

SERVICE MANUAL

STEREO TUNER

TX-9100

FW, KUW, KCW, FVZW

NOTE:

MODEL TX-9100 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Round label on rear panel	Voltage	Type
KUW	120V only	UL approved (U.S.A.)
KCW	120V only	CSA approved (Canada)
FVZW	5-position selector	FTZ approved (West Germany)
FW	5-position selector	General export model

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MISCELLANEOUS

Power Requirements	AC 120V 60Hz or AC 110V, 120V, 130V, 220V and 240V 50/60Hz
Power Consumption	30W
AC Outlet	Unswitched 1
Dimensions	430(W) x 138(H) x 345(D)mm 16-15/16(W) x 5-7/16(H) x 13-9/16(D) in.
Weight Without Package	8.9kg, 19lb 10oz
With Package	10.9kg, 24lb

FURNISHED PARTS

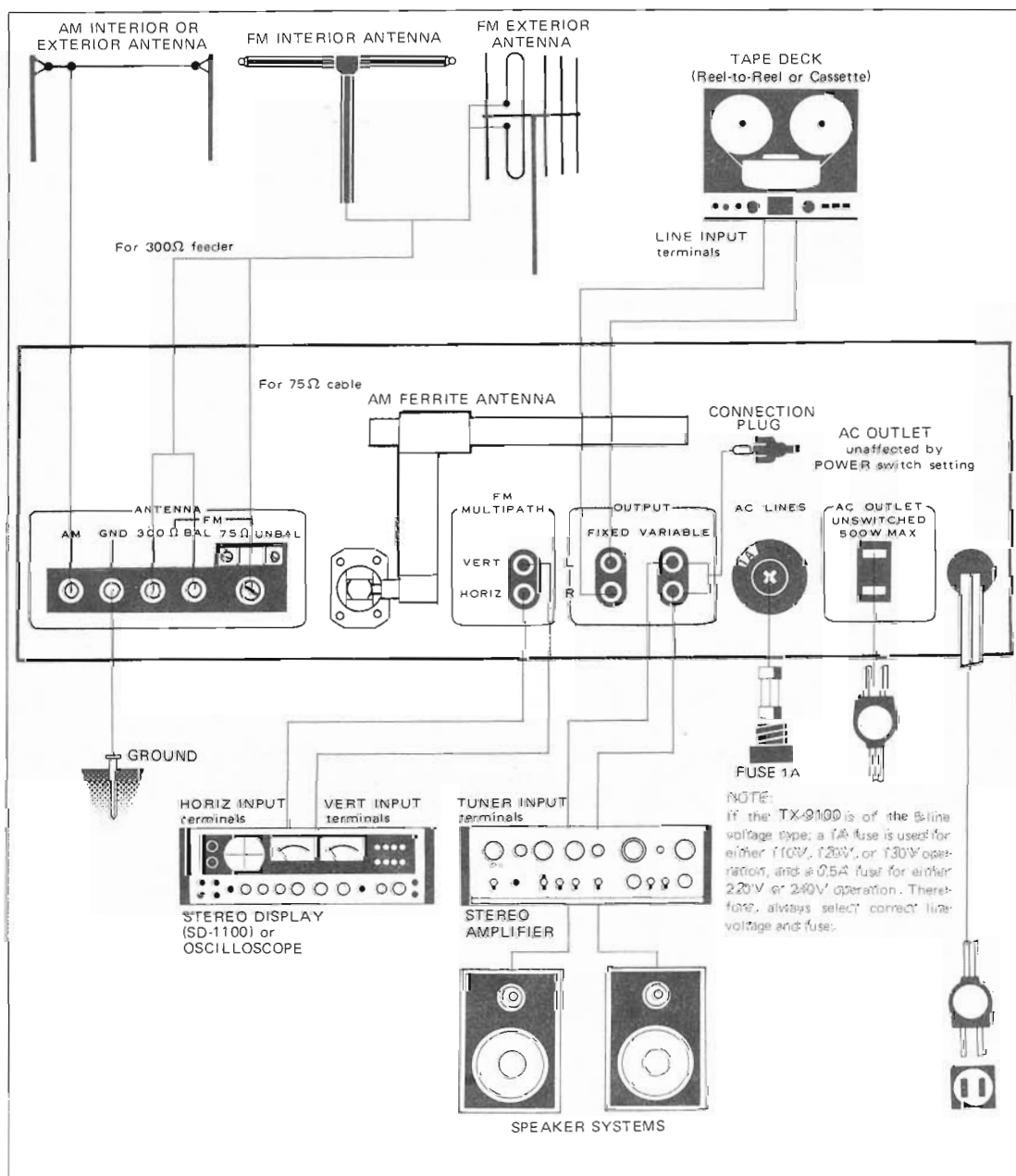
FM T-type Antenna	1
Connection Cord with Pin Plugs	1
Polishing Cloth	1
Operating Instructions	1
Fuse 0.5A	1
Fuses 1.0A (5-line voltage model only)	2

NOTE:

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



2. CONNECTION DIAGRAM



3. FRONT PANEL FACILITIES

POWER SWITCH

Move up to ON to power the set, down to turn it OFF.

SIGNAL METER

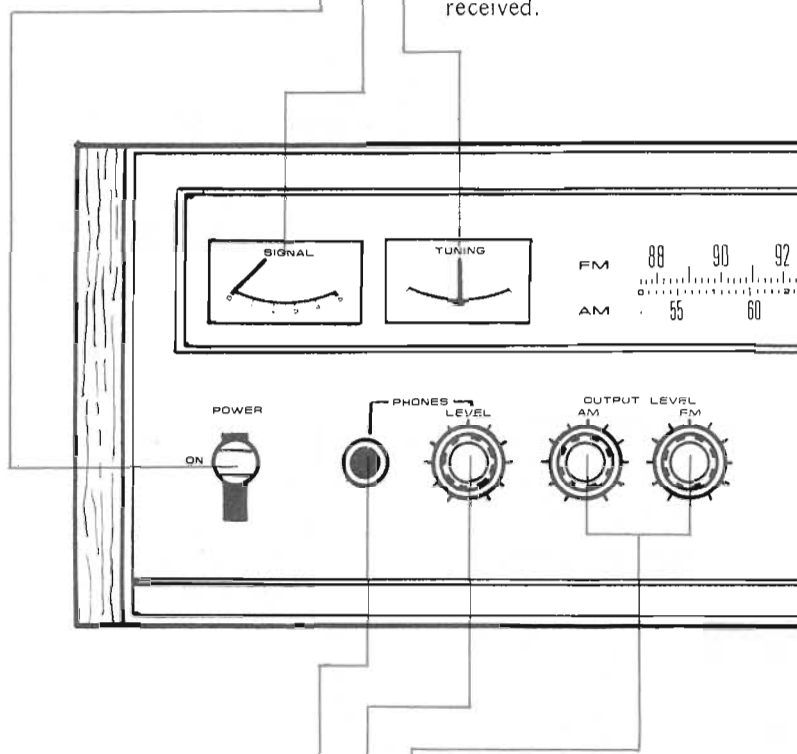
Optimum AM or FM reception needle swings to the extreme right.

TUNING METER

Works together with the SIGNAL METER for accurate tuning (needle cast tuning to indicate precise frequency position).

FM STEREO INDICATOR

When the FUNCTION switch is set to FM, the stereo indicator lamp lights whenever an FM stereo signal is received.



HEADPHONE JACK

Accepts stereo headphones connection cord. Useful for listening without disturbing others.

HEADPHONE OUTPUT LEVEL KNOB

Regulates the volume heard through the headphones. Turn to the right to increase the volume.

FUNCTION SWITCH

Used to select the type of broadcast:
AM For AM broadcast
FM AUTO . . . For normal FM reception
FM MONO . . . For monophonic reception
FM STEREO . . For stereo FM reception
FM AUTO . . . For normal FM reception with automatic switchover to mono when a weak signal is received

AM AND FM OUTPUT LEVEL KNOBS

Control the volume of the signal (VARIABLE) terminals on the speaker. Separate controls for AM and FM. Turn to the right to increase the volume.

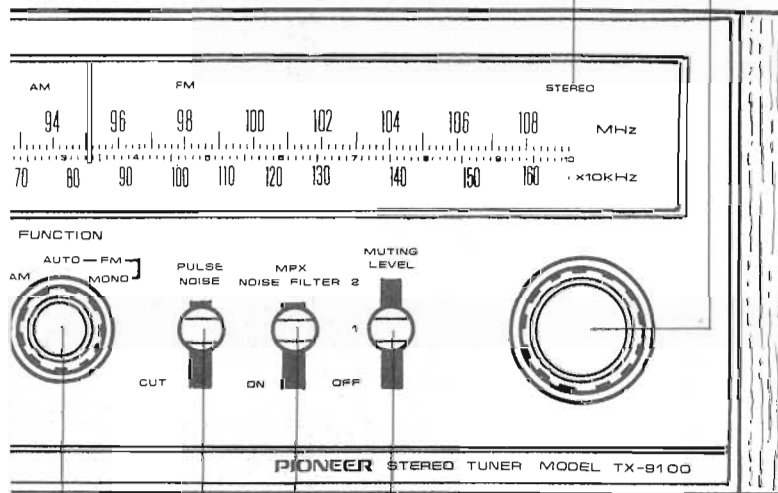
is obtained when the
t.

meter during FM broad-
station alignment (center

is set to FM AUTO this
tereo broadcast is being

TUNING KNOB

Used to tune in both AM and FM stations.



FM MUTING LEVEL SWITCH

In general, used to cut out unpleasant noise between
stations when tuning in an FM broadcast.

2: To tune in a strong signal station.

1: Use this setting when the (2) setting cancels the
desired station along with the noise.

OFF: Switch off once the station is found.

MPX NOISE FILTER SWITCH

Switch on to cut high-frequency noise during FM stereo
broadcast reception.

PULSE NOISE SWITCH

Cuts pulse noise, such as that from automobile ignitions,
etc., without affecting the FM broadcast signal.

ast reception.

t reception.

reception. Provides auto-
to stereo when a stereo

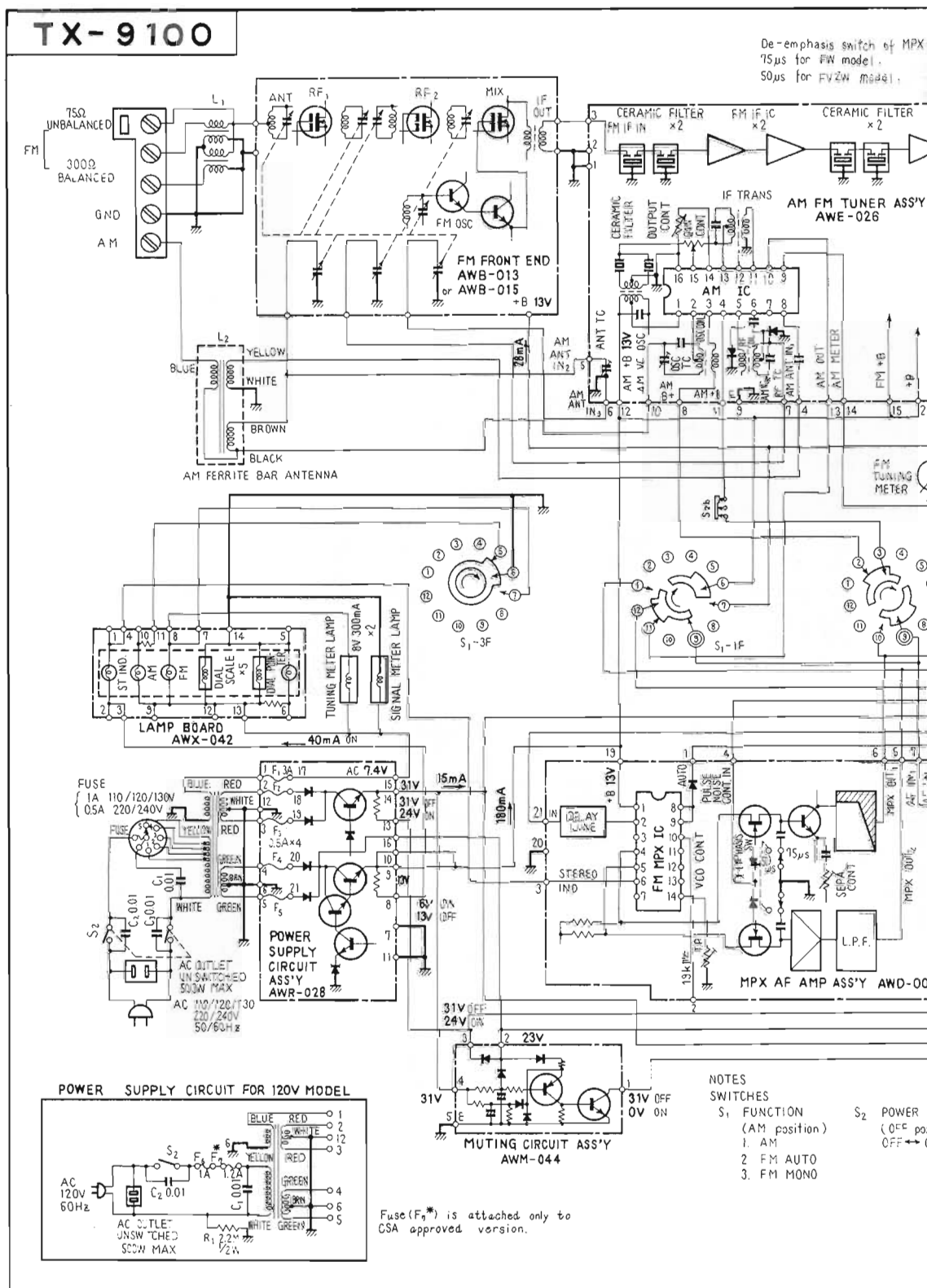
reception of both mono
gnals.

EL KNOBS

nal from the OUTPUT
ear panel.

FM signals. Turn to the

4. BLOCK DIAGRAM



IN OHM, $\frac{1}{4}W$, $\pm 5\%$ TOLERANCE UNLESS OTHERWISE NOTED. K: K Ω , M: M Ω .

IN μF UNLESS OTHERWISE NOTED. P: pF

→ : DC CURRENT AT NO INPUT SIGNAL .
V : DC VOLTAGE AT NO INPUT SIGNAL .
V : SIGNAL VOLTAGE AT 100% MOD .

5. CIRCUIT DESCRIPTION

5.1 MUTING CIRCUIT

The block diagram in Fig. 1 shows the basic function of this circuit. The signal path is grounded when the relay contacts are closed.

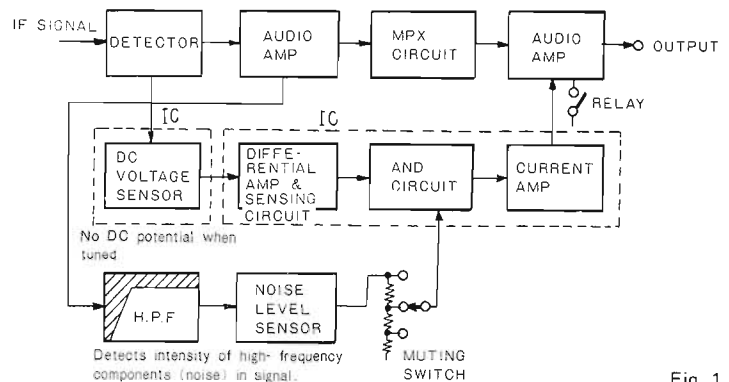


Fig. 1

5.2 MPX DECODER CIRCUIT

The MPX decoder is a radically new design operating on the PLL (phase locked loop) principle; it has no capacitances or inductances. Its function is evident from the block diagram in Fig. 2. VCO stands for Voltage Control Oscillator — its oscillation frequency varies with the supplied input voltage. Adjust the free-running frequency control so that the frequency becomes 76kHz (19kHz at the TP terminal) when no signal is present.

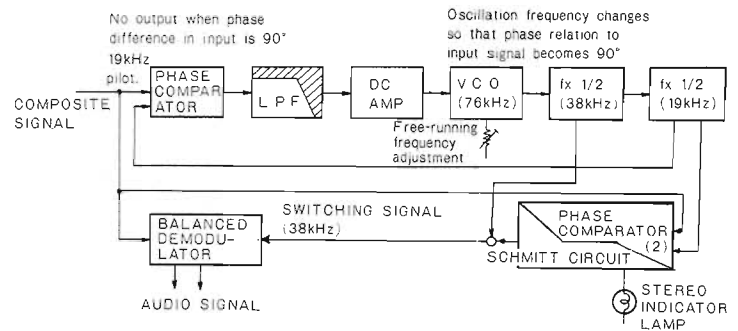


Fig. 2

5.3 PULSE NOISE SUPPRESSOR

The Pulse Noise Suppressor (PNS) circuit is included to eliminate pulse-type noise signals as caused by automobile ignitions etc. Fig. 3 shows the block diagram of this circuit. The circuit is so designed that it will not function when a very weak signal with considerable inherent noise is being received.

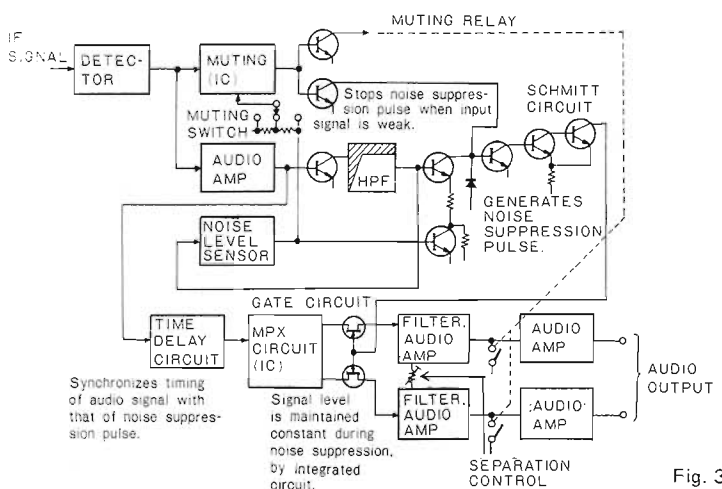
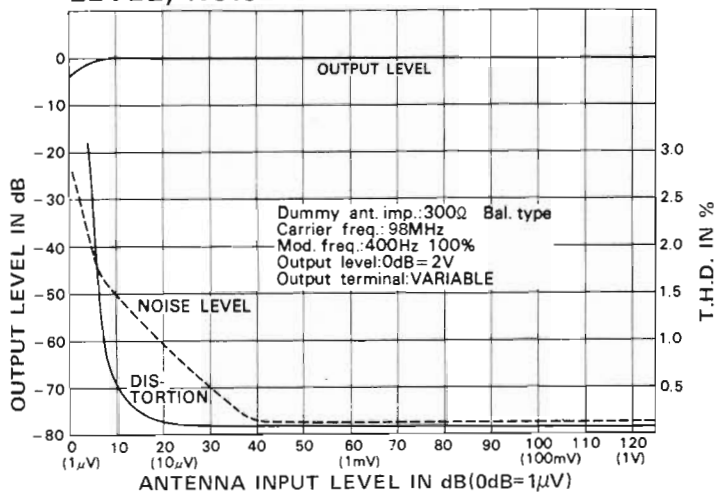


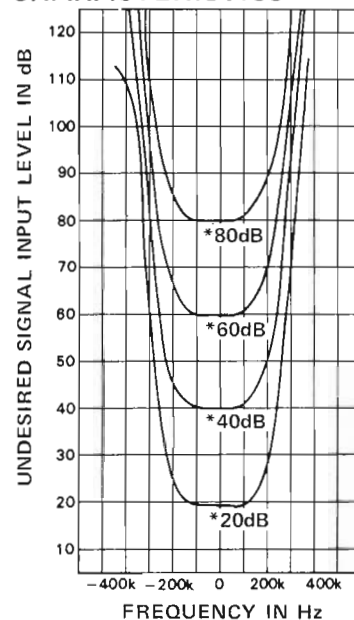
Fig. 3

6. TUNER CHARACTERISTICS

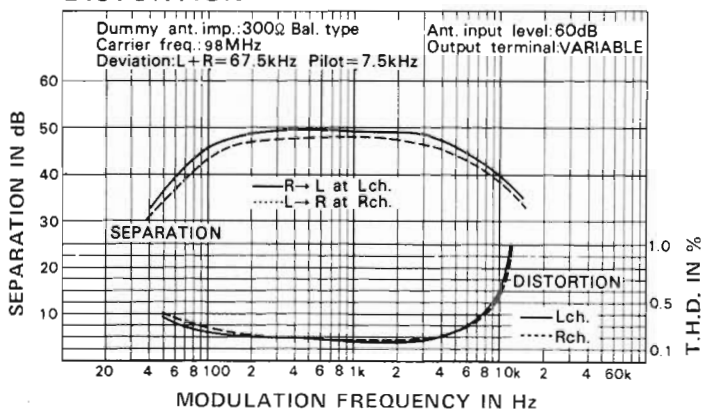
ANTENNA INPUT LEVEL vs. OUTPUT LEVEL, NOISE & DISTORTION



FM USABLE SELECTIVITY CHARACTERISTICS

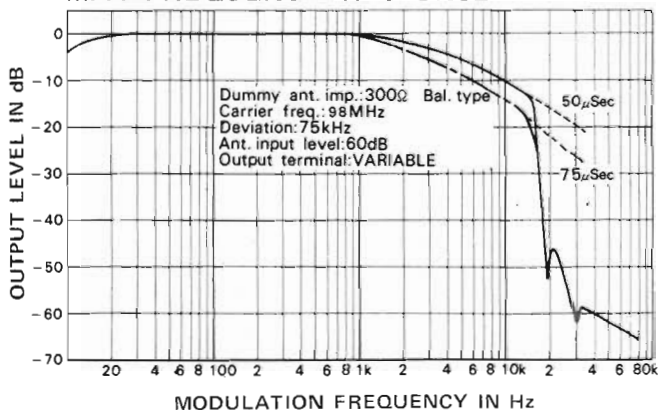


MPX FREQUENCY vs. SEPARATION & DISTORTION



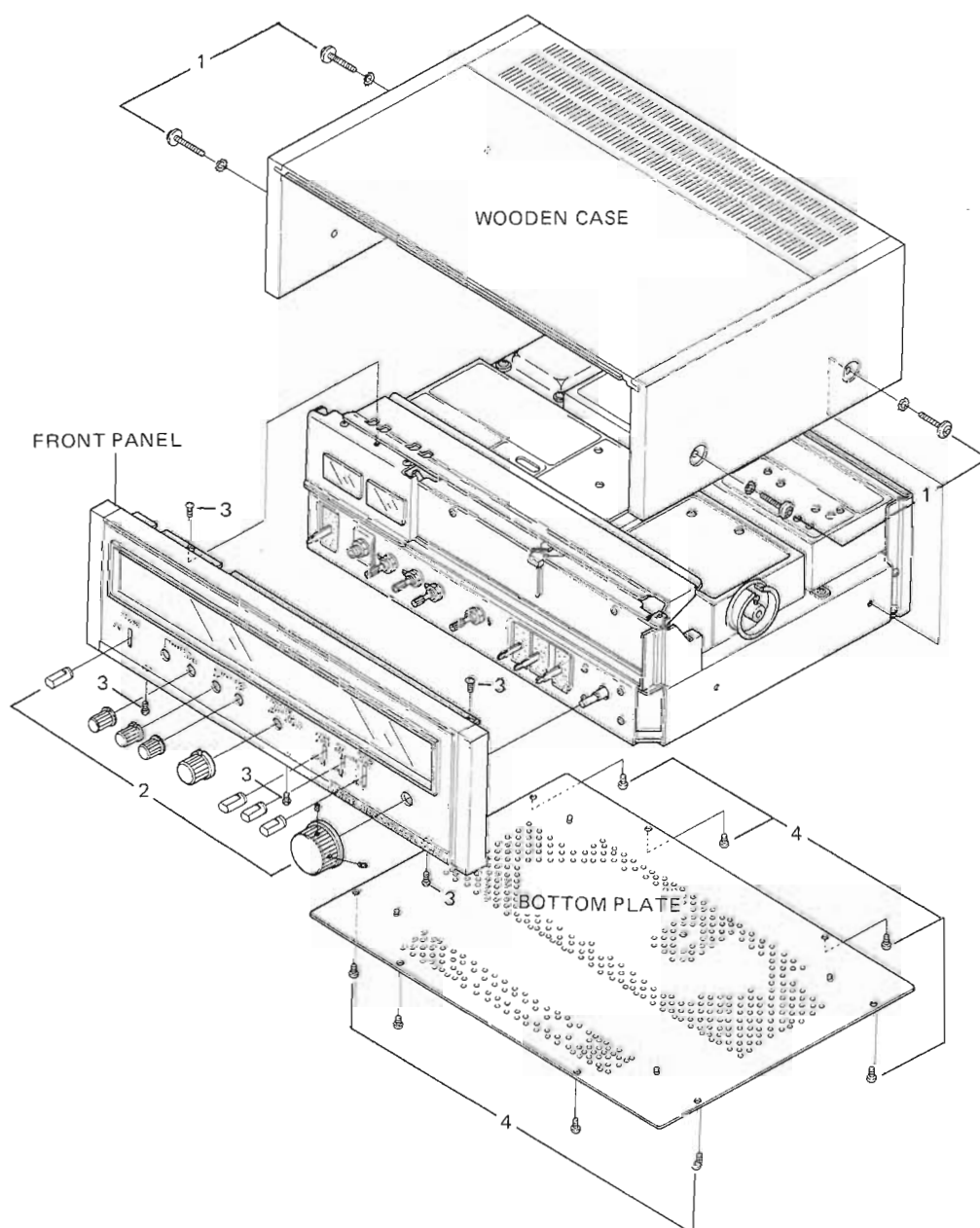
Dummy ant. imp.: 300Ω Bal. type
Carrier freq.: 98MHz
Output terminal: VARIABLE
Undesired/desired signal output ratio: -30dB
Undesired signal: 400Hz 100% Mod.
* DESIRED SIGNAL LEVEL

MPX FREQUENCY RESPONSE



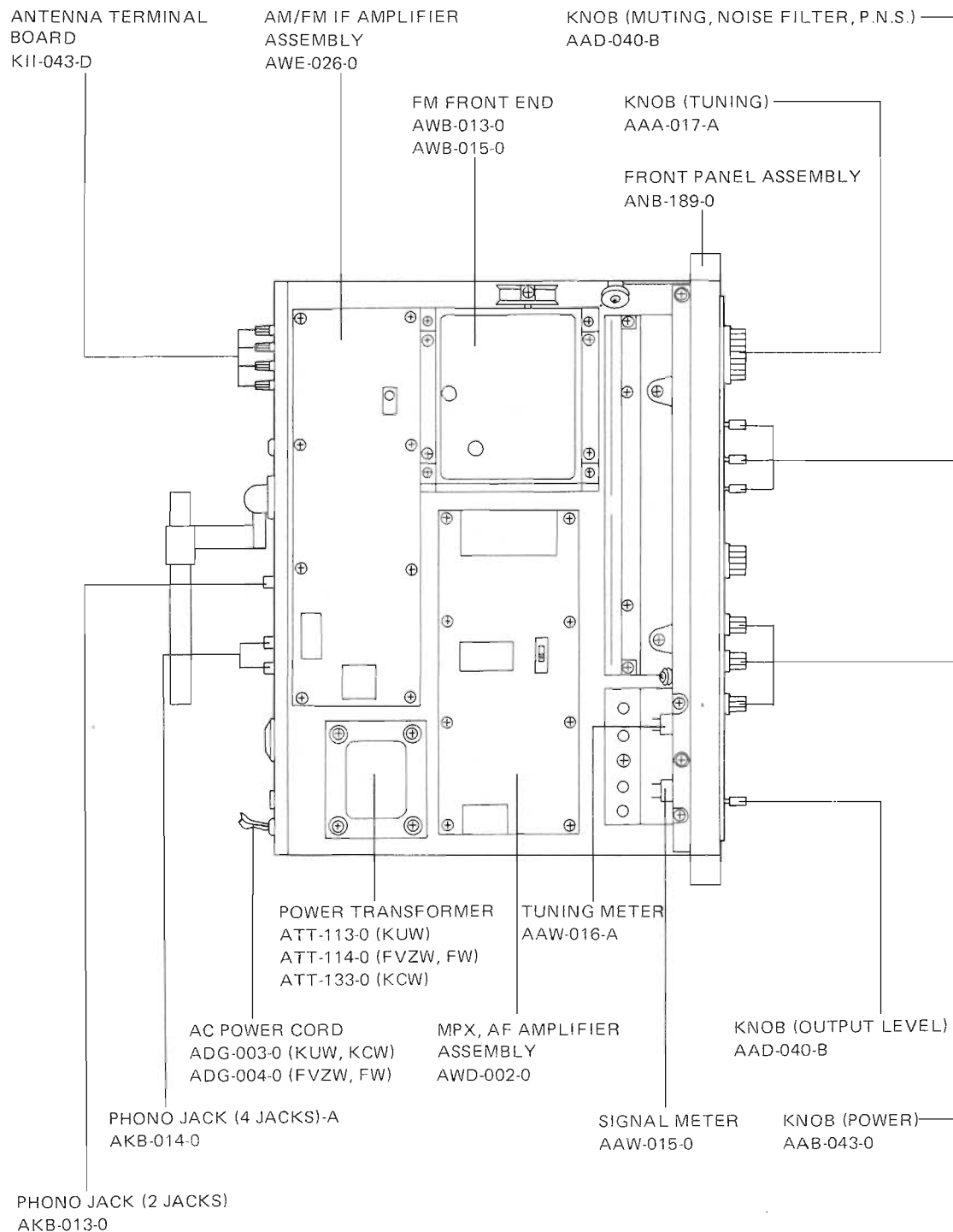
7. DISASSEMBLY PROCEDURE

1. To remove the wooden case, first remove the two screws in each side of the wooden case, then lift up the case by its rear edge.
2. Pull off all knobs. To remove the TUNING knob, first loosen the two screws, then remove the knob, using a hex wrench.
3. The front panel can be pulled off after removing five screws — two in its top edge, three in its bottom edge.
4. For removal of the bottom plate, a total of eight screws have to be removed.

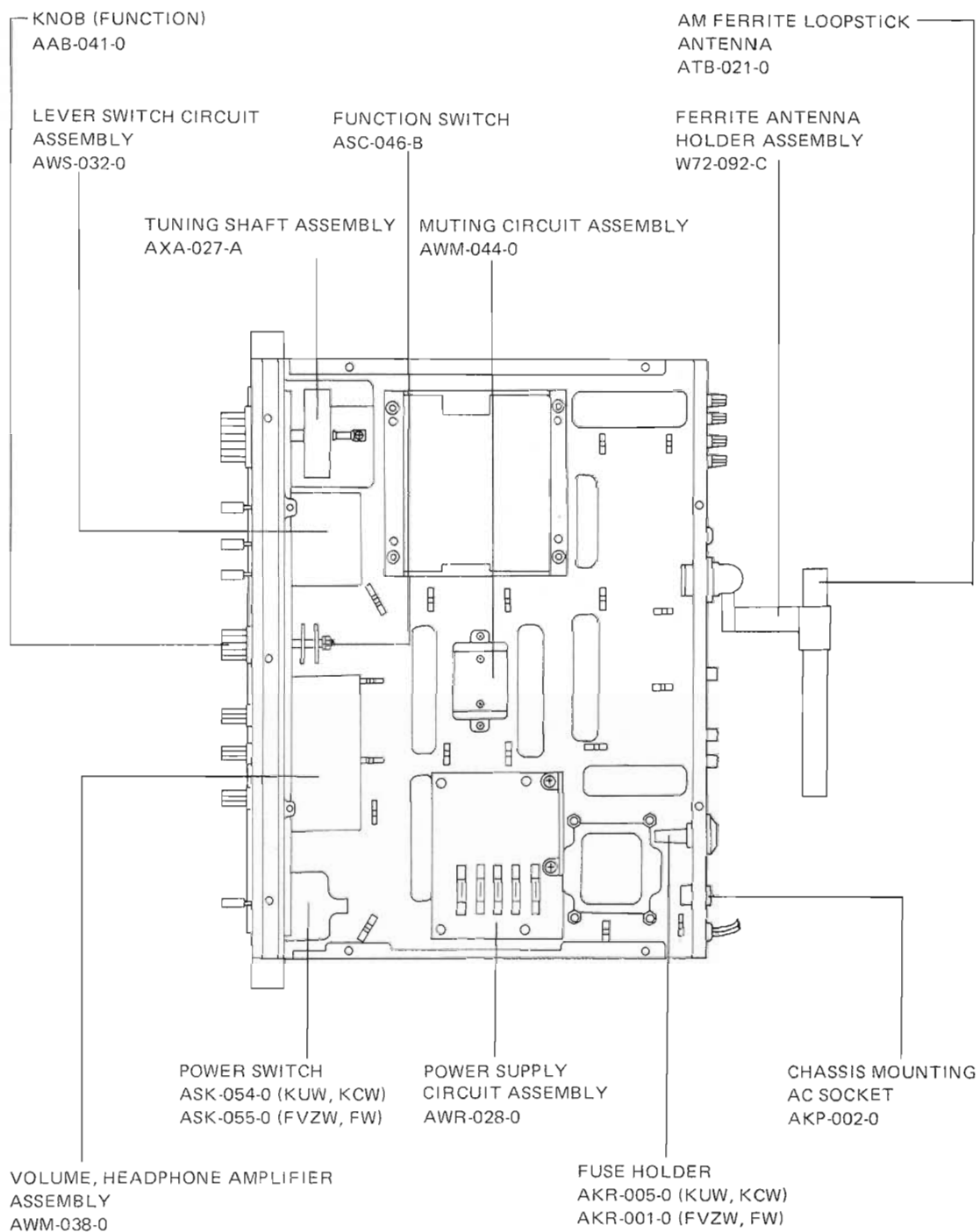


8. PARTS LOCATION

8.1 TOP VIEW

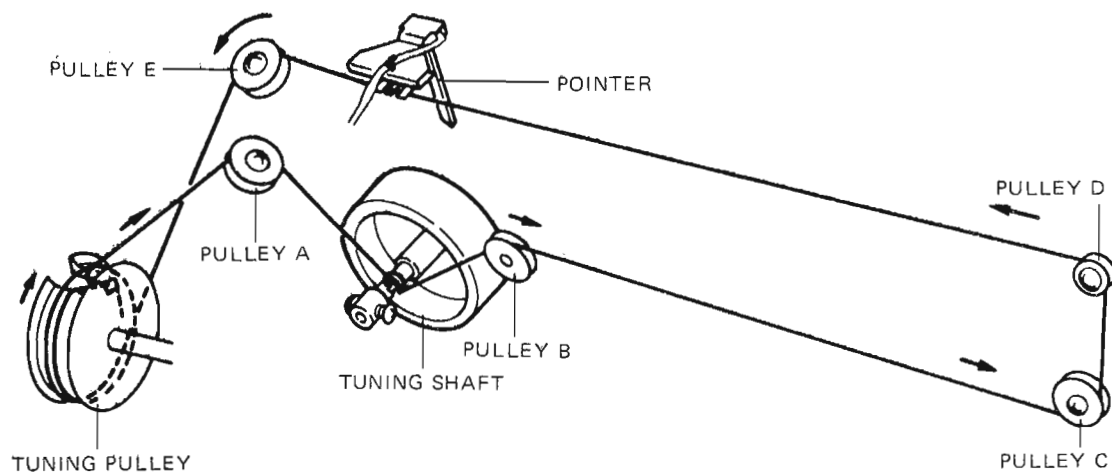


8.2 BOTTOM VIEW



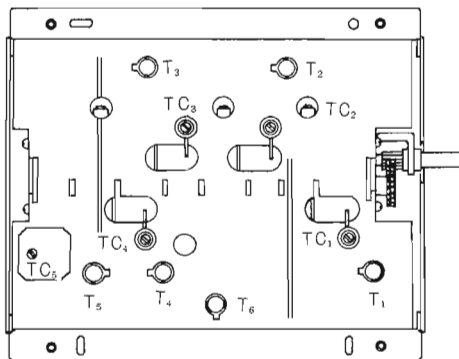
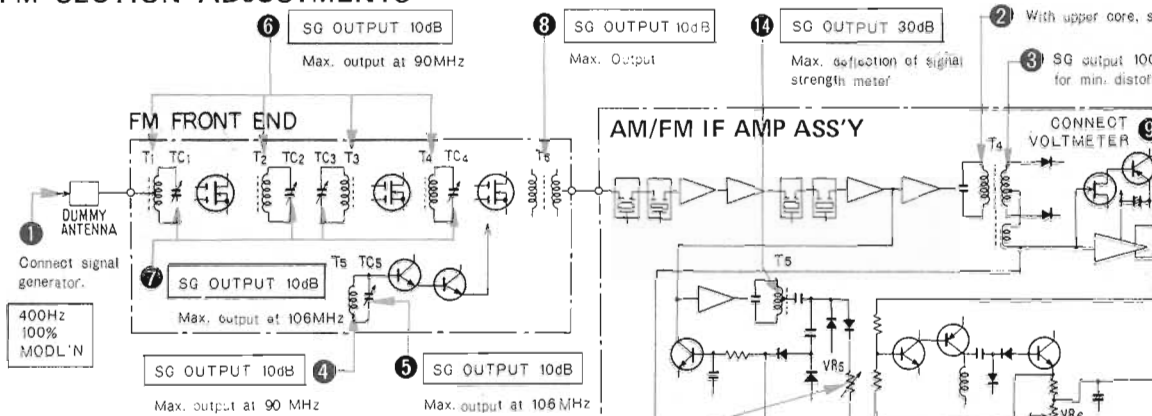
9. DIAL STRINGING PROCEDURE

1. Turn the tuning knob so that the plates of the tuning capacitor are fully extended.
2. Fasten one end of the string to the spring on the tuning pulley.
3. Lead the string around pulley A, then wind it three turns around the tuning shaft.
4. Lead the string around pulleys B, C, D and E, then wind it one and a half turns around the tuning pulley.
5. Tie the other end of the string to the spring on the tuning pulley. Turn the tuning shaft to confirm proper functioning, then cut off excess string.
6. Put the tuning capacitor in fully retracted position. Move the dial pointer to the starting point at the left end of the dial scale and fasten it to the string.

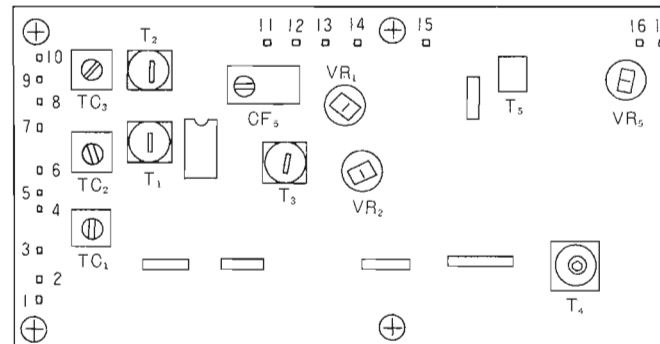


10. ADJUSTMENTS

FM SECTION ADJUSTMENTS

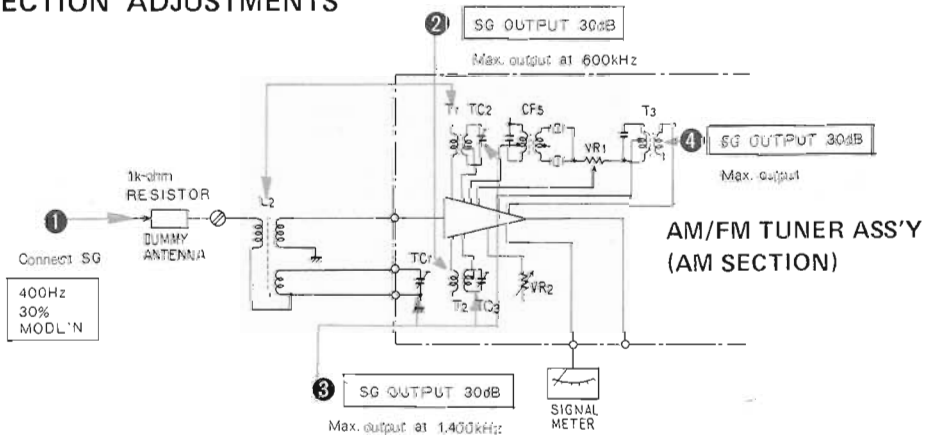


FM FRONT END



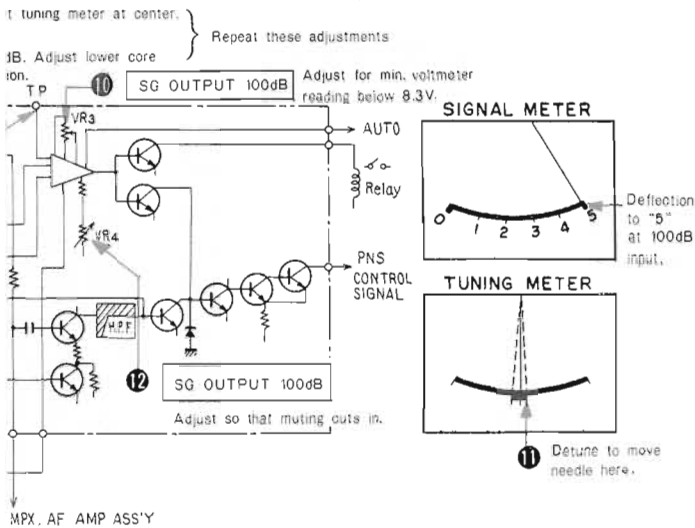
AM/FM IF AMP ASS'Y

AM SECTION ADJUSTMENTS

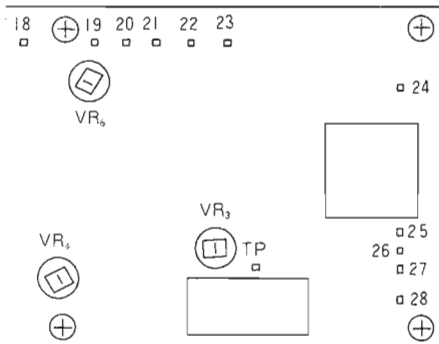
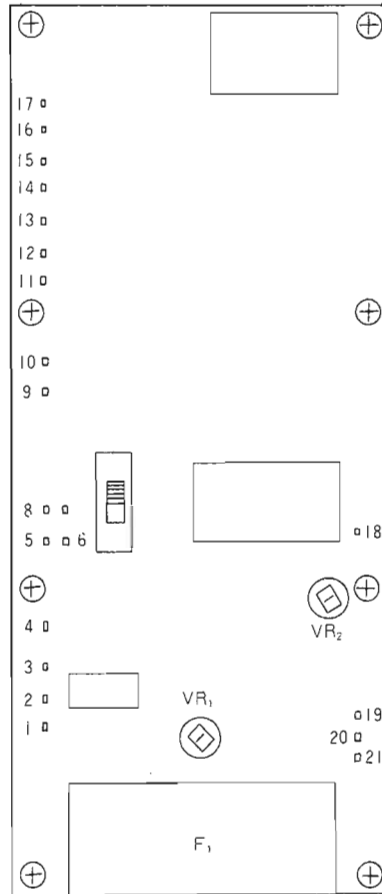


Repeat steps 2 and 3

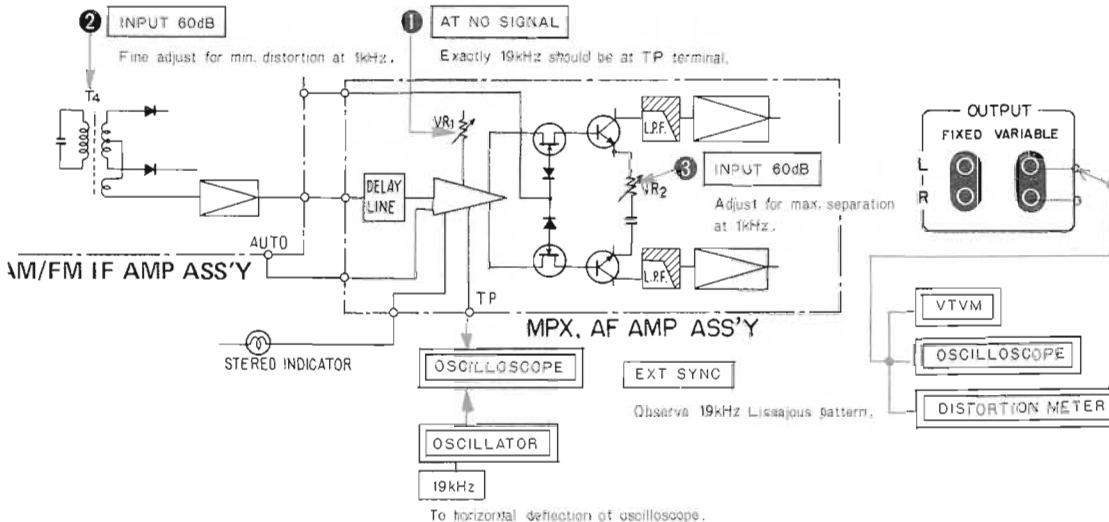
NOTE CONNECT VOLTMETER, OSCILLOSCOPE AND DISTORTION METER TO VARIABLE OUTPUT. TURN OUTPUT LEVEL TO MAX. NUMBERS IN DIAGRAM GIVE ORDER OF ADJUSTMENT STEPS.



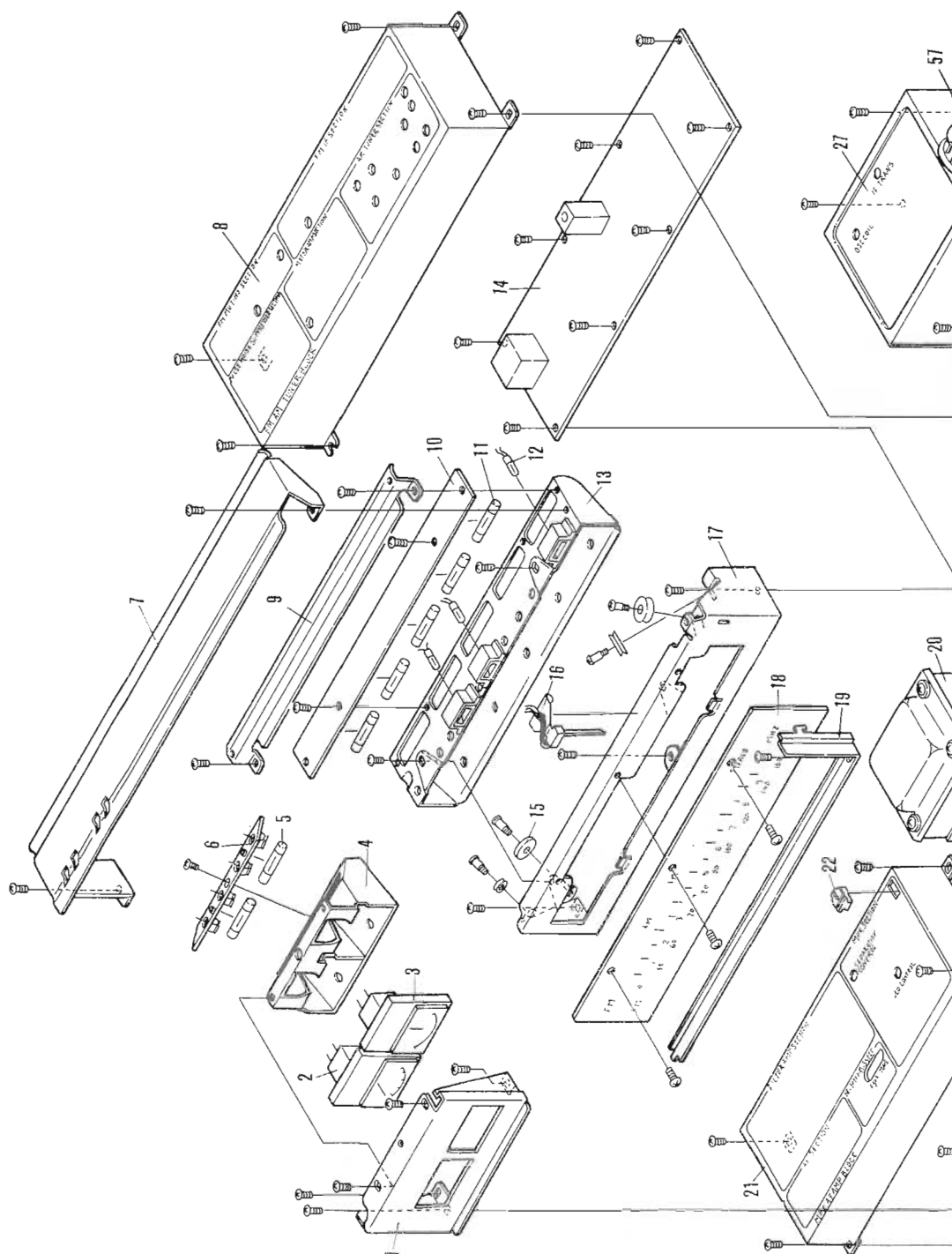
MPX, AF AMP ASS'Y

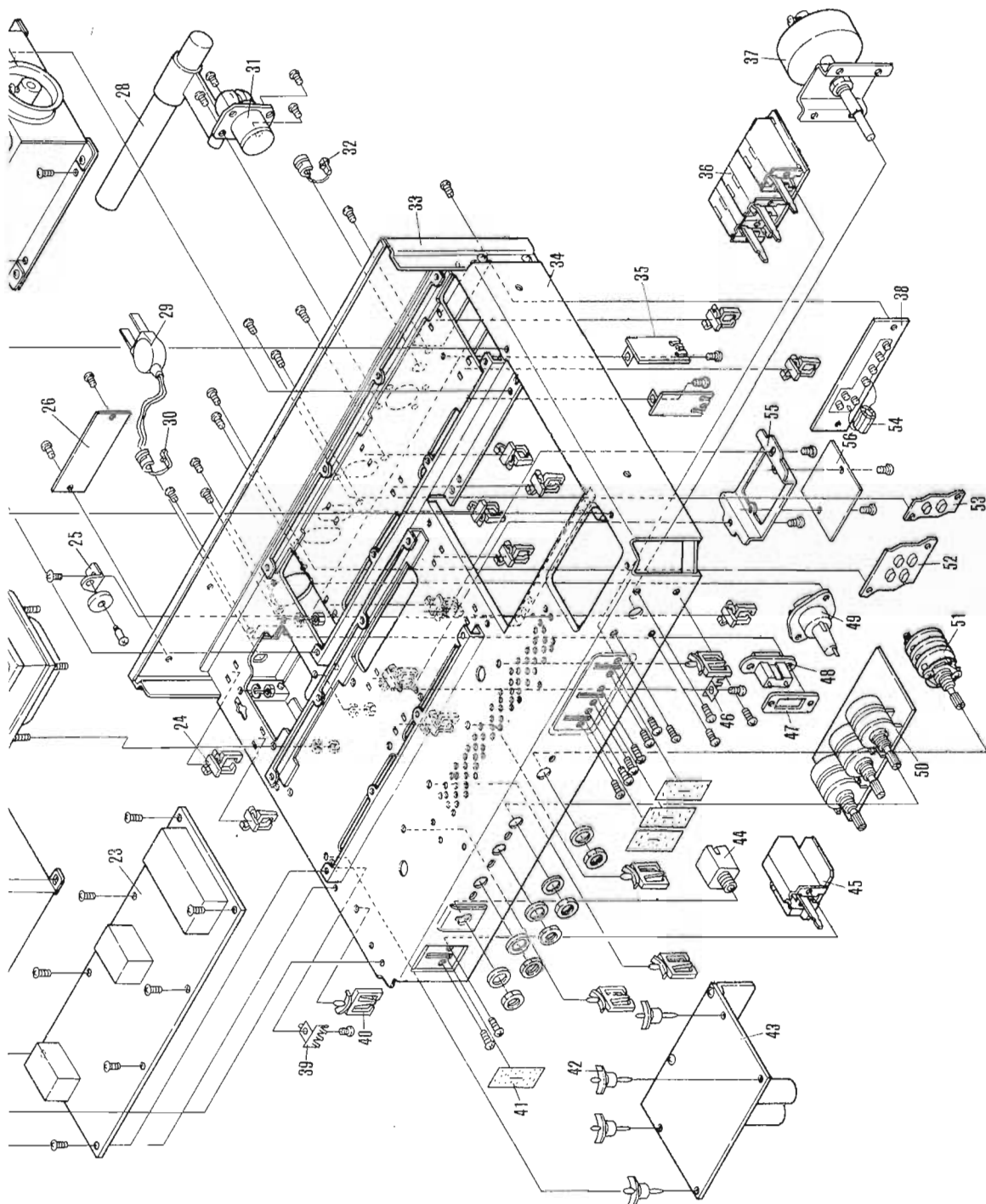


MPX SECTION ADJUSTMENTS



11. EXPLODED VIEW AND PARTS LIST





Parts List

NOTICE: Any parts asterisked(*) are subject to being not supplied.

Key No.	Description	Part No.	
1*	Meter-held metal	ANF-106-C	
2	Signal meter	AAW-015-0	
3	Tuning meter	AAW-016-A	
4*	Lamp box (B)	ANH-127-C	
5	Pilot lamp (for meter)	AEL-015-0	
6	Lamp board	ANF-107-0	
7*	Dial cover	ANK-036-B	
8*	Shield case (A)	ANH-141-0	
9*	P.C. board cover	ANK-034-0	
10	Lamp board assembly (A)	AWX-042-0	
11	Pilot lamp (for dial scale)	E22-032-0	
12	Pilot lamp (for program indicator)	AEL-007-0	
13*	Lamp box (A)	ANH-127-C	
14	AM/FM IF amplifier assembly	AWE-026-0	
15*	Pulley	AEC-006-0	
16	Dial pointer assembly	AAF-025-0	
17*	Sub panel	AND-051-C	
18	Dial scale	AAG-046-0	
	Dial scale	AAG-050-0	
19*	Dial scale-held metal	ANG-075-0	
20	Power transformer	ATT-113-0	KUW model
	Power transformer	ATT-114-0	FVZW, FW model
	Power transformer	ATT-133-0	KCW model
21*	Shield case (B)	ANH-142-A	
22*	Wire holder	AEC-089-0	
23	MPX, AF amplifier assembly	AWD-002-0	
24*	Wire clip (S)	AEC-037-0	
25*	Pulley-held metal	ANG-076-A	
26*	Model name plate	AAL-118-0	KUW, KCW model
	Model name plate	AAL-119-0	FVZW, FW model
27	FM front end	AWB-013-0	
	FM front end	AWB-015-0	
28	AM ferrite loopstic antenna	ATB-021-0	
29	AC power cord	ADG-003-0	KUW, KCW model
	AC power cord	ADG-004-0	FVZW, FW model
30	Cord grommet	AEC-079-0	
31	Ferrite antenna holder assembly	W72-092-C	
32	Cord grommet	AEC-079-0	
33*	Rear panel	ANC-078-0	KUW, KCW model
	Rear panel	ANC-066-0	FVZW, FW model
34*	Chassis	ANA-038-D	
35*	Wire holder	M46-139-0	
36	Lever switch circuit assembly	AWS-032-0	
37	Tuning shaft assembly	AXA-027-A	
38	Antenna terminal board	K11-043-D	
39	Ground terminal strip (4P)	K13-047-0	
40*	Wire clip (A)	AEC-004-0	

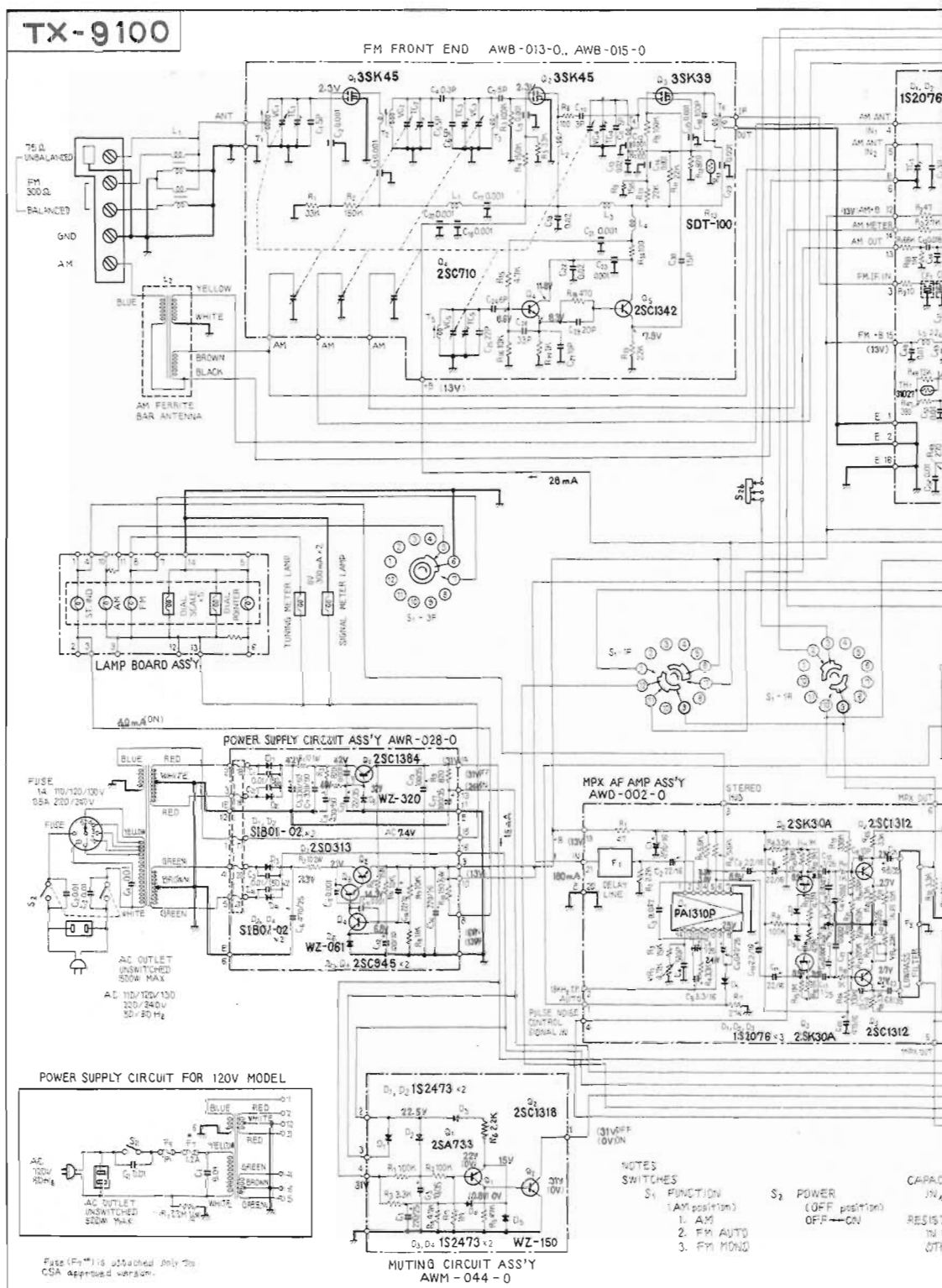
Key No.	Description	Part No.	
41*	Shading plate	AED-018-0	KUW, KCW model FVZW, FW model
42*	P.C. board holder	AEB-019-0	
43	Power supply circuit assembly	AWR-028-0	
44	Headphone jack	K72-026-0	
45	Lever switch (Power) Lever switch (Power)	ASK-054-0 ASK-055-0	
46	Ground terminal strip (4P)	K13-047-0	KUW, KCW model FVZW, FW model
47	AC socket-held metal	M49-127-A	
48	Chassis mounting AC socket	AKP-002-0	
49	Fuse holder Fuse holder	AKR-005-0 AKR-001-0	
50	Volume, headphone amplifier assembly	AWM-038-0	
51	Rotary switch (Function)	ASC-046-B	
52	Phono jack (4 jacks)-A	AKB-014-0	
53	Phono jack (2 jacks)	AKB-013-0	
54	Balune	T22-025-B	
55*	P.C. board held metal	ANF-132-0	
56	Muting circuit assembly	AWM-044-0	
57	Tuning pulley assembly	AXA-015-A	
	Wooden case	AMM-022-A	
	*Bottom plate	ANE-021-A	
	Foot assembly	AEC-083-A	
	Screw to fix wooden case	ABA-010-A	
	Screw to fix bottom plate	ABA-012-0	

NOTE:
Key No. 18 dial scale and key No. 27 FM front end are available in two types respectively as follows:
This table shows how these are combined.

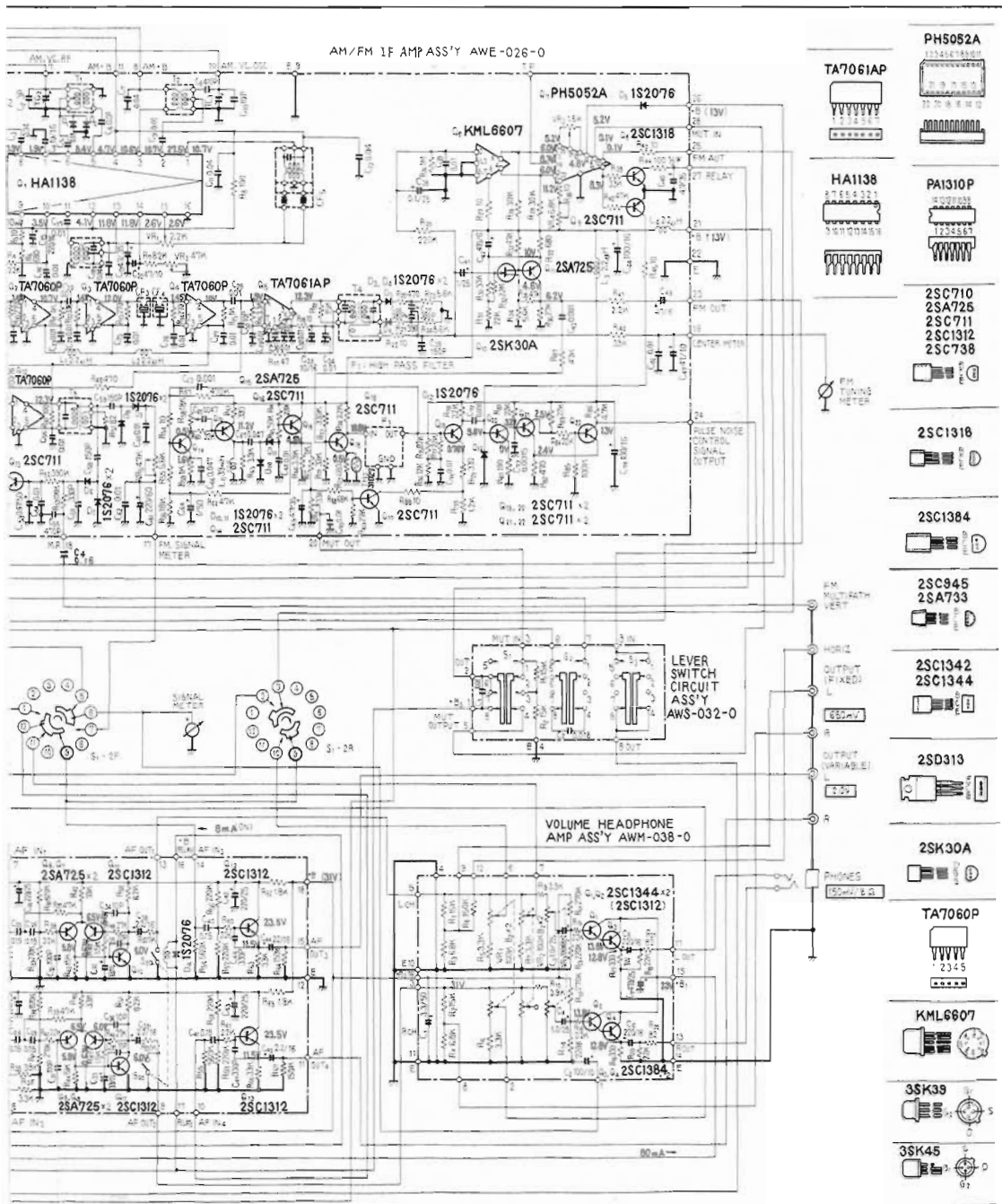
FM front end	Dial scale
AWB-013-0	AAG-046-0
AWB-015-0	AAG-050-0

12. SCHEMATIC DIAGRAMS, P. C. BOARD PATTERNS

12.1 CIRCUIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS LIST



AND PARTS LISTS



FOR
UNLESS OTHERWISE NOTED. P=PF.
1RS
HM, 1/4W, ±5% TOLERANCE UNLESS
OTHERWISE NOTED. K=KΩ, M=MΩ.

→ A: DC CURRENT AT NO INPUT SIGNAL.
V: DC VOLTAGE AT NO INPUT SIGNAL.
V: SIGNAL VOLTAGE AT 100% MOD.

De-emphasis switch of MPX AF AMP ASS'Y
is factory-set at:
75us for FW model.
80us for FVW model.

- CAPACITORS: IN μ F UNLESS OTHERWISE NOTED p: pF.
- RESISTORS: IN Ω , $\frac{1}{2}$ W UNLESS OTHERWISE NOTED k: k Ω , M: M Ω .

Miscellaneous Parts

CAPACITORS AND RESISTOR

Symbol	Description			Part No.	
C1	Metallized mylar	0.01	800V	ACE-002-0	KUW model
	Ceramic	0.01	250V	ACG-003-0	KCW model
	Ceramic	0.01	DC1.4kV	C43-003-0	FVZW, FW model
C2	Ceramic	0.01	150V	ACG-002-0	KUW, KCW model
	Ceramic	0.01	DC1.4kV	C43-003-0	FVZW, FW model
C3	Ceramic	0.01	DC1.4kV	C43-003-0	FVZW, FW model
C4	Mylar	0.15	50V	CQMA 154J 50	
R1	Carbon film	2.2M	$\frac{1}{2}$ W	RD $\frac{1}{2}$ PS 225J	KUW, KCW model

SWITCHES

Symbol	Description		Part No.	
S1	Function		ASC-046-B	
S2	Power		ASK-054-0	KUW, KCW model
	Power		ASK-055-0	FVZW, FW model

COILS AND TRANSFORMER

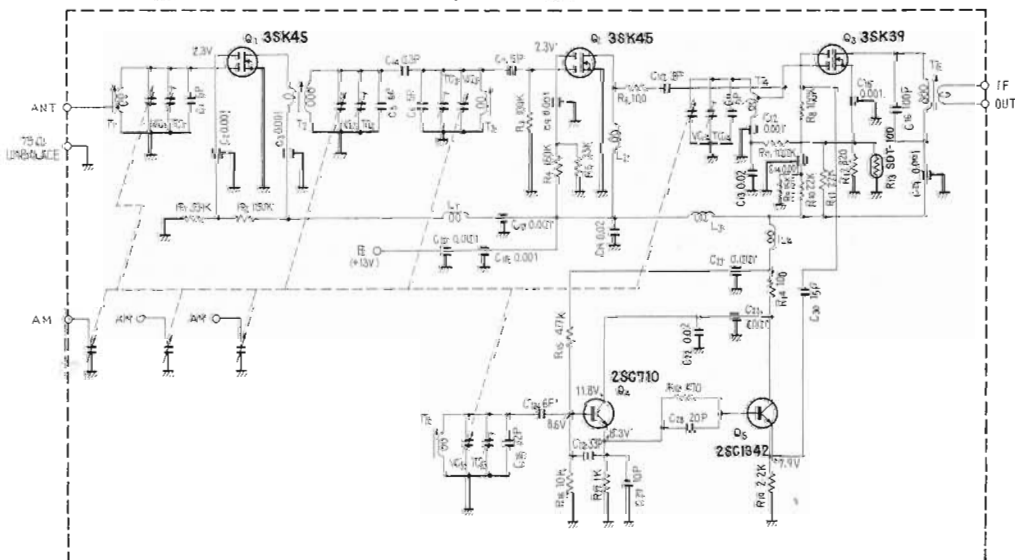
Symbol	Description		Part No.	
T1	Power transformer		ATT-113-0	KUW model
	Power transformer		ATT-133-0	KCW model
	Power transformer		ATT-114-0	FVZW, FW model
L2	AM ferrite loopstick antenna		ATB-021-0	
L3	Balune		T22-025-B	

OTHERS

Symbol	Description		Part No.	
	AM/FM IF amplifier assembly		AWE-026-0	
	MPX, AF amplifier assembly		AWD-002-0	
	Power supply circuit assembly		AWR-028-0	
	Volume, headphone amplifier assembly		AWM-038-0	
	Lever switch circuit assembly		AWS-032-0	
	Lamp board assembly (A)		AWX-042-0	
	FM front end		AWB-013-0	
			AWB-015-0	
	Muting circuit assembly		AWM-044-0	
	Dial scale		AAG-046-0	
			AAG-050-0	
	Dial pointer assembly		AAF-025-0	
	Signal meter		AAW-015-0	
	Tuning meter		AAW-016-A	
	Pilot lamp (for dial scale)		E22-032-0	
	Pilot lamp (for program indicator)		AEL-007-0	

Symbol	Description	Part No.	
F1	Fuse 3A (protection)	E21-021-0	KUW model
	Fuse 3A (protection)	AEK-008-0	KCW model
	Fuse 3A (protection)	E21-036-A	FVZW, FW model
F2	Fuse 0.5A (protection)	E21-028-0	KUW model
	Fuse 0.5A (protection)	AEK-024-0	KCW model
	Fuse 0.5A (protection)	AEK-016-0	FVZW, FW model
F3	Fuse 0.5A (protection)	E21-028-0	KUW model
	Fuse 0.5A (protection)	AEK-024-0	KCW model
	Fuse 0.5A (protection)	AEK-016-0	FVZW, FW model
F4	Fuse 0.5A (protection)	E21-028-0	KUW model
	Fuse 0.5A (protection)	AEK-024-0	KCW model
	Fuse 0.5A (protection)	AEK-016-0	FVZW, FW model
F5	Fuse 0.5A (protection)	E21-028-0	KUW model
	Fuse 0.5A (protection)	AEK-024-0	KCW model
	Fuse 0.5A (protection)	AEK-016-0	FVZW, FW model
F6	Fuse 1A (AC power)	E21-033-0	KUW model
	Fuse 1A (AC power)	E21-034-A	KCW model
	Fuse 0.5A (AC power)	AEK-016-0	FVZW, FW model
F7	Fuse 1.2A (protection)	AEK-019-0	KCW model
	Pilot lamp (for meter)	AEL-015-0	
	AC power cord	ADG-003-0	KUW, KCW model
	AC power cord	ADG-004-0	FVZW, FW model
	Styrotector (upper)	AHA-029-0	
	Styrotector (lower)	HII-070-C	
	Packing case	AHD-157-0	KUW model
	Packing case	AHD-158-0	KCW model
	Packing case	AHD-159-0	FW model
	Packing case	AHD-160-0	FVZW model
	Operating instructions	ARB-073-0	
	FM T-type antenna	D52-013-0	
	Connection cord with pin plugs	ADE-005-0	
	Fuse 1A (AC power)	E21-034-A	FVZW, FW model

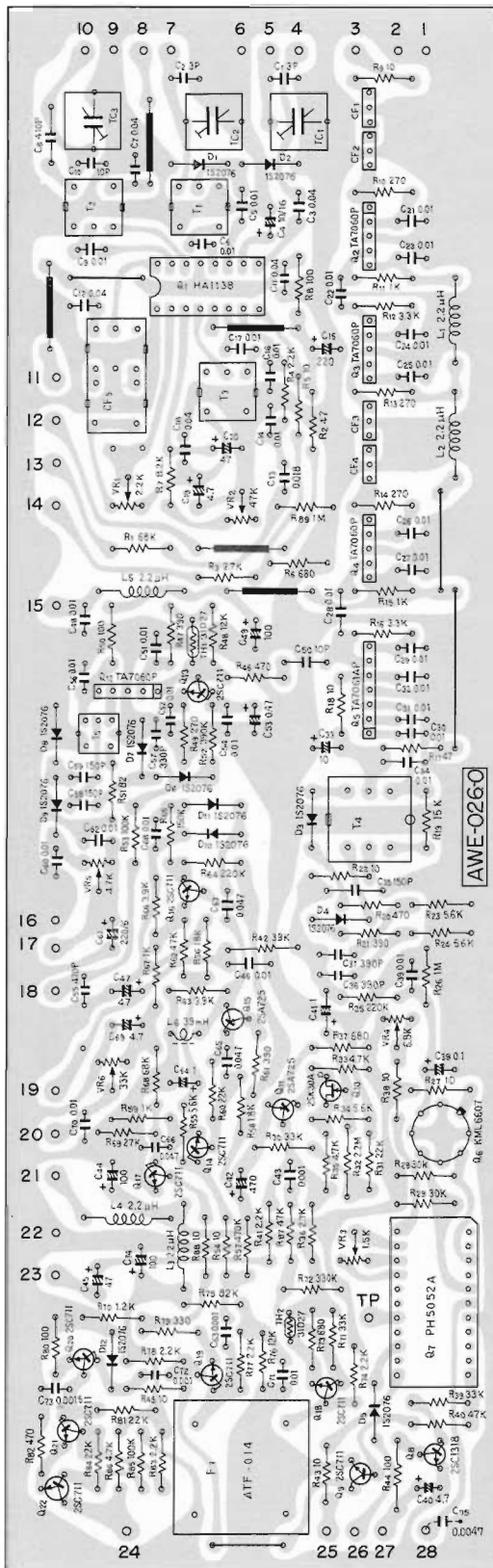
12.2 FM FRONT END (AWB-013-0, AWB-015-0)



AM FM IF AMP ASSY
AWE-026-O

AM FM IF AMP ASSY
AWE-026-O

Foil Side



Parts List of AM/FM IF Amplifier Assembly (AWE-026-0)

CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	3p	50V	CCDSH 030D 50
C2	Ceramic	3p	50V	CCDSH 030D 50
C3	Ceramic	0.04	25V	CKDYF 403Z 25
C4	Electrolytic	10	16V	CEA 100P 16
C5	Ceramic	0.01	50V	CKDYF 103Z 50
C6	Ceramic	0.01	50V	CKDYF 103Z 50
C7	Ceramic	0.04	25V	CKDYF 403Z 25
C8	Styrol	410p	50V	CQSA 411J 50
C9	Mylar	0.01	50V	CQMA 103K 50
C10	Ceramic	10p	50V	CCDWK 100F 50
C11	Ceramic	0.04	25V	CKDYF 403Z 25
C12	Ceramic	0.04	25V	CKDYF 403Z 25
C13	Mylar	0.018	50V	CQMA 183K 50
C14	Mylar	0.01	50V	CQMA 103K 50
C15	Electrolytic	220	16V	CEA 221P 16
C16	Mylar	0.01	50V	CQMA 103K 50
C17	Mylar	0.01	50V	CQMA 103K 50
C18	Ceramic	0.04	25V	CKDYF 403Z 25
C19	Electrolytic	4.7	35V	CEA 4R7P 35
C20	Electrolytic	47	10V	CEA 470P 10
C21	Ceramic	0.01	50V	CKDYF 103Z 50
C22	Ceramic	0.01	50V	CKDYF 103Z 50
C23	Ceramic	0.01	50V	CKDYF 103Z 50
C24	Ceramic	0.01	50V	CKDYF 103Z 50
C25	Ceramic	0.01	50V	CKDYF 103Z 50
C26	Ceramic	0.01	50V	CKDYF 103Z 50
C27	Ceramic	0.01	50V	CKDYF 103Z 50
C28	Ceramic	0.01	50V	CKDYF 103Z 50
C29	Ceramic	0.01	50V	CKDYB 103K 50
C30	Ceramic	0.01	50V	CKDYB 103K 50
C31	Ceramic	0.01	50V	CKDYB 103K 50
C32	Ceramic	0.01	50V	CKDYB 103K 50
C33	Electrolytic	10	16V	CEA 100P 16
C34	Ceramic	0.01	50V	CKDYF 103Z 50
C35	Ceramic	150p	50V	CCDSL 151K 50
C36	Ceramic	390p	50V	CCDSL 391K 50
C37	Ceramic	390p	50V	CCDSL 391K 50
C38	Electrolytic	0.1	25V	CSSA 0R1M 25
C39	Ceramic	0.01	50V	CKDYF 103Z 50
C40	Electrolytic	4.7	35V	CEA 4R7P 35
C41	Electrolytic	1	25V	CSSA 010M 25
C42	Electrolytic	470	6V	CEA 471P 6
C43	Mylar	0.001	50V	CQMA 102K 50
C44	Electrolytic	100	16V	CEA 101P 16
C45	Electrolytic	47	6V	CSZA 470M 6

Symbol	Description			Part No.	
C46	Ceramic	0.01	50V	CKDYF 103Z 50	
C47	Electrolytic	47	10V	CEA 470P 10	
C48	Ceramic	0.01	50V	CKDYF 103Z 50	
C49	Electrolytic	100	16V	CEA 101P 16	
C50	Ceramic	10p	50V	CCDSL 100F 50	
C51	Ceramic	0.01	50V	CKDYB 103K 50	
C52	Ceramic	0.01	50V	CKDYF 103Z 50	
C53	Electrolytic	0.47	50V	CEA R47P 50	
C54	Ceramic	0.01	50V	CKDYF 103Z 50	
C55	Ceramic	470p	50V	CCDSL 471K 50	
C56	Ceramic	0.01	50V	CKDYF 103Z 50	
C57	Ceramic	330p	50V	CCDSL 331K 50	
C58	Ceramic	150p	50V	CCDSL 151K 50	
C59	Ceramic	150p	50V	CCDSL 151K 50	
C60	Ceramic	0.01	50V	CKDYF 103Z 50	
C61	Electrolytic	220	6V	CEA 221P 6	
C62	Ceramic	0.01	50V	CKDYF 103Z 50	
C63	Mylar	0.001	50V	CQMA 102K 50	
C64	Electrolytic	1	50V	CEA 010P 50	
C65	Mylar	0.047	50V	CQMA 473K 50	
C66	Mylar	0.047	50V	CQMA 473K 50	
C67	Mylar	0.047	50V	CQMA 473K 50	
C68	Mylar	0.01	50V	CQMA 103K 50	
C69	Electrolytic	4.7	35V	CEA 4R7P 35	
C70	Ceramic	0.01	50V	CKDYF 103Z 50	
C71	Mylar	0.01	50V	CQMA 103K 50	
C72	Mylar	0.001	50V	CQMA 102K 50	
C73	Mylar	0.0015	50V	CQMA 152K 50	
C74	Electrolytic	100	16V	CEA 101P 16	
C75	Ceramic	0.047	50V	CKDYF 473Z 50	
TC1	Film trimmer			ACM-002-0	
TC2	Film trimmer			ACM-002-0	
TC3	Film trimmer			ACM-002-0	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	68k		RD¼PM 683J	
R2	Carbon film	47		RD¼PM 470J	
R3	Carbon film	2.7k		RD¼PM 272J	
R4	Carbon film	2.2k		RD¼PM 222J	
R5	Carbon film	10		RD¼PM 100J	
R6	Carbon film	680		RD¼PM 681J	
R7	Carbon film	8.2k		RD¼PM 822J	
R8	Carbon film	100		RD¼PM 101J	
R9	Carbon film	10		RD¼PM 100J	
R10	Carbon film	270		RD¼PM 271J	

Symbol	Description		Part No.	
R11	Carbon film	1k	RD%PM 102J	
R12	Carbon film	3.3k	RD%PM 332J	
R13	Carbon film	270	RD%PM 271J	
R14	Carbon film	270	RD%PM 271J	
R15	Carbon film	1k	RD%PM 102J	
R16	Carbon film	3.3k	RD%PM 332J	
R17	Carbon film	47	RD%PM 470J	
R18	Carbon film	10	RD%PM 100J	
R19	Carbon film	15k	RD%PM 153J	
R20	Carbon film	470	RD%PM 471J	
R21	Carbon film	390	RD%PM 391J	
R22	Carbon film	10	RD%PM 100J	
R23	Carbon film	5.6k	RD%PM 562J	
R24	Carbon film	5.6k	RD%PM 562J	
R25	Carbon film	220k	RD%PM 224J	
R26	Carbon film	1M	RD%PM 105J	
R27	Carbon film	10	RD%PM 100J	
R28	Carbon film	30k	RD%PM 303J	
R29	Carbon film	30k	RD%PM 303J	
R30	Carbon film	33k	RD%PM 333J	
R31	Carbon film	22k	RD%PM 223J	
R32	Carbon film	2.2M	RD%PM 225J	
R33	Carbon film	4.7k	RD%PM 472J	
R34	Carbon film	5.6k	RD%PM 562J	
R35	Carbon film	4.7k	RD%PM 472J	
R36	Carbon film	2.7k	RD%PM 272J	
R37	Carbon film	680	RD%PM 681J	
R38	Carbon film	10	RD%PM 100J	
R39	Carbon film	33k	RD%PM 333J	
R40	Carbon film	47k	RD%PM 473J	
R41	Carbon film	2.2k	RD%PM 222J	
R42	Carbon film	39k	RD%PM 393J	
R43	Carbon film	10	RD%PM 100J	
R44	Carbon film	100	RD%PM 101J	
R45	Carbon film	10	RD%PM 100J	
R46	Carbon film	470	RD%PM 471J	
R47	Carbon film	390	RD%PM 391J	
R48	Carbon film	12k	RD%PM 123J	
R49	Carbon film	270	RD%PM 271J	
R50	Carbon film	100	RD%PM 101J	
R51	Carbon film	82	RD%PM 820J	
R52	Carbon film	390k	RD%PM 394J	
R53	Carbon film	100k	RD%PM 104J	
R54	Carbon film	10	RD%PM 100J	
R55	Carbon film	5.6k	RD%PM 562J	
R56	Carbon film	18k	RD%PM 183J	
R57	Carbon film	470k	RD%PM 474J	
R58	Carbon film	1.8k	RD%PM 182J	
R59	Carbon film	1k	RD%PM 102J	
R60	Carbon film	22k	RD%PM 223J	

Symbol	Description	Part No.
R61	Carbon film 390	RD4PM 391J
R62	Carbon film 47k	RD4PM 473J
R63	Carbon film 3.9k	RD4PM 392J
R64	Carbon film 220k	RD4PM 224J
R65	Carbon film 150k	RD4PM 154J
R66	Carbon film 3.9k	RD4PM 392J
R67	Carbon film 1k	RD4PM 102J
R68	Carbon film 68k	RD4PM 683J
R69	Carbon film 27k	RD4PM 273J
R70	Carbon film 1.2k	RD4PM 122J
R71	Carbon film 33k	RD4PM 333J
R72	Carbon film 330k	RD4PM 334J
R73	Carbon film 680	RD4PM 681J
R74	Carbon film 2.2k	RD4PM 222J
R75	Carbon film 82k	RD4PM 823J
R76	Carbon film 12k	RD4PM 123J
R77	Carbon film 2.2k	RD4PM 222J
R78	Carbon film 2.2k	RD4PM 222J
R79	Carbon film 330	RD4PM 331J
R80	Carbon film 100	RD4PM 101J
R81	Carbon film 22k	RD4PM 223J
R82	Carbon film 470	RD4PM 471J
R83	Carbon film 2.2k	RD4PM 222J
R84	Carbon film 22k	RD4PM 223J
R85	Carbon film 100k	RD4PM 104J
R86	Carbon film 4.7k	RD4PM 472J
R87	Carbon film 47k	RD4PM 473J
R88	Carbon film 10	RD4PM 100J
R89	Carbon film 1M	RD4PM 105J
VR1	Semi-fixed 2.2k-B	ACP-001-0
VR2	Semi-fixed 47K-B	C92-048-0
VR3	Semi-fixed 1.5k-B	ACP-026-0
VR4	Semi-fixed 6.8k-B	ACP-023-0
VR5	Semi-fixed 4.7k-B	C92-051-0
VR6	Semi-fixed 33k-B	ACP-025-0

SEMICONDUCTORS

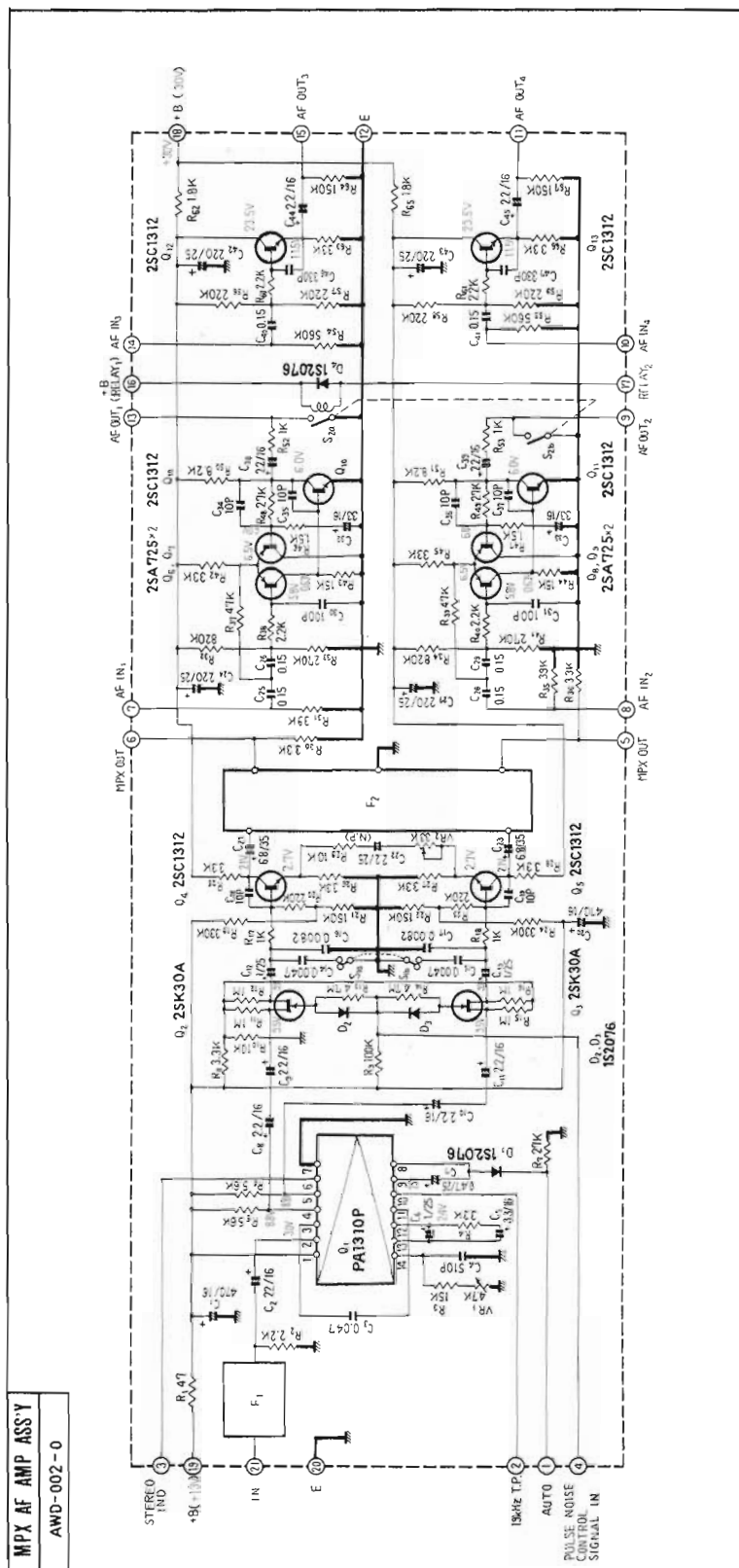
Symbol	Description	Part No.
Q1	IC HA1138	
Q2	IC TA7060P GR	
Q3	IC TA7060P GR	
Q4	IC TA7060P BL	
Q5	IC TA7061AP	
Q6	IC KML6607	
Q7	IC PH5052A	
Q8	Transistor 2SC1318-R or S	
Q9	Transistor 2SC711-F or G	
Q10	FET 2SK30A-Y	

Symbol	Description	Part No.	
Q11	Transistor	2SA725-F	
Q12	IC	TA7060P BL	
Q13	Transistor	2SC711-F	
Q14	Transistor	2SC711-F or G	
Q15	Transistor	2SA725-F	
Q16	Transistor	2SC711-F or G	
Q17	Transistor	2SC711-F	
Q18	Transistor	2SC711-F or G	
Q19	Transistor	2SC711-F or G	
Q20	Transistor	2SC711-F or G	
Q21	Transistor	2SC711-F or G	
Q22	Transistor	2SC711-F or G	
D1	Diode	1S2076	
D2	Diode	1S2076	
D3	Diode	1S2076	
D4	Diode	1S2076	
D5	Diode	1S2076	
D6	Diode	1S2076	
D7	Diode	1S2076	
D8	Diode	1S2076	
D9	Diode	1S2076	
D10	Diode	1S2076	
D11	Diode	1S2076	
D12	Diode	1S2076	
TH1	Thermistor	31D27	
TH2	Thermistor	31D27	

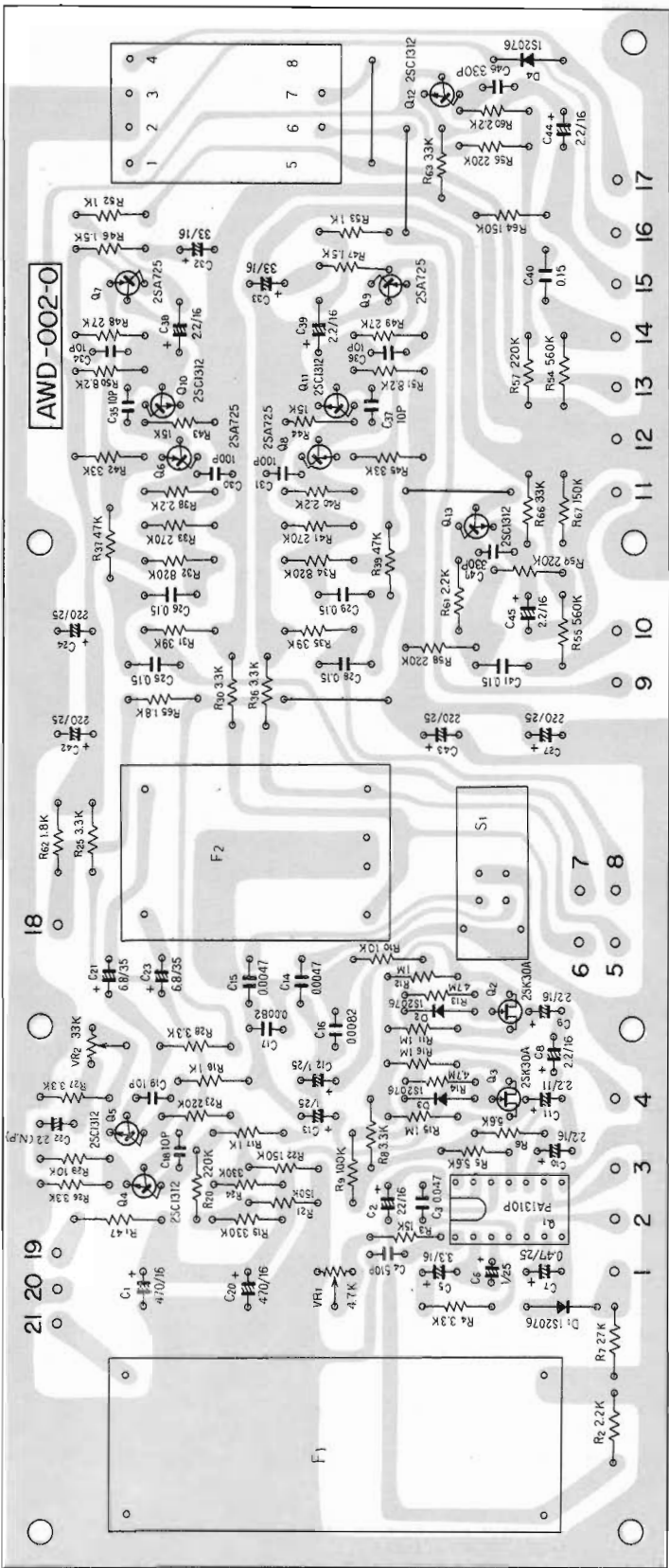
TRANSFORMERS, COILS AND FILTERS

Symbol	Description	Part No.	
T1	MW RF coil	ATB-020-0	
T2	MW OSC coil	ATB-019-0	
T3	AM IFT	ATE-012-0	
T4	FM transformer	ATE-013-0	
T5	FM matching transformer	ATE-001-A	
L1	RF choke coil	T24-028-A	
L2	RF choke coil	T24-028-A	
L3	RF choke coil	T24-028-A	
L4	RF choke coil	T24-028-A	
L5	RF choke coil	T24-028-A	
L6	Choke coil 39mH	T75-006-A	
CF1	FM ceramic filter	ATF-018-0	
CF2	FM ceramic filter	ATF-018-0	
CF3	FM ceramic filter	ATF-018-0	
CF4	FM ceramic filter	ATF-018-0	
CF5	AM ceramic filter	ATF-009-0	
F1	High-pass filter	ATF-014-0	

12.4 MPX, AF AMPLIFIER ASSEMBLY (AWD-002-0)



Foil Side



Parts List of MPX, AF Amplifier Assembly (AWD-002-0)

CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	470	16V	CEA 471P 16
C2	Electrolytic	22	16V	CSZA 220M 16
C3	Mylar	0.047	50V	CQMA 473K 50
C4	Styrol	510p	50V	CQSH 511J 50
C5	Electrolytic	3.3	16V	CSSA 3R3M 16
C6	Electrolytic	1	25V	CSSA 010M 25
C7	Electrolytic	0.47	25V	CSSA R47M 25
C8	Electrolytic	2.2	16V	CSSA 2R2M 16
C9	Electrolytic	2.2	16V	CSSA 2R2M 16
C10	Electrolytic	2.2	16V	CSSA 2R2M 16
C11	Electrolytic	2.2	16V	CSSA 2R2M 16
C12	Electrolytic	1	25V	CSSA 010M 25
C13	Electrolytic	1	25V	CSSA 010M 25
C14	Mylar	0.0047	50V	CQMA 472J 50
C15	Mylar	0.0047	50V	CQMA 472J 50
C16	Mylar	0.0082	50V	CQMA 822J 50
C17	Mylar	0.0082	50V	CQMA 822J 50
C18	Ceramic	10p	50V	CCDSL 100F 50
C19	Ceramic	10p	50V	CCDSL 100F 50
C20	Electrolytic	470	16V	CEA 471P 16
C21	Electrolytic	6.8	35V	CSZA 6R8M 35
C22	Electrolytic	2.2	25V	CEA 2R2M 25NP
C23	Electrolytic	6.8	35V	CSZA 6R8M 35
C24	Electrolytic	220	25V	CEA 221P 25
C25	Mylar	0.15	50V	CQMA 154K 50
C26	Mylar	0.15	50V	CQMA 154K 50
C27	Electrolytic	220	25V	CEA 221P 25
C28	Mylar	0.15	50V	CQMA 154K 50
C29	Mylar	0.15	50V	CQMA 154K 50
C30	Ceramic	100p	50V	CCDSL 101K 50
C31	Ceramic	100	50V	CCDSL 101K 50
C32	Electrolytic	33	16V	CEA 330P 16
C33	Electrolytic	33	16V	CEA 330P 16
C34	Ceramic	10p	50V	CCDSL 100F 50
C35	Ceramic	10p	50V	CCDSL 100F 50
C36	Ceramic	10p	50V	CCDSL 100F 50
C37	Ceramic	10p	50V	CCDSL 100F 50
C38	Electrolytic	2.2	16V	CSSA 2R2M 16
C39	Electrolytic	2.2	16V	CSSA 2R2M 16
C40	Mylar	0.15	50V	CQMA 154K 50
C41	Mylar	0.15	50V	CQMA 154K 50
C42	Electrolytic	220	25V	CEA 221P 25
C43	Electrolytic	220	25V	CEA 221P 25
C44	Electrolytic	2.2	16V	CSSA 2R2M 16
C45	Electrolytic	2.2	16V	CSSA 2R2M 16
C46	Ceramic	330p	50V	CCDSL 331K 50
C47	Ceramic	330p	50V	CCDSL 331K 50

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 47	RD%PM 470J
R2	Carbon film 2.2k	RD%PM 222J
R3	Carbon film 15k	RD%PM 153J
R4	Carbon film 3.3k	RD%PM 332J
R5	Carbon film 5.6k	RD%PM 562J
R6	Carbon film 5.6k	RD%PM 562J
R7	Carbon film 27k	RD%PM 273J
R8	Carbon film 3.3k	RD%PM 332J
R9	Carbon film 100k	RD%PM 104J
R10	Carbon film 10k	RD%PM 103J
R11	Carbon film 1M	RD%PM 105J
R12	Carbon film 1M	RD%PM 105J
R13	Carbon film 4.7M	RD%PM 475J
R14	Carbon film 4.7M	RD%PM 475J
R15	Carbon film 1M	RD%PM 105J
R16	Carbon film 1M	RD%PM 105J
R17	Carbon film 1k	RD%PM 102J
R18	Carbon film 1k	RD%PM 102J
R19	Carbon film 330k	RD%PM 334J
R20	Carbon film 220k	RD%PM 224J
R21	Carbon film 150k	RD%PM 154J
R22	Carbon film 150k	RD%PM 154J
R23	Carbon film 220k	RD%PM 224J
R24	Carbon film 330k	RD%PM 334J
R25	Carbon film 3.3k	RD%PM 332J
R26	Carbon film 3.3k	RD%PM 332J
R27	Carbon film 3.3k	RD%PM 332J
R28	Carbon film 3.3k	RD%PM 332J
R29	Carbon film 10k	RD%PM 103J
R30	Carbon film 3.3k	RD%PM 332J
R31	Carbon film 39k	RD%PM 393J
R32	Carbon film 820k	RD%PM 824J
R33	Carbon film 270k	RD%PM 274J
R34	Carbon film 820k	RD%PM 824J
R35	Carbon film 39k	RD%PM 393J
R36	Carbon film 3.3k	RD%PM 332J
R37	Carbon film 47k	RD%PM 473J
R38	Carbon film 2.2k	RD%PM 222J
R39	Carbon film 47k	RD%PM 473J
R40	Carbon film 2.2k	RD%PM 222J
R41	Carbon film 270k	RD%PM 274J
R42	Carbon film 33k	RD%PM 333J
R43	Carbon film 15k	RD%PM 153J
R44	Carbon film 15k	RD%PM 153J
R45	Carbon film 33k	RD%PM 333J
R46	Carbon film 1.5k	RD%PM 152J
R47	Carbon film 1.5k	RD%PM 152J
R48	Carbon film 27k	RD%PM 273J
R49	Carbon film 27k	RD%PM 273J
R50	Carbon film 8.2k	RD%PM 822J

Symbol	Description		Part No.	
R51	Carbon film	8.2k	RD%PM 822J	
R52	Carbon film	1k	RD%PM 102J	
R53	Carbon film	1k	RD%PM 102J	
R54	Carbon film	560k	RD%PM 564J	
R55	Carbon film	560k	RD%PM 564J	
R56	Carbon film	220k	RD%PM 224J	
R57	Carbon film	220k	RD%PM 224J	
R58	Carbon film	220k	RD%PM 224J	
R59	Carbon film	220k	RD%PM 224J	
R60	Carbon film	2.2k	RD%PM 222J	
R61	Carbon film	2.2k	RD%PM 222J	
R62	Carbon film	1.8k	RD%PM 182J	
R63	Carbon film	33k	RD%PM 333J	
R64	Carbon film	150k	RD%PM 154J	
R65	Carbon film	1.8k	RD%PM 182J	
R66	Carbon film	33k	RD%PM 333J	
R67	Carbon film	150k	RD%PM 154J	
VR1	Semi-fixed	4.7k-B	ACP-018-0	
VR 2	Semi-fixed	33k-B	ACP-027-0	

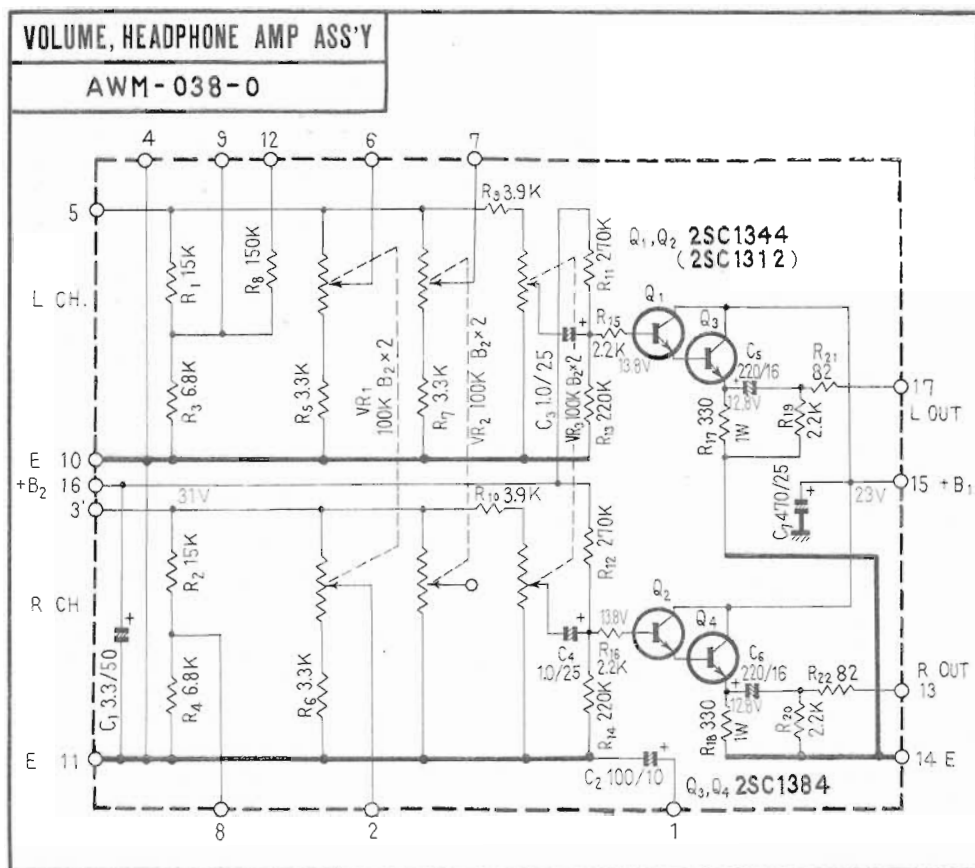
SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	IC	PA1310P		
Q2	FET	2SK30A-Y		
Q3	FET	2SK30A-Y		
Q4	Transistor	2SC1312-G or F (2SC1344-E or D)		
Q5	Transistor	2SC1312-G or F (2SC1344-E or D)		
Q6	Transistor	2SA725-G or F		
Q7	Transistor	2SA725-G or F		
Q8	Transistor	2SA725-G or F		
Q9	Transistor	2SA725-G or F		
Q10	Transistor	2SC1312-G or F (2SC1344-E or D)		
Q11	Transistor	2SC1312-G or F (2SC1344-E or D)		
Q12	Transistor	2SC1312-G or F (2SC1344-E or D)		
Q13	Transistor	2SC1312-G or F (2SC1344-E or D)		
D1	Diode	1S2076		
D2	Diode	1S2076		
D3	Diode	1S2076		
D4	Diode	1S2076		

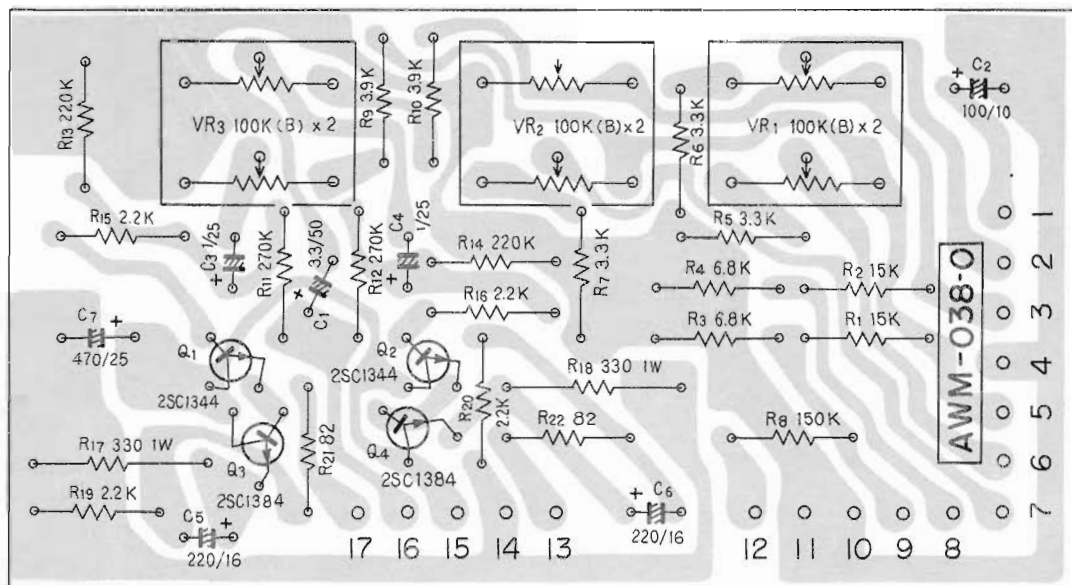
SWITCHES AND OTHERS

Symbol	Description	Part No.	
S1	Slide switch	ASH-002-0	
S2	Reed relay	ASR-004-A	
F1	Delay line	ATF-015-0	
F2	Low-pass filter	ATF-016-0	

12.5 VOLUME, HEADPHONE AMPLIFIER ASSEMBLY (AWM-038-0)



Foil Side



Parts List of Volume, Headphone Amplifier Assembly (AWM-038-0)

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	3.3	50V	CEA 3R3P 50	
C2	Electrolytic	100	10V	CEA 101P 10	
C3	Electrolytic	1	25V	CSSA 010M 25	
C4	Electrolytic	1	25V	CSSA 010M 25	
C5	Electrolytic	220	16V	CEA 221P 16	
C6	Electrolytic	220	16V	CEA 221P 16	
C7	Electrolytic	470	25V	CEA 471P 25	

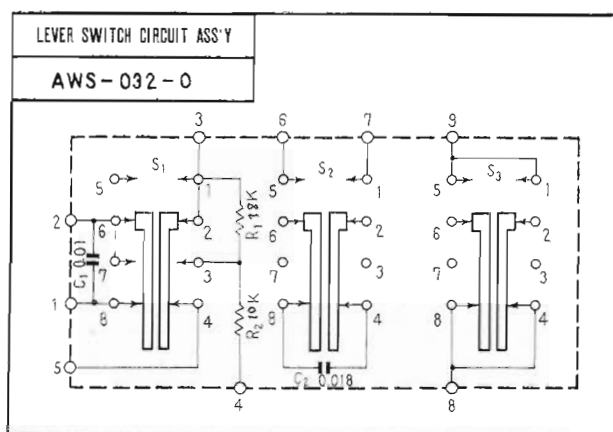
RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	15k		RD4PS 153J	
R2	Carbon film	15k		RD4PS 153J	
R3	Carbon film	6.8k		RD4PS 682J	
R4	Carbon film	6.8k		RD4PS 682J	
R5	Carbon film	3.3k		RD4PS 332J	
R6	Carbon film	3.3k		RD4PS 332J	
R7	Carbon film	3.3k		RD4PS 332J	
R8	Carbon film	150k		RD4PS 154J	
R9	Carbon film	3.9k		RD4PS 392J	
R10	Carbon film	3.9k		RD4PS 392J	
R11	Carbon film	270k		RD4PS 274J	
R12	Carbon film	270k		RD4PS 274J	
R13	Carbon film	220k		RD4PS 224J	
R14	Carbon film	220k		RD4PS 224J	
R15	Carbon film	2.2k		RD4PS 222J	
R16	Carbon film	2.2k		RD4PS 222J	
R17	Metal oxide	330	1W	RS1P 331K	
R18	Metal oxide	330	1W	RS1P 331K	
R19	Carbon film	2.2k		RD4PS 222J	
R20	Carbon film	2.2k		RD4PS 222J	
R21	Carbon film	82		RD4PS 820J	
R22	Carbon film	82		RD4PS 820J	
VR1	Potentiometer (dual)	100k-B2		ACV-115-0	
VR2	Potentiometer (dual)	100k-B2		ACV-115-0	
VR3	Potentiometer (dual)	100k-B2		ACV-115-0	

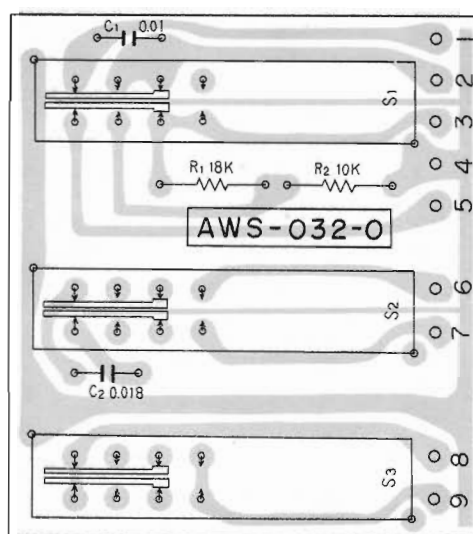
SEMICONDUCTORS

Symbol	Description			Part No.	
Q1	Transistor	2SC1344-E or D (or 2SC1312-G, F)			
Q2	Transistor	2SC1344-E or D (or 2SC1312-G, F)			
Q3	Transistor	2SC1384-R or Q			
Q4	Transistor	2SC1384-R or Q			

12.6 LEVER SWITCH CIRCUIT ASSEMBLY (AWS-032-0)



Foil Side



CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	50V	CKDYF 103Z 50	
C2	Mylar	0.018	50V	CQMA 183K 50	

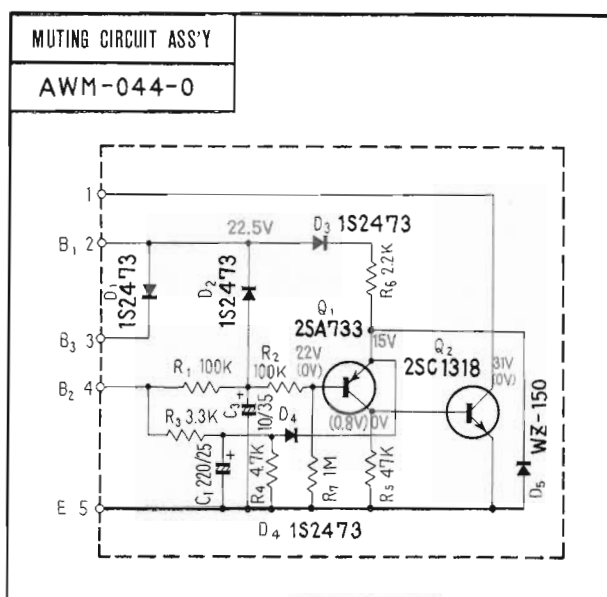
RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	18k		RD4PS 183J	
R2	Carbon film	10k		RD4PS 103J	

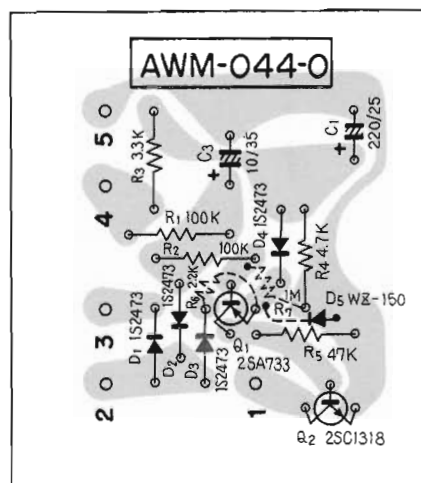
SWITCHES

Symbol	Description			Part No.	
S1	Lever switch			ASK-043-0	
S2	Lever switch			ASK-042-0	
S3	Lever switch			ASK-042-0	

12.7 MUTING CIRCUIT ASSEMBLY (AWM-044-0)



Foil Side



CAPACITORS

Symbol	Description	Part No.	
C1	Electrolytic 220 25V	CEA 221P 25	
C2	Electrolytic 10 35V	CEA 100P 35	

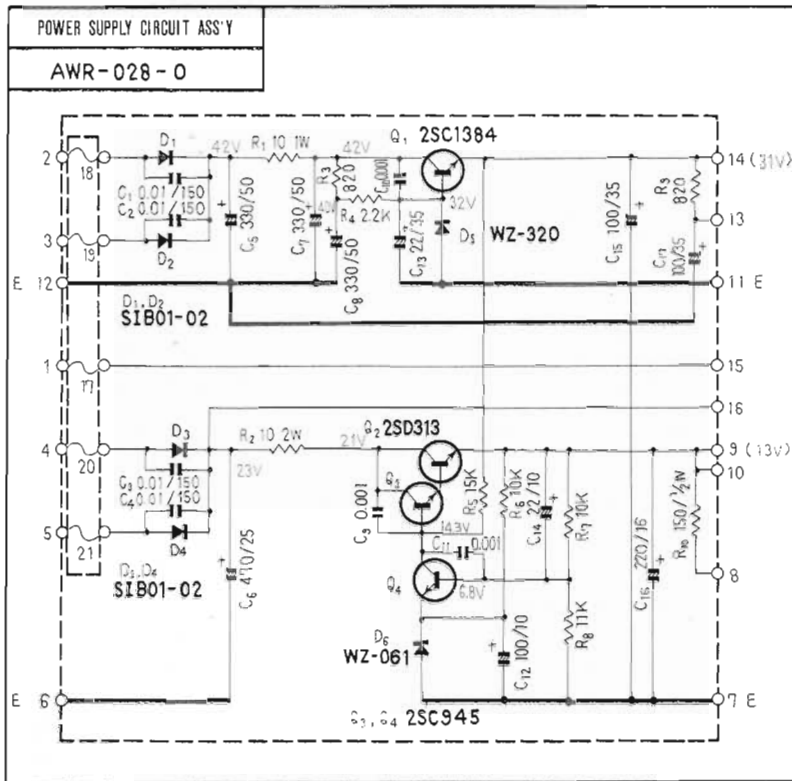
RESISTORS

Symbol	Description	Part No.	
R1	Carbon film 100k	RD4PM 104J	
R2	Carbon film 100k	RD4PM 104J	
R3	Carbon film 3.3k	RD4PM 332J	
R4	Carbon film 4.7k	RD4PM 472J	
R5	Carbon film 47k	RD4PM 473J	
R6	Carbon film 2.2k	RD4PM 222J	
R7	Carbon film 1M	RD4PM 105J	

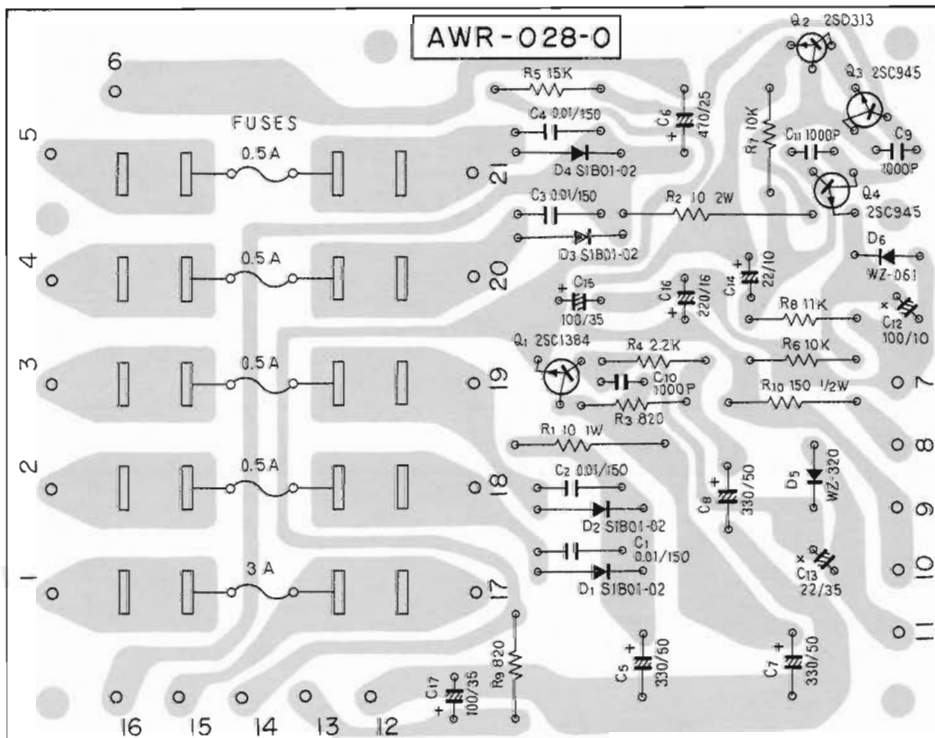
SEMICONDUCTORS

Symbol	Description	Part No.	
Q1	Transistor 2SA733-Q or R		
Q2	Transistor 2SC1318-Q or R		
D1	Diode 1S2473		
D2	Diode 1S2473		
D3	Diode 1S2473		
D4	Diode 1S2473		
D5	Zener diode WZ-150		

12.8 POWER SUPPLY CIRCUIT ASSEMBLY (AWR-028-0)



Foil Side



Parts List of Power Supply Circuit Assembly (AWR-028-0)

CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	150V	ACG-002-0
C2	Ceramic	0.01	150V	ACG-002-0
C3	Ceramic	0.01	150V	ACG-002-0
C4	Ceramic	0.01	150V	ACG-002-0
C5	Electrolytic	330	50V	CEA331P 50
C6	Electrolytic	470	25V	CEA 471P 25
C7	Electrolytic	330	50V	CEA 331P 50
C8	Electrolytic	330	50V	CEA 331P 50
C9	Ceramic	0.001	50V	CKDYF 102Z 50
C10	Ceramic	0.001	50V	CKDYF 102Z 50
C11	Ceramic	0.001	50V	CKDYF 102Z 50
C12	Electrolytic	100	10V	CEA 101P 10
C13	Electrolytic	22	35V	CEA 220P 35
C14	Electrolytic	22	10V	CEA 220P 10
C15	Electrolytic	100	35V	CEA 101P 35
C16	Electrolytic	220	16V	CEA 221P 16
C17	Electrolytic	100	35V	CEA 101P 35

RESISTORS

Symbol	Description			Part No.
R1	Metal oxide	10	1W	RS1P 100K
R2	Metal oxide	10	2W	RS2P 100K
R3	Carbon film	820		RD $\frac{1}{4}$ PS 821J
R4	Carbon film	2.2k		RD $\frac{1}{4}$ PS 222J
R5	Carbon film	15k		RD $\frac{1}{4}$ PS 153J
R6	Carbon film	10k		RD $\frac{1}{4}$ PS 103J
R7	Carbon film	10k		RD $\frac{1}{4}$ PS 103J
R8	Carbon film	11k		RD $\frac{1}{4}$ PS 113J
R9	Carbon film	820		RD $\frac{1}{4}$ PS 821J
R10	Carbon film	150	$\frac{1}{2}$ W	RD $\frac{1}{4}$ PS 151J

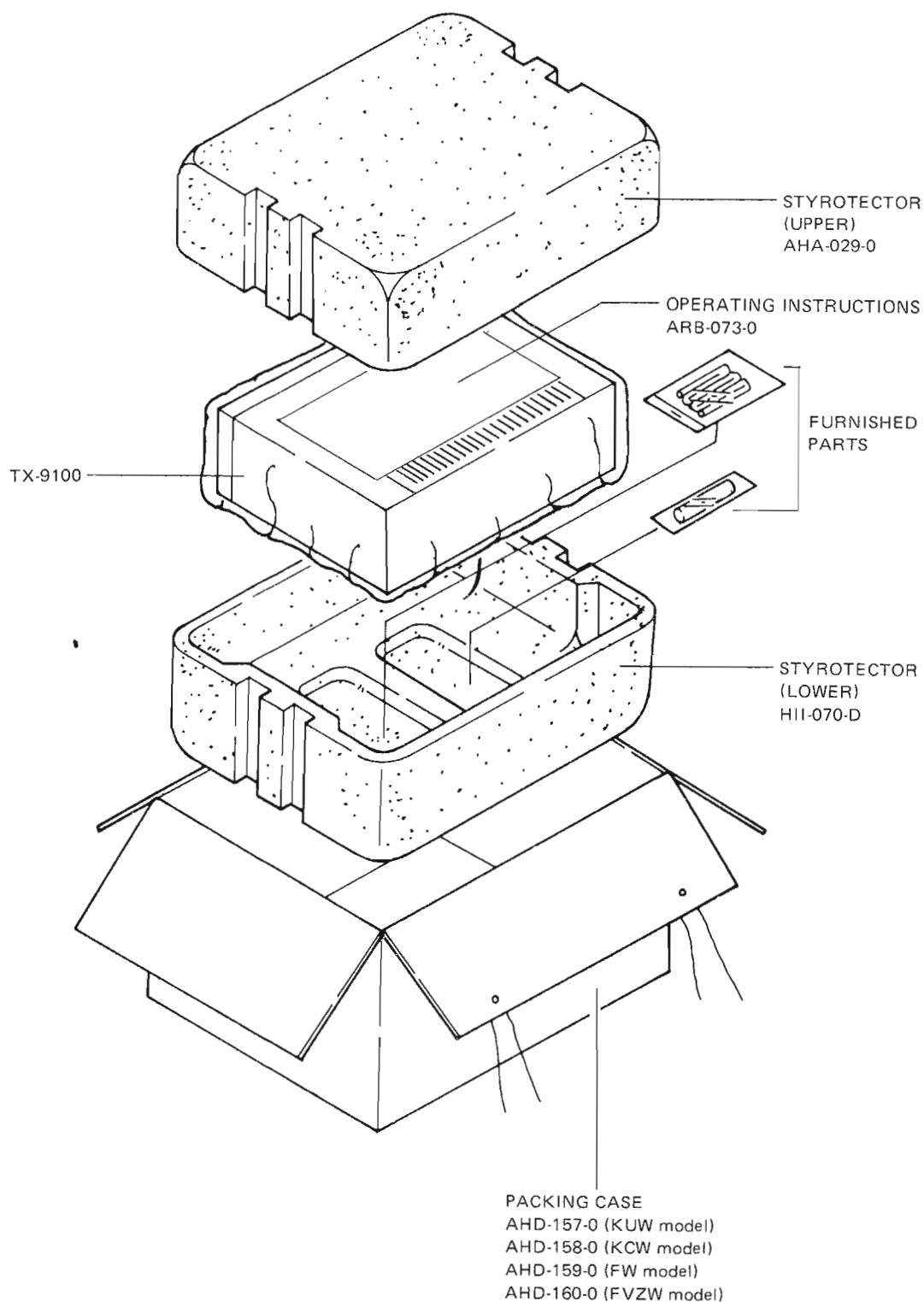
SEMICONDUCTORS

Symbol	Description			Part No.
Q1	Transistor	2SC1384-R		
Q2	Transistor	2SD313-D or E		
Q3	Transistor	2SC945-Q or R		
Q4	Transistor	2SC945-Q or R		
D1	Diode	S1B01-02		
D2	Diode	S1B01-02		
D3	Diode	S1B01-02		
D4	Diode	S1B01-02		
D5	Zener diode	WZ-320		
D6	Zener diode	WZ-061		

OTHERS

Symbol	Description	Part No.
	Fuse holder for circuit board	K91-006-0

13. PACKING METHOD AND PART NUMBERS



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