

# **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

## CONTENTS

1.	SPECIFICATIONS .....	2
2.	CONNECTION DIAGRAM .....	4
3.	FRONT PANEL FACILITIES .....	5
4.	BLOCK DIAGRAM .....	7
5.	CIRCUIT DESCRIPTION	
5.1	Muting Circuit .....	9
5.2	MPX Decoder Circuit .....	9
5.3	Pulse Noise Suppressor .....	9
6.	TUNER CHARACTERISTICS .....	10
7.	DISASSEMBLY PROCEDURE .....	11
8.	PARTS LOCATION	
8.1	Top View .....	12
8.2	Bottom View .....	13
9.	DIAL STRINGING PROCEDURE .....	14
10.	ADJUSTMENTS .....	15
11.	EXPLODED VIEW AND PARTS LIST .....	17
12.	SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PARTS LISTS	
12.1	Circuit Connection Diagram and Miscellaneous Parts List .....	21
12.2	FM Front End (AWB-013, AWB-015) .....	24
12.3	AM/FM IF Amplifier Assembly (AWE-026) .....	25
12.4	MPX, AF Amplifier Assembly (AWD-002) .....	32
12.5	Volume, Headphone Amplifier Assembly (AWM-038) .....	38
12.6	Lever Switch Circuit Assembly (AWS-032) .....	40
12.7	Muting Circuit Assembly (AWM-044) .....	41
12.8	Power Supply Circuit Assembly (AWR-028) .....	42
13.	PACKING METHOD AND PARTS NUMBERS .....	44

# 1. SPECIFICATIONS

## SEMICONDUCTOR

FETs .....	6
ICs .....	9
Transistors .....	35
Diodes .....	27

## FM TUNER SECTION

Circuitry .....	3 MOS FETs 2-stage RF Amplifier 5-gang Variable Capacitor, 6-stage Limiter PLL MPX Circuit.
Usable Sensitivity (IHF) .....	1.5 $\mu$ V
Capture Ratio (IHF) .....	1dB
Selectivity (IHF) .....	90dB
Signal-to-Noise Ratio .....	75dB
Image Rejection (98MHz) .....	More than 110dB
IF Rejection (98MHz) .....	More than 110dB
Spurious Rejection .....	More than 110dB
AM Suppression .....	65dB
Harmonic Distortion Mono .....	Less than 0.2%
Stereo .....	Less than 0.3%
Frequency Response Stereo .....	20Hz ~ 15kHz $\pm$ 0.2 -2.0 dB
Stereo .....	50Hz ~ 10kHz $\pm$ 0.2 -0.5 dB
Stereo Separation	
1kHz .....	More than 40dB
50Hz to 10kHz .....	More than 30dB
Sub Carrier Suppression .....	65dB
Antenna Input .....	300 $\Omega$ Balanced 75 $\Omega$ Unbalanced
Muting .....	2-step Level Switch
MPX Noise Filter .....	ON-OFF
De-emphasis Switch .....	50 $\mu$ S $\rightarrow$ 75 $\mu$ S (except FTZ approved and 120V models.)

## AM TUNER SECTION

Circuitry .....	1-stage RF Amplifier, 3-gang Variable Capacitor
Sensitivity	
(IHF, Ferrite antenna) .....	300 $\mu$ V/m
(IHF) .....	15 $\mu$ V
Selectivity .....	40dB
Signal-to-Noise Ratio .....	50dB
Image Rejection .....	More than 65dB
IF Rejection .....	More than 85dB
Antenna .....	Built-in Ferrite Loopstick Antenna

## AUDIO SECTION

Output (Level/Impedance)	
FIXED .....	650mV/4.7k $\Omega$
VARIABLE .....	70mV ~ 2V/300 $\Omega$
HEADPHONE .....	150mV (8 $\Omega$ )

**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**

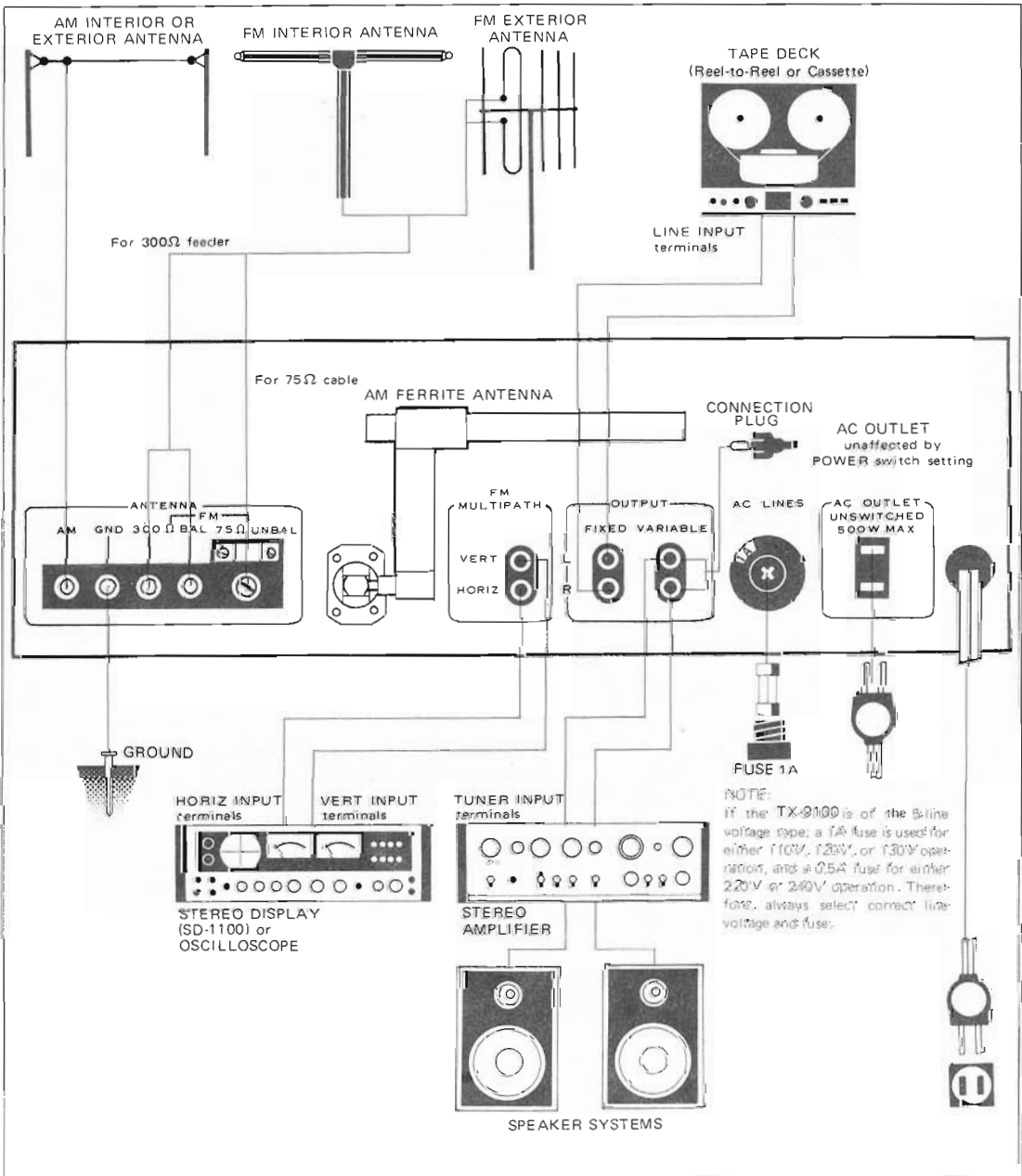
FM T-type Antenna	1
Connection Cord with Pin Plugs	1
Polishing Cloth	1
Operating Instructions	1
Fuse 0.5A	1
Fuses 1.0A (5-line voltage model only)	2

**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

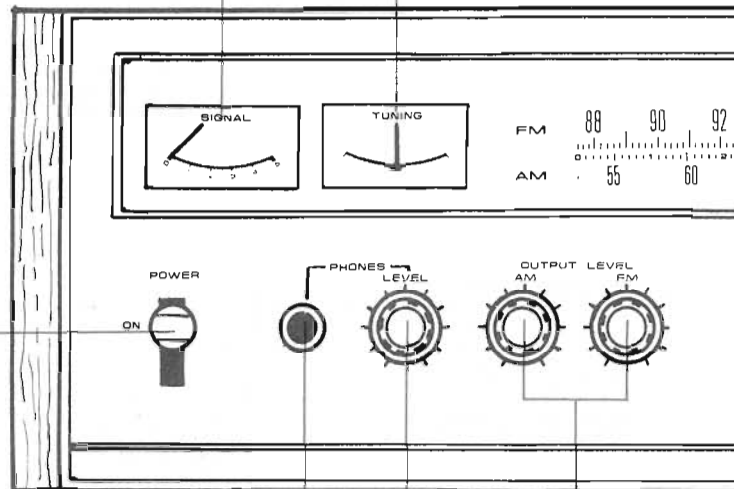
Optimum AM or FM reception needle swings to the extreme right.

#### TUNING METER

Works together with the SIGNAL METER to indicate precise tuning (cast tuning to indicate precise position).

#### FM STEREO INDICATOR

When the FUNCTION switch is set to FM, the 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 with automatic switchover when a stereo signal is received  
FM MONO . . . For monophonic reception of AM and stereo FM signals

#### AM AND FM OUTPUT LEVEL

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

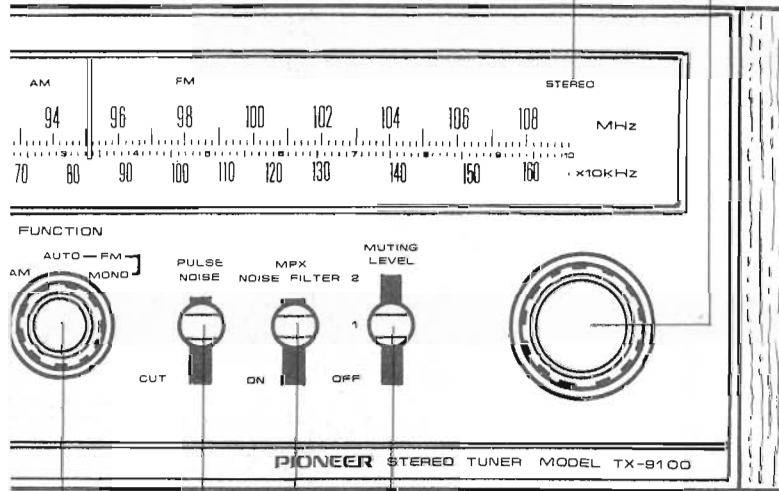
is obtained when the  
t.

meter during FM broad-  
tation alignment (center

is set to FM AUTO this  
tereo broadcast is being

**TUNING KNOB**

Used to tune in both AM and FM stations.



st 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

**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.

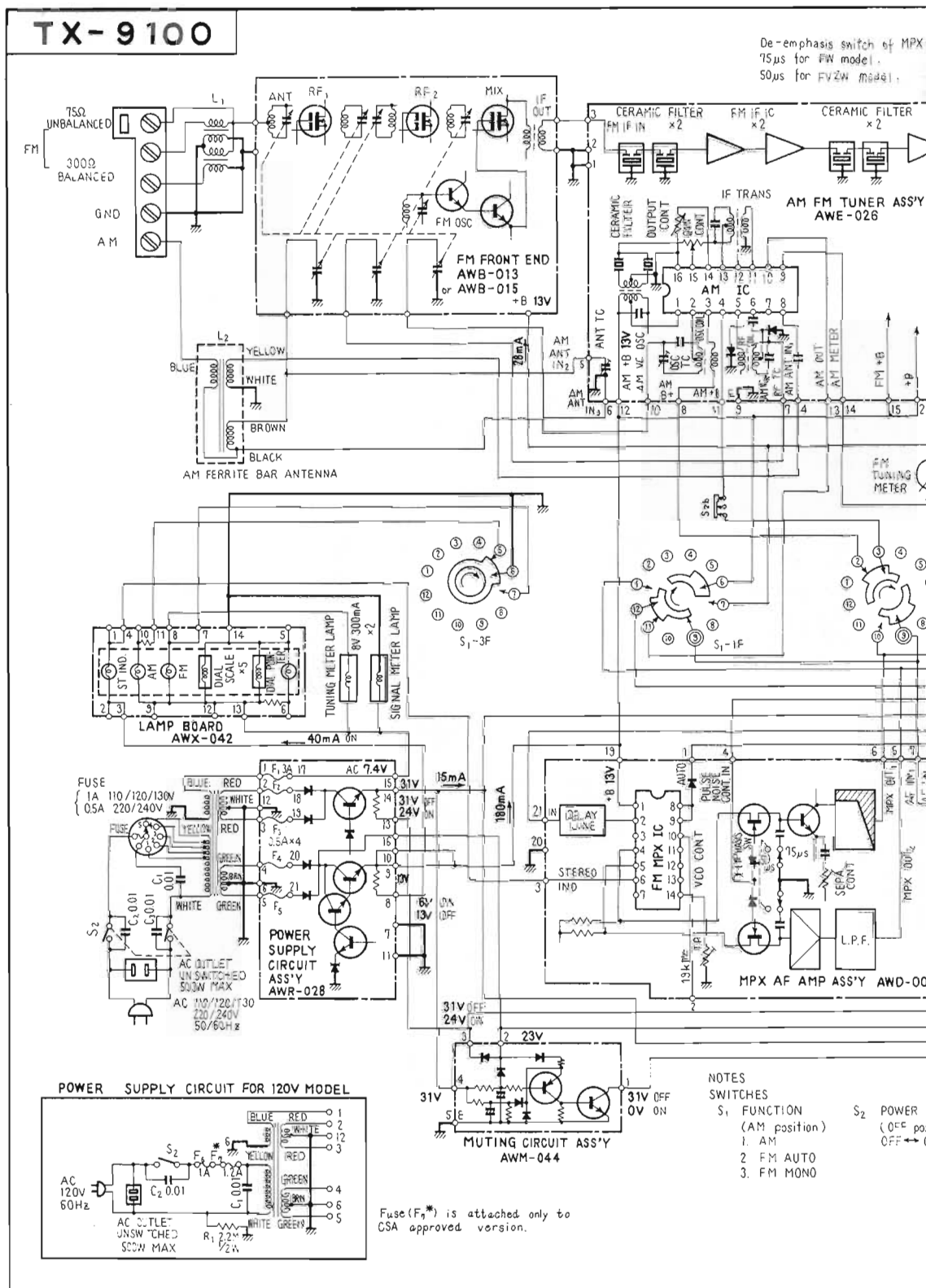
**MPX NOISE FILTER SWITCH**

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

**PULSE NOISE SWITCH**

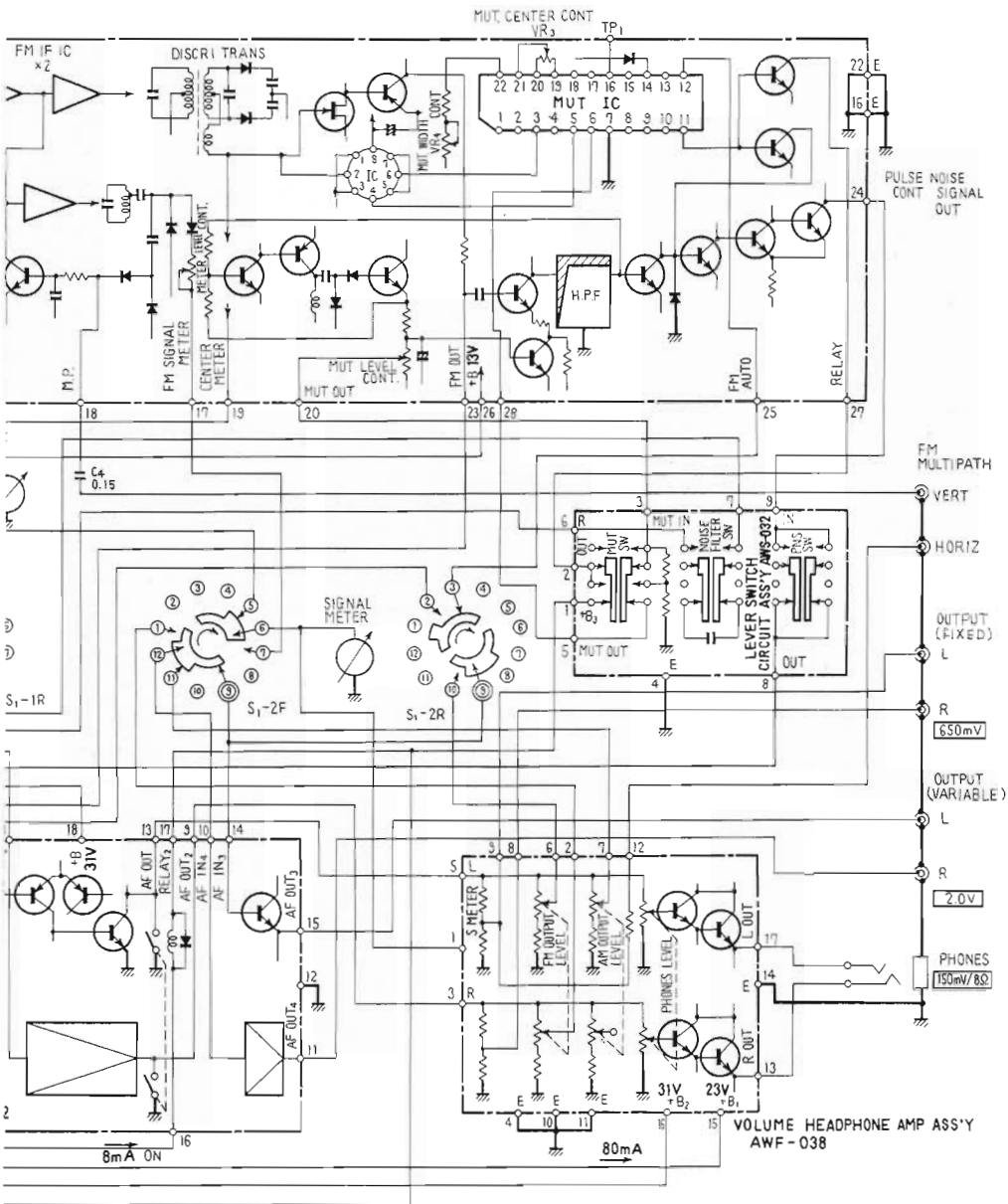
Cuts pulse noise, such as that from automobile ignitions,  
etc., without affecting the FM broadcast signal.

# 4. BLOCK DIAGRAM





AF AMP Ass'y is factory-set at:



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

RESISTORS  
 IN OHM, 1/4W, ±5% TOLERANCE UNLESS  
 OTHERWISE NOTED. K: KΩ, M: MΩ.  
 CAPACITORS  
 IN μF UNLESS OTHERWISE NOTED. P: pF

## 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.

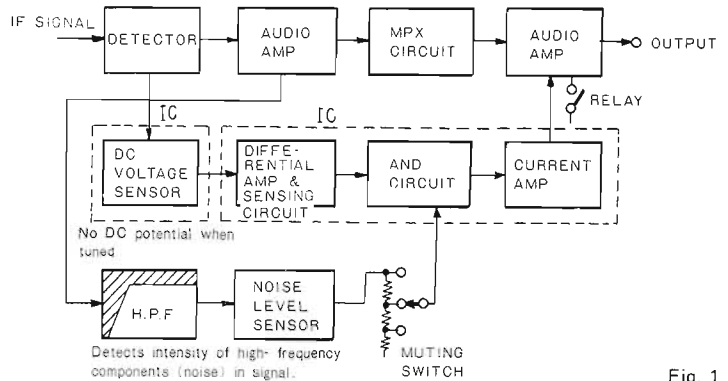


Fig. 1

### 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.

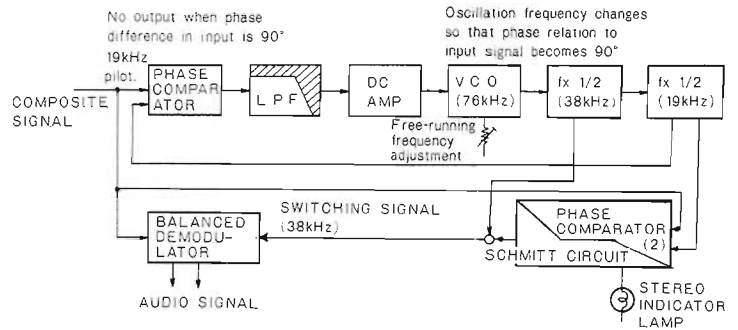


Fig. 2

### 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.

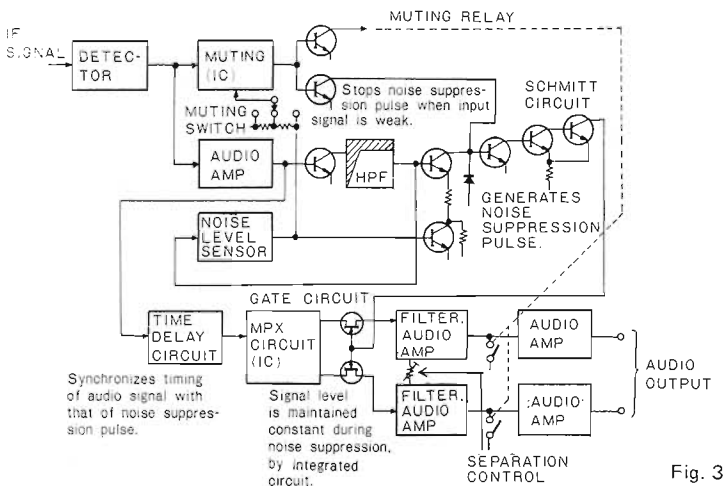
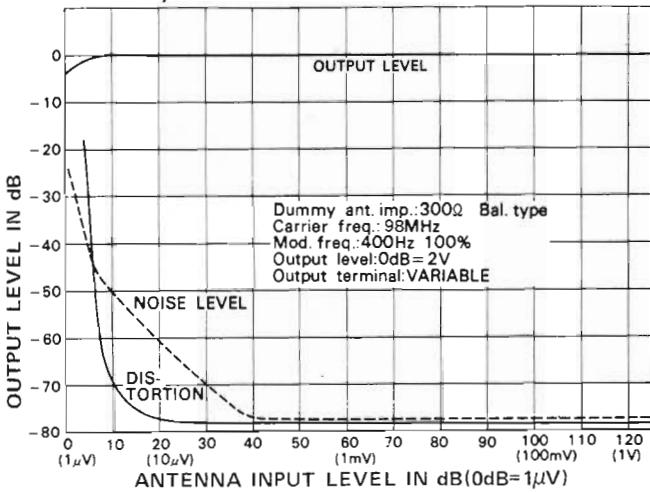


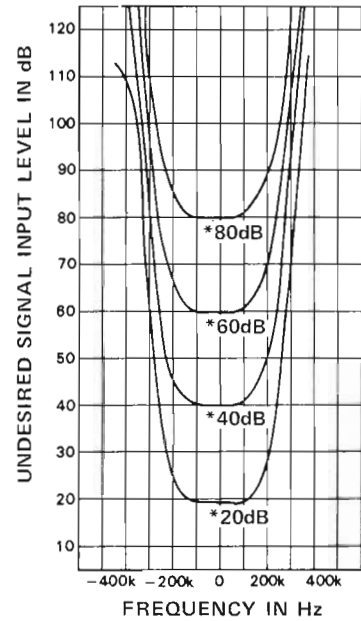
Fig. 3

# 6. TUNER CHARACTERISTICS

ANTENNA INPUT LEVEL vs. OUTPUT LEVEL, NOISE & DISTORTION

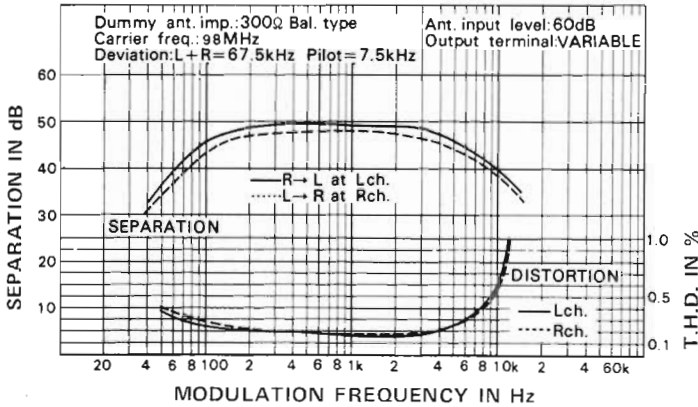


FM USABLE SELECTIVITY CHARACTERISTICS

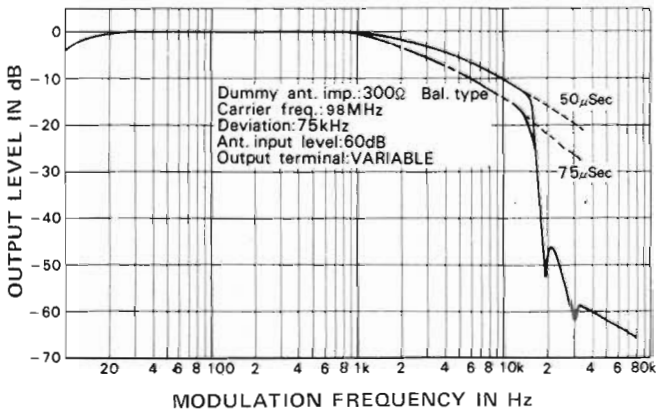


Dummy ant. imp.: 300Ω Bal. type  
Carrier freq.: 98MHz  
Output terminal: VARIABLE  
Undesired/desired signal output ratio: -30dB  
Undesired signal: 400Hz 100% Mod.  
\* DESIRED SIGNAL LEVEL

MPX FREQUENCY vs. SEPARATION & DISTORTION

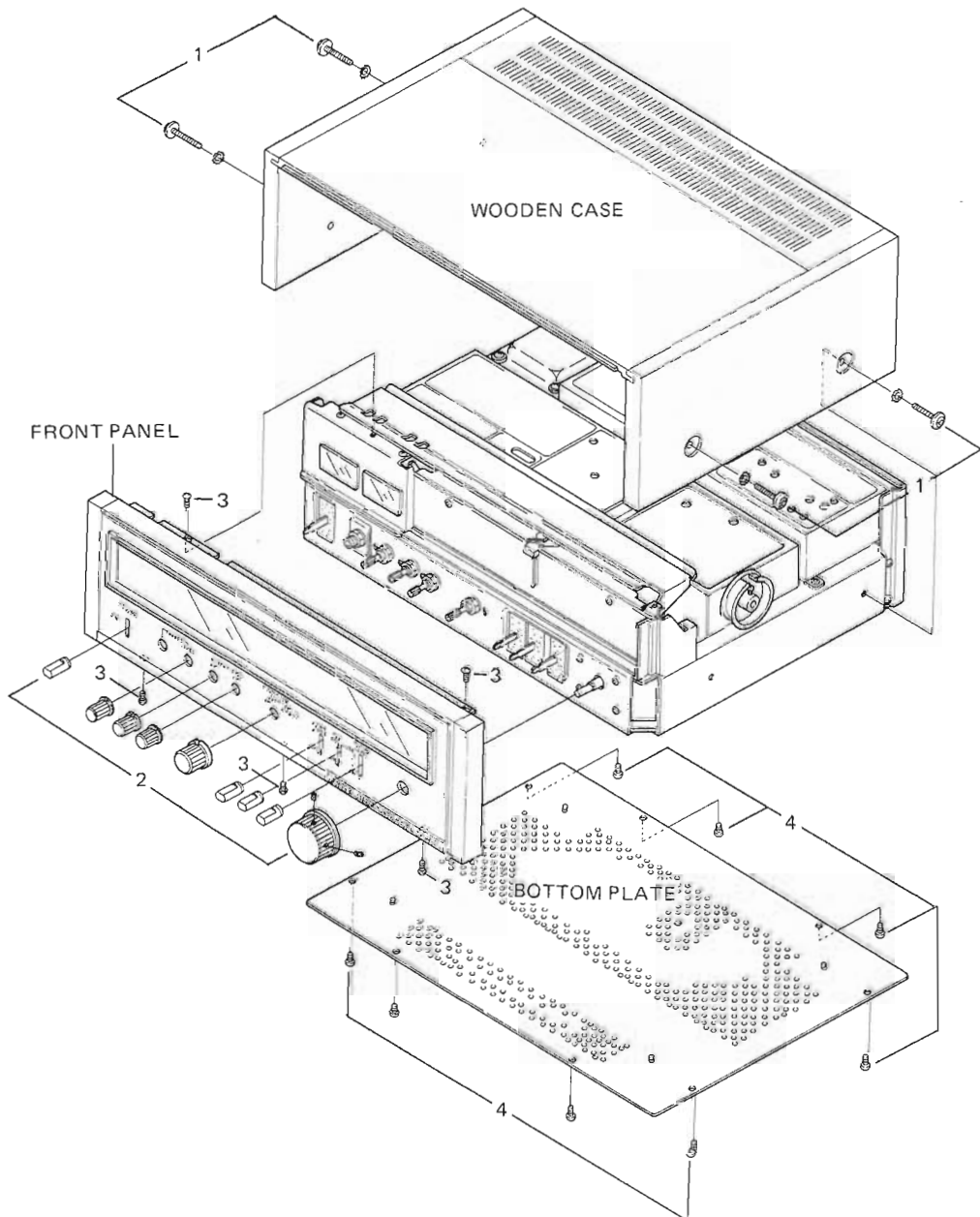


MPX FREQUENCY RESPONSE



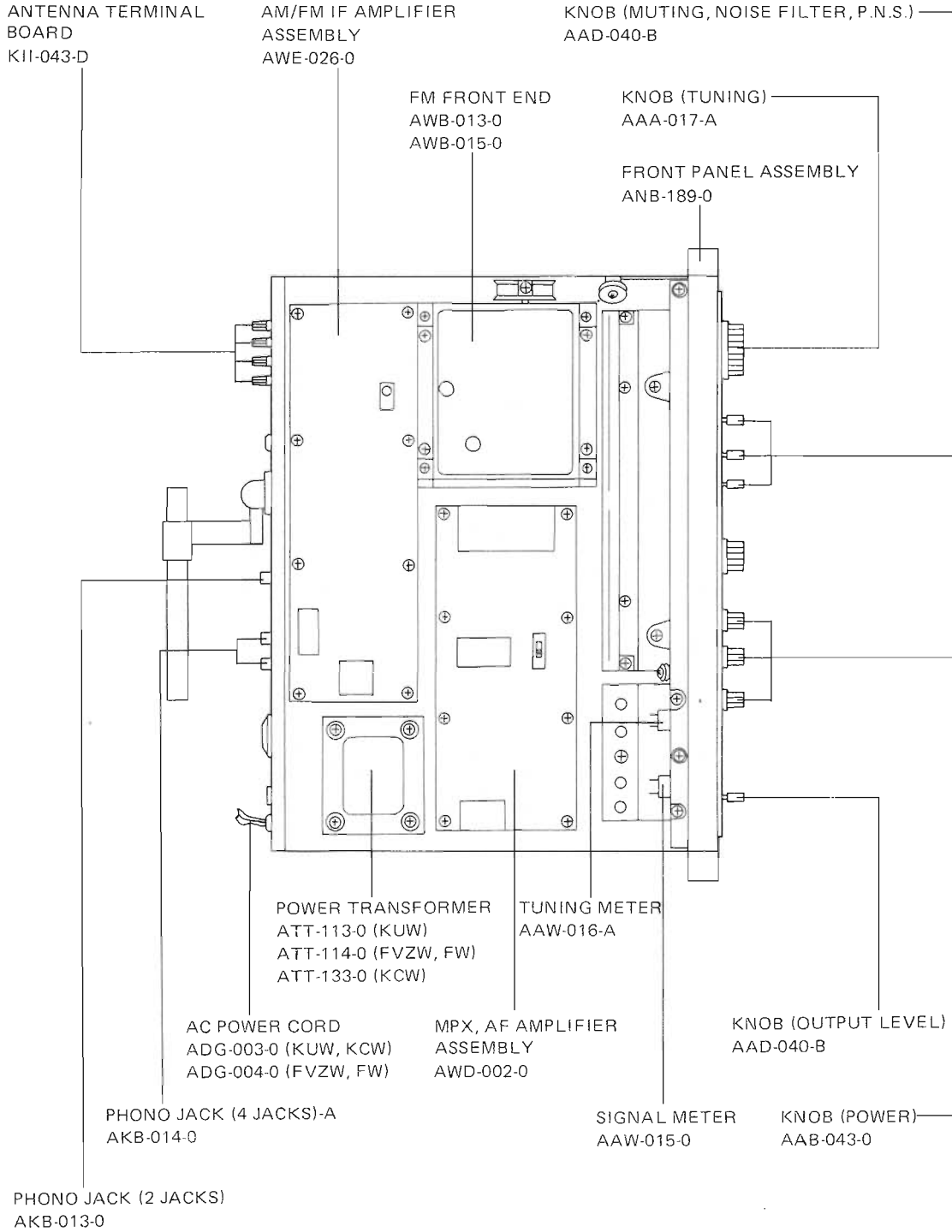
## 7. DISASSEMBLY PROCEDURE

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.

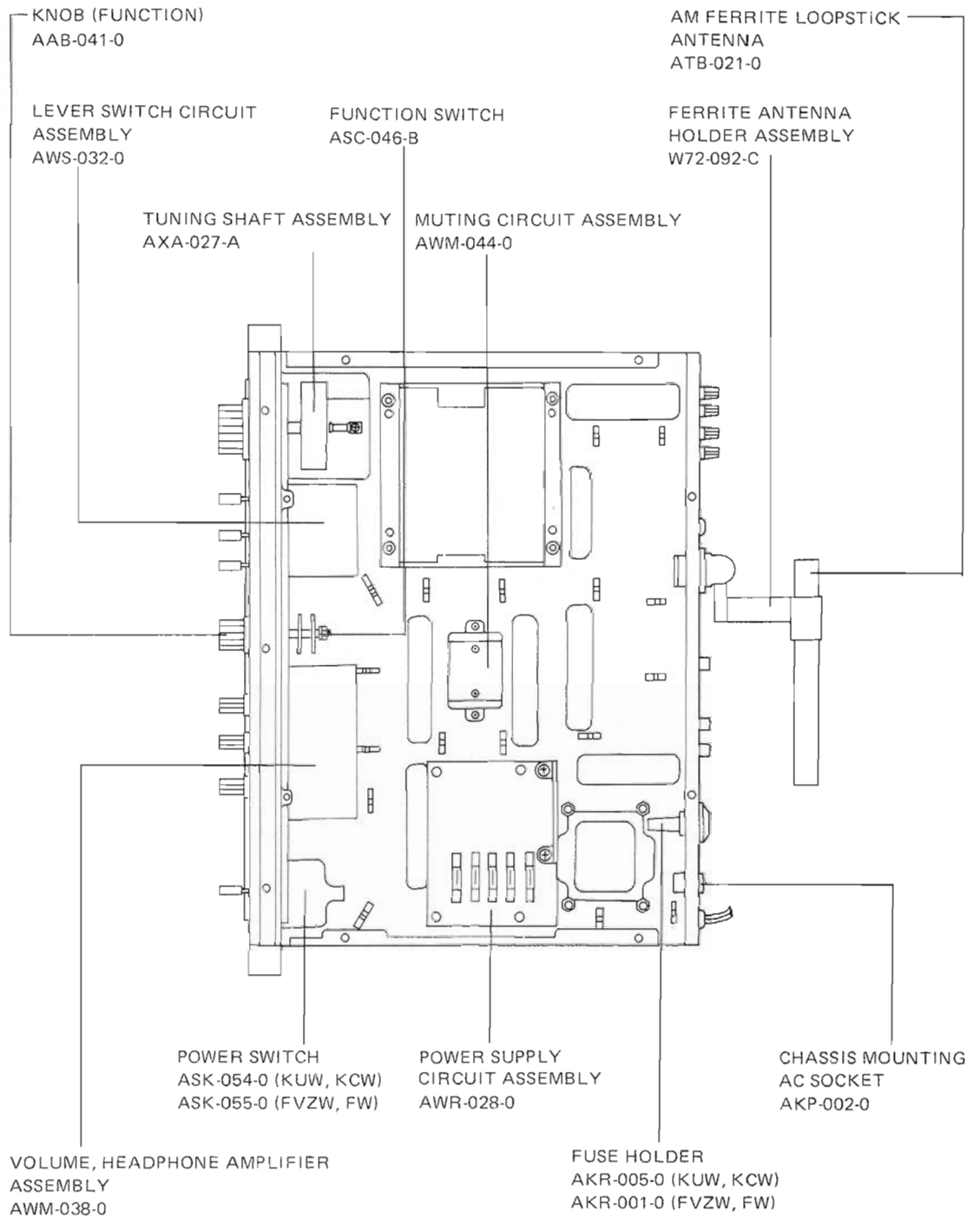


# 8. PARTS LOCATION

## 8.1 TOP VIEW

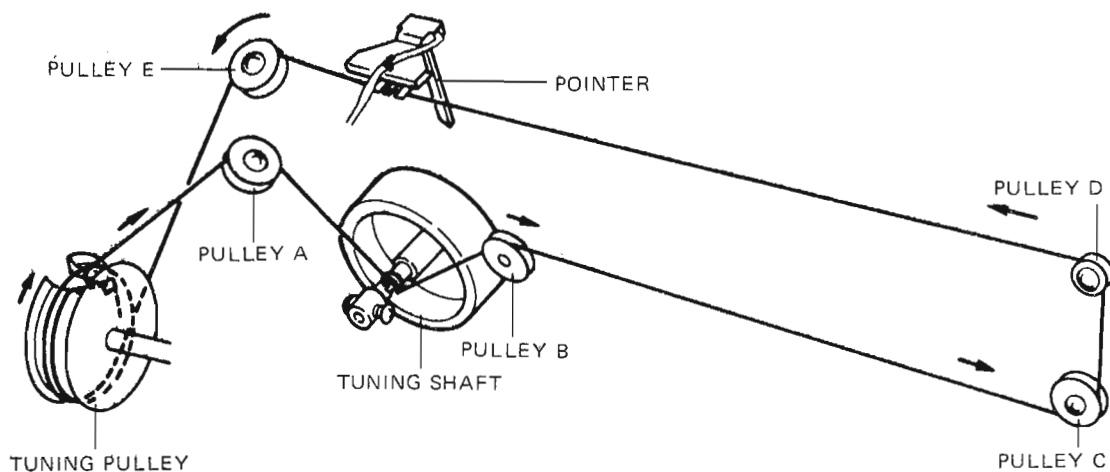


8.2 BOTTOM VIEW



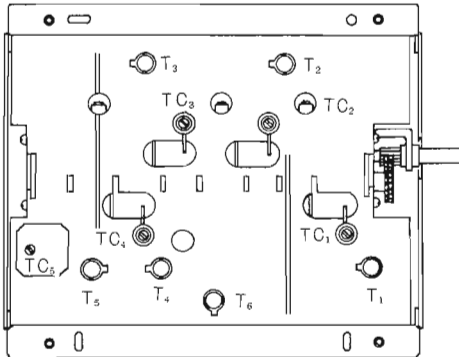
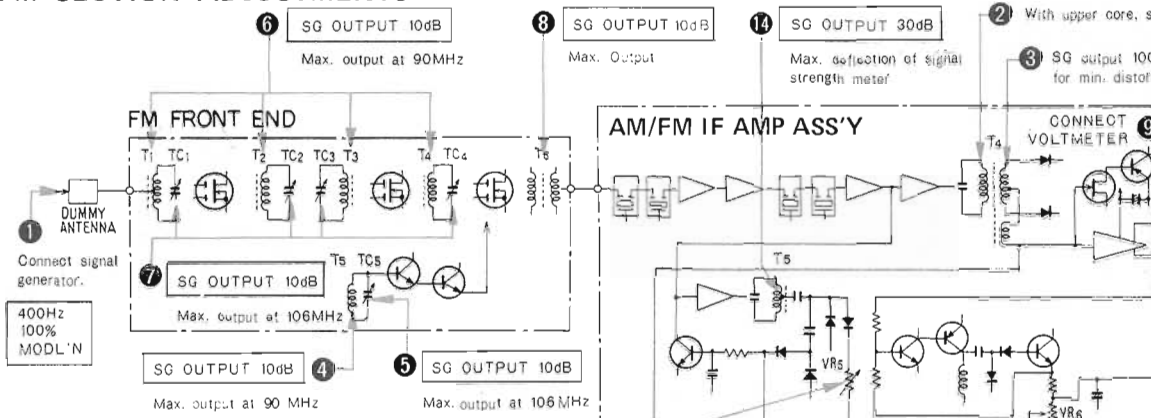
## 9. DIAL STRINGING PROCEDURE

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.

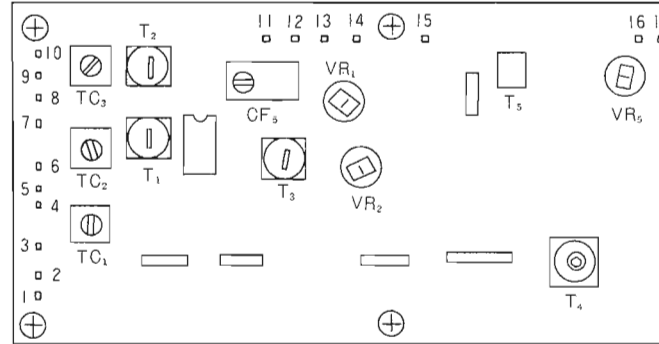


# 10. ADJUSTMENTS

## FM SECTION ADJUSTMENTS

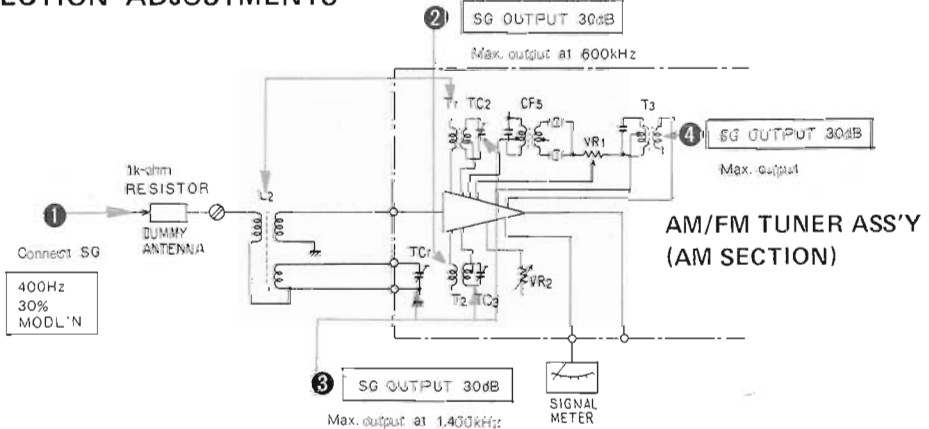


FM FRONT END



AM/FM IF AMP ASS'Y

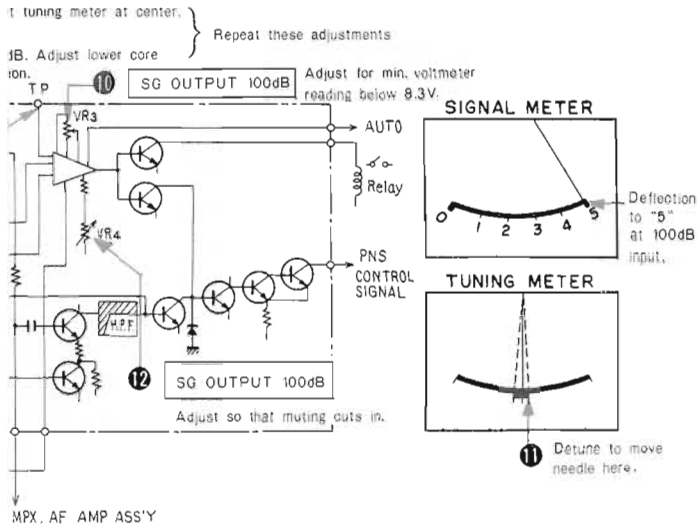
## AM SECTION ADJUSTMENTS



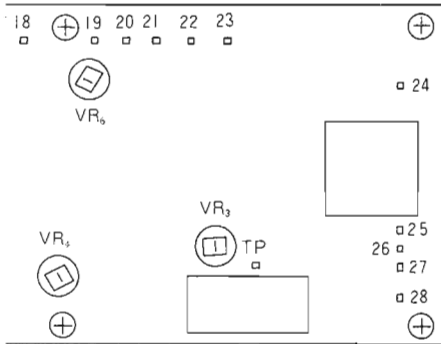
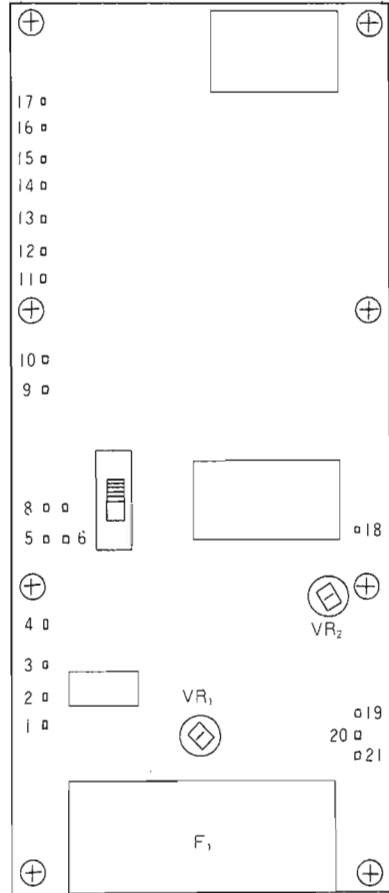
Repeat steps 2 and 3



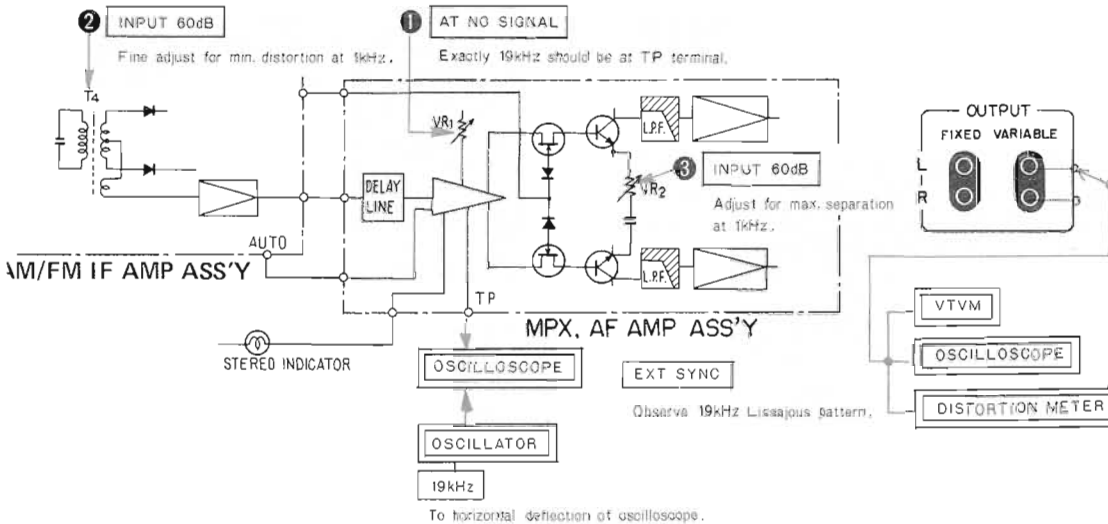
NOTE CONNECT VOLTMETER, OSCILLOSCOPE AND DISTORTION METER TO VARIABLE OUTPUT. TURN OUTPUT LEVEL TO MAX. NUMBERS IN DIAGRAM GIVE ORDER OF ADJUSTMENT STEPS.



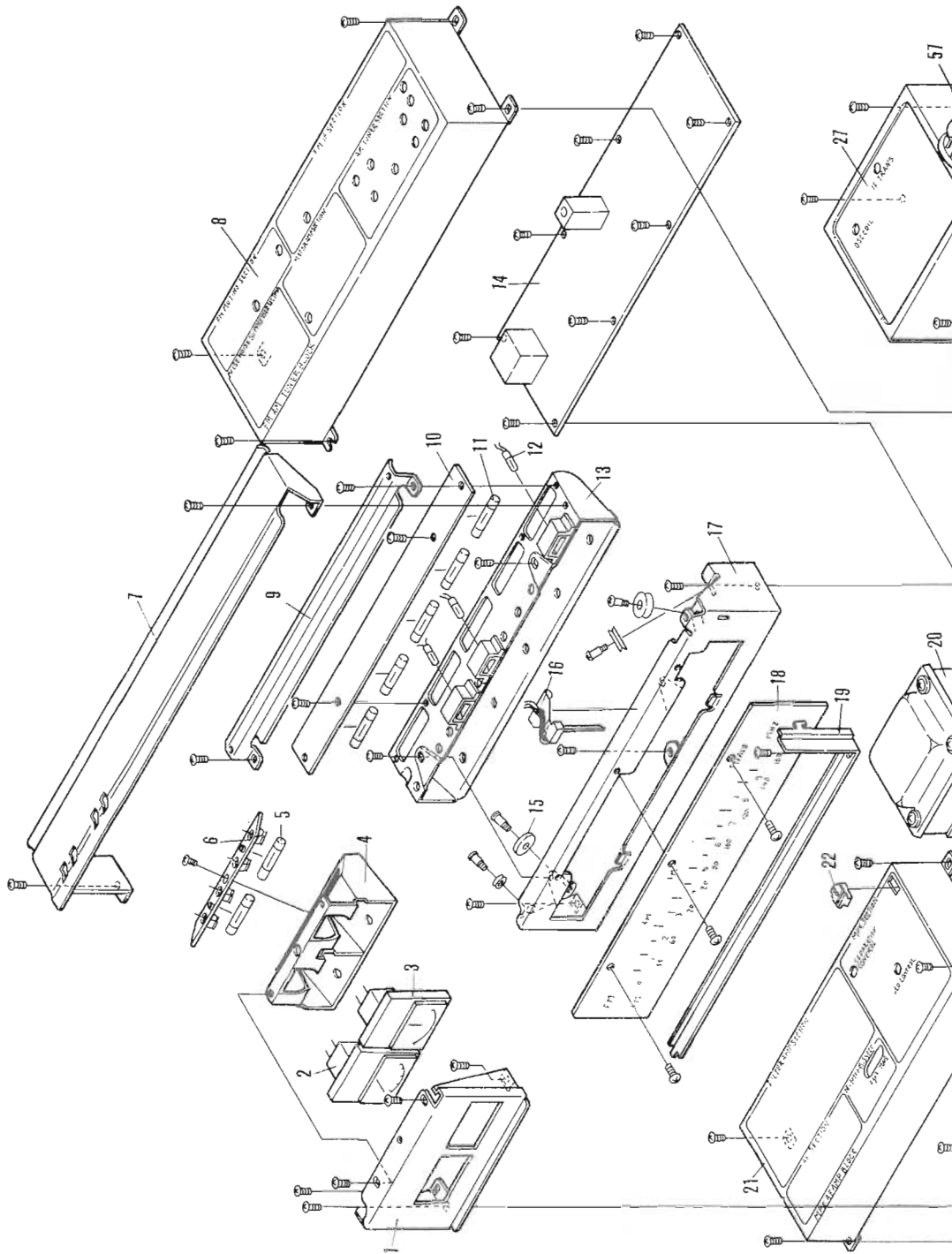
## MPX, AF AMP ASS'Y

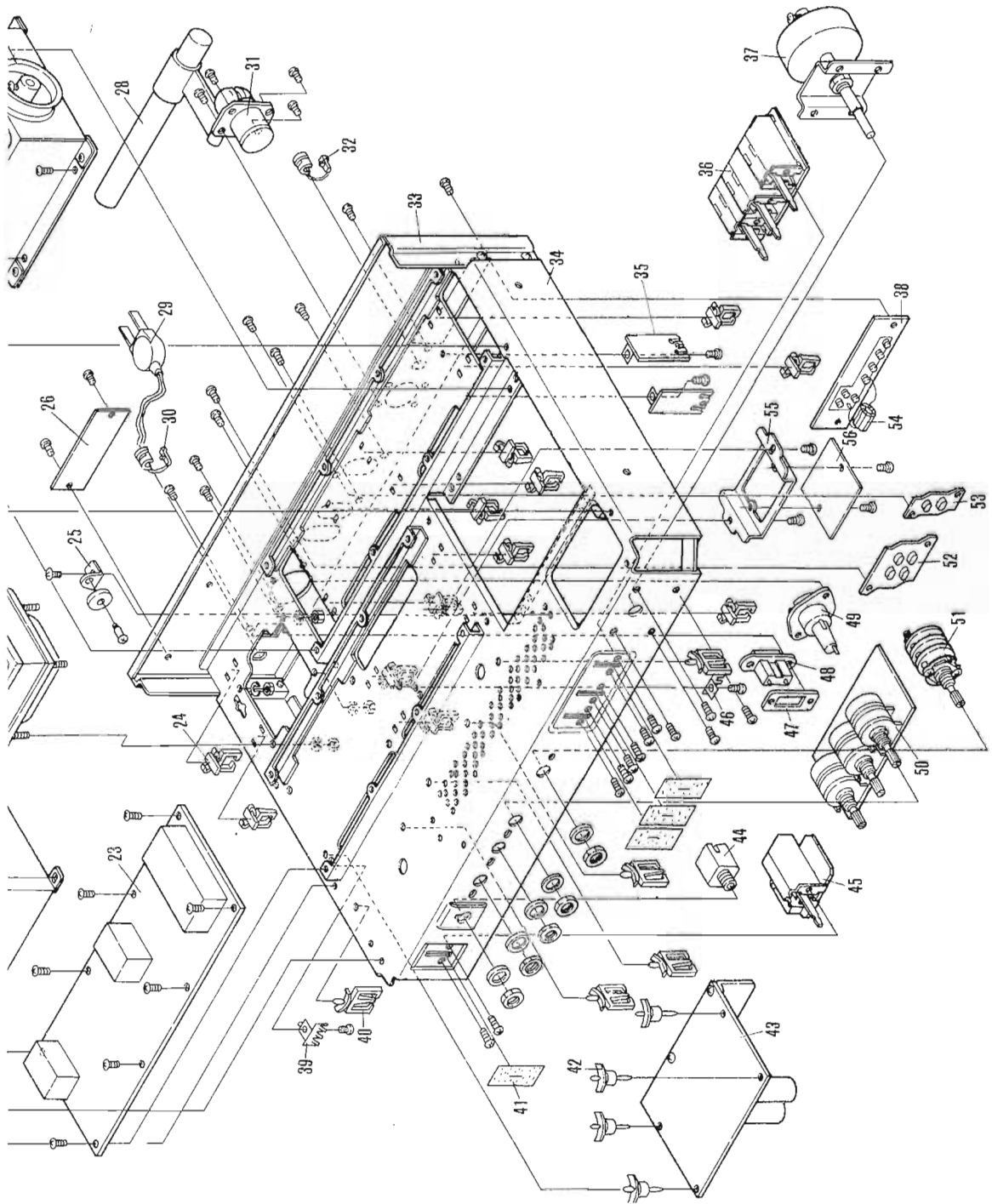


## MPX SECTION ADJUSTMENTS



# 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	

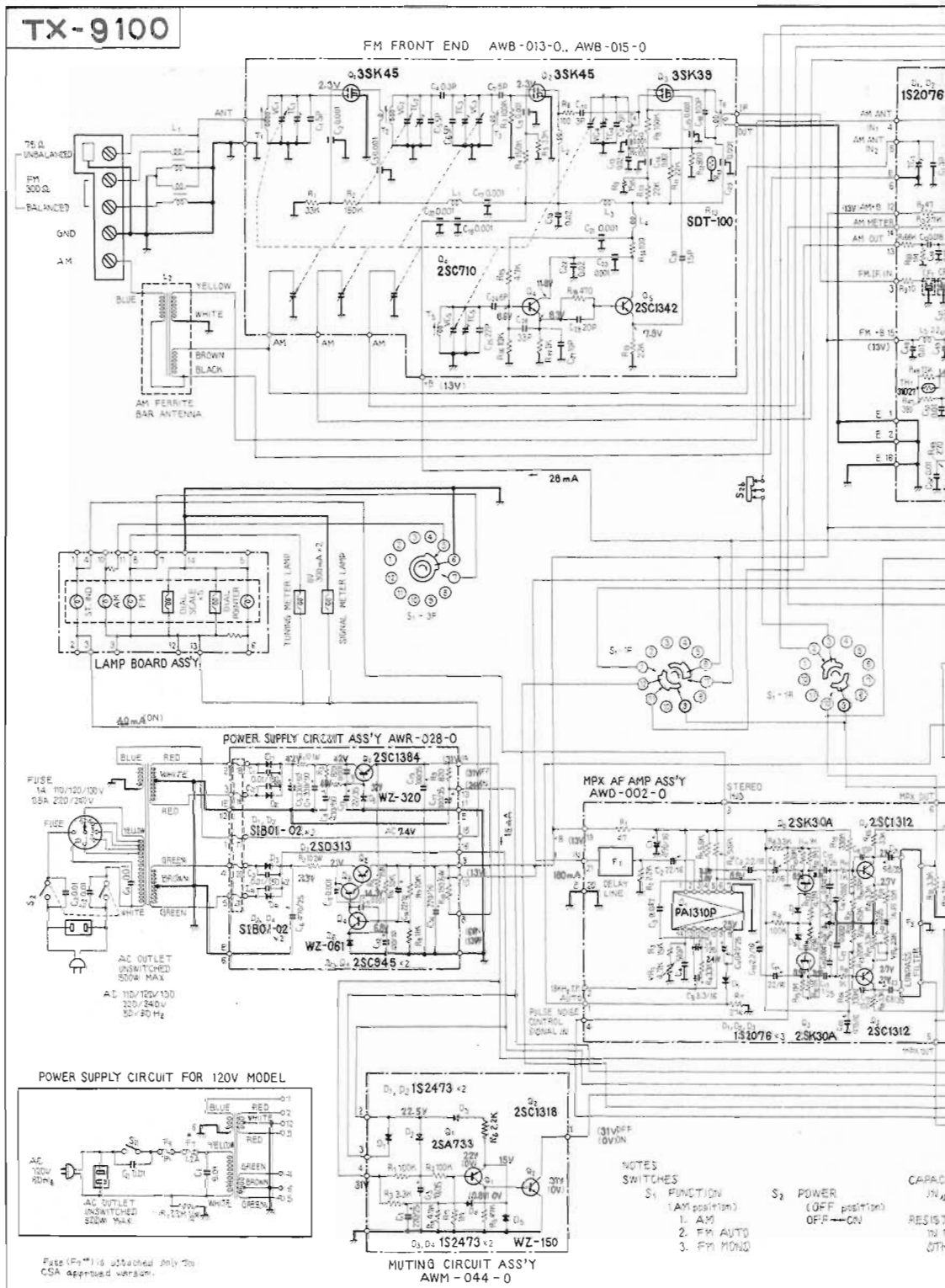
Key No.	Description	Part No.	
41*	Shading plate	AED-018-0	
42*	P.C. board holder	AEB-019-0	
43	Power supply circuit assembly	AWR-028-0	
44	Headphone jack	K72-026-0	
45	Lever switch (Power)	ASK-054-0	KUW, KCW model FVZW, FW model
	Lever switch (Power)	ASK-055-0	
46	Ground terminal strip (4P)	K13-047-0	
47	AC socket-held metal	M49-127-A	
48	Chassis mounting AC socket	AKP-002-0	
49	Fuse holder	AKR-005-0	KUW, KCW model FVZW, FW model
	Fuse holder	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.

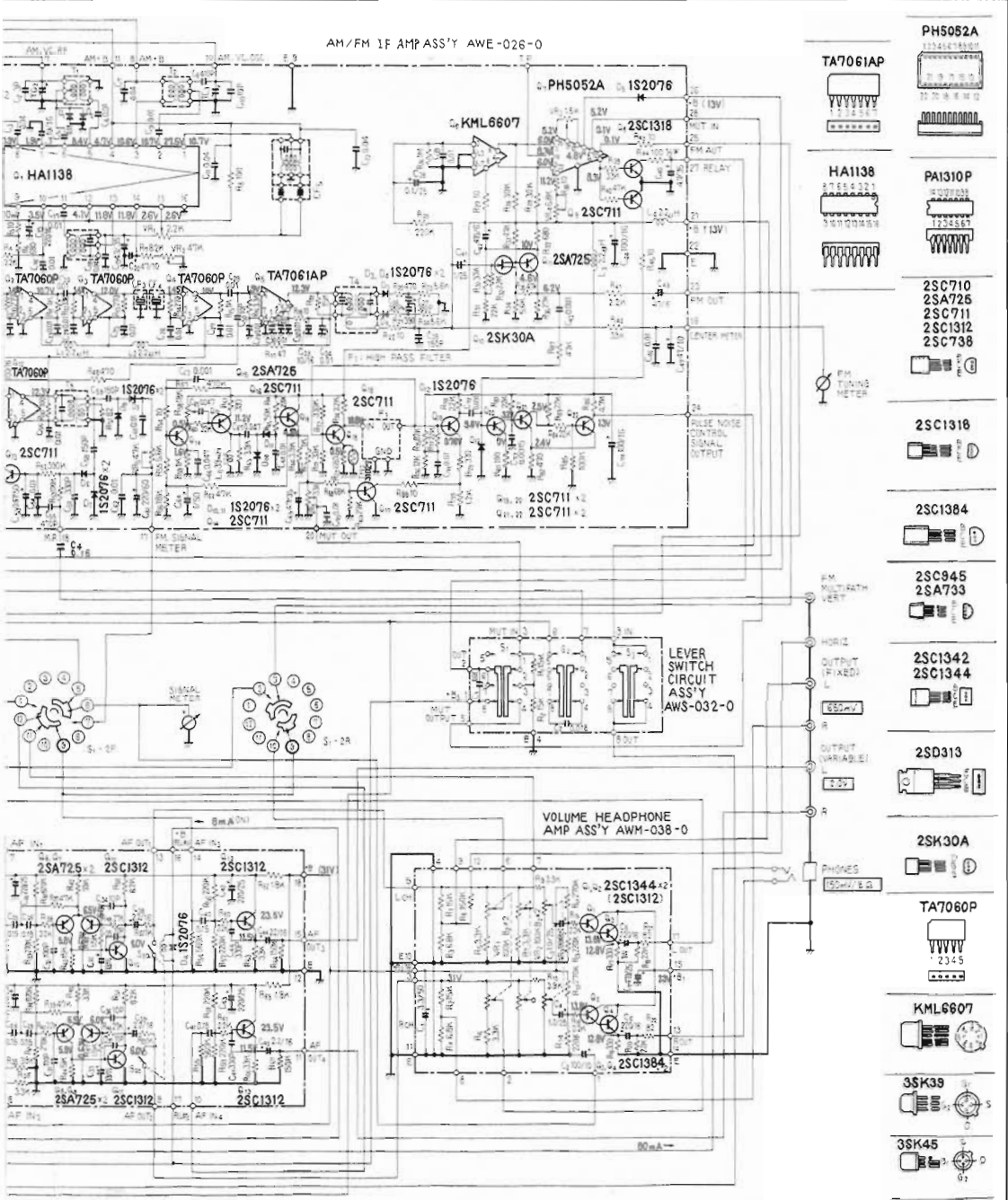
FM front end	Dial scale
AWB-013-0	AAG-046-0
AWB-015-0	AAG-050-0

# 12. SCHEMATIC DIAGRAMS, P. C. BOARD PATTERNS

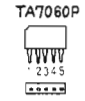
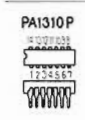
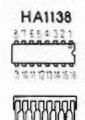
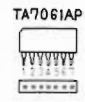
## 12.1 CIRCUIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS LIST



# AND PARTS LISTS



**PH5052A**  
1214418401



TDRS  
UNLESS OTHERWISE NOTED. P=F.F.  
1RS  
HM, 1/2 W, ±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 ASSY  
is factory-set at:  
75μs for FW model.  
50μs for FVZW model.

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

## 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	

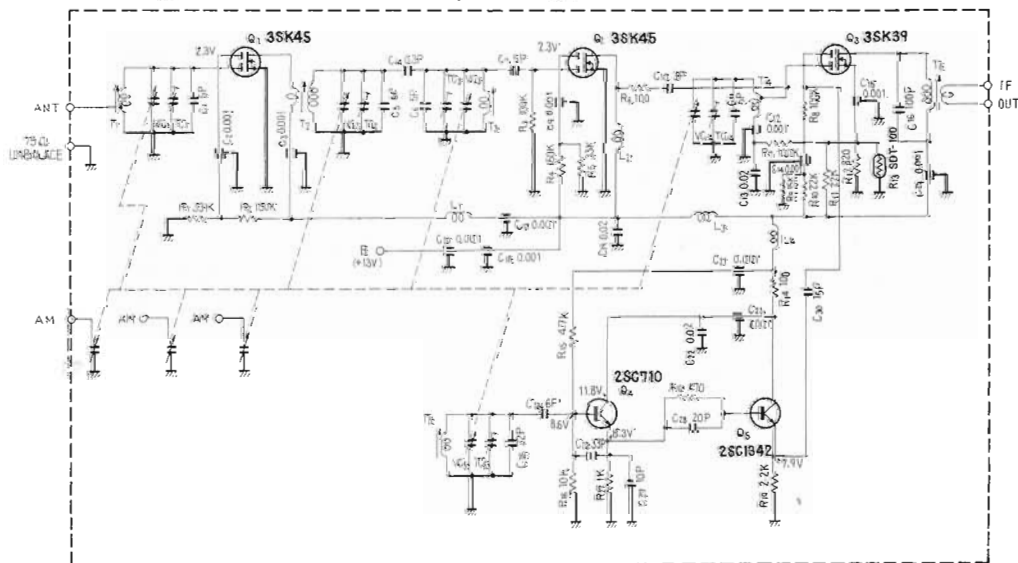
### OTHERS

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	

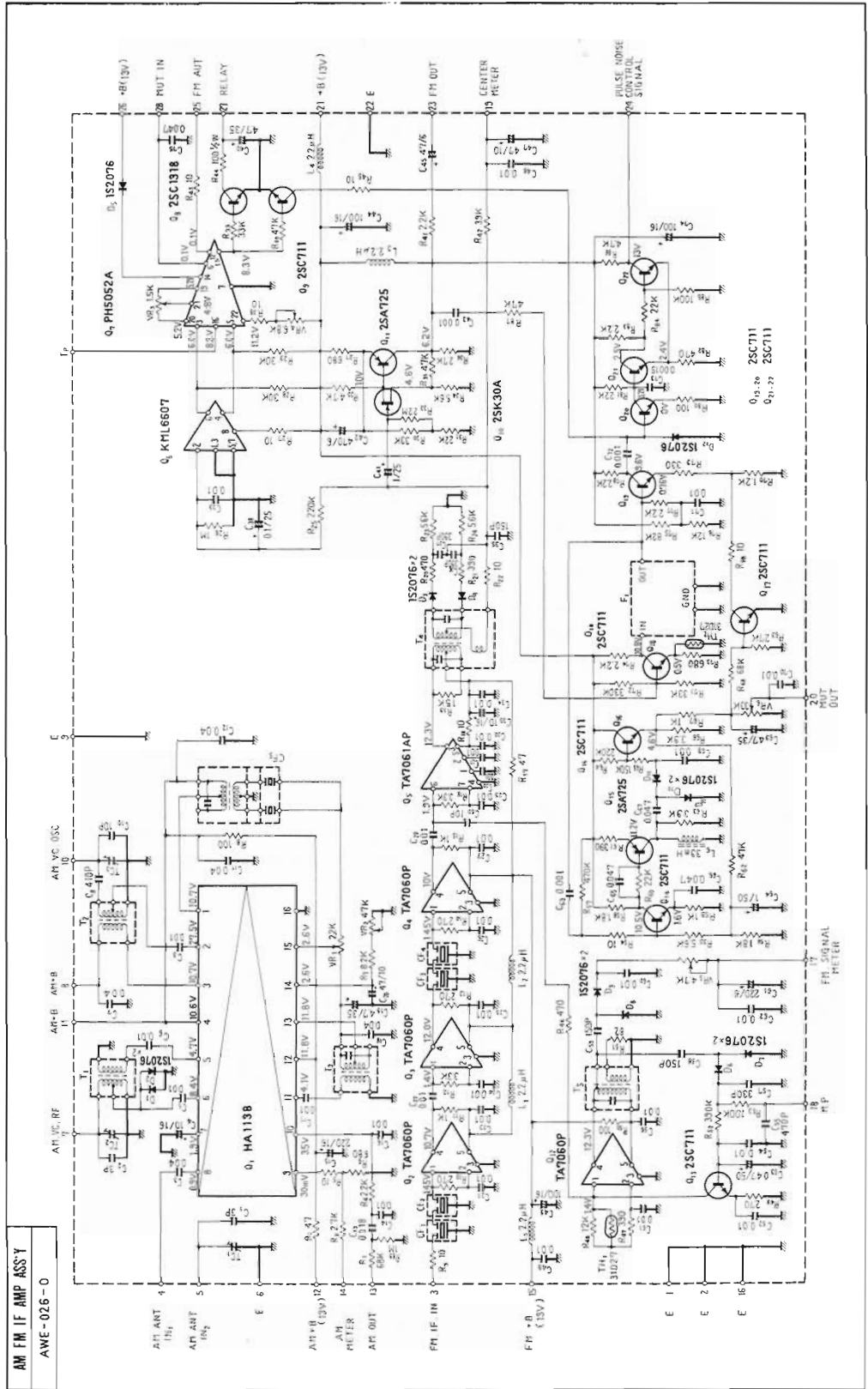


Symbol	Description	Part No.	
F1	Fuse 3A (protection)	E21-021-0	KUW model
	Fuse 3A (protection)	AEK-008-0	KCW model
	Fuse 3A (protection)	E21-036-A	FVZW, FW model
F2	Fuse 0.5A (protection)	E21-028-0	KUW model
	Fuse 0.5A (protection)	AEK-024-0	KCW model
	Fuse 0.5A (protection)	AEK-016-0	FVZW, FW model
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)	H11-070-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	

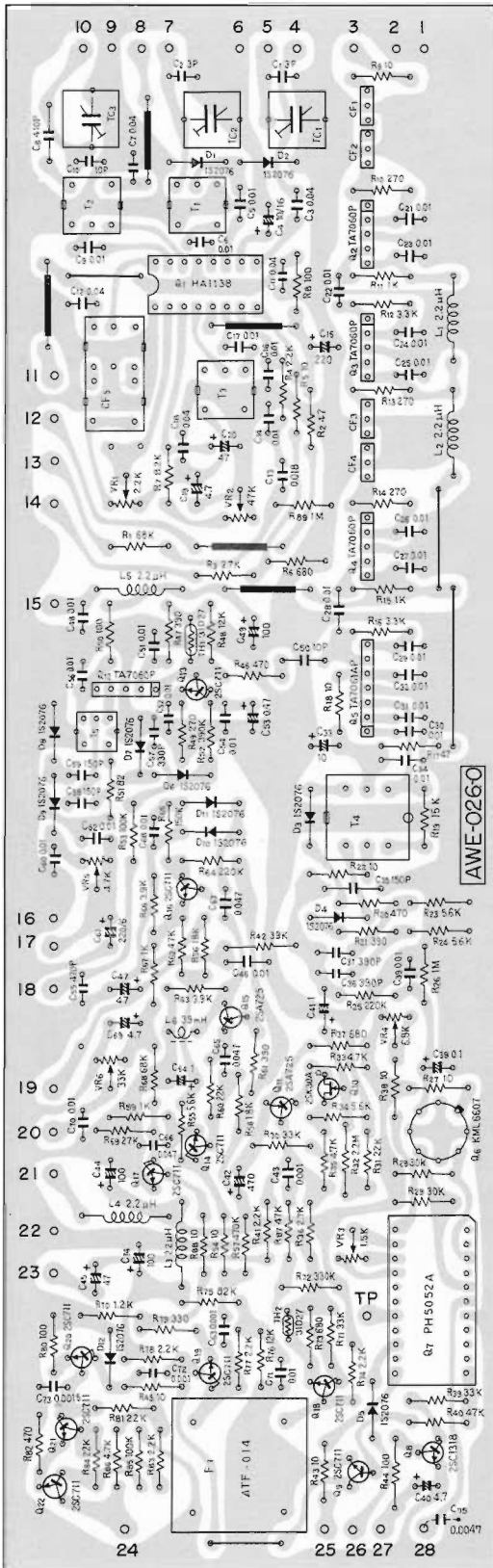
12.2 FM FRONT END (AWB-013-0, AWB-015-0)



# 12.3 AM/FM IF AMPLIFIER ASSEMBLY (AWE-026-0)



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 $\frac{1}{2}$ PM 102J
R12	Carbon film 3.3k	RD $\frac{1}{2}$ PM 332J
R13	Carbon film 270	RD $\frac{1}{2}$ PM 271J
R14	Carbon film 270	RD $\frac{1}{2}$ PM 271J
R15	Carbon film 1k	RD $\frac{1}{2}$ PM 102J
R16	Carbon film 3.3k	RD $\frac{1}{2}$ PM 332J
R17	Carbon film 47	RD $\frac{1}{2}$ PM 470J
R18	Carbon film 10	RD $\frac{1}{2}$ PM 100J
R19	Carbon film 15k	RD $\frac{1}{2}$ PM 153J
R20	Carbon film 470	RD $\frac{1}{2}$ PM 471J
R21	Carbon film 390	RD $\frac{1}{2}$ PM 391J
R22	Carbon film 10	RD $\frac{1}{2}$ PM 100J
R23	Carbon film 5.6k	RD $\frac{1}{2}$ PM 562J
R24	Carbon film 5.6k	RD $\frac{1}{2}$ PM 562J
R25	Carbon film 220k	RD $\frac{1}{2}$ PM 224J
R26	Carbon film 1M	RD $\frac{1}{2}$ PM 105J
R27	Carbon film 10	RD $\frac{1}{2}$ PM 100J
R28	Carbon film 30k	RD $\frac{1}{2}$ PM 303J
R29	Carbon film 30k	RD $\frac{1}{2}$ PM 303J
R30	Carbon film 33k	RD $\frac{1}{2}$ PM 333J
R31	Carbon film 22k	RD $\frac{1}{2}$ PM 223J
R32	Carbon film 2.2M	RD $\frac{1}{2}$ PM 225J
R33	Carbon film 4.7k	RD $\frac{1}{2}$ PM 472J
R34	Carbon film 5.6k	RD $\frac{1}{2}$ PM 562J
R35	Carbon film 4.7k	RD $\frac{1}{2}$ PM 472J
R36	Carbon film 2.7k	RD $\frac{1}{2}$ PM 272J
R37	Carbon film 680	RD $\frac{1}{2}$ PM 681J
R38	Carbon film 10	RD $\frac{1}{2}$ PM 100J
R39	Carbon film 33k	RD $\frac{1}{2}$ PM 333J
R40	Carbon film 47k	RD $\frac{1}{2}$ PM 473J
R41	Carbon film 2.2k	RD $\frac{1}{2}$ PM 222J
R42	Carbon film 39k	RD $\frac{1}{2}$ PM 393J
R43	Carbon film 10	RD $\frac{1}{2}$ PM 100J
R44	Carbon film 100 $\frac{1}{2}$ W	RD $\frac{1}{2}$ PM 101J
R45	Carbon film 10	RD $\frac{1}{2}$ PM 100J
R46	Carbon film 470	RD $\frac{1}{2}$ PM 471J
R47	Carbon film 390	RD $\frac{1}{2}$ PM 391J
R48	Carbon film 12k	RD $\frac{1}{2}$ PM 123J
R49	Carbon film 270	RD $\frac{1}{2}$ PM 271J
R50	Carbon film 100	RD $\frac{1}{2}$ PM 101J
R51	Carbon film 82	RD $\frac{1}{2}$ PM 820J
R52	Carbon film 390k	RD $\frac{1}{2}$ PM 394J
R53	Carbon film 100k	RD $\frac{1}{2}$ PM 104J
R54	Carbon film 10	RD $\frac{1}{2}$ PM 100J
R55	Carbon film 5.6k	RD $\frac{1}{2}$ PM 562J
R56	Carbon film 18k	RD $\frac{1}{2}$ PM 183J
R57	Carbon film 470k	RD $\frac{1}{2}$ PM 474J
R58	Carbon film 1.8k	RD $\frac{1}{2}$ PM 182J
R59	Carbon film 1k	RD $\frac{1}{2}$ PM 102J
R60	Carbon film 22k	RD $\frac{1}{2}$ PM 223J

Symbol	Description	Part No.
R61	Carbon film 390	RD¼PM 391J
R62	Carbon film 47k	RD¼PM 473J
R63	Carbon film 3.9k	RD¼PM 392J
R64	Carbon film 220k	RD¼PM 224J
R65	Carbon film 150k	RD¼PM 154J
R66	Carbon film 3.9k	RD¼PM 392J
R67	Carbon film 1k	RD¼PM 102J
R68	Carbon film 68k	RD¼PM 683J
R69	Carbon film 27k	RD¼PM 273J
R70	Carbon film 1.2k	RD¼PM 122J
R71	Carbon film 33k	RD¼PM 333J
R72	Carbon film 330k	RD¼PM 334J
R73	Carbon film 680	RD¼PM 681J
R74	Carbon film 2.2k	RD¼PM 222J
R75	Carbon film 82k	RD¼PM 823J
R76	Carbon film 12k	RD¼PM 123J
R77	Carbon film 2.2k	RD¼PM 222J
R78	Carbon film 2.2k	RD¼PM 222J
R79	Carbon film 330	RD¼PM 331J
R80	Carbon film 100	RD¼PM 101J
R81	Carbon film 22k	RD¼PM 223J
R82	Carbon film 470	RD¼PM 471J
R83	Carbon film 2.2k	RD¼PM 222J
R84	Carbon film 22k	RD¼PM 223J
R85	Carbon film 100k	RD¼PM 104J
R86	Carbon film 4.7k	RD¼PM 472J
R87	Carbon film 47k	RD¼PM 473J
R88	Carbon film 10	RD¼PM 100J
R89	Carbon film 1M	RD¼PM 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	

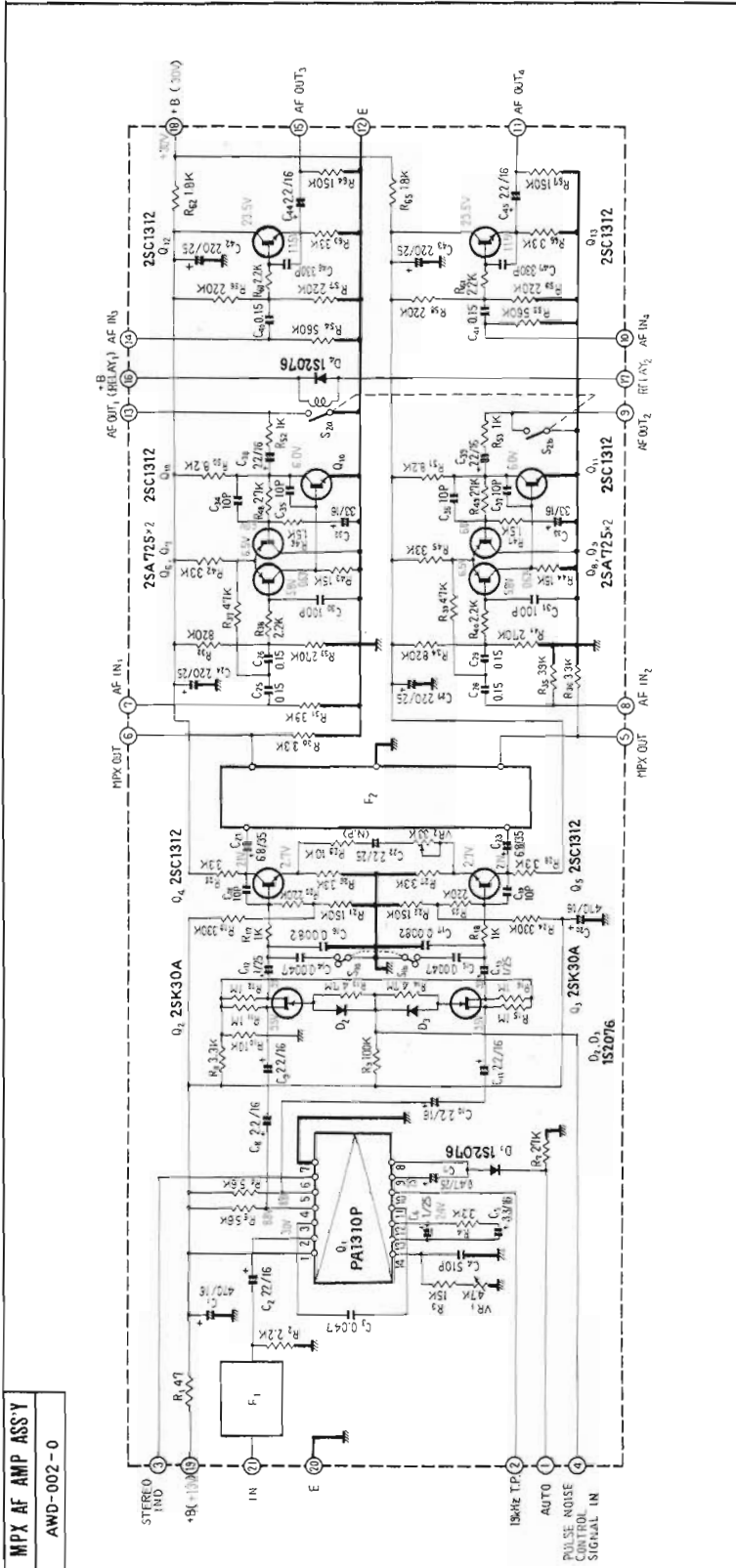
Symbol	Description	Part No.
Q11	Transistor 2SA725-F	
Q12	IC TA7060P BL	
Q13	Transistor 2SC711-F	
Q14	Transistor 2SC711-F or G	
Q15	Transistor 2SA725-F	
Q16	Transistor 2SC711-F or G	
Q17	Transistor 2SC711-F	
Q18	Transistor 2SC711-F or G	
Q19	Transistor 2SC711-F or G	
Q20	Transistor 2SC711-F or G	
Q21	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**

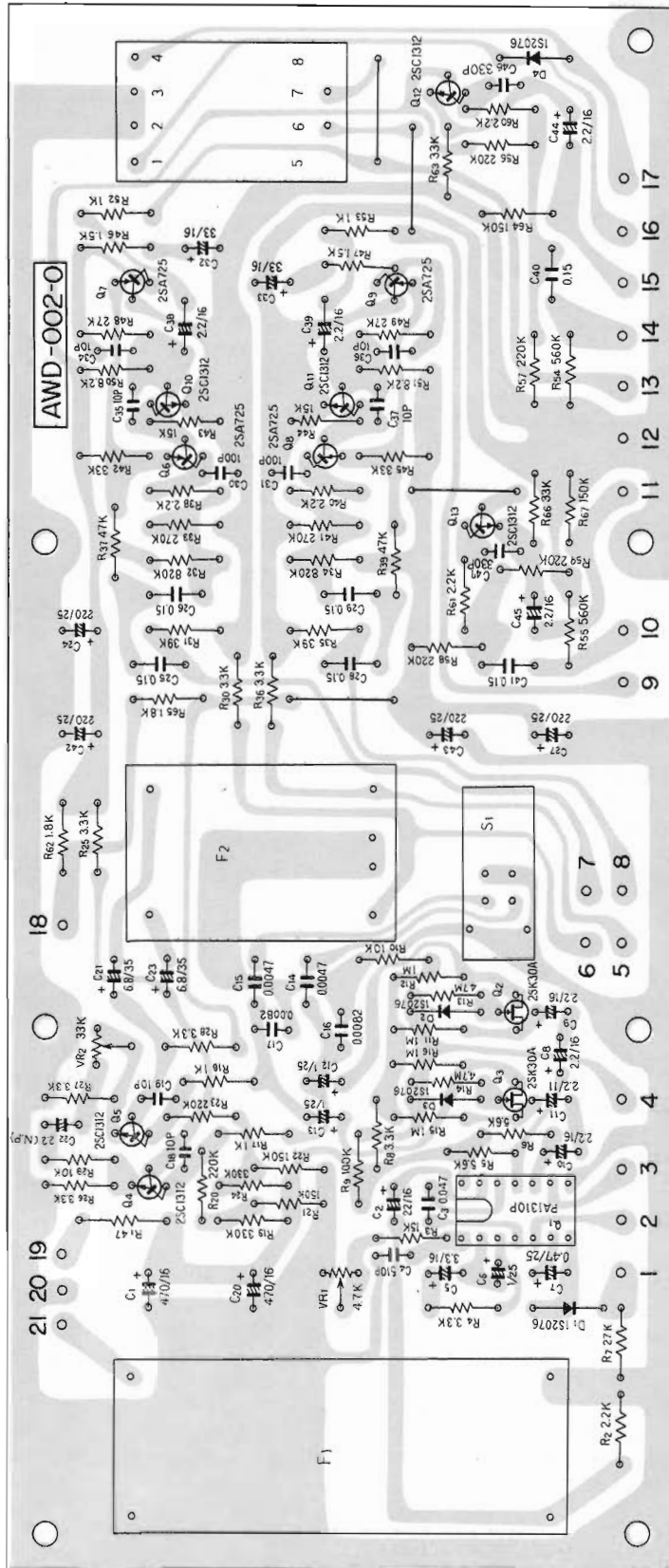
Symbol	Description	Part No.
T1	MW RF coil	ATB-020-0
T2	MW OSC coil	ATB-019-0
T3	AM IFT	ATE-012-0
T4	FM transformer	ATE-013-0
T5	FM matching transformer	ATE-001-A
L1	RF choke coil	T24-028-A
L2	RF choke coil	T24-028-A
L3	RF choke coil	T24-028-A
L4	RF choke coil	T24-028-A
L5	RF choke coil	T24-028-A
L6	Choke 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	RD¼PM 822J
R52	Carbon film 1k	RD¼PM 102J
R53	Carbon film 1k	RD¼PM 102J
R54	Carbon film 560k	RD¼PM 564J
R55	Carbon film 560k	RD¼PM 564J
R56	Carbon film 220k	RD¼PM 224J
R57	Carbon film 220k	RD¼PM 224J
R58	Carbon film 220k	RD¼PM 224J
R59	Carbon film 220k	RD¼PM 224J
R60	Carbon film 2.2k	RD¼PM 222J
R61	Carbon film 2.2k	RD¼PM 222J
R62	Carbon film 1.8k	RD¼PM 182J
R63	Carbon film 33k	RD¼PM 333J
R64	Carbon film 150k	RD¼PM 154J
R65	Carbon film 1.8k	RD¼PM 182J
R66	Carbon film 33k	RD¼PM 333J
R67	Carbon film 150k	RD¼PM 154J
VR1	Semi-fixed 4.7k-B	ACP-018-0
VR 2	Semi-fixed 33k-B	ACP-027-0

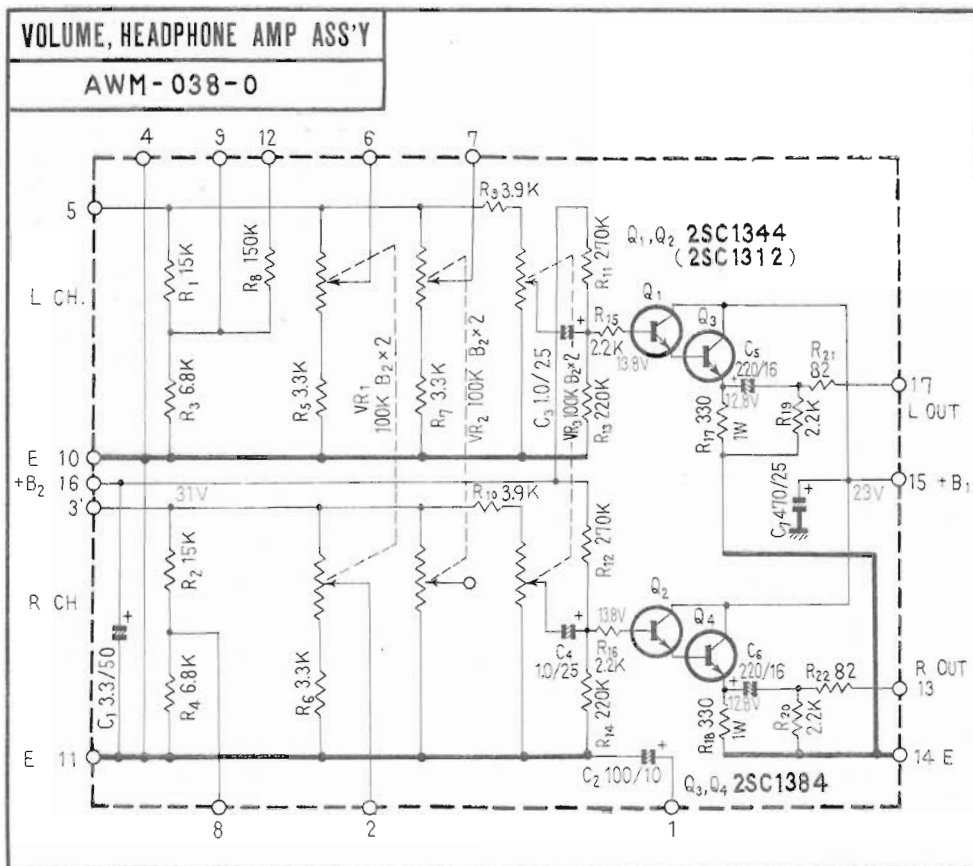
## SEMICONDUCTORS

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	

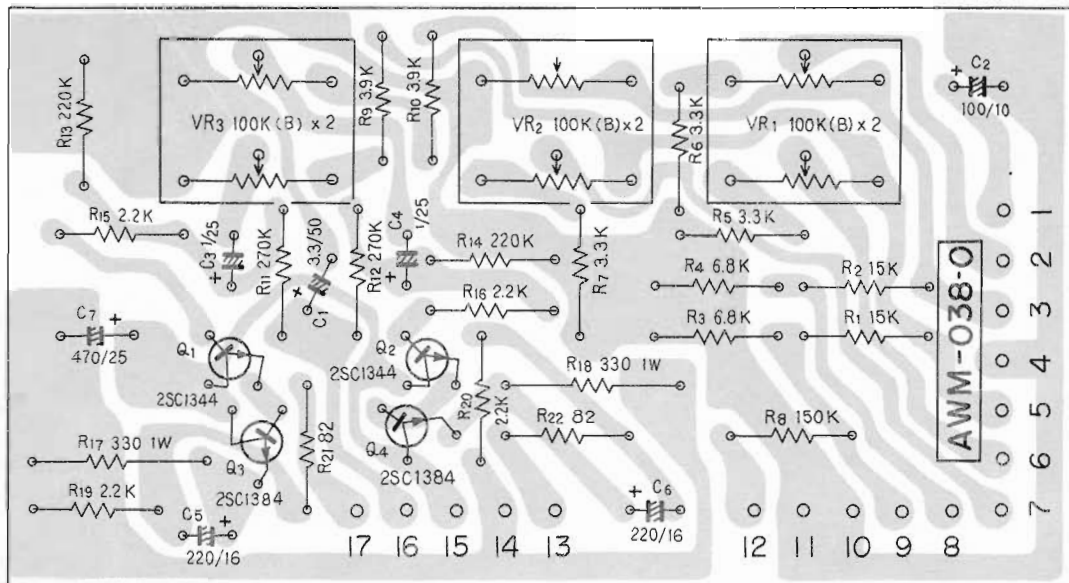
## SWITCHES AND OTHERS

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

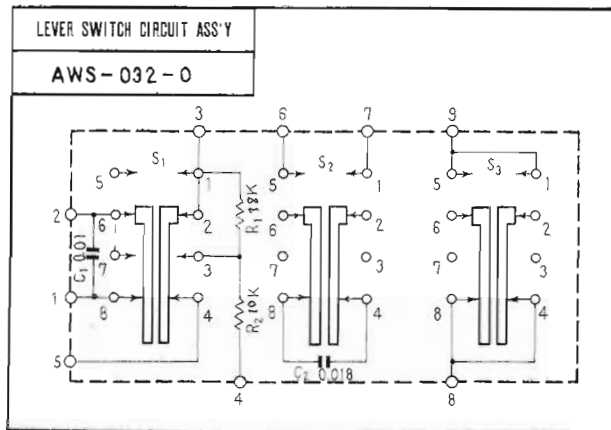
Symbol	Description	Part No.
R1	Carbon film 15k	RD $\frac{1}{4}$ PS 153J
R2	Carbon film 15k	RD $\frac{1}{4}$ PS 153J
R3	Carbon film 6.8k	RD $\frac{1}{4}$ PS 682J
R4	Carbon film 6.8k	RD $\frac{1}{4}$ PS 682J
R5	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332J
R6	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332J
R7	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332J
R8	Carbon film 150k	RD $\frac{1}{4}$ PS 154J
R9	Carbon film 3.9k	RD $\frac{1}{4}$ PS 392J
R10	Carbon film 3.9k	RD $\frac{1}{4}$ PS 392J
R11	Carbon film 270k	RD $\frac{1}{4}$ PS 274J
R12	Carbon film 270k	RD $\frac{1}{4}$ PS 274J
R13	Carbon film 220k	RD $\frac{1}{4}$ PS 224J
R14	Carbon film 220k	RD $\frac{1}{4}$ PS 224J
R15	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R16	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R17	Metal oxide 330 1W	RS1P 331K
R18	Metal oxide 330 1W	RS1P 331K
R19	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R20	Carbon film 2.2k	RD $\frac{1}{4}$ PS 222J
R21	Carbon film 82	RD $\frac{1}{4}$ PS 820J
R22	Carbon film 82	RD $\frac{1}{4}$ PS 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

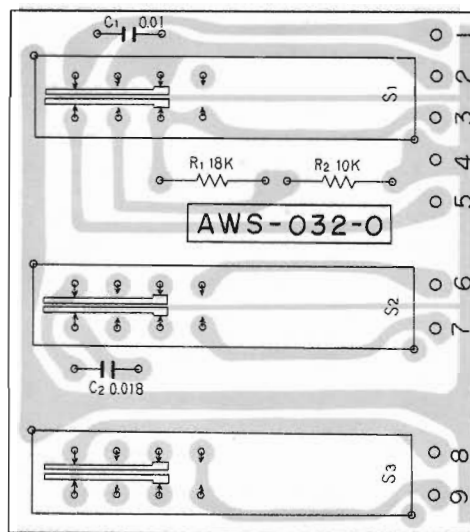
Symbol	Description	Part No.
Q1	Transistor 2SC1344-E or D (or 2SC1312-G, F)	
Q2	Transistor 2SC1344-E or D (or 2SC1312-G, F)	
Q3	Transistor 2SC1384-R or Q	
Q4	Transistor 2SC1384-R or Q	



## 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

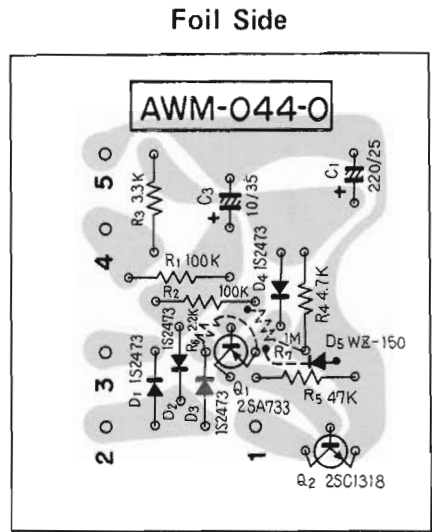
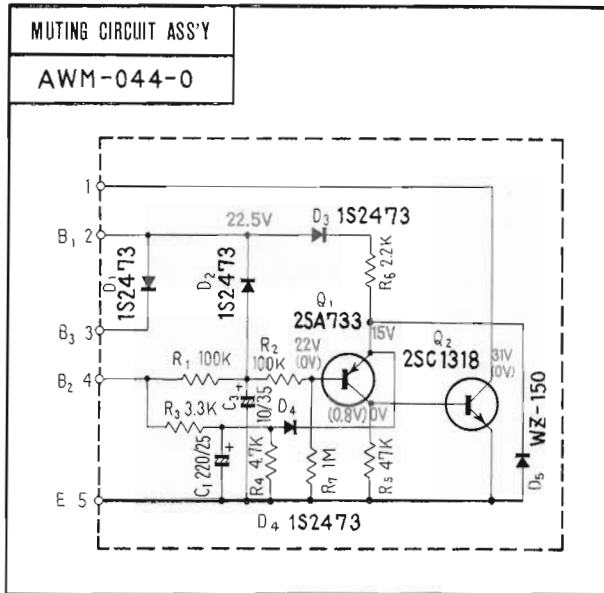
### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 18k	RD¼PS 183J
R2	Carbon film 10k	RD¼PS 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)



CAPACITORS

Symbol	Description	Part No.	
C1	Electrolytic 220 25V	CEA 221P 25	
C2			
C3	Electrolytic 10 35V	CEA 100P 35	

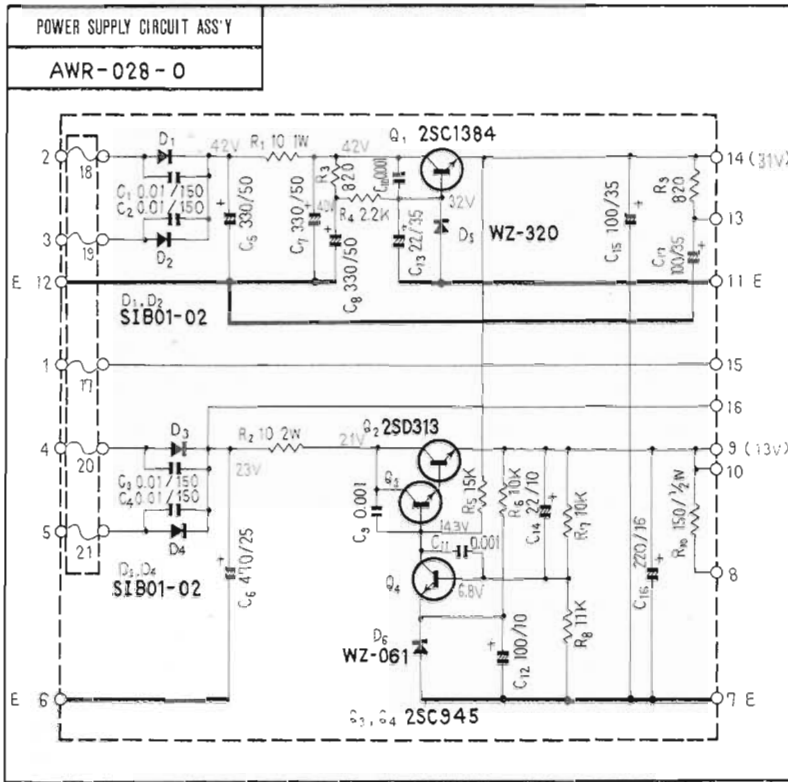
RESISTORS

Symbol	Description	Part No.	
R1	Carbon film 100k	RD¼PM 104J	
R2	Carbon film 100k	RD¼PM 104J	
R3	Carbon film 3.3k	RD¼PM 332J	
R4	Carbon film 4.7k	RD¼PM 472J	
R5	Carbon film 47k	RD¼PM 473J	
R6	Carbon film 2.2k	RD¼PM 222J	
R7	Carbon film 1M	RD¼PM 105J	

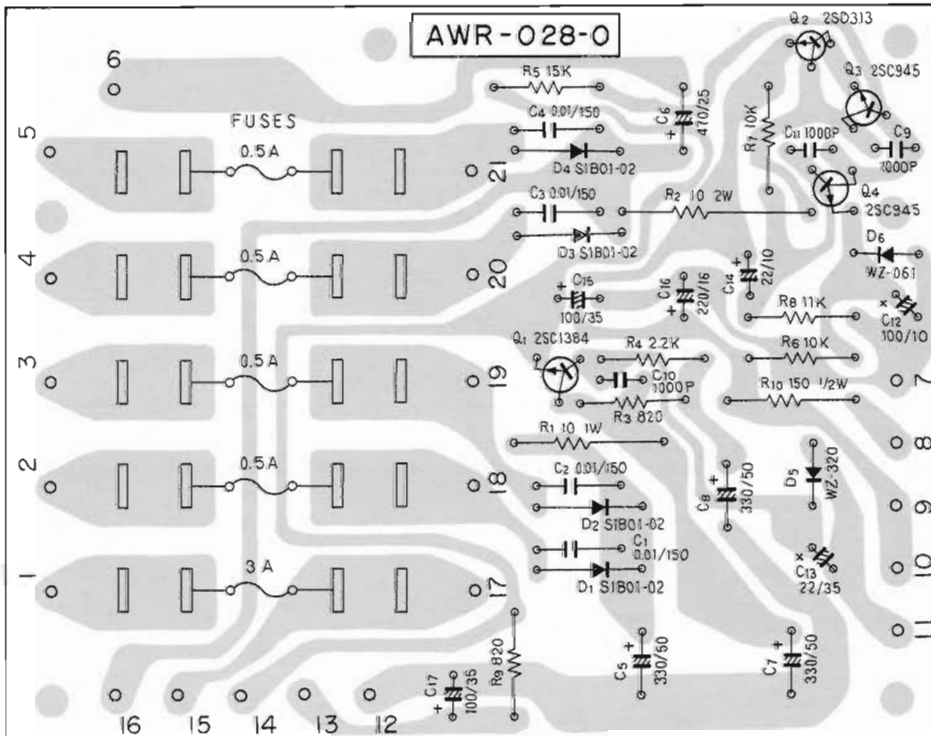
SEMICONDUCTORS

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 $\frac{1}{2}$ PS 821J
R4	Carbon film 2.2k	RD $\frac{1}{2}$ PS 222J
R5	Carbon film 15k	RD $\frac{1}{2}$ PS 153J
R6	Carbon film 10k	RD $\frac{1}{2}$ PS 103J
R7	Carbon film 10k	RD $\frac{1}{2}$ PS 103J
R8	Carbon film 11k	RD $\frac{1}{2}$ PS 113J
R9	Carbon film 820	RD $\frac{1}{2}$ PS 821J
R10	Carbon film 150 $\frac{1}{2}$ W	RD $\frac{1}{2}$ PS 151J

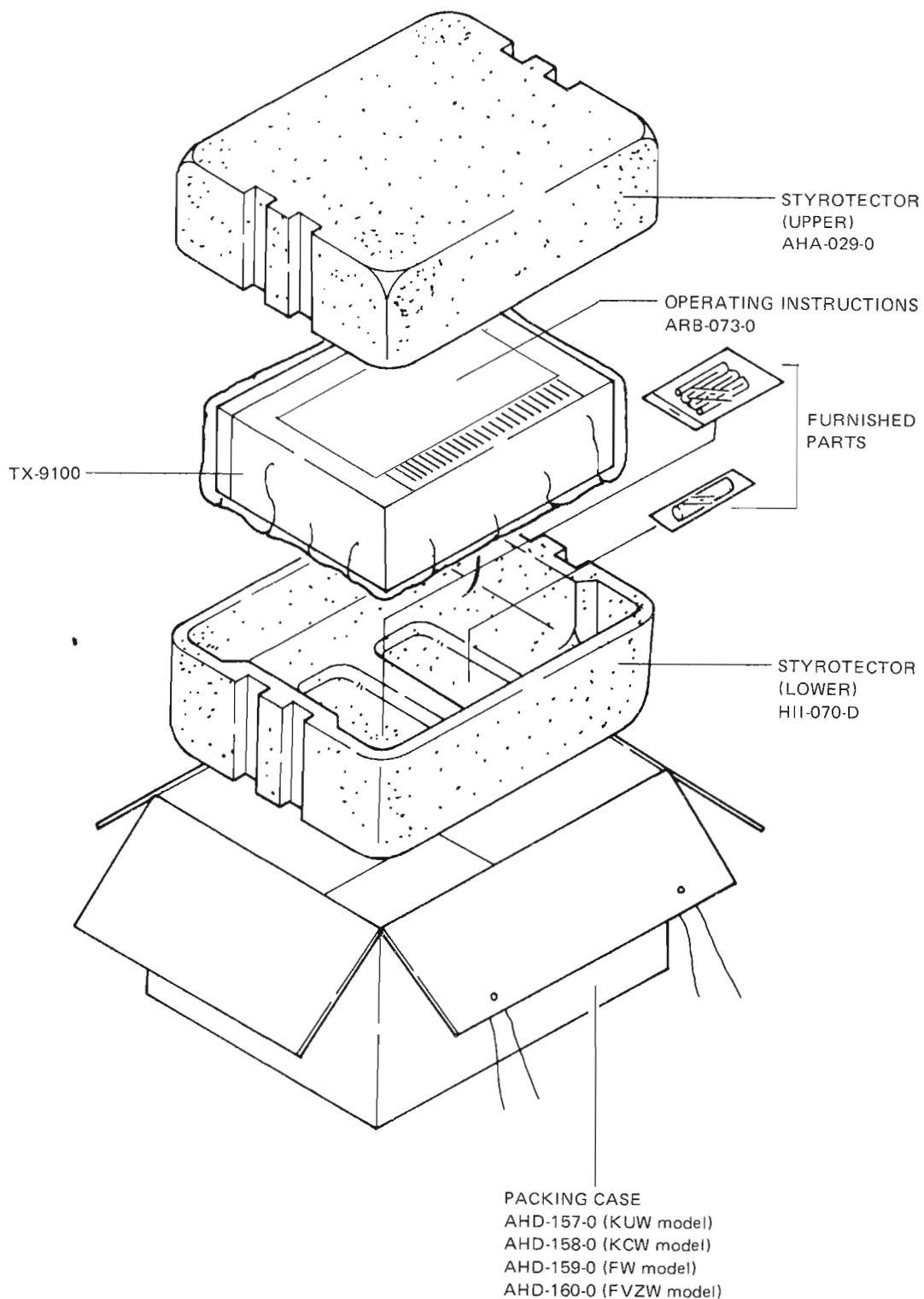
## SEMICONDUCTORS

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 SIB01-02	
D2	Diode SIB01-02	
D3	Diode SIB01-02	
D4	Diode SIB01-02	
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



**PIONEER ELECTRONIC CORPORATION**

15-5, 4-Chome, Ohmori-nishi, Ohta-ku, Tokyo, Japan

**U.S. PIONEER ELECTRONICS CORPORATION**

178 Commerce Road, Carlstadt New Jersey 07072 U.S.A.

**PIONEER ELECTRONIC (EUROPE) N.V.**

Meir-center, Meir 21, 2000 Antwerp, Belgium