	1-161-047-00	0.082	1-161-024-00	1-161-062-00
0.0056	→	1-161-048-00	0.1	1-161-025-00	1-161-063-00
0.0068	→	1-161-049-00			
0.0082	1-161-012-00	1-161-050-00			
0.01	1-161-013-00	1-161-051-00			
0.012	→	1-161-052-00			
0.015	1-161-015-00	1-161-053-00			

MYLAR CAPACITORS

RATING											
CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.	CAP. (μF)	50 VOLT. PART No.	100 VOLT. PART No.	200 VOLT. PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	—	—
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	—	—
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	—	—
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	—	—
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				



TANTALUM CAPACITORS

RATING →: Use the high voltage rated one.							
CAP. (μF)	3.15 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	25 VOLT. PART No.	35 VOLT. PART No.
0.01					→	→	1-131-396-00
0.015					→	→	1-131-397-00
0.022					→	→	1-131-398-00
0.033					→	→	1-131-399-00
0.047					→	→	1-131-400-00
0.068					→	→	1-131-401-00
0.1					→	→	1-131-402-00
0.15					→	→	1-131-403-00
0.22					→	→	1-131-404-00
0.33					→	1-131-409-00	1-131-405-00
0.47	—	—	—	—	1-131-412-00	→	1-131-406-00
0.68	—	—	—	1-131-415-00	→	1-131-410-00	1-131-407-00
1.0	—	—	1-131-418-00	—	1-131-413-00	→	1-131-408-00
1.5	—	1-131-421-00	—	1-131-416-00	→	1-131-411-00	1-131-348-00
2.2	1-131-424-00	—	1-131-419-00	—	1-131-414-00	1-131-355-00	1-131-349-00
3.3	—	1-131-422-00	—	1-131-417-00	1-131-362-00	1-131-356-00	1-131-350-00
4.7	1-131-425-00	—	1-131-420-00	1-131-369-00	1-131-363-00	1-131-357-00	1-131-351-00
6.8	—	1-131-423-00	1-131-376-00	1-131-370-00	1-131-364-00	1-131-358-00	1-131-352-00
10	1-131-426-00	1-131-383-00	1-131-377-00	1-131-371-00	1-131-365-00	1-131-359-00	1-131-353-00
15	1-131-390-00	1-131-384-00	1-131-378-00	1-131-372-00	1-131-366-00	1-131-360-00	—
22	1-131-391-00	1-131-385-00	1-131-379-00	1-131-373-00	1-131-367-00		
33	1-131-392-00	1-131-386-00	1-131-380-00	1-131-374-00			
47	1-131-393-00	1-131-387-00	1-131-381-00	—			
68	1-131-394-00	1-131-388-00	—	—			
100	1-131-395-00	—	—	—			

TANTALUM CAPACITORS



RATING						
CAP. (μF)	3 VOLT. PART No.	6.3 VOLT. PART No.	10 VOLT. PART No.	16 VOLT. PART No.	20 VOLT. PART No.	35 VOLT. PART No.
0.033						1-131-273-00
0.047						1-131-274-00
0.068						1-131-275-00
0.1						1-131-276-00
0.15						1-131-277-00
0.22			—	—	1-131-262-00	1-131-278-00
0.33			—	—	1-131-263-00	1-131-279-00
0.47			1-131-169-00	—	1-131-264-00	1-131-280-00
0.68			—	1-131-258-00	1-131-265-00	1-131-281-00
1.0			1-131-254-00	—	1-131-266-00	1-131-282-00
1.5		1-131-250-00	—	—	1-131-267-00	1-131-283-00
2.2		—	—	1-131-259-00	1-131-268-00	1-131-284-00
3.3		—	1-131-255-00	—	1-131-269-00	—
4.7		1-131-251-00	1-131-171-00	—	1-131-270-00	—
6.8		—	—	1-131-260-00	1-131-271-00	—
10	—	—	1-131-256-00	—	1-131-272-00	—
15	—	1-131-252-00	—	1-131-261-00		
22	—	—	1-131-257-00	—		
33	1-131-176-00	1-131-253-00	1-131-173-00	—		
47	1-131-288-00	1-131-174-00	—	—		
100	1-131-177-00	—	—	—		

1/4 WATT CARBON RESISTORS

Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-476-00	13k	1-246-500-00	130k	1-246-524-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-477-00	15k	1-246-501-00	150k	1-246-525-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-478-00	16k	1-246-502-00	160k	1-246-526-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-479-00	18k	1-246-503-00	180k	1-246-527-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-480-00	20k	1-246-504-00	200k	1-246-528-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-481-00	22k	1-246-505-00	220k	1-246-529-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-482-00	24k	1-246-506-00	240k	1-246-530-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-483-00	27k	1-246-507-00	270k	1-246-531-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-484-00	30k	1-246-508-00	300k	1-246-532-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-485-00	33k	1-246-509-00	330k	1-246-533-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-486-00	36k	1-246-510-00	360k	1-246-534-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-487-00	39k	1-246-511-00	390k	1-246-535-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00

HARDWARE NOMENCLATURE

Screw:

P 3 x 10

L: Length in mm

D: Diameter in mm

Type of head

Indicated slotted-head only.

Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:

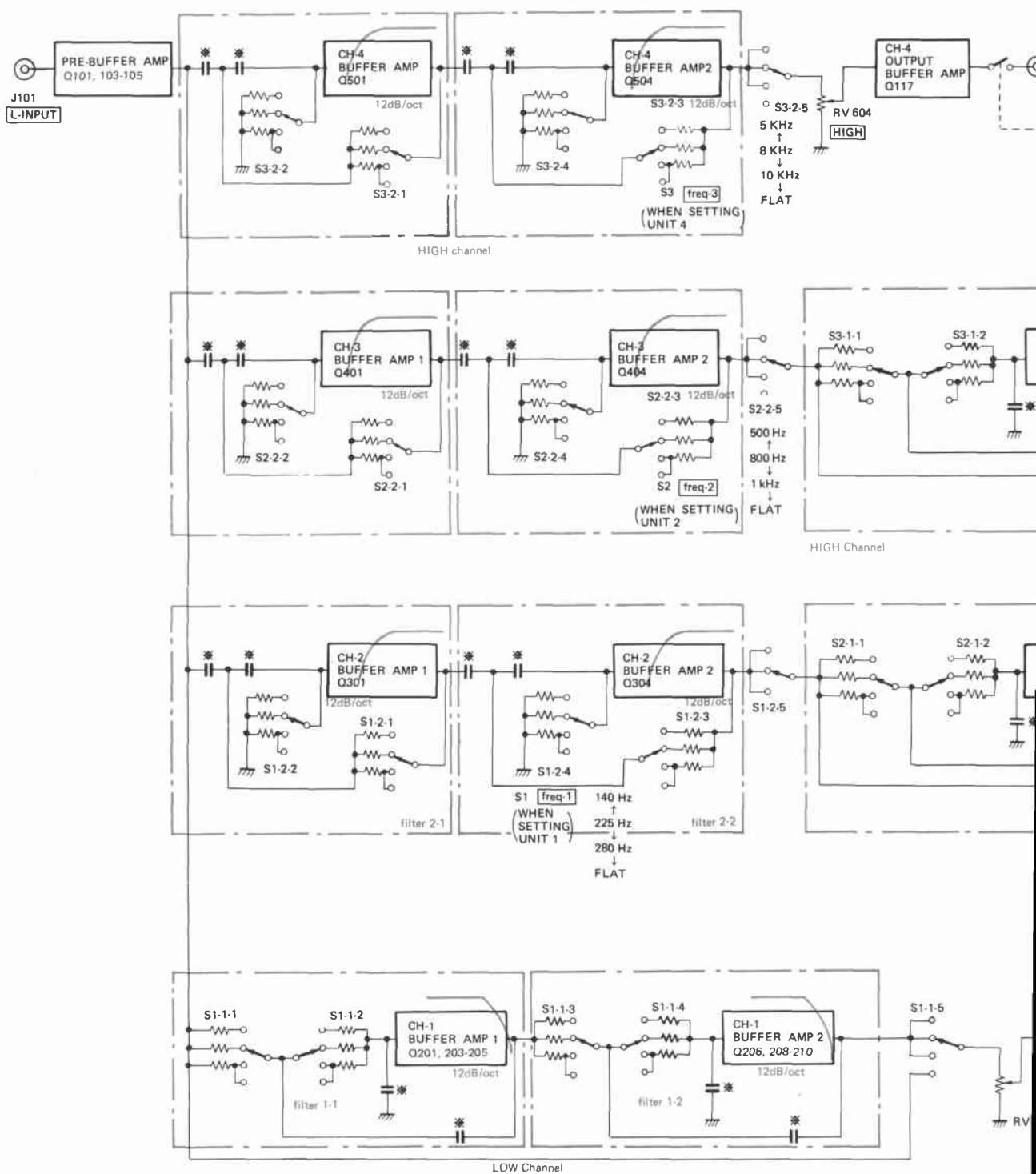
N 3

Diameter of usable screw or shaft

Reference designation

Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		brazer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	



The capacitance values marked * are decided by setting the units 0 to 4.

Fig.



Fig. 3-4

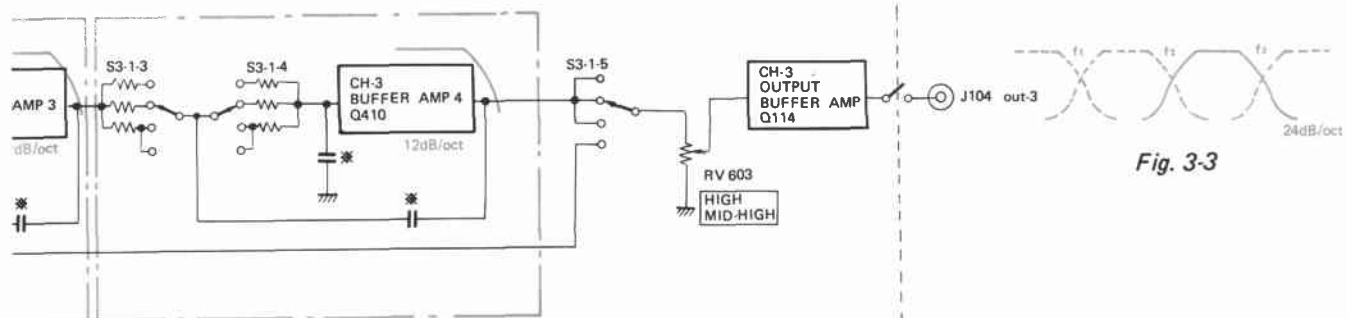


Fig. 3-3

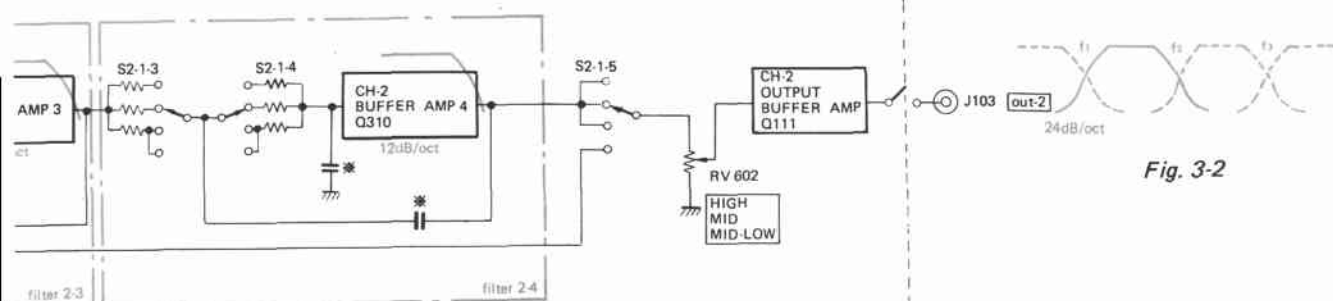


Fig. 3-2

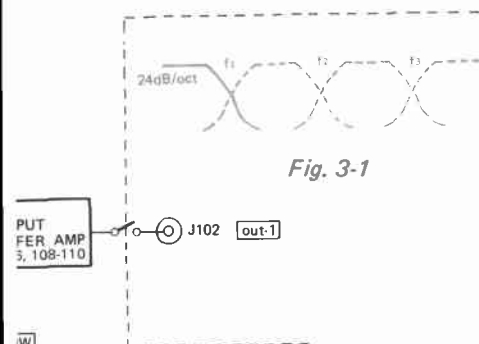


Fig. 3-1

SECTION 1

OUTLINE

1-1. CIRCUIT DESCRIPTION

The TA-D900 is an electronic crossover network designed for use in multi-amplifier stereo systems. The input audio signal is divided into a number of different frequency bands, each band being amplified independently and passed on to individual speakers. See Fig.3 for an outline of the circuit diagram.

Each set of crossover frequency filters have been incorporated into separate plug-in type units. Suitable crossover frequencies for a wide range of speakers available on the market may be set by plugging in an appropriate combination of the 4 different units.

The crossover frequency of each unit is determined by the capacitance of the filters, and the frequency selector switches S1-S4. For 2-way to 4-way multi-amplifier systems, the crossover frequencies are set by adjusting S1-S4, and by rearranging the filter units in accordance with the crossover frequencies of the speakers employed. Levels are also adjusted to match the efficiency of each speaker.

Note that the following description refers to a 4-way multi-amplifier system.

1. Pre-buffer Amplifier Stage (see Fig. 1)

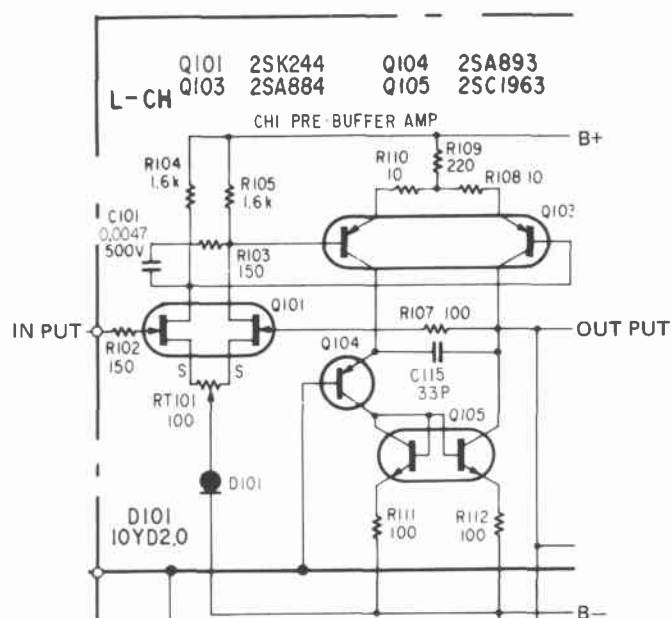


Fig. 1

The purpose of the pre-buffer amplifier (Q101, 103-105, D104) is to eliminate the influence of the preamplifier and connecting cord upon the filters. With 100% negative feedback applied to the first-stage differential amplifier (Q101) by resistor R107 (100 Ω), the pre-buffer amplifier has high input

impedance and low output impedance. In addition, a current-mirror loaded 2-stage differential amplifier structure reduces distortion to a very low level. Furthermore, in order to make the low channel amplifier a pure DC amplifier employing no coupling capacitors, a dual FET differential amplifier which suppresses DC drift has been used in the first stage (Q101). Dual transistors have also been used in the second stage differential amplifier (Q103) and current mirror (Q105) to further suppress DC drift. By connecting the base of Q104 to ground, the collector voltage of the PNP transistor on the left hand side of Q103 is reduced to almost 0V, thereby equalizing the collector voltage of both PNP transistors in Q103. The dual transistor P_c (power input dc to collector) are therefore very much the same, resulting in the amount of drift in both sides being balanced. The impedance-converted signal is then passed from the pre-buffer amplifier to CH1-CH4 where it is divided into 4 different frequency bands.

2. LOW Channel Stage (CH-1)

The low-pass filters employed in this stage achieve a very sharp cut-off slope of 24 dB/oct (12 dB/oct at filter 1-1 and again at filter 1-2). (See Fig. 3-1).

Each low-pass filter buffer amplifier has a high input impedance and low output impedance current-mirror loaded 2-stage differential amplifier, similar to the pre-buffer amplifier (Q101, 103-105, D104). The crossover frequency is selected by the freq-1 switch (S1), thereby defining the f_1 frequency band.

The filter output signal is then passed via the level adjustment control (RV601) on to the output buffer amplifier (Q106, 108–110, D104) where the impedance is again converted, and finally appears on the J102 output terminal. The role of this output buffer amplifier is to maintain the crossover-frequency and the input impedance of the power amplifier.

3. MID-LOW Channel Stage (CH-2)

The signal whose impedance was converted in the pre-buffer amplifier is narrowed down to a frequency band between f_1 and f_2 according to the freq-1 and freq-2 settings (see Fig. 3-2). Both the high-pass filter and low-pass filter feature sharp cut-off curves of 24 dB/oct (12 dB/oct cut-off characteristics in filters 2-1, 2-2, 2-3, and 2-4).

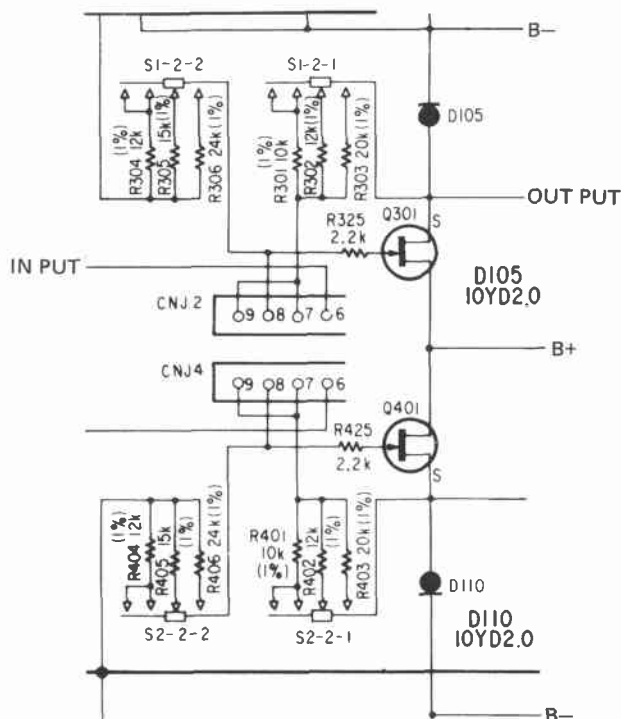


Fig. 2

The basic circuitry employed in the buffer amplifiers in each of the filters in the MID-LOW channel stage is outlined in Fig. 2. Each of these buffer amplifiers are source-follower amplifiers employing constant current diodes and FETs designed for high frequency circuits. The cascade-connected high frequency FET is used at the source follower, and a 100% negative feedback is applied for high input impedance and low output impedance. The load for this amplifier is D105. And since it is a constant current load, there is very little distortion, and no interference from the filter unit power supplies.

Since there is no need to operate the MID-LOW channel stage anywhere near the DC region, coupling capacitors have been employed prior to the RV602 control and the output terminals, thereby cutting DC drift and DC offset. The capacitor employed in front of RV602 consists of a tantalum capacitor (C305) connected in parallel with a film capacitor (C306), and has been inserted in order to prevent deterioration of sound quality.

The MID-LOW channel stage employs an output buffer amplifier (Q111) in the output stage for the same reason as the LOW channel stage.

4. MID-HIGH Channel Stage (CH-3)

The MID-HIGH channel stage employs the same basic circuit structure as the MID-LOW channel stage. The frequency band between the f_2 and f_3 crossover frequencies is set by the freq-2 and freq-3 switch positions (see Fig. 3-3).

5. HIGH Channel Stage (CH-4)

The circuitry of this stage is basically the same as the high-pass filter and output buffer amplifier employed in the MID-HIGH channel stage. The frequency band is determined by the f_3 crossover frequency set by the freq-3 switch position (see Fig. 3-4).

6. Muting Circuit (Fig. 4)

By activating a relay circuit, the muting circuit disconnects the signal line, and thereby prevents the appearance of any signals at the output terminals when the power switch is turned on and off. The "pop" noises generated at this time are therefore completely silenced. Note that this muting circuit is designed to release the output line from ground when the muting relays (RY1–RY8) are "on".

In addition, whenever the frequency response select cover is opened to exchange filter units, S8 is switched off, and again prevents the appearance of any signals at the output terminals.

1) When the power switch is turned on:

- (a) As soon as the power switch is turned on, B+ will commence to "charge up". C805 will also commence to charge up, requiring 2 to 3 seconds (as determined by the R804/C805 time constant) to be fully charged. During this period Q801 and Q802 will remain off, thereby keeping the muting relays (RV1–RV8) off as well. Therefore, no signals will appear at the

output terminals, effectively muting out the power switching noise.

- (b) 2 to 3 seconds after turning the power switch on, the potential on the base of Q801 reaches "on" potential, resulting in this transistor turning on.
- (c) As soon as Q801 is turned on, Q802 is also turned on, resulting in muting relays (RY1–RY8) being turned on, and the output signals appear at the output terminals.

2) When the power switch is turned off:

- (a) At the same time that the power switch is turned off, the positive potential which had been applied to the cathode of D807 via D806 decreases, resulting in the D807 diode being turned on by the forward biasing.
- (b) The charge on C805 is consequently discharged via D807 and R807, resulting in Q801 and Q802 both being turned off. The muting relays are also turned off, preventing any output signals from appearing at the output terminals. The "pop" noise generated when the power switch is turned off is also effectively muted.

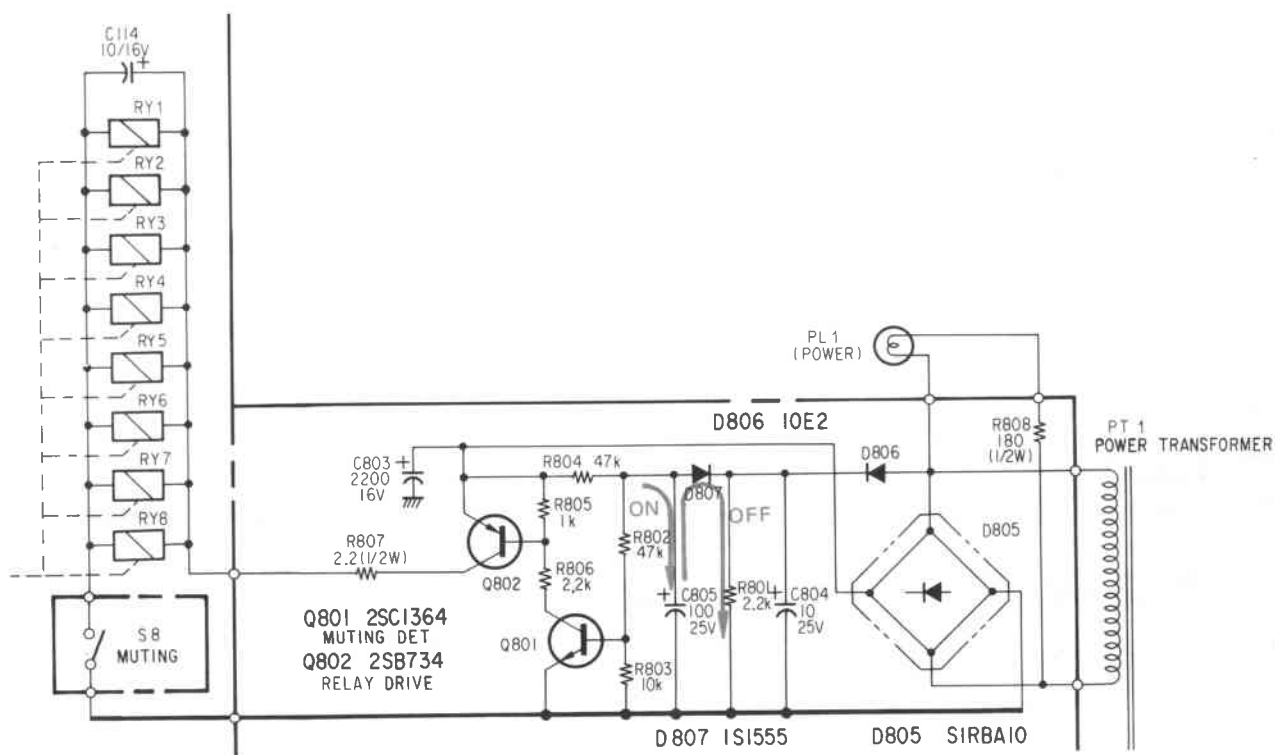


Fig. 4

- 3) When the frequency response select cover is opened (Fig. 5):

When the frequency response select cover is opened, S8 is turned off, thereby cutting off the voltage being applied to the muting relays (RY1—RY8). These relays are therefore turned off, and no signals will appear at the output terminals. So none of the noise generated when exchanging units will reach the speakers.

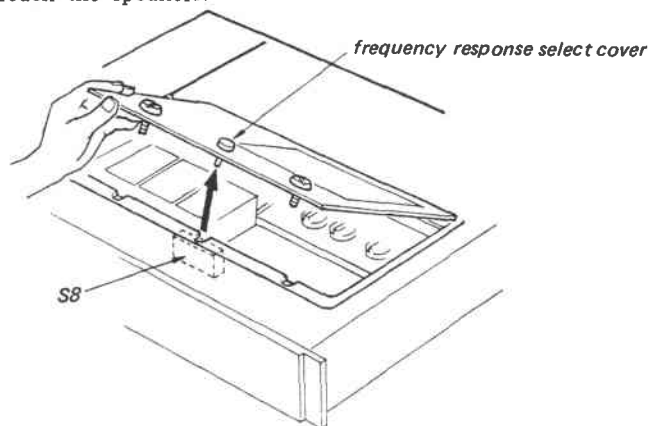


Fig. 5

7. Bass Boost Circuit

LOW channel stage (CH-1) contains the bass boost circuit which compensates for low frequency of the speakers. In this circuit, response in dB at frequency of 50 Hz becomes 6 dB at maximum, in steps of 1.5 dB, owing to the T-type filter in NFB loop (negative feedback loop) of the output buffer amp.

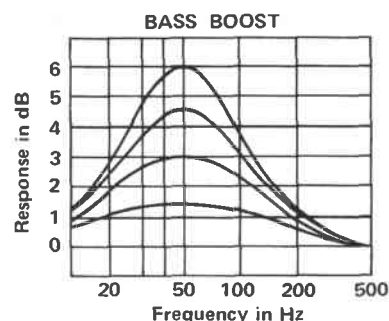
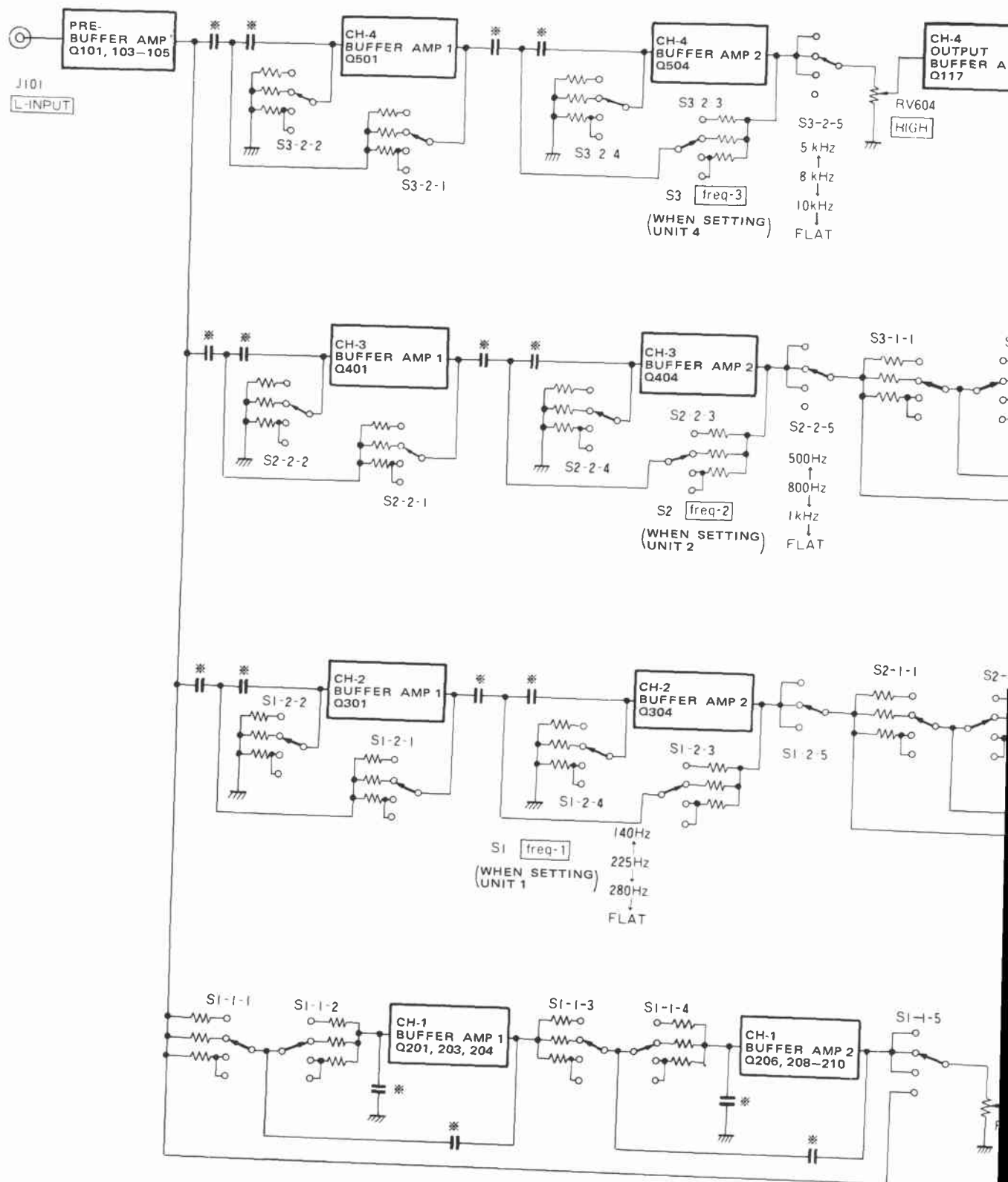
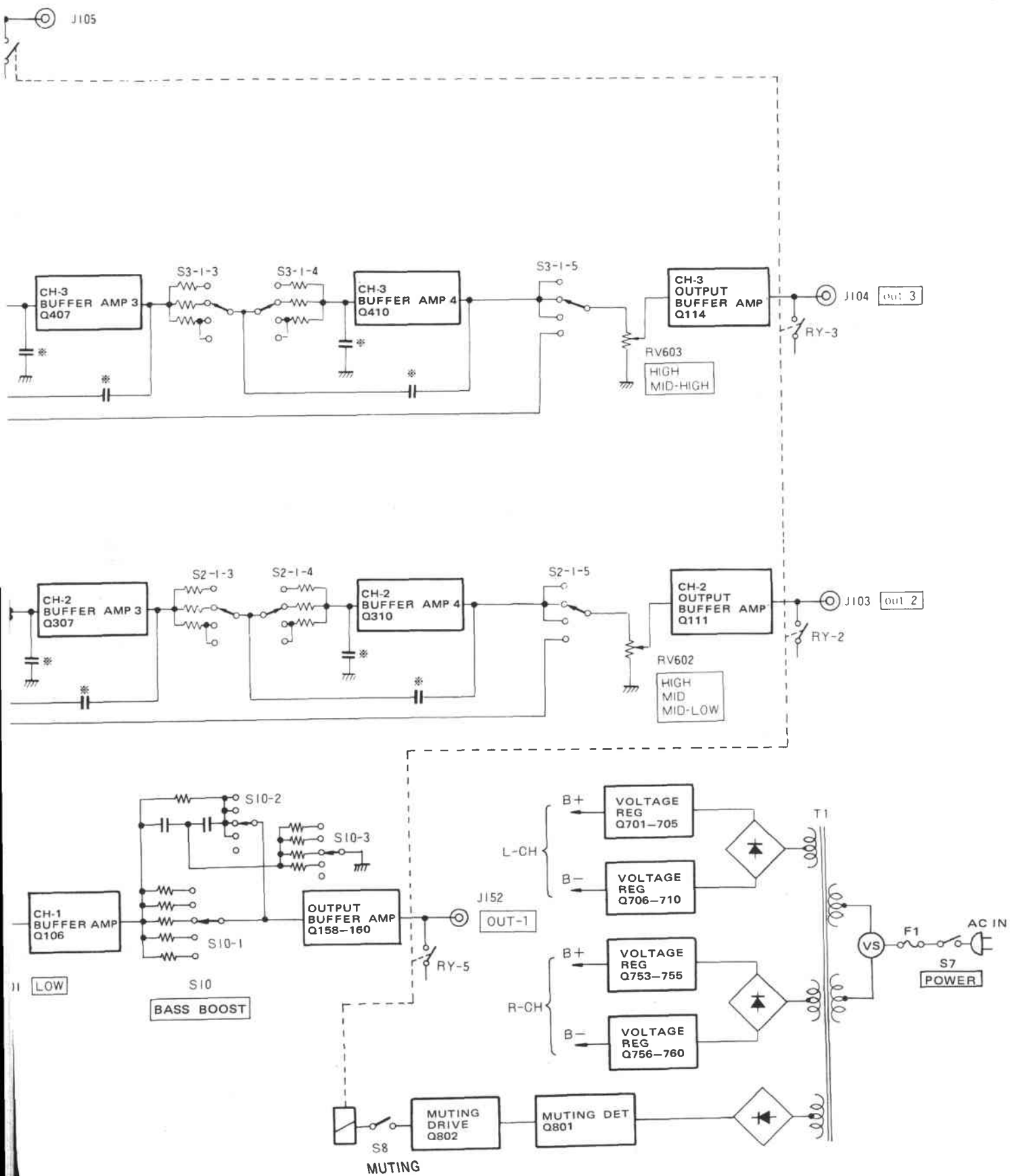


Fig. 6

1-2. BLOCK DIAGRAM



The capacitance values marked * are decided by setting the units 0 to 4.



ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C305	1-131-520-00	TANTALUM	22MF	20%	160V
C306	1-130-301-00	FILM	0.015MF	5%	100V
C355	1-131-520-00	TANTALUM	22MF	20%	160V
C356	1-130-301-00	FILM	0.015MF	5%	100V
C405	1-131-520-00	TANTALUM	22MF	20%	160V
C406	1-130-301-00	FILM	0.015MF	5%	100V
C455	1-131-520-00	TANTALUM	22MF	20%	160V
C456	1-130-301-00	FILM	0.015MF	5%	100V
C503	1-131-520-00	TANTALUM	22MF	20%	160V
C504	1-130-301-00	FILM	0.015MF	5%	100V
C553	1-131-520-00	TANTALUM	22MF	20%	160V
C554	1-130-301-00	FILM	0.015MF	5%	100V
C611	1-130-175-00	FILM	0.082MF	2%	100V
C612	1-130-175-00	FILM	0.082MF	2%	100V
C613	1-130-175-00	FILM	0.082MF	2%	100V
C614	1-130-175-00	FILM	0.082MF	2%	100V
C615	1-130-174-00	FILM	0.043MF	2%	100V
C616	1-130-173-00	FILM	0.039MF	2%	100V
C617	1-130-126-00	FILM	0.056MF	2%	100V
C618	1-130-172-00	FILM	0.022MF	2%	100V
C621	1-130-172-00	FILM	0.022MF	2%	100V
C622	1-130-172-00	FILM	0.022MF	2%	100V
C623	1-130-172-00	FILM	0.022MF	2%	100V
C624	1-130-172-00	FILM	0.022MF	2%	100V
C625	1-130-171-00	FILM	0.012MF	2%	100V
C626	1-130-170-00	FILM	0.011MF	2%	100V
C627	1-130-125-00	FILM	0.016MF	2%	100V
C628	1-130-168-00	FILM	0.0062MF	2%	100V
C631	1-130-169-00	FILM	0.0091MF	2%	100V
C632	1-130-169-00	FILM	0.0091MF	2%	100V
C633	1-130-169-00	FILM	0.0091MF	2%	100V
C634	1-130-169-00	FILM	0.0091MF	2%	100V
C635	1-130-167-00	FILM	0.0047MF	2%	100V
C636	1-130-123-00	FILM	0.0043MF	2%	100V
C637	1-130-168-00	FILM	0.0062MF	2%	100V
C638	1-130-166-00	FILM	0.0024MF	2%	100V
C641	1-130-165-00	FILM	0.0022MF	2%	100V
C642	1-130-165-00	FILM	0.0022MF	2%	100V
C643	1-130-165-00	FILM	0.0022MF	2%	100V
C644	1-130-165-00	FILM	0.0022MF	2%	100V
C645	1-130-164-00	FILM	0.0012MF	2%	100V
C646	1-130-163-00	FILM	0.0011MF	2%	100V
C647	1-130-131-00	FILM	0.0016MF	2%	100V
C648	1-109-692-00	MICA	620PF	2%	500V
C701	1-131-520-00	TANTALUM	22MF	20%	160V
C702	1-123-687-00	ELECT	2200MF	20%	16V
C703	1-131-520-00	TANTALUM	22MF	20%	160V
C704	1-123-687-00	ELECT	2200MF	20%	16V
C706	1-131-450-00	TANTALUM	1MF	20%	35V
C708	1-131-450-00	TANTALUM	1MF	20%	35V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C709	1-107-277-00	MICA	5PF	0.5PF	100V
C709	1-131-520-00	TANTALUM	22MF	20%	160V
C710	1-107-277-00	MICA	5PF	0.5PF	100V
C751	1-131-520-00	TANTALUM	22MF	20%	160V
C752	1-123-687-00	ELECT	2200MF	20%	16V
C753	1-131-520-00	TANTALUM	22MF	20%	160V
C754	1-123-687-00	ELECT	2200MF	20%	16V
C756	1-131-450-00	TANTALUM	1MF	20%	35V
C758	1-131-450-00	TANTALUM	1MF	20%	35V
C759	1-107-277-00	MICA	5PF	0.5PF	100V
C759	1-131-520-00	TANTALUM	22MF	20%	160V
C760	1-107-277-00	MICA	5PF	0.5PF	100V
C801	1-123-842-00	ELECT	3300MF	20%	25V
C802	1-123-842-00	ELECT	3300MF	20%	25V
C803	1-123-842-00	ELECT	3300MF	20%	25V
C804	1-123-842-00	ELECT	3300MF	20%	25V
C805	1-123-494-	ELECT	100MF	20%	25V
C806	1-130-232-00	FILM	0.022MF	20%	300V
C901	1-131-450-00	TANTALUM	1MF	20%	35V
C902	1-131-450-00	TANTALUM	1MF	20%	35V
C903	1-131-450-00	TANTALUM	1MF	20%	35V
C904	1-131-450-00	TANTALUM	1MF	20%	35V
CNJ1	1-561-141-00	CONNECTOR, PC BOARD			
CNJ12					
D101	8-719-210-20	DIODE 10YG2.0			
D102	8-719-210-20	DIODE 10YG2.0			
D103	8-719-210-20	DIODE 10YG2.0			
D104	8-719-210-20	DIODE 10YG2.0			
D105	8-719-210-20	DIODE 10YG2.0			
D106	8-719-210-20	DIODE 10YG2.0			
D107	8-719-210-20	DIODE 10YG2.0			
D108	8-719-210-20	DIODE 10YG2.0			
D109	8-719-210-20	DIODE 10YG2.0			
D110	8-719-210-20	DIODE 10YG2.0			
D111	8-719-210-20	DIODE 10YG2.0			
D112	8-719-210-20	DIODE 10YG2.0			
D113	8-719-210-20	DIODE 10YG2.0			
D114	8-719-210-20	DIODE 10YG2.0			
D115	8-719-210-20	DIODE 10YG2.0			
D116	8-719-210-20	DIODE 10YG2.0			
D117	8-719-210-20	DIODE 10YG2.0			
D151	8-719-210-20	DIODE 10YG2.0			
D152	8-719-210-20	DIODE 10YG2.0			
D153	8-719-210-20	DIODE 10YG2.0			
D154	8-719-210-20	DIODE 10YG2.0			
D155	8-719-210-20	DIODE 10YG2.0			
D156	8-719-210-20	DIODE 10YG2.0			
D157	8-719-210-20	DIODE 10YG2.0			
D158	8-719-210-20	DIODE 10YG2.0			

NOTE:

- * Items with no part number and no description are not stocked because they are seldom required for routine service.
- * Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- * Due to standardization, parts with part numbers (▲-△△△-△△△-XX or ▲-△△△△-△△△-X) may be different from those used in the set.

CAPACITORS:

- * All capacitors are in μ F. Common capacitors are omitted. Refer to the following lists for their part numbers. MF: μ F, PF: μ pF.

RESISTORS

- * All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- * F : nonflammable

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

COILS

- * MMH : mH, UH : μ H

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D159	8-719-210-20	DIODE 10YG2.0
D160	8-719-210-20	DIODE 10YG2.0
D161	8-719-210-20	DIODE 10YG2.0
D162	8-719-210-20	DIODE 10YG2.0
D163	8-719-210-20	DIODE 10YG2.0
D164	8-719-210-20	DIODE 10YG2.0
D165	8-719-210-20	DIODE 10YG2.0
D166	8-719-210-20	DIODE 10YG2.0
D167	8-719-210-20	DIODE 10YG2.0
D702	8-719-201-11	DIODE 10YG1.1
D703	8-719-999-64	DIODE EQA01-06T2
D704	8-719-999-64	DIODE EQA01-06T2
D705	8-719-201-11	DIODE 10YG1.1
D706	8-719-999-64	DIODE EQA01-06T2
D707	8-719-201-11	DIODE 10YG1.1
D751	8-719-201-11	DIODE 10YG1.1
D752	8-719-201-11	DIODE 10YG1.1
D754	8-719-201-11	DIODE 10YG1.1
D755	8-719-201-11	DIODE 10YG1.1
D756	8-719-999-64	DIODE EQA01-06T2
D757	8-719-201-11	DIODE 10YG1.1
D758	8-719-999-64	DIODE EQA01-06T2
D801	8-719-230-02	DIODE 30DF2
D802	8-719-230-02	DIODE 30DF2
D803	8-719-230-02	DIODE 30DF2
D804	8-719-230-02	DIODE 30DF2
D805	8-719-510-10	DIODE S1RB10
D806	8-719-200-02	DIODE 10E-2
D807	8-719-815-55	DIODE 1S1555
D851	8-719-230-02	DIODE 30DF2
D852	8-719-230-02	DIODE 30DF2
D853	8-719-230-02	DIODE 30DF2
D854	8-719-230-02	DIODE 30DF2
F1	 1-552-078-00	TIMELAG FUSE
PT1	 1-447-056-00	TRANSFORMER, POWER
Q101	8-765-640-10	TRANSISTOR 2SK244-1
Q103	8-765-020-00	TRANSISTOR 2SA884
Q104	8-729-309-36	TRANSISTOR 2SA1027R
Q105	8-765-222-20	TRANSISTOR 2SC1963
Q106	8-765-640-10	TRANSISTOR 2SK244-1
Q108	8-765-020-00	TRANSISTOR 2SA884
Q109	8-729-309-36	TRANSISTOR 2SA1027R
Q110	8-765-222-20	TRANSISTOR 2SC1963
Q111	8-727-313-07	TRANSISTOR 2SK42-3
Q114	8-727-313-07	TRANSISTOR 2SK42-3

ELECTRICAL PARTS

Ref.No.	Part No.	Description
Q117	8-727-313-07	TRANSISTOR 2SK42-3
Q151	8-765-640-10	TRANSISTOR 2SK244-1
Q153	8-765-020-00	TRANSISTOR 2SA884
Q154	8-729-309-36	TRANSISTOR 2SA1027R
Q155	8-765-222-20	TRANSISTOR 2SC1963
Q156	8-765-640-10	TRANSISTOR 2SK244-1
Q158	8-765-020-00	TRANSISTOR 2SA884
Q159	8-729-309-36	TRANSISTOR 2SA1027R
Q160	8-765-222-20	TRANSISTOR 2SC1963
Q161	8-727-313-08	TRANSISTOR 2SK42-3
Q164	8-727-313-07	TRANSISTOR 2SK42-3
Q167	8-727-313-07	TRANSISTOR 2SK42-3
Q201	8-765-640-10	TRANSISTOR 2SK244-1
Q203	8-765-020-00	TRANSISTOR 2SA884
Q204	8-729-309-36	TRANSISTOR 2SA1027R
Q205	8-765-222-20	TRANSISTOR 2SC1963
Q206	8-765-640-10	TRANSISTOR 2SK244-1
Q208	8-765-020-00	TRANSISTOR 2SA884
Q209	8-729-309-36	TRANSISTOR 2SA1027R
Q210	8-765-222-20	TRANSISTOR 2SC1963
Q251	8-765-640-10	TRANSISTOR 2SK244-1
Q253	8-765-020-00	TRANSISTOR 2SA884
Q254	8-729-309-36	TRANSISTOR 2SA1027R
Q255	8-765-222-20	TRANSISTOR 2SC1963
Q256	8-765-640-10	TRANSISTOR 2SK244-1
Q258	8-765-020-00	TRANSISTOR 2SA884
Q259	8-729-309-36	TRANSISTOR 2SA1027R
Q260	8-765-222-20	TRANSISTOR 2SC1963
Q301	8-727-313-07	TRANSISTOR 2SK42-3
Q304	8-727-313-07	TRANSISTOR 2SK42-3
Q307	8-727-313-07	TRANSISTOR 2SK42-3
Q310	8-727-313-07	TRANSISTOR 2SK42-3
Q351	8-727-313-07	TRANSISTOR 2SK42-3
Q354	8-727-313-07	TRANSISTOR 2SK42-3
Q357	8-727-313-07	TRANSISTOR 2SK42-3
Q360	8-727-313-07	TRANSISTOR 2SK42-3
Q401	8-727-313-07	TRANSISTOR 2SK42-3
Q404	8-727-313-07	TRANSISTOR 2SK42-3
Q407	8-727-313-07	TRANSISTOR 2SK42-3
Q410	8-727-313-07	TRANSISTOR 2SK42-3
Q451	8-727-313-07	TRANSISTOR 2SK42-3
Q454	8-727-313-07	TRANSISTOR 2SK42-3
Q457	8-727-313-07	TRANSISTOR 2SK42-3
Q460	8-727-313-07	TRANSISTOR 2SK42-3
Q501	8-727-313-07	TRANSISTOR 2SK42-3
Q504	8-727-313-07	TRANSISTOR 2SK42-3
Q551	8-727-313-07	TRANSISTOR 2SK42-3
Q554	8-727-313-07	TRANSISTOR 2SK42-3
Q701	8-729-376-02	TRANSISTOR 2SD760
Q702	8-729-167-62	TRANSISTOR 2SC2676

NOTE:

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- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

COILS

- MMH : mH, UH : μH

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
Q703	8-729-113-82	TRANSISTOR 2SA1138			
Q704	8-729-113-82	TRANSISTOR 2SA1138			
Q705	8-729-167-62	TRANSISTOR 2SC2676			
Q706	8-729-113-82	TRANSISTOR 2SA1138			
Q707	8-729-113-82	TRANSISTOR 2SA1138			
Q708	8-729-167-62	TRANSISTOR 2SC2676			
Q709	8-729-167-62	TRANSISTOR 2SC2676			
Q710	8-729-372-02	TRANSISTOR 2SB720			
Q751	8-729-376-02	TRANSISTOR 2SD760			
Q752	8-729-167-62	TRANSISTOR 2SA2676			
Q753	8-729-113-82	TRANSISTOR 2SA1138			
Q754	8-729-113-82	TRANSISTOR 2SA1138			
Q755	8-729-167-62	TRANSISTOR 2SC2676			
Q756	8-729-113-82	TRANSISTOR 2SA1138			
Q757	8-729-113-82	TRANSISTOR 2SA1138			
Q758	8-729-167-62	TRANSISTOR 2SA2676			
Q759	8-729-167-62	TRANSISTOR 2SC2676			
Q760	8-729-372-02	TRANSISTOR 2SB720			
Q801	8-729-663-47	TRANSISTOR 2SC1364			
Q802	8-729-103-43	TRANSISTOR 2SB734			
R101	1-214-173-00	METAL	51K	1%	1/4W
R102	1-214-844-00	METAL	150	1%	1/2W
R103	1-214-844-00	METAL	150	1%	1/2W
R104	1-214-869-00	METAL	1.6K	1%	1/2W
R105	1-214-869-00	METAL	1.6K	1%	1/2W
R107	1-214-840-00	METAL	100	1%	1/2W
R108	1-214-816-00	METAL	10	1%	1/2W
R109	1-214-848-00	METAL	220	1%	1/2W
R110	1-214-816-00	METAL	10	1%	1/2W
R111	1-214-840-00	METAL	100	1%	1/2W
R112	1-214-840-00	METAL	100	1%	1/2W
R113	1-214-913-00	METAL	100K	1%	1/2W
R114	1-214-840-00	METAL	100	1%	1/2W
R115	1-214-844-00	METAL	150	1%	1/2W
R116	1-214-869-00	METAL	1.6K	1%	1/2W
R117	1-214-869-00	METAL	1.6K	1%	1/2W
R119	1-214-816-00	METAL	10	1%	1/2W
R120	1-214-816-00	METAL	10	1%	1/2W
R121	1-214-848-00	METAL	220	1%	1/2W
R123	1-214-840-00	METAL	100	1%	1/2W
R124	1-214-840-00	METAL	100	1%	1/2W
R126	1-214-840-00	METAL	100	1%	1/2W
R127	1-214-180-00	METAL	100K	1%	1/4W
R128	1-214-913-00	METAL	100K	1%	1/2W
R129	1-214-872-00	METAL	2.2K	1%	1/2W
R133	1-214-840-00	METAL	100	1%	1/2W
R134	1-214-180-00	METAL	100K	1%	1/4W
R135	1-214-913-00	METAL	100K	1%	1/2W
R136	1-214-872-00	METAL	2.2K	1%	1/2W
R140	1-214-840-00	METAL	100	1%	1/2W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R141	1-214-180-00	METAL	100K	1%	1/4W
R142	1-214-913-00	METAL	100K	1%	1/2W
R143	1-214-872-00	METAL	2.2K	1%	1/2W
R147	1-214-840-00	METAL	100	1%	1/2W
R148	1-214-180-00	METAL	100K	1%	1/4W
R151	1-214-173-00	METAL	51K	1%	1/4W
R152	1-214-844-00	METAL	150	1%	1/2W
R153	1-214-844-00	METAL	150	1%	1/2W
R154	1-214-869-00	METAL	1.6K	1%	1/2W
R155	1-214-869-00	METAL	1.6K	1%	1/2W
R157	1-214-840-00	METAL	100	1%	1/2W
R158	1-214-816-00	METAL	10	1%	1/2W
R159	1-214-848-00	METAL	220	1%	1/2W
R160	1-214-816-00	METAL	10	1%	1/2W
R161	1-214-840-00	METAL	100	1%	1/2W
R162	1-214-840-00	METAL	100	1%	1/2W
R163	1-214-913-00	METAL	100K	1%	1/2W
R164	1-214-840-00	METAL	100	1%	1/2W
R165	1-214-844-00	METAL	150	1%	1/2W
R166	1-214-869-00	METAL	1.6K	1%	1/2W
R167	1-214-869-00	METAL	1.6K	1%	1/2W
R169	1-214-816-00	METAL	10	1%	1/2W
R170	1-214-816-00	METAL	10	1%	1/2W
R171	1-214-848-00	METAL	220	1%	1/2W
R173	1-214-840-00	METAL	100	1%	1/2W
R174	1-214-840-00	METAL	100	1%	1/2W
R176	1-214-840-00	METAL	100	1%	1/2W
R177	1-214-180-00	METAL	100K	1%	1/4W
R178	1-214-913-00	METAL	100K	1%	1/2W
R179	1-214-872-00	METAL	2.2K	1%	1/2W
R183	1-214-840-00	METAL	100	1%	1/2W
R184	1-214-180-00	METAL	100K	1%	1/4W
R185	1-214-913-00	METAL	100K	1%	1/2W
R186	1-214-872-00	METAL	2.2K	1%	1/2W
R190	1-214-840-00	METAL	100	1%	1/2W
R191	1-214-180-00	METAL	100K	1%	1/4W
R192	1-214-913-00	METAL	100K	1%	1/2W
R193	1-214-872-00	METAL	2.2K	1%	1/2W
R197	1-214-840-00	METAL	100	1%	1/2W
R198	1-214-180-00	METAL	100K	1%	1/4W
R201	1-214-156-00	METAL	10K	1%	1/4W
R202	1-214-159-00	METAL	13K	1%	1/4W
R203	1-214-163-00	METAL	20K	1%	1/4W
R204	1-214-156-00	METAL	10K	1%	1/4W
R205	1-214-159-00	METAL	13K	1%	1/4W
R206	1-214-163-00	METAL	20K	1%	1/4W
R207	1-214-156-00	METAL	10K	1%	1/4W
R208	1-214-159-00	METAL	13K	1%	1/4W
R209	1-214-163-00	METAL	20K	1%	1/4W
R210	1-214-156-00	METAL	10K	1%	1/4W

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "●" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers.
- MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F: nonflammable

COILS

- MMH: mH, UH: μH

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R211	1-214-159-00	METAL	13K	1%	1/4W
R212	1-214-163-00	METAL	20K	1%	1/4W
R213	1-214-844-00	METAL	150	1%	1/2W
R214	1-214-844-00	METAL	150	1%	1/2W
R215	1-214-869-00	METAL	1.6K	1%	1/2W
R216	1-214-869-00	METAL	1.6K	1%	1/2W
R218	1-214-816-00	METAL	10	1%	1/2W
R219	1-214-816-00	METAL	10	1%	1/2W
R220	1-214-848-00	METAL	220	1%	1/2W
R221	1-214-840-00	METAL	100	1%	1/2W
R222	1-214-840-00	METAL	100	1%	1/2W
R223	1-214-840-00	METAL	100	1%	1/2W
R224	1-214-844-00	METAL	150	1%	1/2W
R225	1-214-844-00	METAL	150	1%	1/2W
R226	1-214-869-00	METAL	1.6K	1%	1/2W
R227	1-214-869-00	METAL	1.6K	1%	1/2W
R229	1-214-816-00	METAL	10	1%	1/2W
R230	1-214-816-00	METAL	10	1%	1/2W
R231	1-214-848-00	METAL	220	1%	1/2W
R232	1-214-840-00	METAL	100	1%	1/2W
R233	1-214-840-00	METAL	100	1%	1/2W
R234	1-214-840-00	METAL	100	1%	1/2W
R236	1-214-840-00	METAL	100	1%	1/2W
R251	1-214-156-00	METAL	10K	1%	1/4W
R252	1-214-159-00	METAL	13K	1%	1/4W
R253	1-214-163-00	METAL	20K	1%	1/4W
R254	1-214-156-00	METAL	10K	1%	1/4W
R255	1-214-159-00	METAL	13K	1%	1/4W
R256	1-214-163-00	METAL	20K	1%	1/4W
R257	1-214-156-00	METAL	10K	1%	1/4W
R258	1-214-159-00	METAL	13K	1%	1/4W
R259	1-214-163-00	METAL	20K	1%	1/4W
R260	1-214-156-00	METAL	10K	1%	1/4W
R261	1-214-159-00	METAL	13K	1%	1/4W
R262	1-214-163-00	METAL	20K	1%	1/4W
R263	1-214-844-00	METAL	150	1%	1/2W
R264	1-214-844-00	METAL	150	1%	1/2W
R265	1-214-869-00	METAL	1.6K	1%	1/2W
R266	1-214-869-00	METAL	1.6K	1%	1/2W
R268	1-214-816-00	METAL	10	1%	1/2W
R269	1-214-816-00	METAL	10	1%	1/2W
R270	1-214-848-00	METAL	220	1%	1/2W
R271	1-214-840-00	METAL	100	1%	1/2W
R272	1-214-840-00	METAL	100	1%	1/2W
R273	1-214-840-00	METAL	100	1%	1/2W
R274	1-214-844-00	METAL	150	1%	1/2W
R275	1-214-844-00	METAL	150	1%	1/2W
R276	1-214-869-00	METAL	1.6K	1%	1/2W
R277	1-214-869-00	METAL	1.6K	1%	1/2W
R279	1-214-816-00	METAL	10	1%	1/2W

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF . Common capacitors are omitted. Refer to the following lists for their part numbers. MF: μF , PF: $\mu\mu\text{F}$.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R280	1-214-816-00	METAL	10	1%	1/2W
R281	1-214-848-00	METAL	220	1%	1/2W
R282	1-214-840-00	METAL	100	1%	1/2W
R283	1-214-840-00	METAL	100	1%	1/2W
R284	1-214-840-00	METAL	100	1%	1/2W
R286	1-214-840-00	METAL	100	1%	1/2W
R301	1-214-156-00	METAL	10K	1%	1/4W
R302	1-214-158-00	METAL	12K	1%	1/4W
R303	1-214-163-00	METAL	20K	1%	1/4W
R304	1-214-158-00	METAL	12K	1%	1/4W
R305	1-214-160-00	METAL	15K	1%	1/4W
R306	1-214-165-00	METAL	24K	1%	1/4W
R307	1-214-153-00	METAL	7.5K	1%	1/4W
R308	1-214-155-00	METAL	9.1K	1%	1/4W
R309	1-214-160-00	METAL	15K	1%	1/4W
R310	1-214-162-00	METAL	18K	1%	1/4W
R311	1-214-165-00	METAL	24K	1%	1/4W
R312	1-214-169-00	METAL	36K	1%	1/4W
R313	1-214-156-00	METAL	10K	1%	1/4W
R314	1-214-159-00	METAL	13K	1%	1/4W
R315	1-214-163-00	METAL	20K	1%	1/4W
R316	1-214-156-00	METAL	10K	1%	1/4W
R317	1-214-159-00	METAL	13K	1%	1/4W
R318	1-214-163-00	METAL	20K	1%	1/4W
R319	1-214-156-00	METAL	10K	1%	1/4W
R320	1-214-159-00	METAL	13K	1%	1/4W
R321	1-214-163-00	METAL	20K	1%	1/4W
R322	1-214-156-00	METAL	10K	1%	1/4W
R323	1-214-159-00	METAL	13K	1%	1/4W
R324	1-214-163-00	METAL	20K	1%	1/4W
R325	1-214-872-00	METAL	2.2K	1%	1/2W
R328	1-214-872-00	METAL	2.2K	1%	1/2W
R331	1-214-913-00	METAL	100K	1%	1/2W
R332	1-214-872-00	METAL	2.2K	1%	1/2W
R335	1-214-872-00	METAL	2.2K	1%	1/2W
R339	1-214-840-00	METAL	100	1%	1/2W
R351	1-214-156-00	METAL	10K	1%	1/4W
R352	1-214-158-00	METAL	12K	1%	1/4W
R353	1-214-163-00	METAL	20K	1%	1/4W
R354	1-214-158-00	METAL	12K	1%	1/4W
R355	1-214-160-00	METAL	15K	1%	1/4W
R356	1-214-165-00	METAL	24K	1%	1/4W
R357	1-214-153-00	METAL	7.5K	1%	1/4W
R358	1-214-155-00	METAL	9.1K	1%	1/4W
R359	1-214-160-00	METAL	15K	1%	1/4W
R360	1-214-162-00	METAL	18K	1%	1/4W
R361	1-214-165-00	METAL	24K	1%	1/4W
R362	1-214-169-00	METAL	36K	1%	1/4W
R363	1-214-156-00	METAL	10K	1%	1/4W
R364	1-214-159-00	METAL	13K	1%	1/4W

COILS

- MMH : mH, UH : μH

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R365	1-214-163-00	METAL	20K	1%	1/4W
R366	1-214-156-00	METAL	10K	1%	1/4W
R367	1-214-159-00	METAL	13K	1%	1/4W
R368	1-214-163-00	METAL	20K	1%	1/4W
R369	1-214-156-00	METAL	10K	1%	1/4W
R370	1-214-159-00	METAL	13K	1%	1/4W
R371	1-214-163-00	METAL	20K	1%	1/4W
R372	1-214-156-00	METAL	10K	1%	1/4W
R373	1-214-159-00	METAL	13K	1%	1/4W
R374	1-214-163-00	METAL	20K	1%	1/4W
R375	1-214-872-00	METAL	2.2K	1%	1/2W
R378	1-214-872-00	METAL	2.2K	1%	1/2W
R381	1-214-913-00	METAL	100K	1%	1/2W
R382	1-214-872-00	METAL	2.2K	1%	1/2W
R385	1-214-872-00	METAL	2.2K	1%	1/2W
R389	1-214-840-00	METAL	100	1%	1/2W
R401	1-214-156-00	METAL	10K	1%	1/4W
R402	1-214-158-00	METAL	12K	1%	1/4W
R403	1-214-163-00	METAL	20K	1%	1/4W
R404	1-214-158-00	METAL	12K	1%	1/4W
R405	1-214-160-00	METAL	15K	1%	1/4W
R406	1-214-165-00	METAL	24K	1%	1/4W
R407	1-214-153-00	METAL	7.5K	1%	1/4W
R408	1-214-155-00	METAL	9.1K	1%	1/4W
R409	1-214-160-00	METAL	15K	1%	1/4W
R410	1-214-162-00	METAL	18K	1%	1/4W
R411	1-214-165-00	METAL	24K	1%	1/4W
R412	1-214-169-00	METAL	36K	1%	1/4W
R413	1-214-156-00	METAL	10K	1%	1/4W
R414	1-214-159-00	METAL	13K	1%	1/4W
R415	1-214-163-00	METAL	20K	1%	1/4W
R416	1-214-156-00	METAL	10K	1%	1/4W
R417	1-214-159-00	METAL	13K	1%	1/4W
R418	1-214-163-00	METAL	20K	1%	1/4W
R419	1-214-156-00	METAL	10K	1%	1/4W
R420	1-214-159-00	METAL	13K	1%	1/4W
R421	1-214-163-00	METAL	20K	1%	1/4W
R422	1-214-156-00	METAL	10K	1%	1/4W
R423	1-214-159-00	METAL	13K	1%	1/4W
R424	1-214-163-00	METAL	20K	1%	1/4W
R425	1-214-872-00	METAL	2.2K	1%	1/2W
R428	1-214-872-00	METAL	2.2K	1%	1/2W
R431	1-214-913-00	METAL	100K	1%	1/2W
R432	1-214-872-00	METAL	2.2K	1%	1/2W
R435	1-214-872-00	METAL	2.2K	1%	1/2W
R439	1-214-840-00	METAL	100	1%	1/2W
R451	1-214-156-00	METAL	10K	1%	1/4W
R452	1-214-158-00	METAL	12K	1%	1/4W
R453	1-214-163-00	METAL	20K	1%	1/4W
R454	1-214-158-00	METAL	12K	1%	1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R455	1-214-160-00	METAL	15K	1%	1/4W
R456	1-214-165-00	METAL	24K	1%	1/4W
R457	1-214-153-00	METAL	7.5K	1%	1/4W
R458	1-214-155-00	METAL	9.1K	1%	1/4W
R459	1-214-160-00	METAL	15K	1%	1/4W
R460	1-214-162-00	METAL	18K	1%	1/4W
R461	1-214-165-00	METAL	24K	1%	1/4W
R462	1-214-169-00	METAL	36K	1%	1/4W
R463	1-214-156-00	METAL	10K	1%	1/4W
R464	1-214-159-00	METAL	13K	1%	1/4W
R465	1-214-163-00	METAL	20K	1%	1/4W
R466	1-214-156-00	METAL	10K	1%	1/4W
R467	1-214-159-00	METAL	13K	1%	1/4W
R468	1-214-163-00	METAL	20K	1%	1/4W
R469	1-214-156-00	METAL	10K	1%	1/4W
R470	1-214-159-00	METAL	13K	1%	1/4W
R471	1-214-163-00	METAL	20K	1%	1/4W
R472	1-214-156-00	METAL	10K	1%	1/4W
R473	1-214-159-00	METAL	13K	1%	1/4W
R474	1-214-163-00	METAL	20K	1%	1/4W
R475	1-214-872-00	METAL	2.2K	1%	1/2W
R478	1-214-872-00	METAL	2.2K	1%	1/2W
R481	1-214-913-00	METAL	100K	1%	1/2W
R482	1-214-872-00	METAL	2.2K	1%	1/2W
R485	1-214-872-00	METAL	2.2K	1%	1/2W
R489	1-214-840-00	METAL	100	1%	1/2W
R501	1-214-156-00	METAL	10K	1%	1/4W
R502	1-214-158-00	METAL	12K	1%	1/4W
R503	1-214-163-00	METAL	20K	1%	1/4W
R504	1-214-158-00	METAL	12K	1%	1/4W
R505	1-214-160-00	METAL	15K	1%	1/4W
R506	1-214-165-00	METAL	24K	1%	1/4W
R507	1-214-153-00	METAL	7.5K	1%	1/4W
R508	1-214-155-00	METAL	9.1K	1%	1/4W
R509	1-214-160-00	METAL	15K	1%	1/4W
R510	1-214-162-00	METAL	18K	1%	1/4W
R511	1-214-165-00	METAL	24K	1%	1/4W
R512	1-214-169-00	METAL	36K	1%	1/4W
R513	1-214-872-00	METAL	2.2K	1%	1/2W
R516	1-214-872-00	METAL	2.2K	1%	1/2W
R520	1-214-840-00	METAL	100	1%	1/2W
R551	1-214-156-00	METAL	10K	1%	1/4W
R552	1-214-158-00	METAL	12K	1%	1/4W
R553	1-214-163-00	METAL	20K	1%	1/4W
R554	1-214-158-00	METAL	12K	1%	1/4W
R555	1-214-160-00	METAL	15K	1%	1/4W
R556	1-214-165-00	METAL	24K	1%	1/4W
R557	1-214-153-00	METAL	7.5K	1%	1/4W
R558	1-214-155-00	METAL	9.1K	1%	1/4W
R559	1-214-160-00	METAL	15K	1%	1/4W

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "A" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (A-ΔΔΔ-ΔΔΔ-XX or A-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

COILS

- MMH : mH, UH : μH

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R560	1-214-162-00	METAL	18K	1%	1/4W
R561	1-214-165-00	METAL	24K	1%	1/4W
R562	1-214-169-00	METAL	36K	1%	1/4W
R563	1-214-872-00	METAL	2.2K	1%	1/2W
R566	1-214-872-00	METAL	2.2K	1%	1/2W
R570	1-214-840-00	METAL	100	1%	1/2W
R701	1-214-132-00	METAL	1K	1%	1/4W
R702	1-214-151-00	METAL	6.2K	1%	1/4W
R703	1-214-096-00	METAL	33	1%	1/4W
R704	1-214-128-00	METAL	680	1%	1/4W
R705	1-214-128-00	METAL	680	1%	1/4W
R706	1-214-878-00	METAL	3.9K	1%	1/2W
R707	1-214-096-00	METAL	33	1%	1/4W
R708	1-214-132-00	METAL	1K	1%	1/4W
R710	1-214-128-00	METAL	680	1%	1/4W
R711	1-214-128-00	METAL	680	1%	1/4W
R712	1-214-878-00	METAL	3.9K	1%	1/2W
R713	1-214-882-00	METAL	7.5K	1%	1/2W
R714	1-214-151-00	METAL	6.2K	1%	1/4W
R751	1-214-132-00	METAL	1K	1%	1/4W
R752	1-214-151-00	METAL	6.2K	1%	1/4W
R753	1-214-096-00	METAL	33	1%	1/4W
R754	1-214-128-00	METAL	680	1%	1/4W
R755	1-214-128-00	METAL	680	1%	1/4W
R756	1-214-878-00	METAL	3.9K	1%	1/2W
R757	1-214-096-00	METAL	33	1%	1/4W
R758	1-214-132-00	METAL	1K	1%	1/4W
R760	1-214-128-00	METAL	680	1%	1/4W
R761	1-214-128-00	METAL	680	1%	1/4W
R762	1-214-878-00	METAL	3.9K	1%	1/2W
R763	1-214-882-00	METAL	7.5K	1%	1/2W
R764	1-214-151-00	METAL	6.2K	1%	1/4W
R801	1-214-140-00	METAL	2.2K	1%	1/4W
R802	1-214-172-00	METAL	47K	1%	1/4W
R803	1-214-156-00	METAL	10K	1%	1/4W
R804	1-214-172-00	METAL	47K	1%	1/4W
R805	1-214-132-00	METAL	1K	1%	1/4W
R806	1-214-140-00	METAL	2.2K	1%	1/4W
R807	1-244-809-00	CARBON	2.2	5%	1/2W
R808	1-244-855-00	CARBON	180	5%	1/2W
R901	1-214-888-00	METAL	10K	1%	1/2W
R902	1-214-885-00	METAL	7.5K	1%	1/2W
R903	1-214-882-00	METAL	7.5K	1%	1/2W
R904	1-214-880-00	METAL	4.7K	1%	1/2W
R905	1-214-840-00	METAL	100	1%	1/2W
R906	1-214-937-00	METAL	1M	1%	1/2W
R907	1-214-880-00	METAL	4.7K	1%	1/2W
R908	1-214-882-00	METAL	7.5K	1%	1/2W
R909	1-214-883-00	METAL	6.2K	1%	1/2W
R910	1-214-890-00	METAL	12K	1%	1/2W

ELECTRICAL PARTS

Ref.No.	Part No.	Description	
RT101	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RT102	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RT151	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RT152	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RT201	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RT202	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RT251	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RT252	1-224-247-XX	RES, ADJ, METAL GLAZE	100
RY1	1-515-323-00	RELAY	
RY2	1-515-323-00	RELAY	
RY3	1-515-323-00	RELAY	
RY4	1-515-323-00	RELAY	
RY5	1-515-323-00	RELAY	
RY6	1-515-323-00	RELAY	
RY7	1-515-323-00	RELAY	
RY8	1-515-323-00	RELAY	
S1	1-552-381-00	SWITCH, ROTARY SLIDE	
S2	1-552-381-00	SWITCH, ROTARY SLIDE	
S3	1-552-381-00	SWITCH, ROTARY SLIDE	
S4	1-552-381-00	SWITCH, ROTARY SLIDE	
S5	1-552-381-00	SWITCH, ROTARY SLIDE	
S6	1-552-381-00	SWITCH, ROTARY SLIDE	
S7	A.1-552-975-00	SWITCH, AC	
VS	A.1-552-963-00	SWITCH, VOLT SELECT	

NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- Items marked "▲" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part numbers (Δ-ΔΔΔ-ΔΔΔ-XX or Δ-ΔΔΔΔ-ΔΔΔ-X) may be different from those used in the set.

CAPACITORS:

- All capacitors are in μF. Common capacitors are omitted. Refer to the following lists for their part numbers. MF:μF, PF:μμF.

RESISTORS

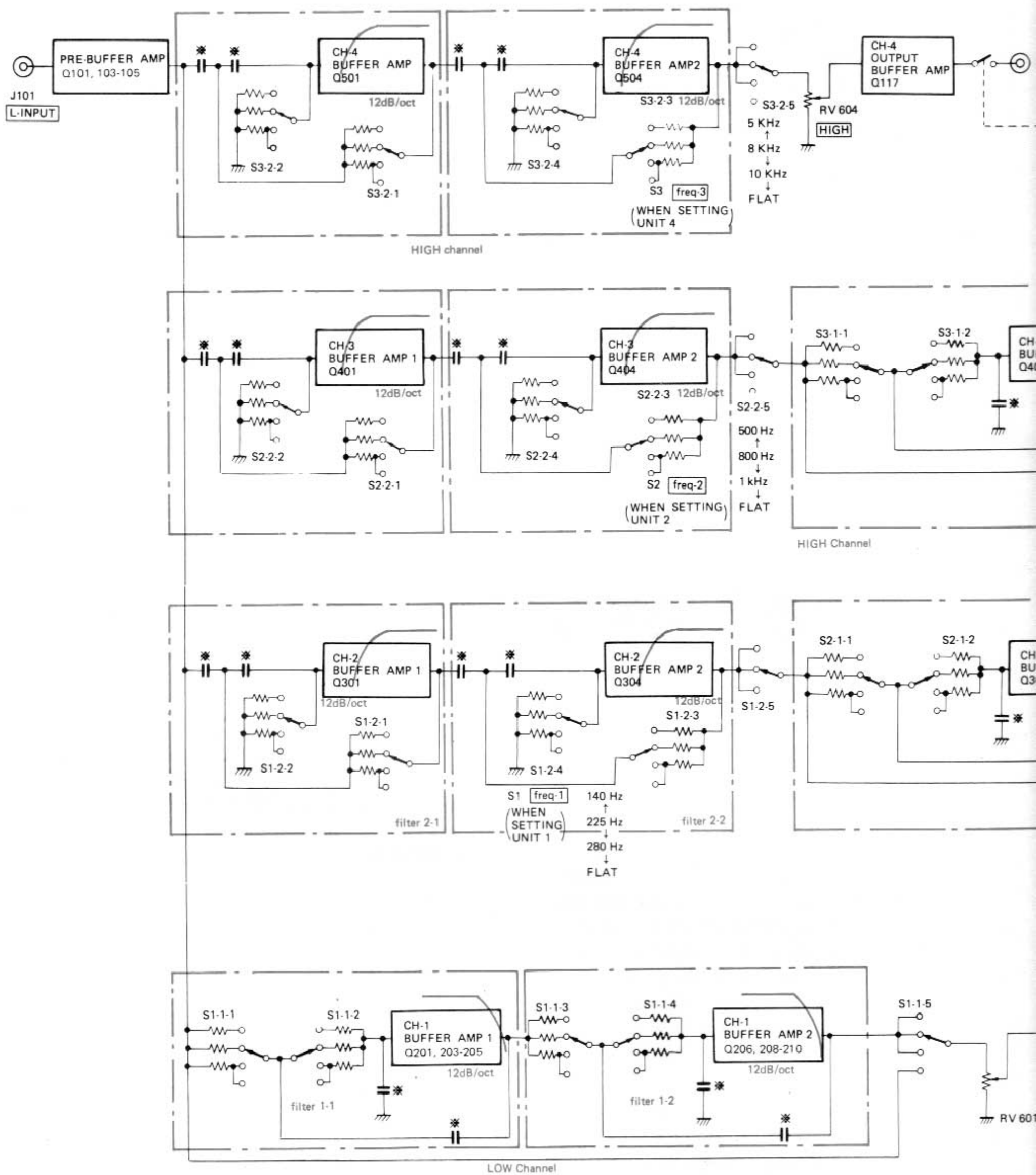
- All resistors are in ohms. Common 1/4W, 1/8W and 1/16W carbon resistors are omitted. Refer to the following lists for their part numbers.

- F : nonflammable

The components identified by shading and mark ▲ are critical for safety. Replace only with part number specified.

COILS

- MMH : mH, UH : μH



The capacitance values marked * are decided by setting the units 0 to 4.

Fig. 3



Fig. 3-4

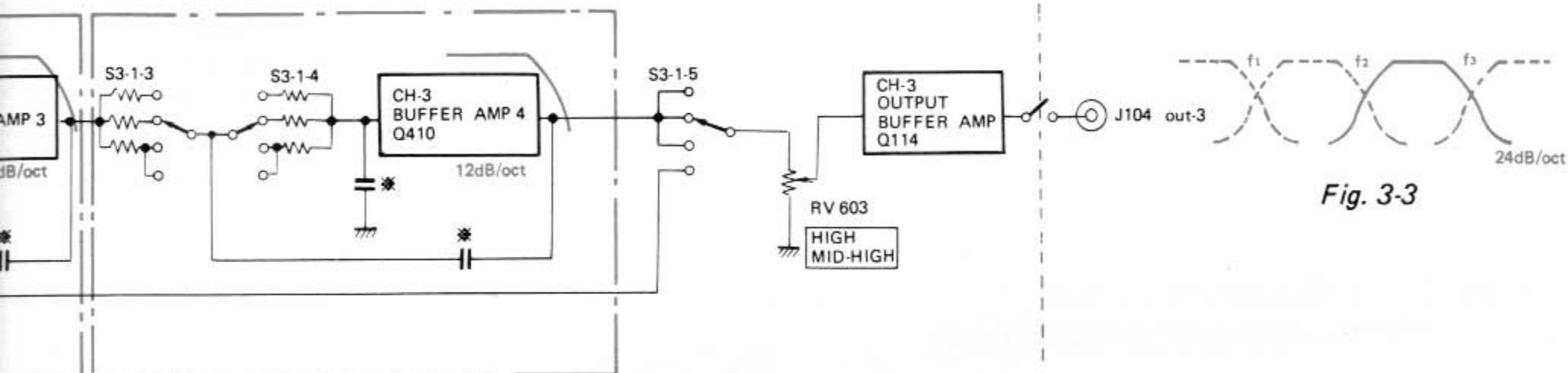


Fig. 3-3

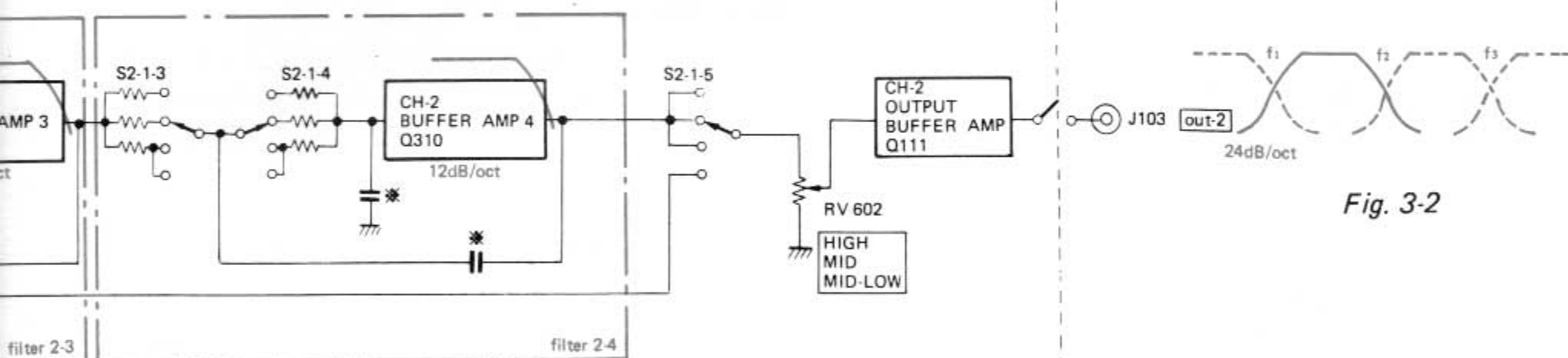


Fig. 3-2

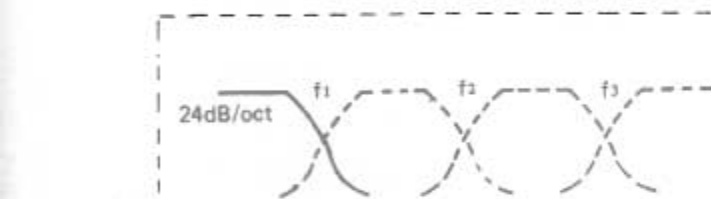
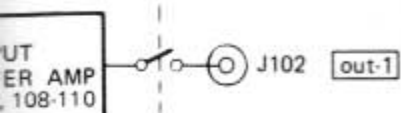
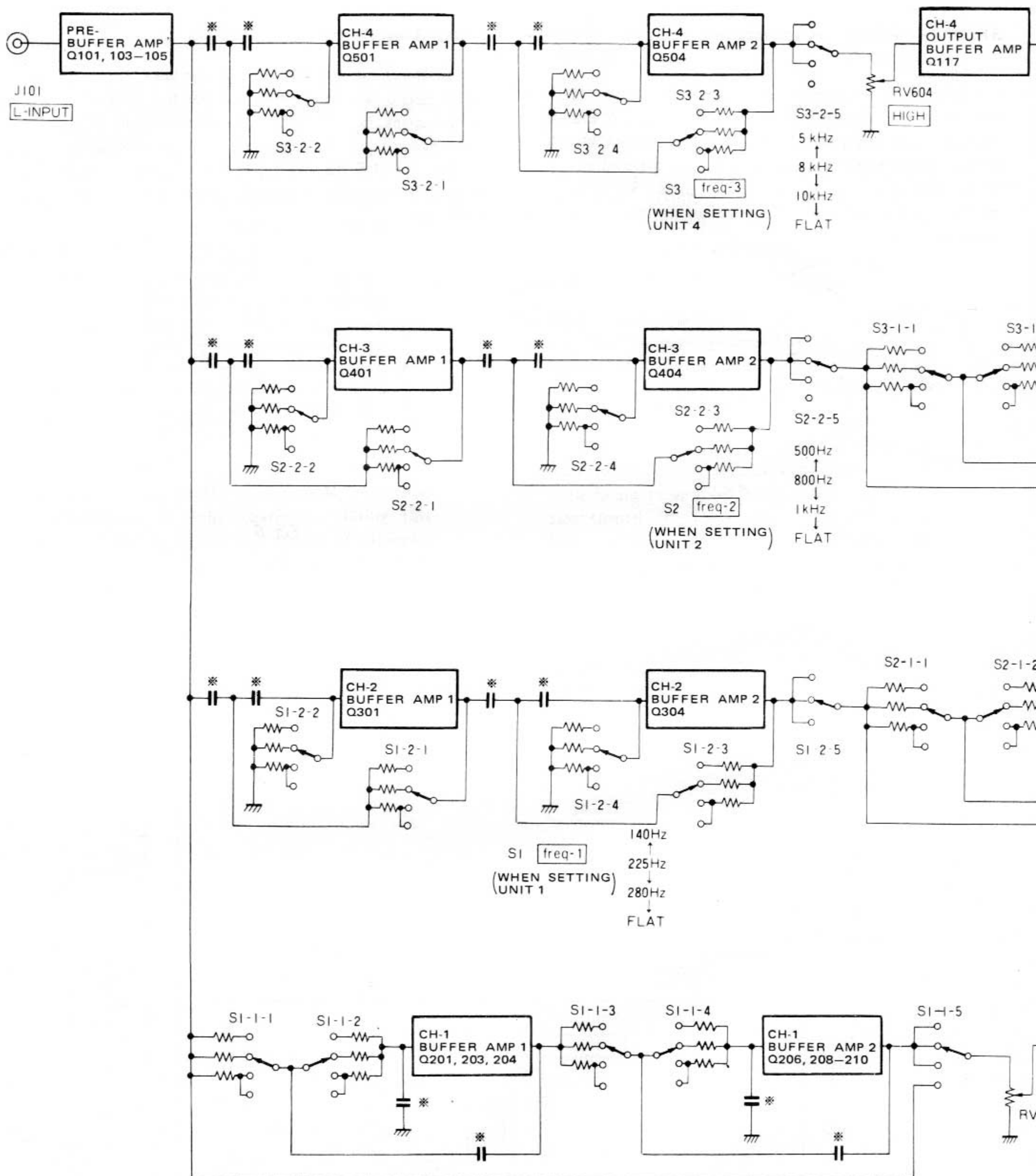


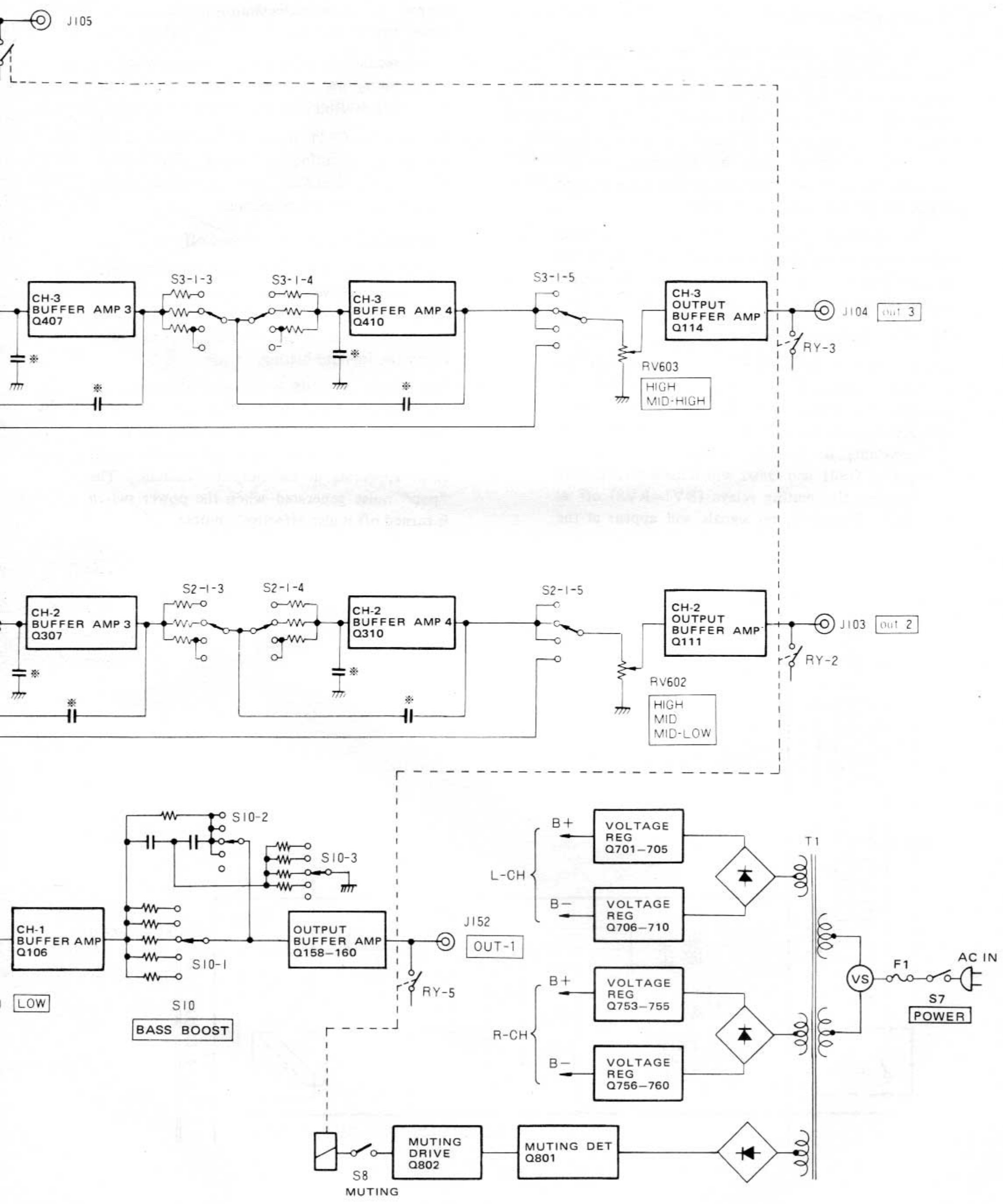
Fig. 3-1



1-2. BLOCK DIAGRAM



The capacitance values marked * are decided by setting the units 0 to 4.



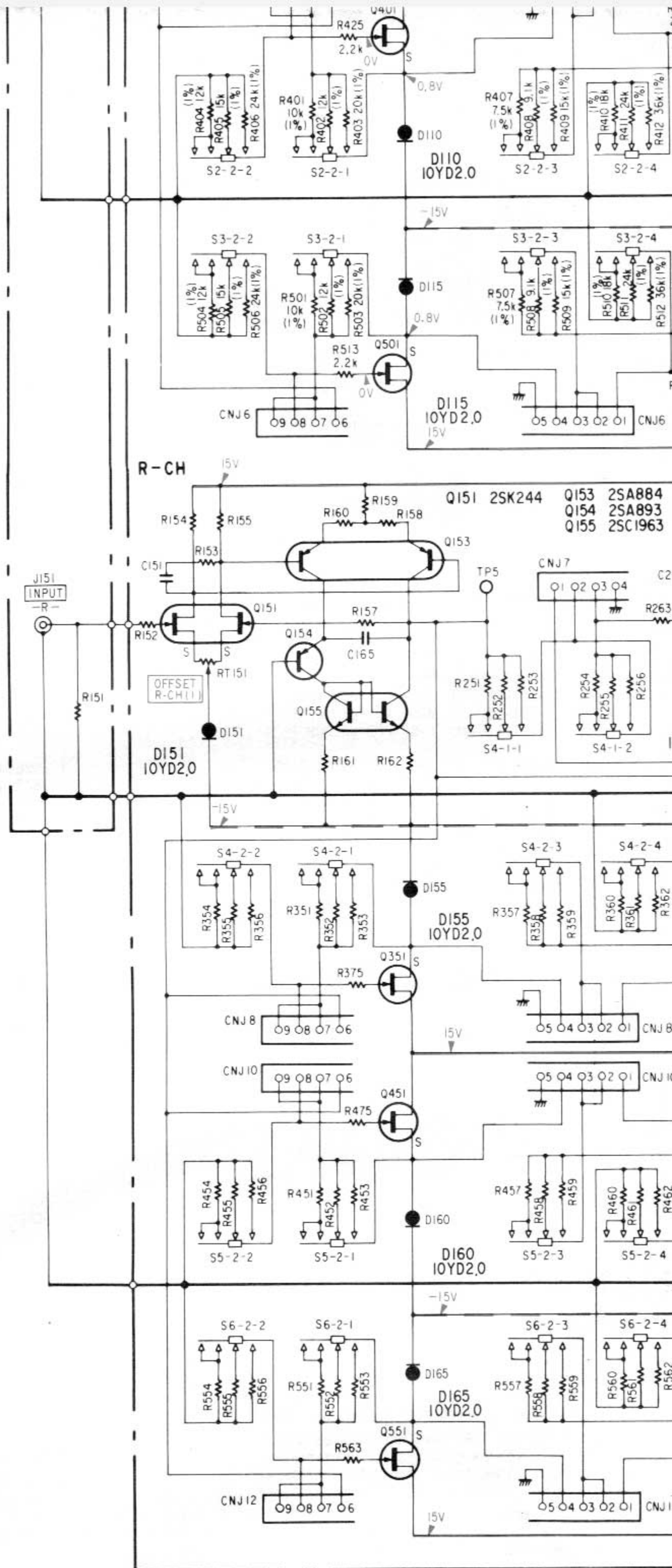
5

6

7

8

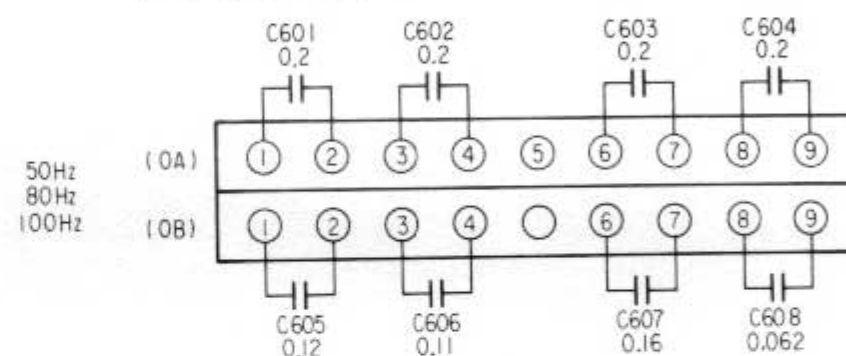
9



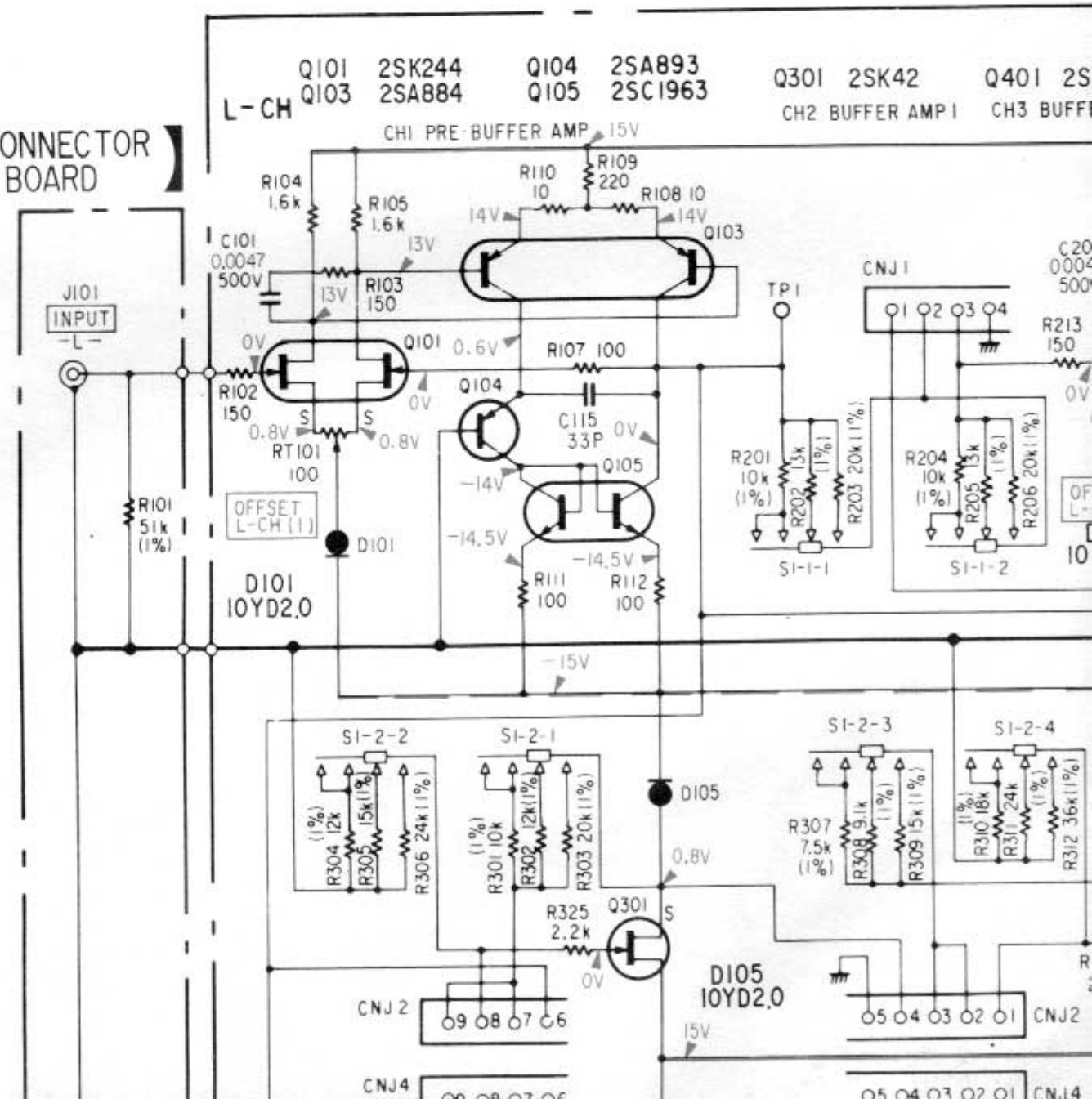
4-2. SCHEMATIC DIAGRAM

EACH BOARD SHOWN BELOW IS CONNECTED WITH

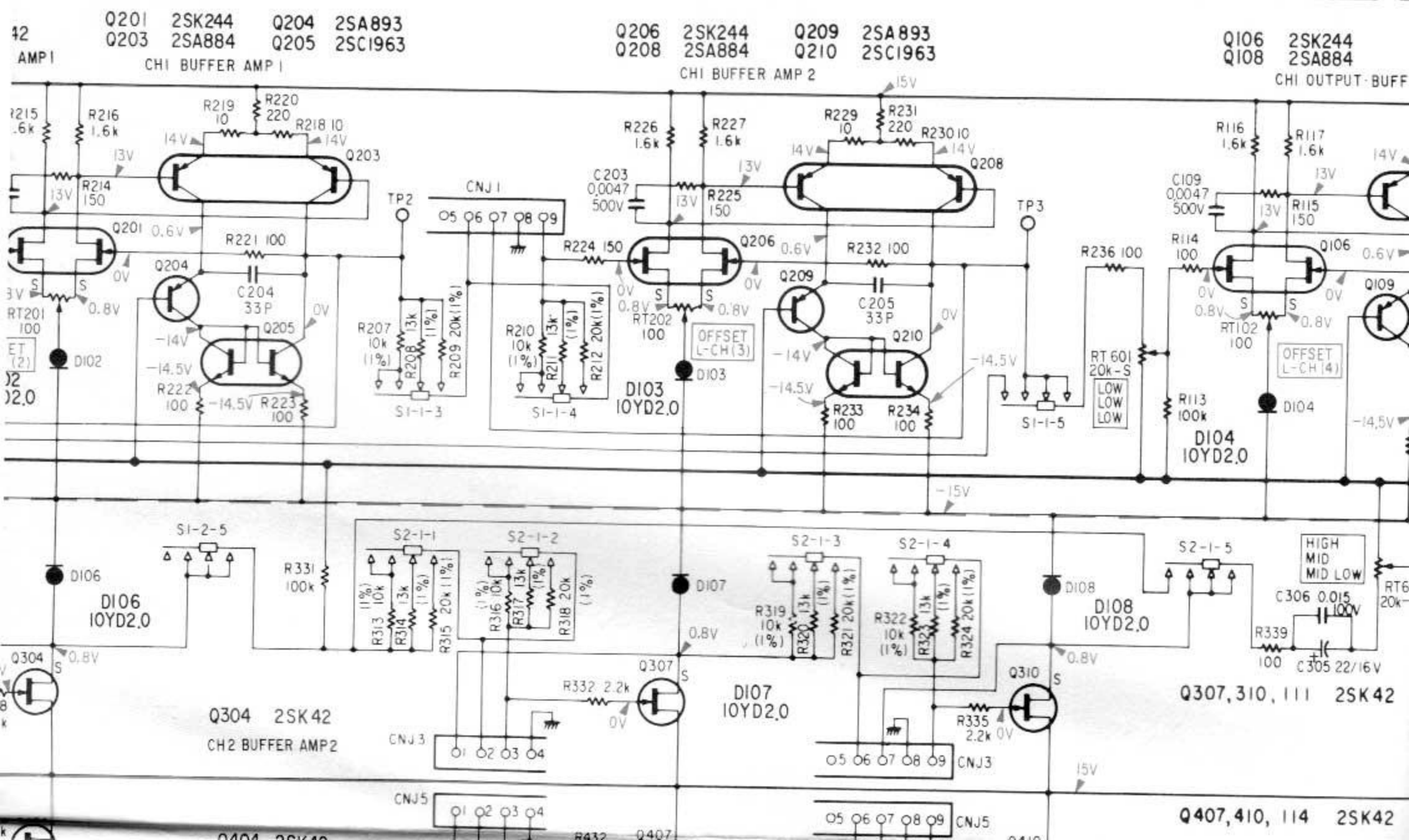
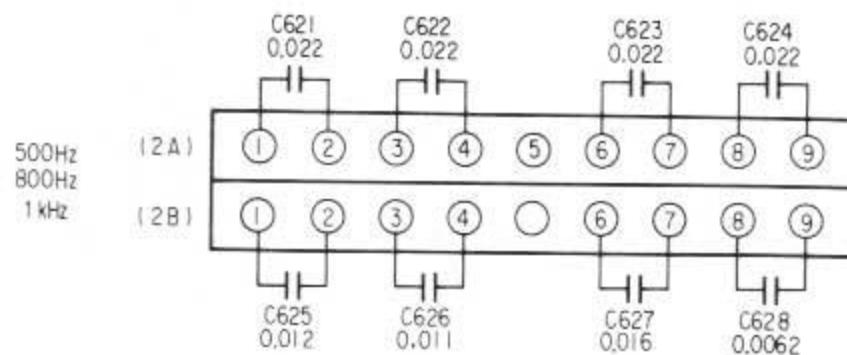
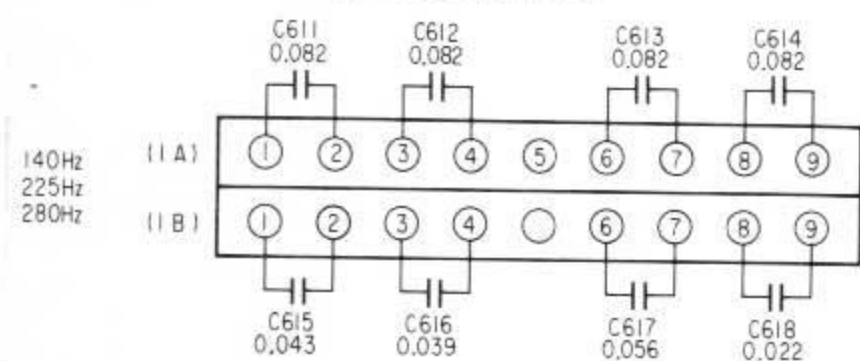
【UNIT(OA,OB)BOARD】



【CONNECTOR BOARD】



ONE OF CNJ1-12.



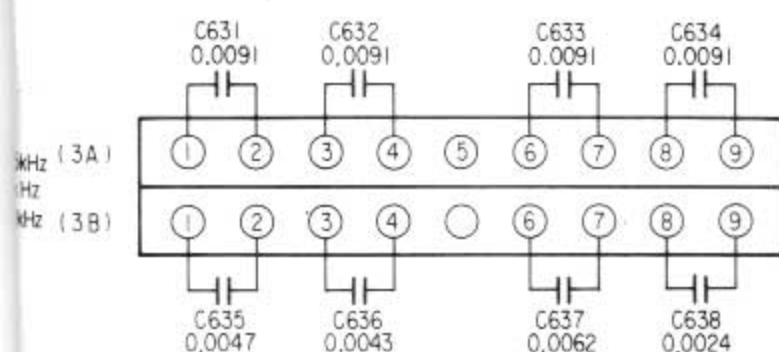
G

H

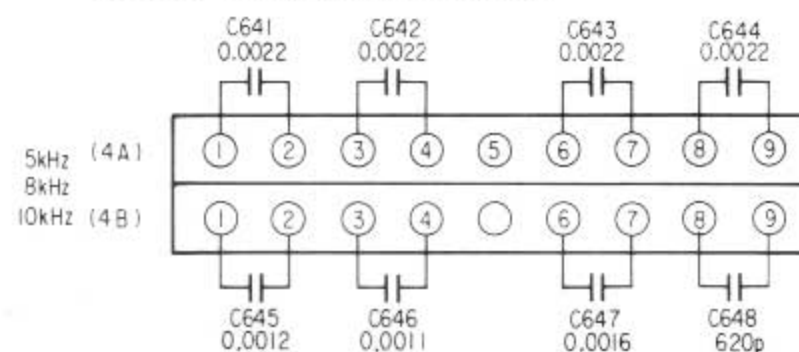
1

J

【UNIT(3A,3B)BOARD】



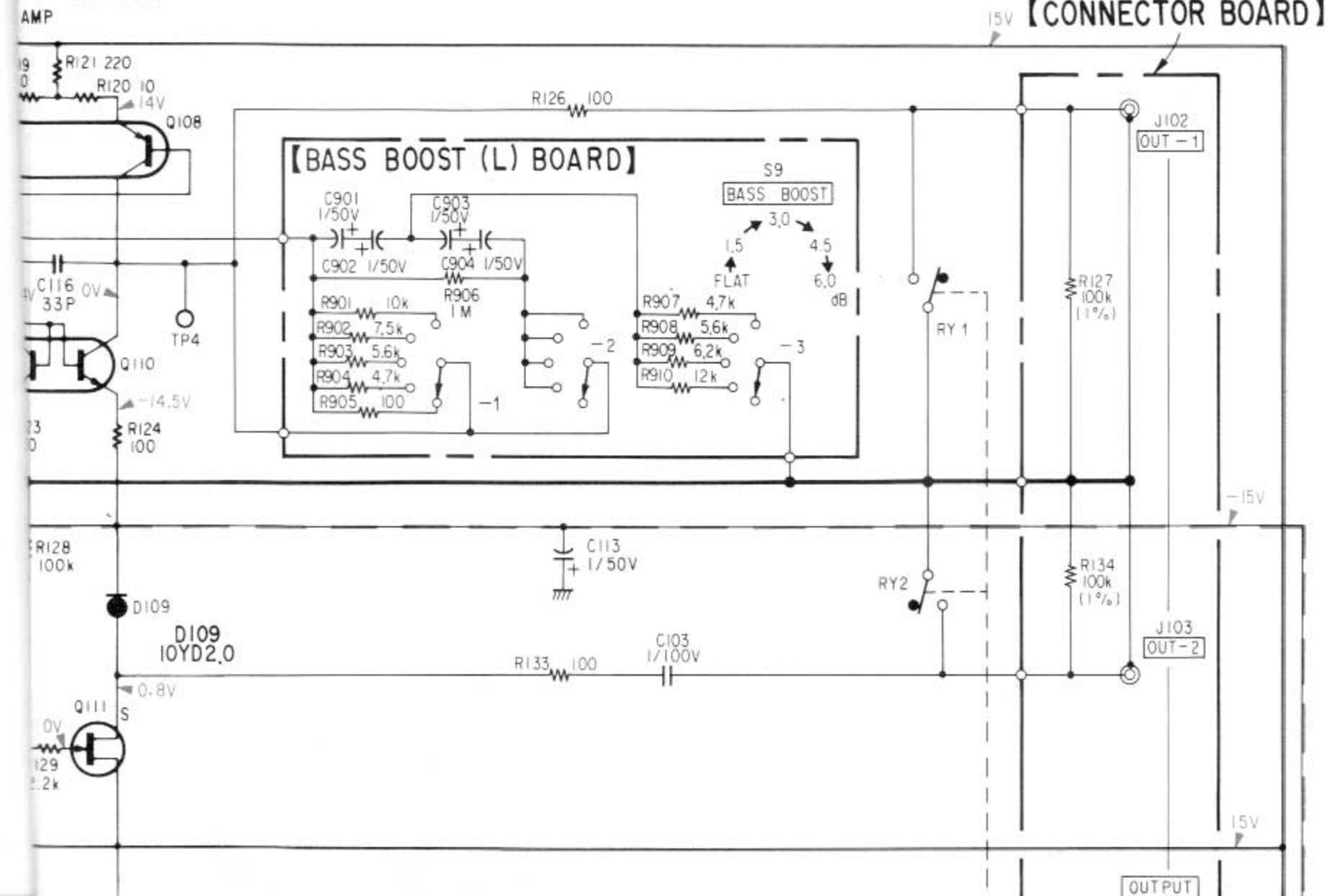
【UNIT(4A,4B)BOARD】

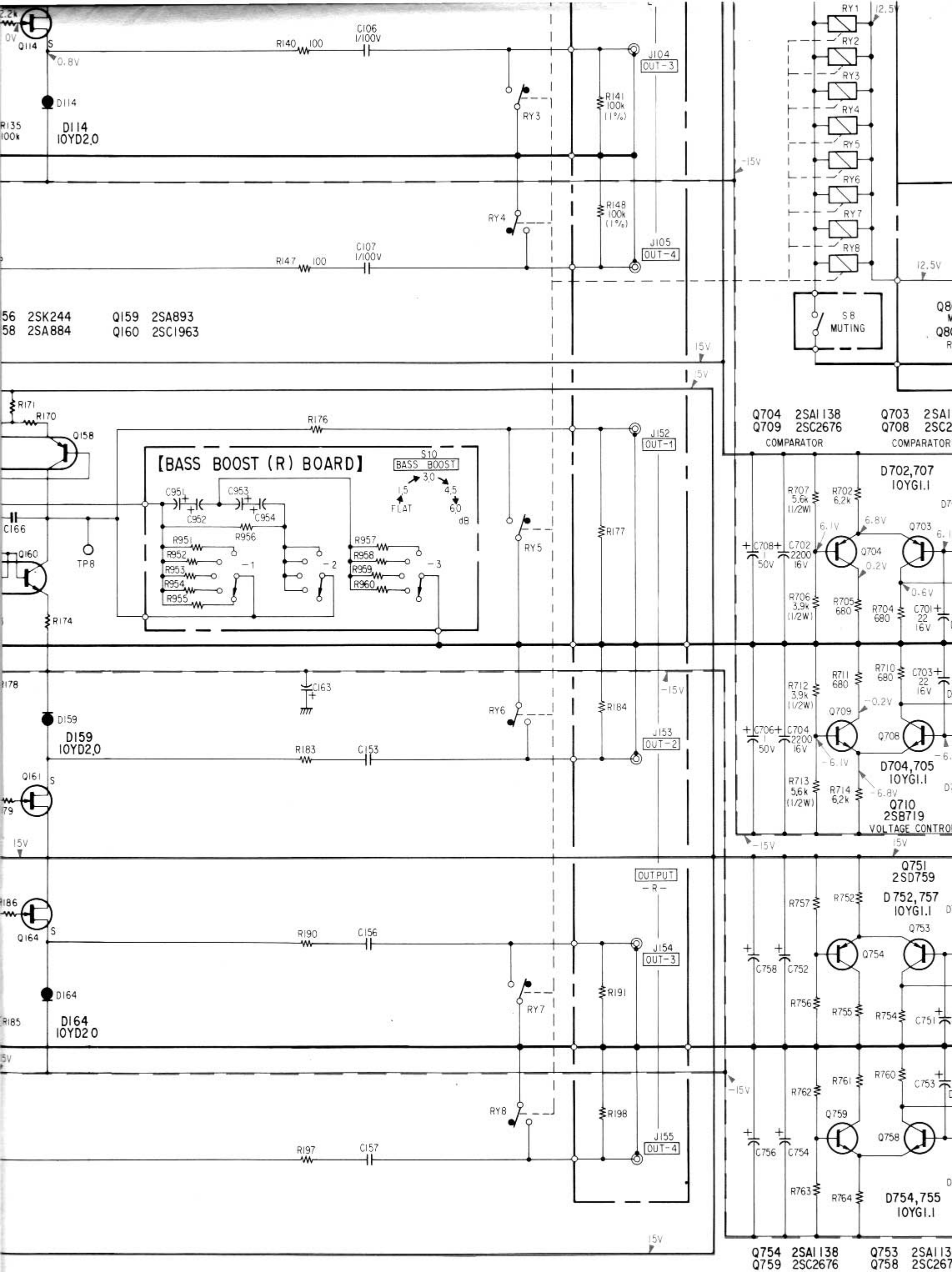


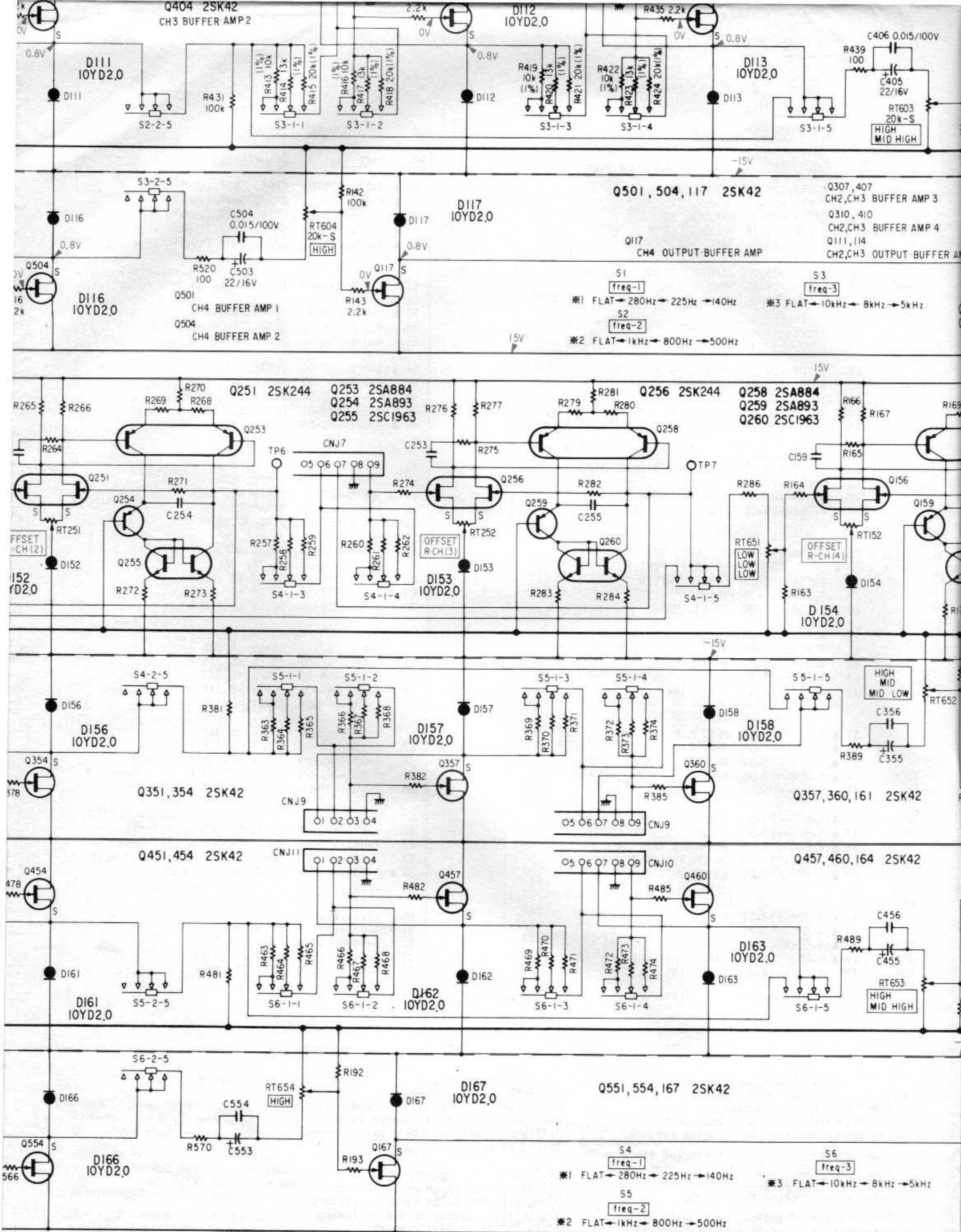
【MAIN BOARD】

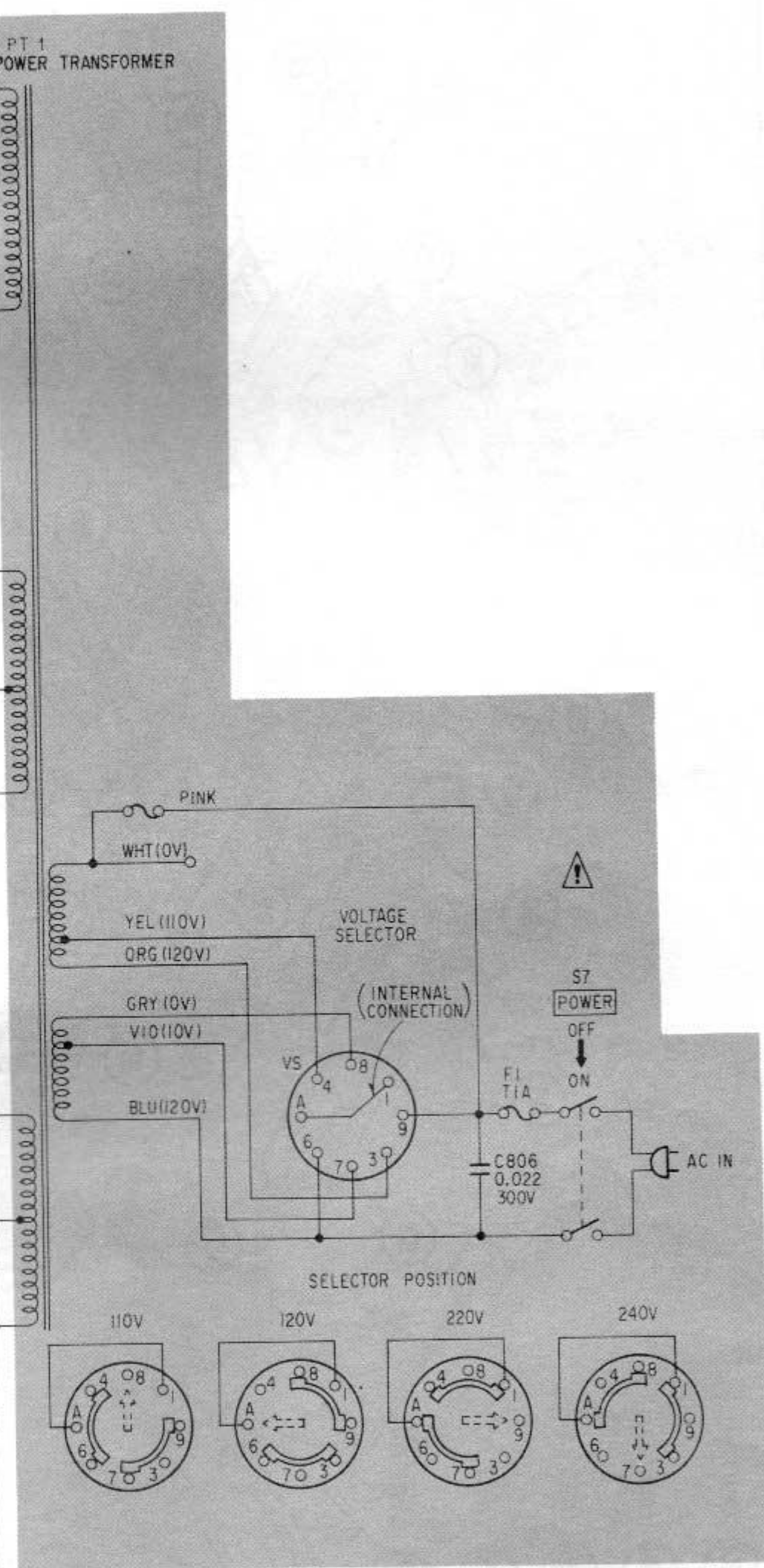
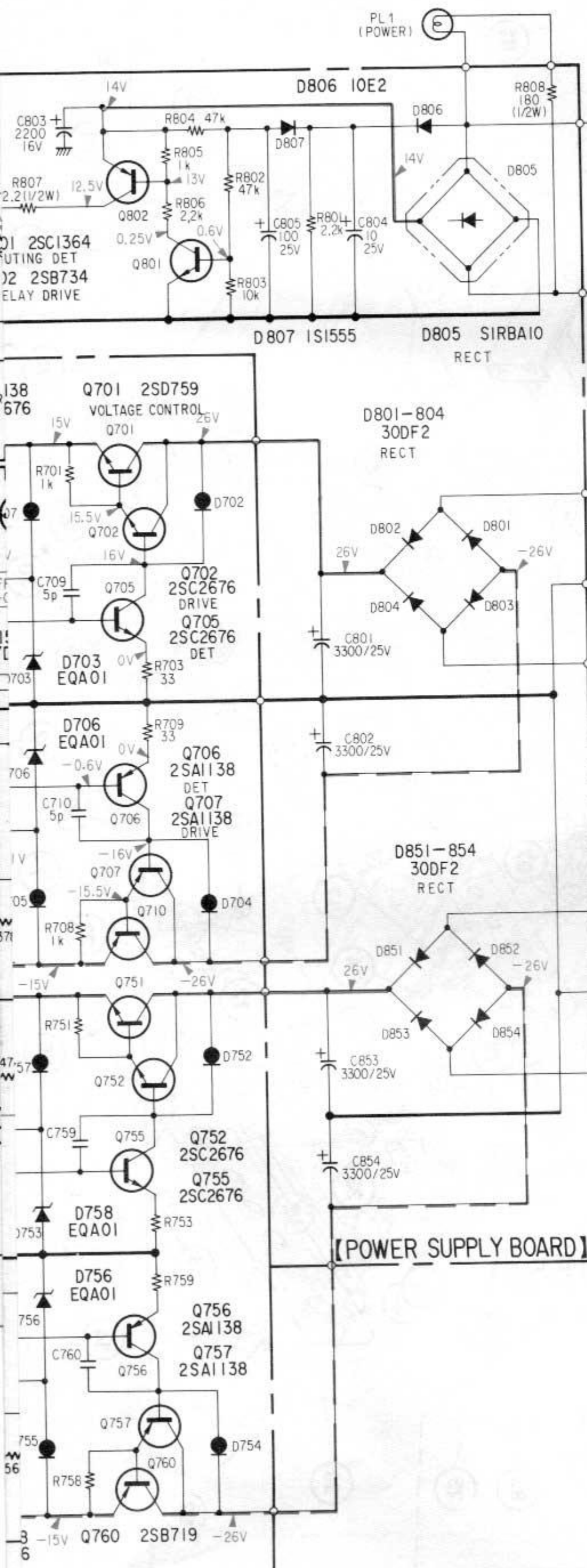


【CONNECTOR BOARD】









K

L

N

M

Frequency marked ※1 means that it is measured when UNIT 1 is used.
 Frequency marked ※2 means that it is measured when UNIT 2 is used.
 Frequency marked ※3 means that it is measured when UNIT 3 is used.

Note:

- Components for right channel have same values as for left channel.
- All capacitors are in μF unless otherwise noted. $\text{pF} : \mu\mu\text{F}$
 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, $\frac{1}{4}\text{W}$ unless otherwise noted.
 $\text{k}\Omega : 1000\Omega$, $\text{M}\Omega : 1000\text{k}\Omega$
-  : nonflammable resistor.
-  : panel designation.
-  : B+ bus.
-  : B- bus.
- Readings are taken under no-signal conditions with a VOM ($20\text{ k}\Omega/\text{V}$).

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

1

2

3

4

SECTION 4
DIAGRAMS

A

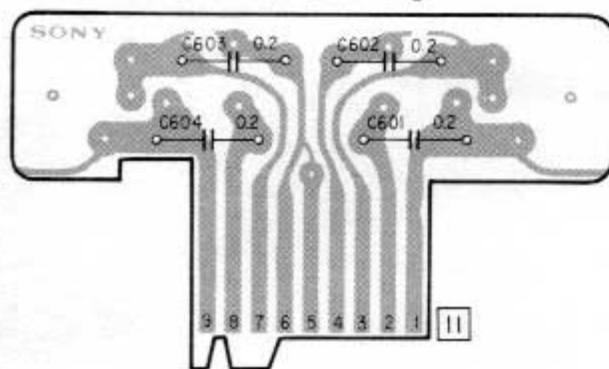
B

C

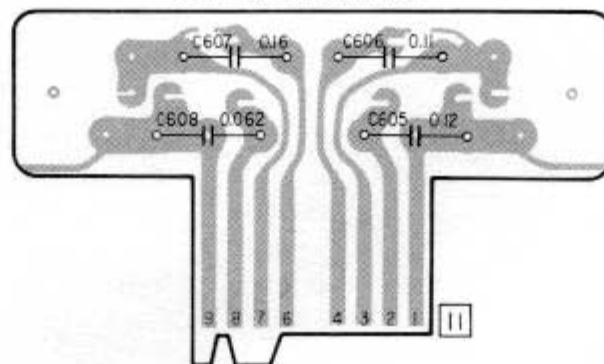
D

4-1. MOUNTING DIAGRAM

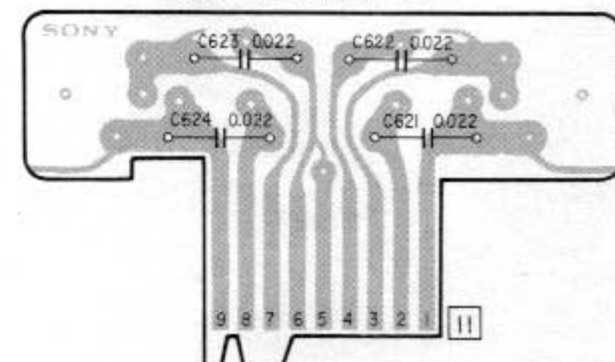
【UNIT(0A)BOARD】



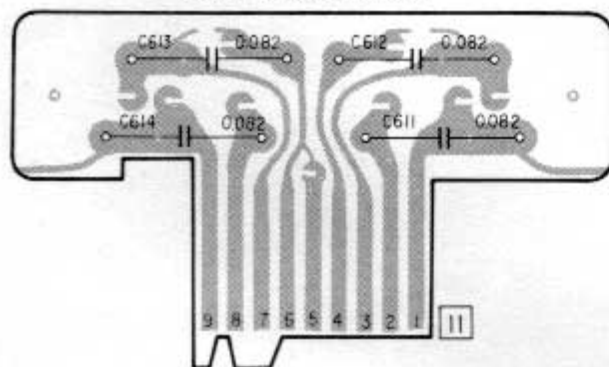
【UNIT(0B)BOARD】



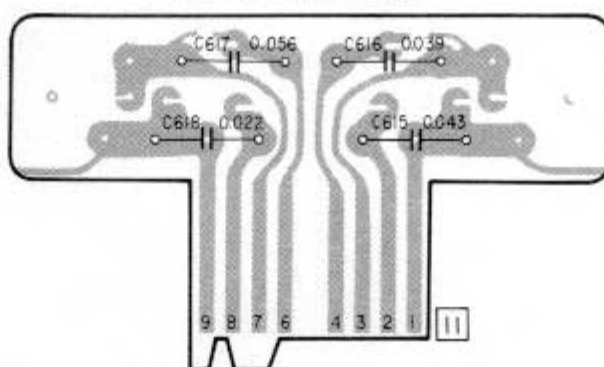
【UNIT(2A)BOARD】



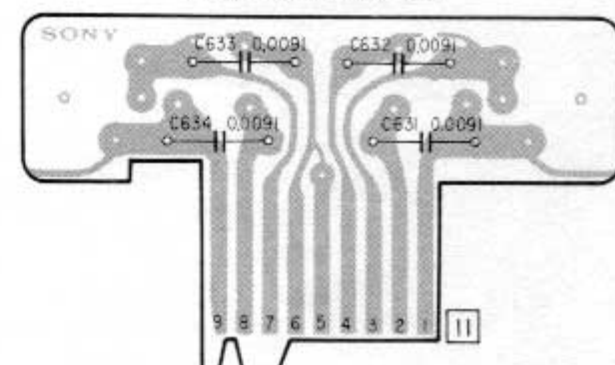
【UNIT(1A)BOARD】



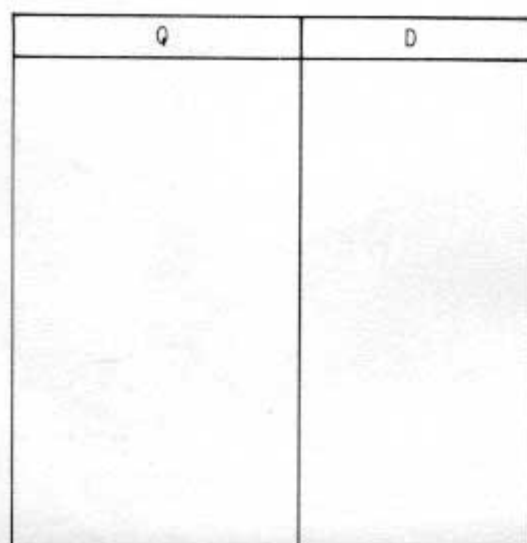
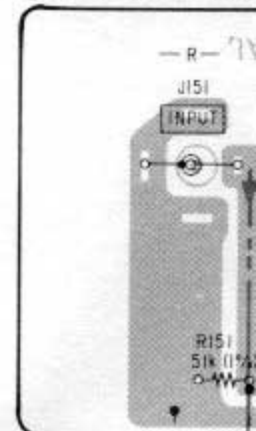
【UNIT(1B)BOARD】



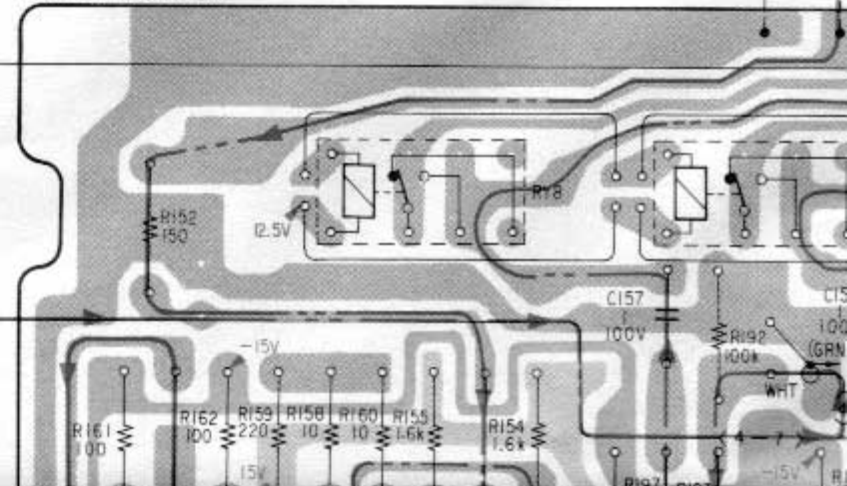
【UNIT(3A)BOARD】



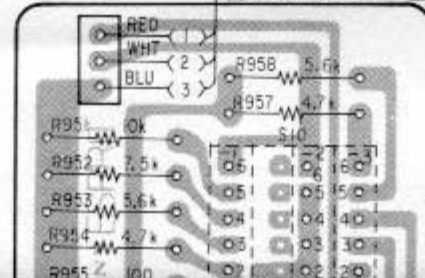
【CONNECTOR BOARD】

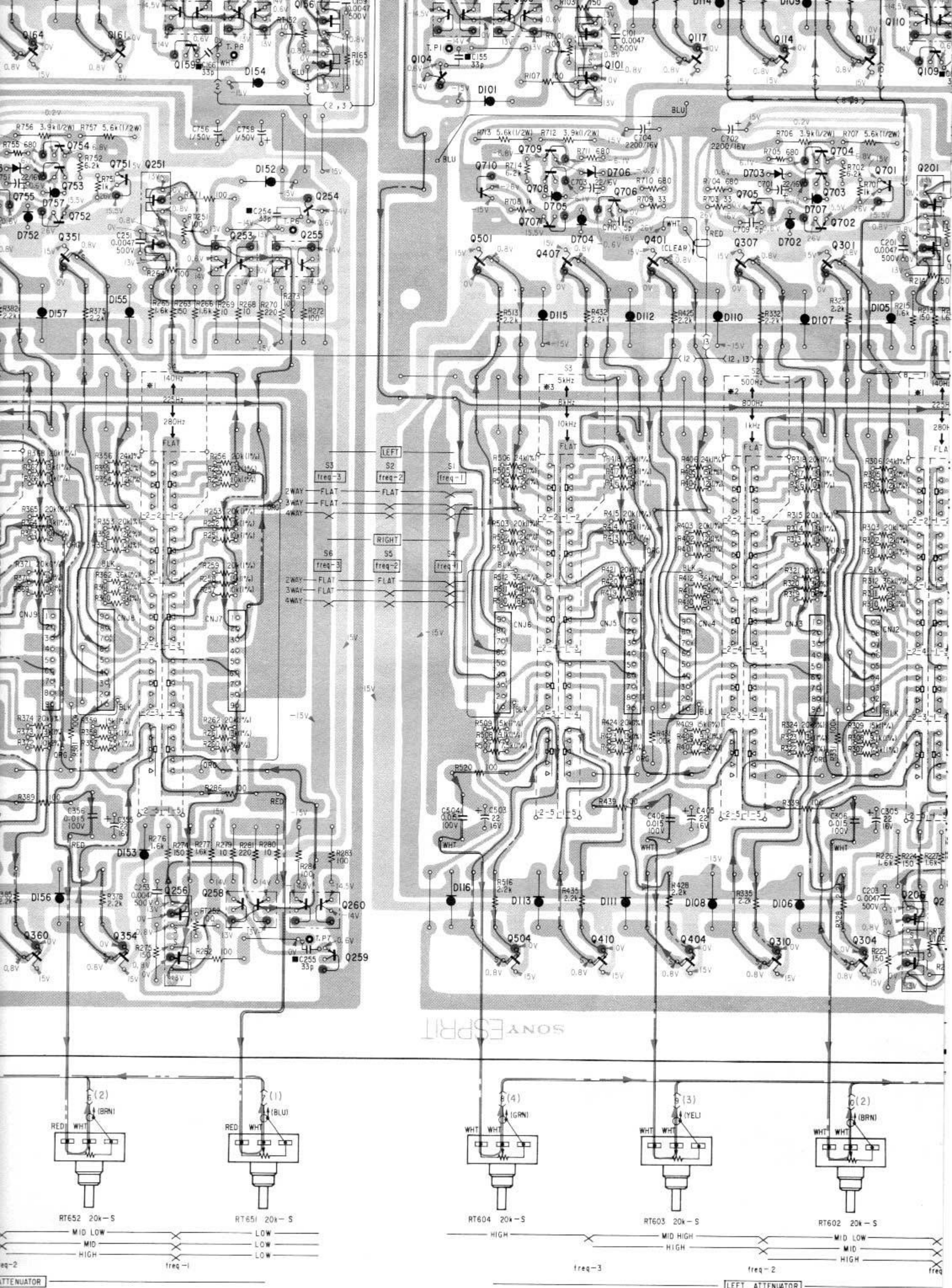


【MAIN BOARD】



【BASS BOOST (R) BOARD】





semiconductor Lead Layouts

84
93
364
634
40

B

1027R
634A

C B

1963

E
C
B

42-3

S D

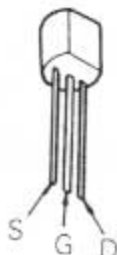
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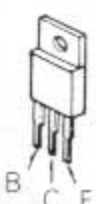
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2SB734
2SC2676



2SC945



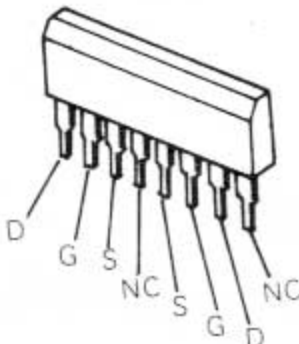
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2SB720
2SD759
2SD760



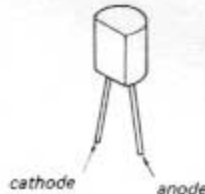
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10E-1
10E-2
30DF2
EQA01-06T2
RM-1Z
SIB01-02



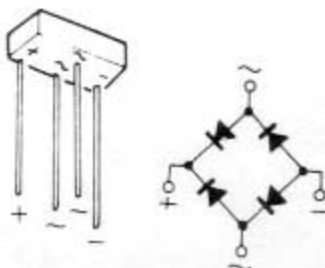
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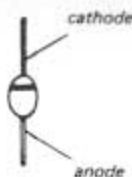
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10YG1.1
10YG1.5
10YD2.4A



SIRB10
SIRBA10

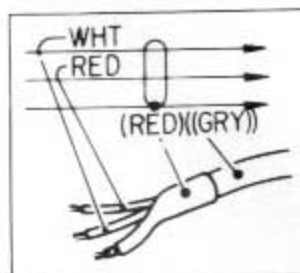


V06C

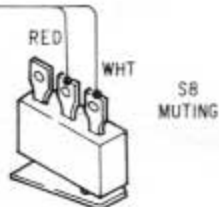
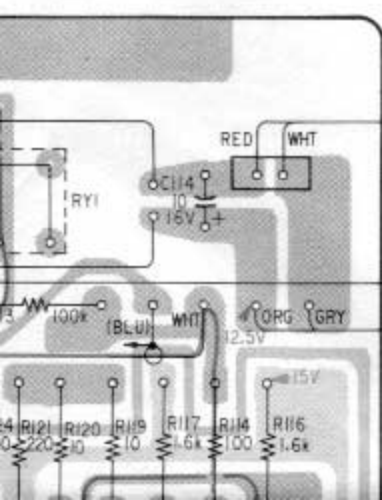


Note:

- Color code of sleeving over the end of the jacket.



- : B+ pattern
- : B- pattern
- : signal path
- : L-CH signal path
- : R-CH signal path

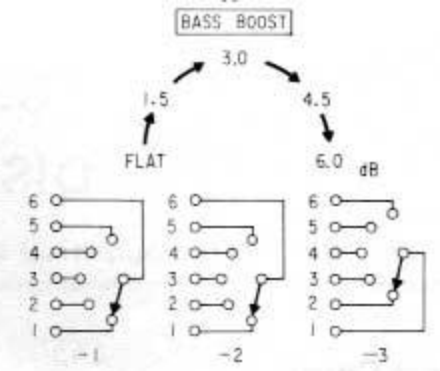
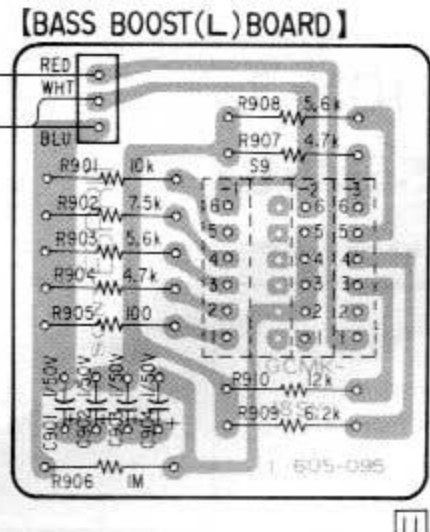
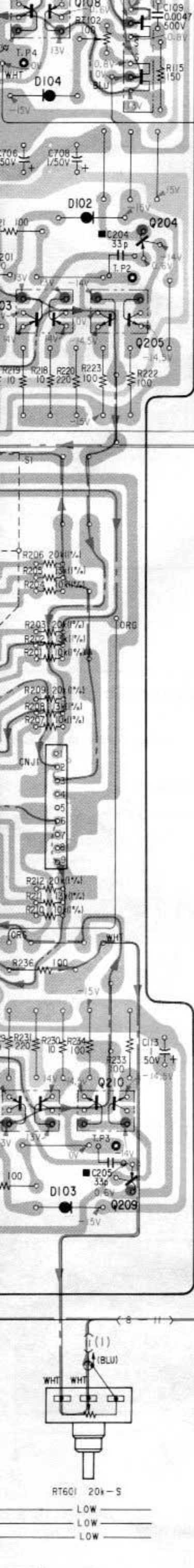


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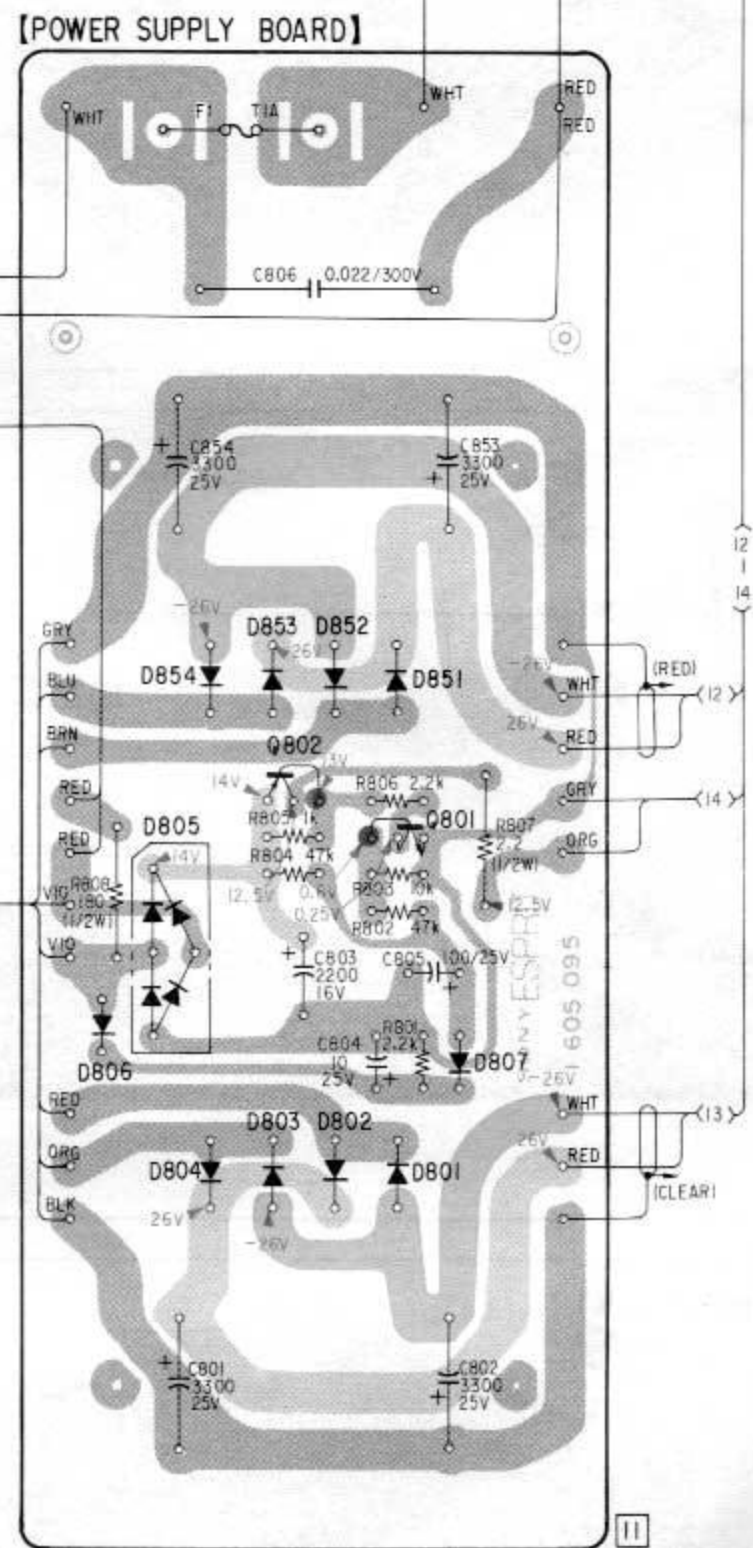
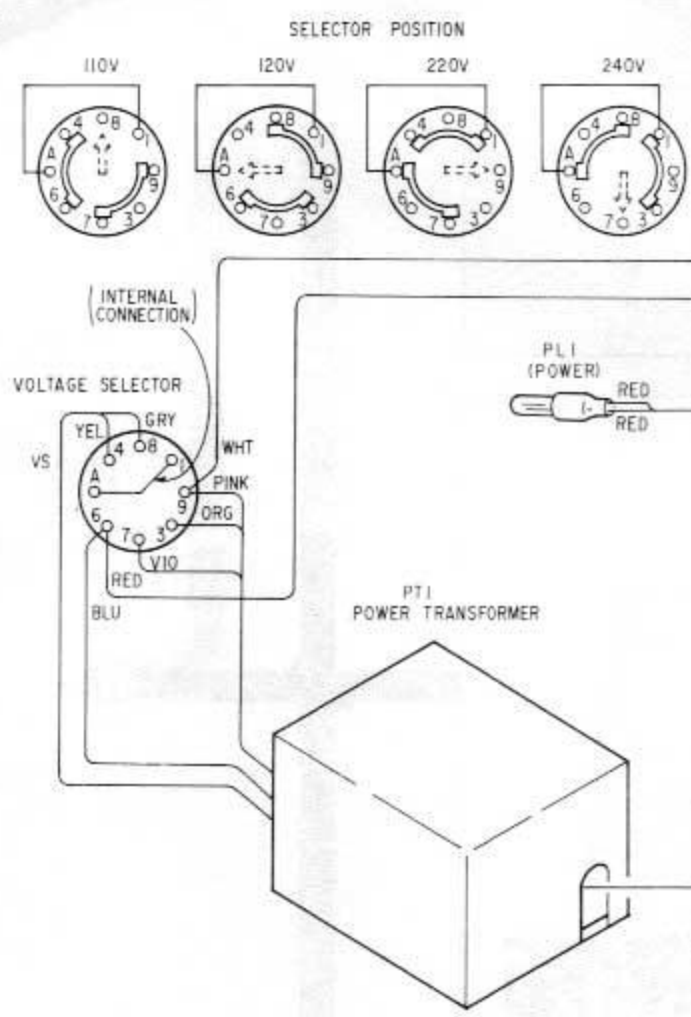
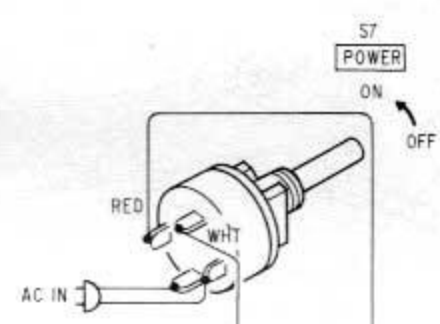
2

3

4



5



Q	802	801
D	806 805 804 803 802 801	807