<R42-232-0>

Service Manual

AM/FM STEREO RECEIVER

SX-828/ KUW, FVZW, FW

NOTE

MODEL SX-828 COMES IN THREE VERSIONS DISTINGUISHED AS FOLLOWS:

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

<72AO2M8ID>

PIONEER®

CONTENTS

1. SPECIFICATIONS

SEMICONDUCTORS

FETs	6
ICs	4
Transistors	57
Diodes	38

POWER AMPLIFIER SECTION

Music Power Output (IHF)	270W (4Ω), 180W (8Ω)
Continuous Power Output	95W/95W (4Ω)
(1kHz: each channel driven)	70W/70W (8Ω)
Continuous Power Output	75W + 75W (4Ω)
(1kHz: both channels driven)	60W + 60W (8Ω)
Power Output in the Range of 20Hz to 20kHz (both channels driven)	54W + 54W (8Ω, Harmonic distortion less than 0.5%)
Harmonic Distortion	Less than 0.5% (Continuous power output) Less than 0.03% (8Ω, 35W/35W power output)
Intermodulation Distortion	Less than 0.5% (Continuous power output) Less than 0.03% (8Ω, 35W/35W power output)
Power Bandwidth (IHF)	10Hz to 60kHz (8Ω, Harmonic distortion Less than 0.5%)
Frequency Response	5Hz to 80kHz, ±1dB
Input Sensitivity/Impedance (1kHz, Continuous power output)	500mV/50kΩ
Speakers	4 to 16Ω
Damping Factor	40 (8Ω, 1kHz)

PREAMPLIFIER SECTION

Output Voltage	500mV (Rated output), 4V (Max.)	
Harmonic Distortion	Less than 0.1%	
Frequency Response	10Hz to 40kHz, ±1dB	
Input Sensitivity/Impedance (1kHz, for rated output)	PHONO 1 MAG	2.7mV/50kΩ
	PHONO 2 MM	2.7mV/50kΩ
	MC	115μV/30Ω
	(with PHONO INPUT transformer "PP-402")	
	MIC	2.6mV/50kΩ
	AUX	200mV/100kΩ
	TAPE MONITOR 1, 2	200mV/100kΩ
Recording Output	TAPE REC 1, 2 (Pin jack)	200mV
	TAPE REC (DIN connector)	35mV
BASS Control	−10dB, +10dB/100Hz	
TREBLE Control	−10dB, +10dB/10kHz	
LOW Filter	−3dB/60Hz (12dB/oct.)	
HIGH Filter	−3dB/6kHz (12dB/oct.)	
Equalization Curve	PHONO: RIAA S.T.D.	
Loudness Contour	+10dB/100Hz, +6dB/10kHz with Volume Control set at −40dB position.	
Muting	−20dB	
Hum and Noise (Short circuit, IHF network)	PHONO	More than 85dB
	AUX	More than 95dB

FM TUNER SECTION

Frequency Range	88MHz to 108MHz 87.5MHz to 108MHz (FTZ approved)
Usable Sensitivity (IHF)	1.7μV
Capture Ratio (IHF)	1.5dB
Selectivity (IHF)	More than 75dB
Image Rejection	More than 95dB (98MHz)
IF Rejection	More than 100dB (90MHz)
Spurious Rejection	More than 100dB (98MHz)
AM Suppression	50dB
Signal-to-Noise Ratio	70dB
Harmonic Distortion	Mono: Less than 0.2% (100% Mod.) Stereo: Less than 0.4% (100% Mod.)
Tuning Indicator	Signal strength type and Center tuning type
Muting	Switchable to ON-OFF
Stereo Separation	More than 40dB (1kHz)
Sub Carrier Suppression	More than 50dB
De-emphasis switch	50μsec., 75μsec. (FW model only)
Antenna Input	Impedance 300Ω balanced and 75Ω unbalanced

AM TUNER SECTION

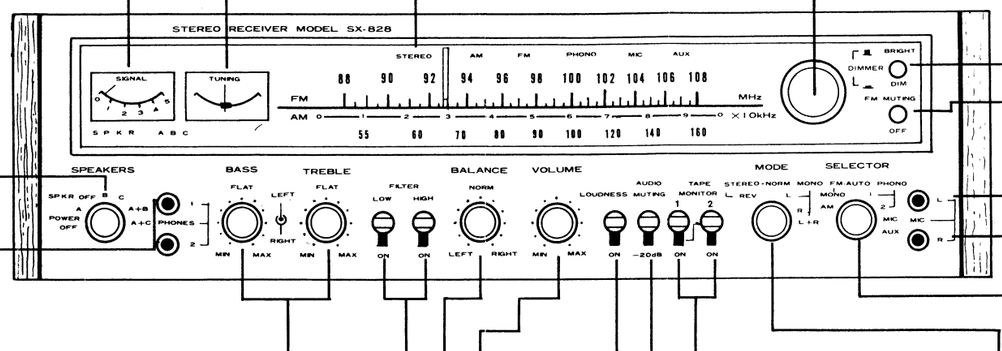
Frequency Range	525kHz to 1,605kHz
Usable Sensitivity (IHF)	10μV
Selectivity (IHF)	More than 35dB
Image Rejection	More than 85dB (1,000kHz)
IF Rejection	More than 80dB
Signal-to-Noise Ratio	More than 50dB
Antenna	Built-in ferrite loopstick antenna

MISCELLANEOUS

Power Requirements	120V 60Hz or 110V, 120V, 130V, 220V and 240V (Switchable) 50–60Hz	
Power Consumption	370W (Max.)	
AC Outlets	Switched 1, Unswitched 2	
Dimensions (overall)	19-1/8 in./485 mm (width) 5-15/16 in./150 mm (height) 14-3/4 in./375 mm (depth)	
Weight Without package	32 lb 10oz/14.8 kg	
With package	39 lb 3oz/17.8 kg	
Furnished Parts	FM T-type Antenna	1
	Fuse 1.5A (5-line voltage model)	1
	3A (5-line voltage model)	2
	Pin plug	2
	Speaker plug	6
	Hexagonal wrench	1
	Polishing cloth	1
	Operating instructions	1

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

2. FRONT PANEL FACILITIES



SPEAKERS SWITCH

A combination of the power ON/OFF switch and the speaker system selector switch.

POWER OFF: The equipment is off.

A: The speaker system plugged into the A speaker sockets is in operation.

SPKR OFF: All speaker systems off. Useful for listening through headphones.

B: The speaker system plugged into the B speaker sockets is in operation.

C: The speaker system plugged into the C speaker sockets is in operation.

A+B: Both speaker systems A and B are in operation.

A+C: Both speaker systems A and C are in operation.

PHONES JACKS (1, 2)

Use these to plug in stereo headphones.
A full selection of high-performance headphones is available from Pioneer.

BASS & TREBLE CONTROL

Used for adjusting bass and treble.
Clockwise (Counterclockwise) rotation of these controls from the FLAT position will boost (diminish) tone. Also, only the left (right) channel can be adjusted by turning the front (rear) part of the knob while holding the other part in place.
Adjustment of both channels or only the left channel is made by click-stops. For normal listening, set to the FLAT position.

FILTER SWITCHES

LOW: Setting this switch to ON will eliminate low noise such as record rumble, hum, etc. Leave it at OFF unless the filter is required.

HIGH: Setting this switch to ON will eliminate high noise such as record scratch, tape hiss, static noise from fluorescent lamps, etc. Leave it at OFF unless the filter is required.

BALANCE CONTROL

Adjust the stereo balance. When the volume of the right channel speaker is smaller, turn the knob clockwise toward RIGHT; when left channel volume is smaller, turn the knob counterclockwise toward LEFT. For normal listening, set it to the NORM position.

VOLUME CONTROL

The volume increases when this knob is turned clockwise.

SIGNAL METER

This meter indicates the optimum tuning point for AM and FM stations. Maximum deflection to the right indicates that the station has been properly tuned in.

FM TUNING METER

When tuning in an FM station, use this meter to make the tuning perfect. After the desired station has been properly tuned in with the SIGNAL METER, adjust the TUNING KNOB so that the needle comes to the center.

FM STEREO INDICATOR

This lamp lights when an FM stereo broadcast is being received.

LOUDNESS SWITCH

When listening at low volume level, set this switch to ON. This emphasizes the extreme ends of the sound spectrum, giving a more natural sound contour.

AUDIO MUTING SWITCH

In position −20dB, the volume will be attenuated by 20dB.
For restoring the volume to its former level, set the switch to the OFF position.

TAPE MONITOR SWITCHES (1 and 2)

These switches are set to ON for monitoring of a recording in progress or playback of recorded tapes with tape decks.

1: This switch is set to ON for using a tape deck plugged into the TAPE 1 MON and TAPE 1 REC jacks or the TAPE 1 REC/P.B. connector.

2: This switch is set to ON for using a tape deck plugged into the TAPE 2 MON and TAPE 2 REC jacks.

NOTE: For phonograph records or broadcasts, leave these switches in OFF position. If either of these switches is set to ON, no sound will be heard.

MODE SWITCH

This selects the mode of reproducing sound.

STEREO REV: Stereo, with the input signals of the left and right channels reversed.

STEREO NORM: Normal stereo.

MONO L: Playing the input signals of only the left channel through the left and right speakers.

MONO R: Playing the input signals of only the right channel through the left and right speakers.

MONO L+R: Monophonic reproduction, mixing the input signals of the left and right channels.

TUNING KNOB

Used to tune in the desired station.

NOTE: If the setscrews holding the TUNING KNOB should ever become loose, they can be tightened with the supplied L-shaped hexagonal wrench.

DIMMER SWITCH

The brightness of the front panel illumination is controllable by this switch. The front panel becomes dimmer when the switch is pushed in.

FM MUTING SWITCH

This switch is used to suppress noise between FM stations when tuning. When receiving weak stations, this switch should be kept OFF because it would suppress the desired station signal at the same time. Note that this switch is OFF when it is pushed in, and ON when released.

MIC JACKS

Connect the microphone plugs to these jacks. Only high-impedance, dynamic microphones with standard plugs (6.4ϕ) should be used. A selection of high-performance dynamic microphone is available from Pioneer.

SELECTOR SWITCH

Choose the program source.

AM: AM reception.

FM MONO: FM monophonic reception only.

FM AUTO: FM reception with automatic switching for either stereo or monophonic programs.

PHONO 1: For playing records on a turntable plugged into the PHONO 1 jacks.

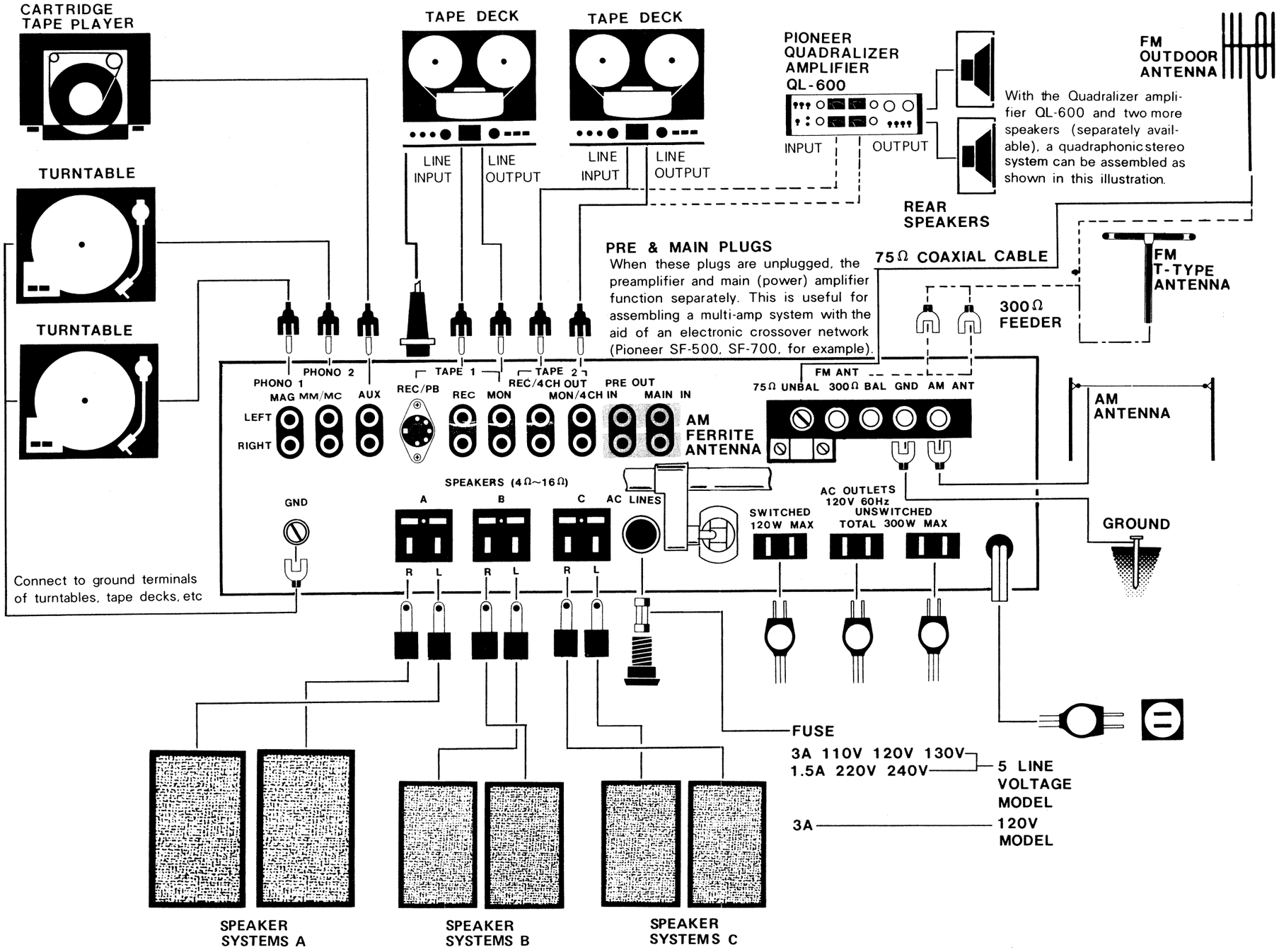
PHONO 2: Same as above, for PHONO 2 jacks.

MIC: Microphone sound can be reproduced.

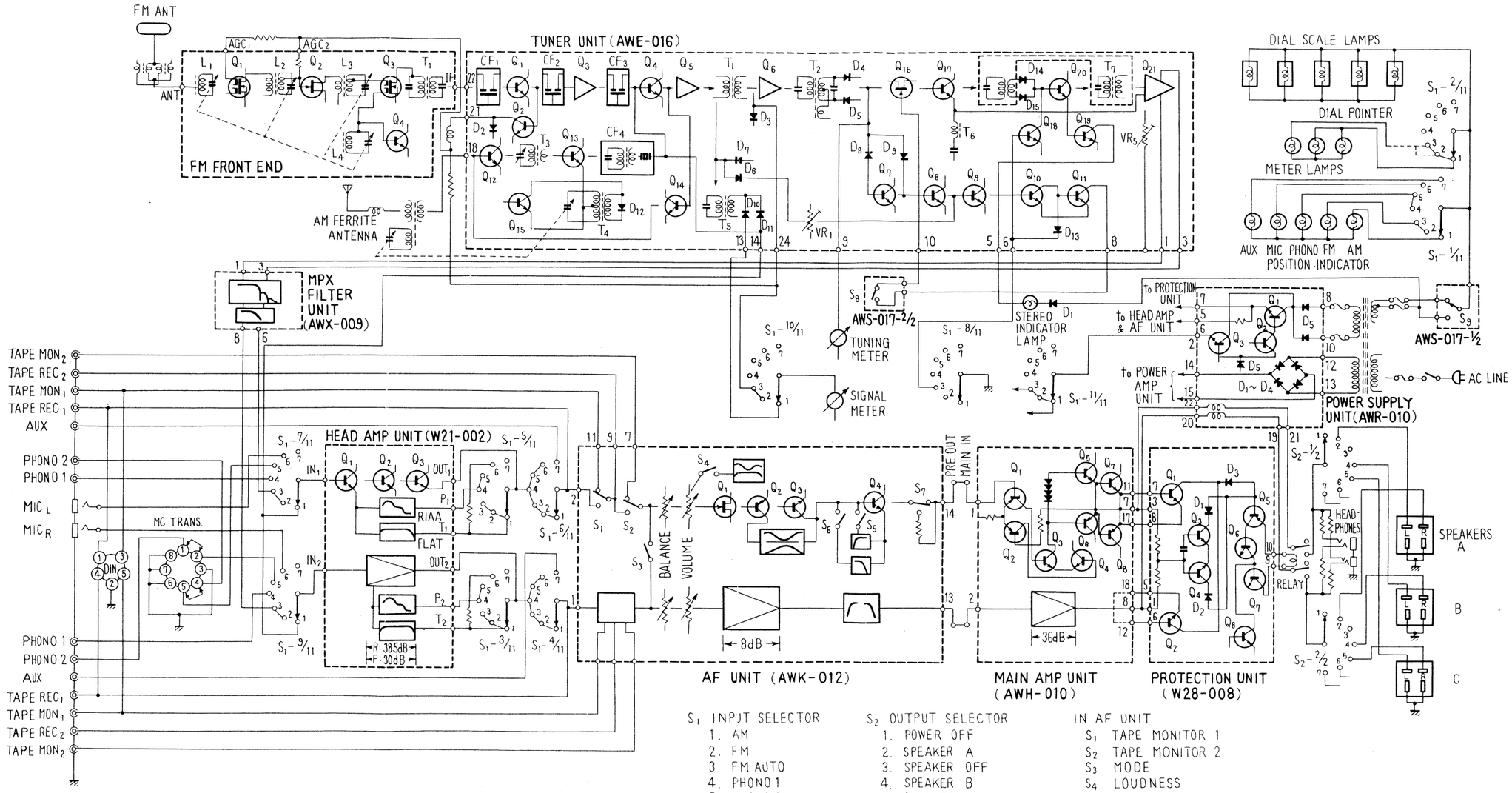
AUX: For playing signals fed to the AUX jacks.

NOTE: If the front panel inscriptions of your unit become dirty, clean them with volatile fluid (chemical thinner, pure alcohol, etc.). In this case, the letters on the front panel may be blotted. Wipe out them with a soft dry cloth, however they will still remain unerased.

3. CONNECTION DIAGRAM



4. BLOCK DIAGRAM



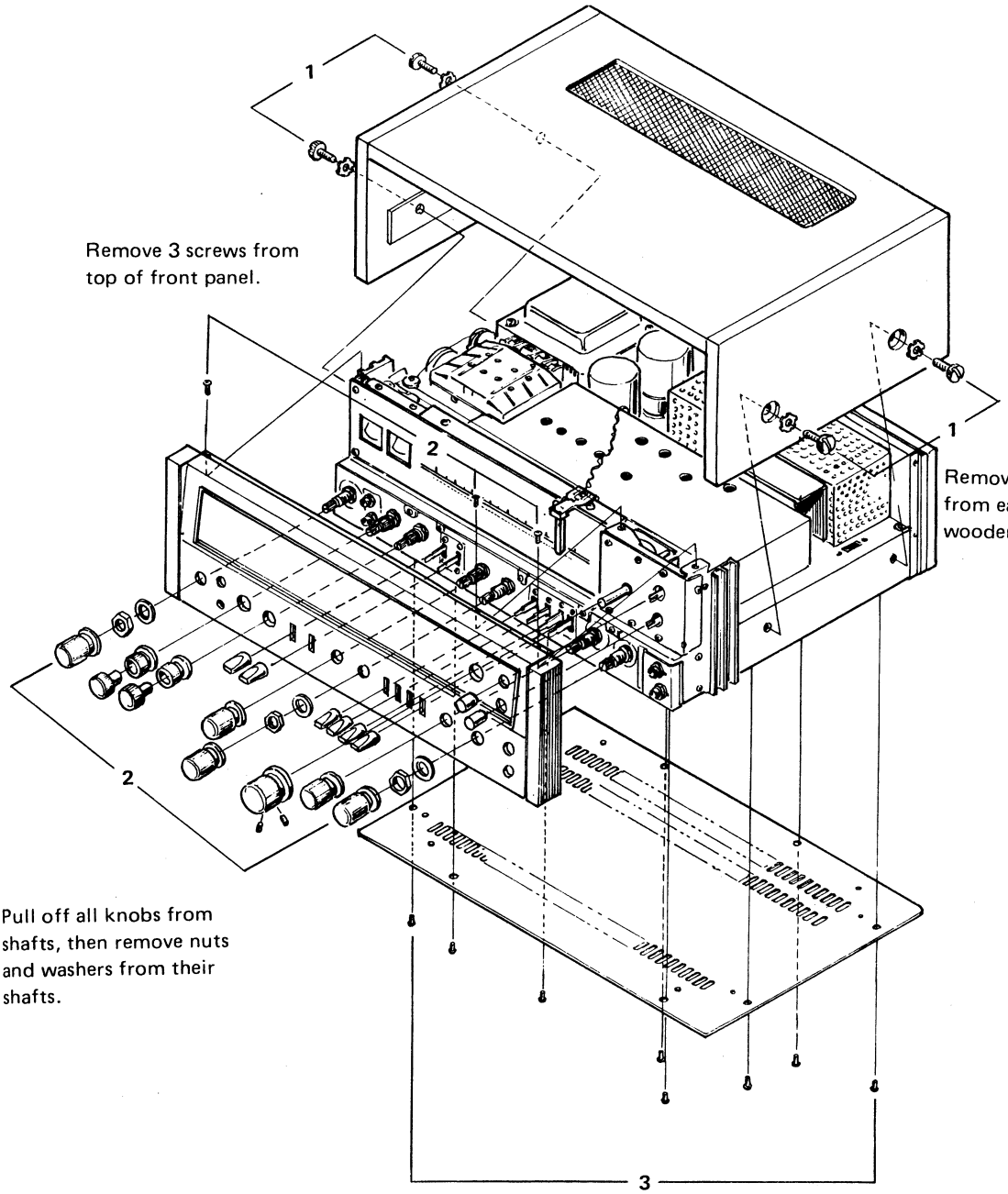
S_1 INPJT SELECTOR
1. AM
2. FM
3. FM AUTO
4. PHONO 1
5. PHONO 2
6. MIC
7. AUX

S_2 OUTPUT SELECTOR
1. POWER OFF
2. SPEAKER A
3. SPEAKER OFF
4. SPEAKER B
5. SPEAKER C
6. SPEAKER A+B
7. SPEAKER A+C

IN AF UNIT
S_1 TAPE MONITOR 1
S_2 TAPE MONITOR 2
S_3 MODE
S_4 LOUDNESS
S_5 LOW FILTER
S_6 HIGH FILTER
S_7 AUDIO MUTING

5. DISASSEMBLY

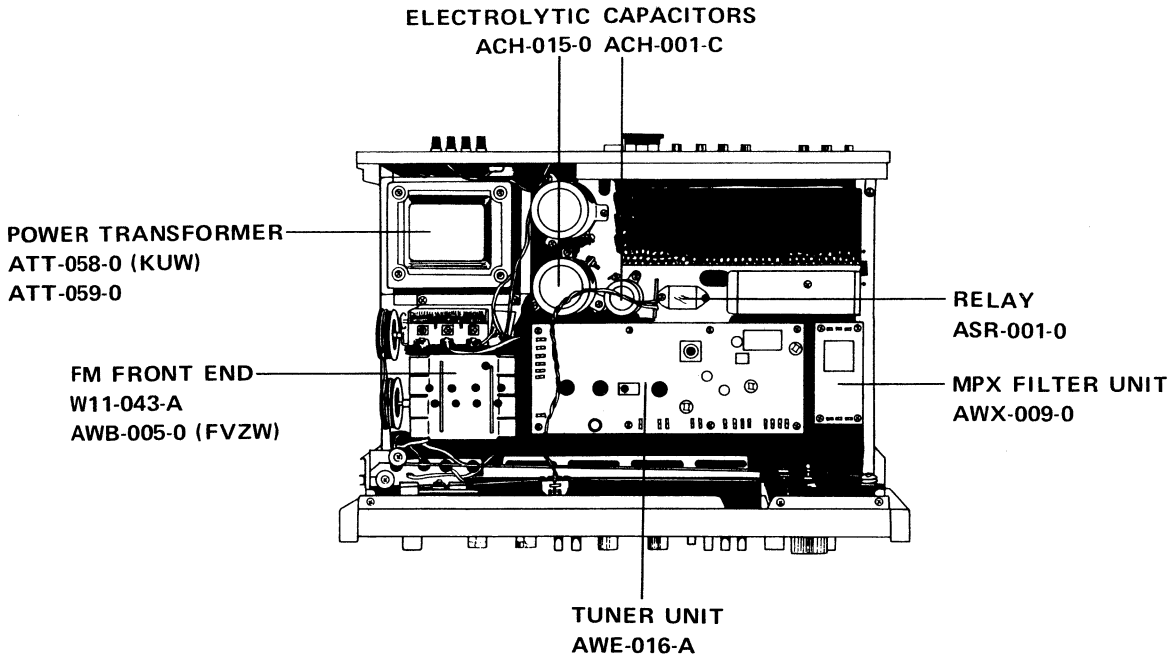
- Numbers indicate order of disassembly.



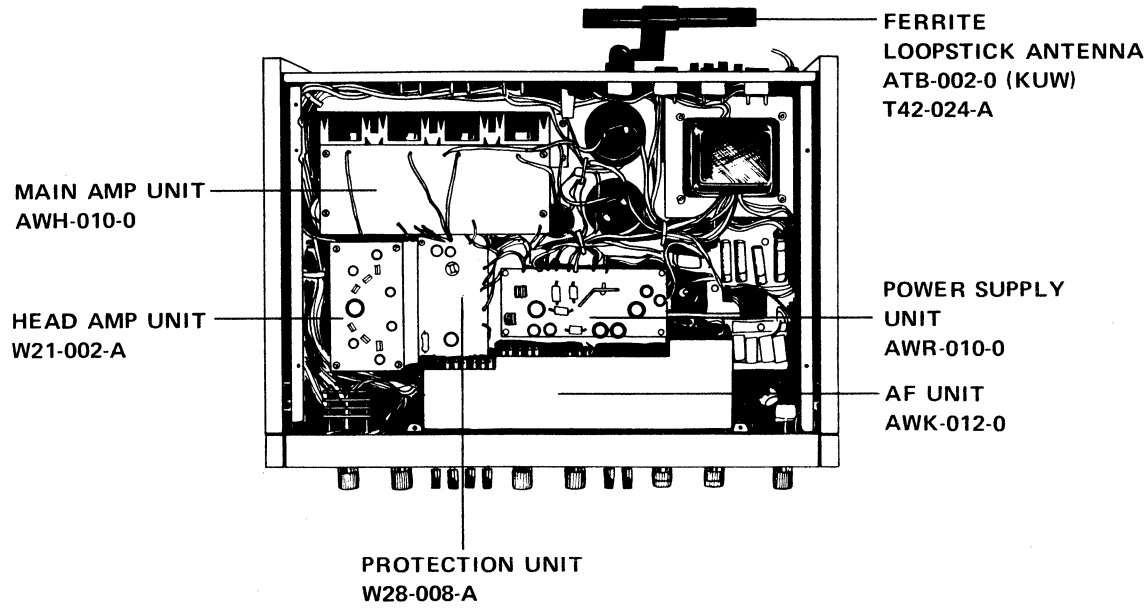
NOTE: RE-ASSEMBLY can be made in reverse order of the above DISASSEMBLY procedure.

6. PARTS AND PCB LOCATION

- TOP VIEW

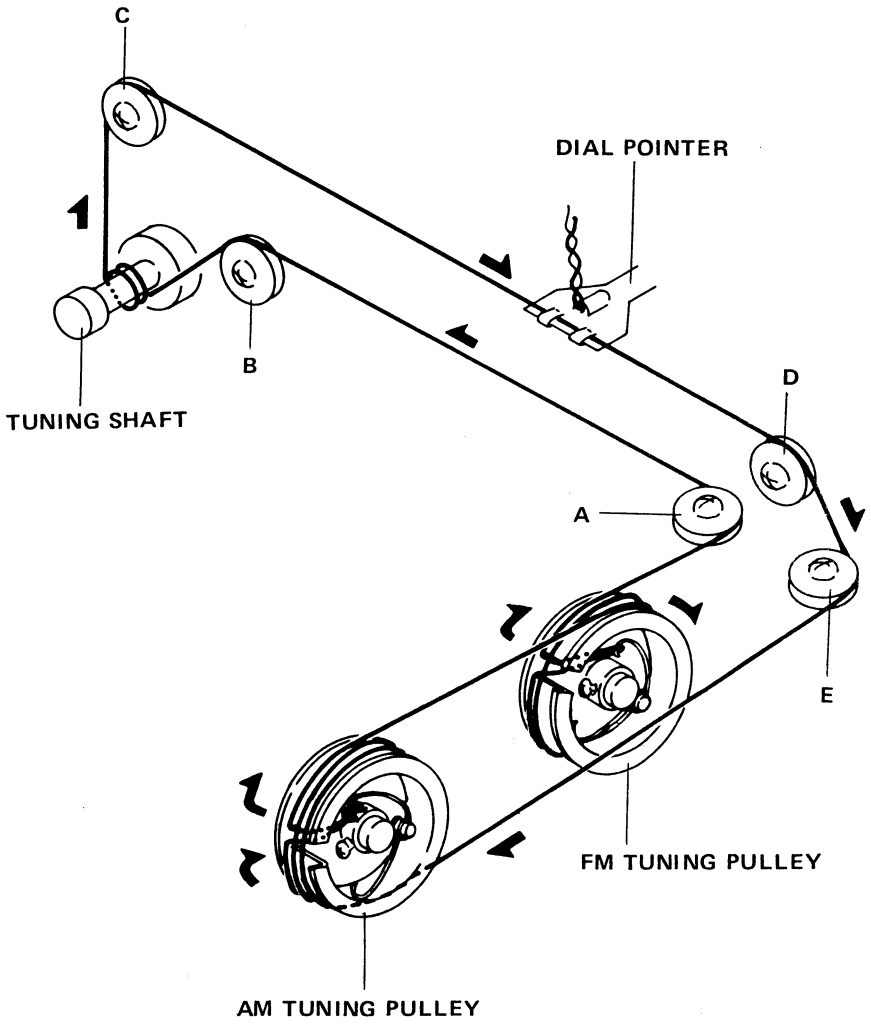


- BOTTOM VIEW



7. DIAL CORD STRINGING

1. Set the both AM and FM tuning capacitors to maximum capacitance.
2. Tie one end of the string to the spring on the AM tuning pulley.
3. Wind the string 1/4 turn around the AM tuning pulley, then wind it 2 turns around the FM tuning pulley.
4. Hook the string to the spring on the FM tuning pulley.
5. Lead the string around the small pulleys A and B.
6. Wind the string 2 turns around the tuning shaft.
7. Lead the string around the small pulleys C and D, then fasten it to the dial pointer.
8. Lead the string around the small pulley E, and wind it 2 turns around the AM tuning pulley.
9. Finally, tie the end of the string to remaining side of the spring on the AM tuning pulley.
10. Tune receiver to low end. Fasten dial pointer to the string so that it indicates low end on dial scale.



8. ALIGNMENT PROCEDURE

The following alignments are required only in very rare cases and should never be attempted without the proper test equipment. Also, only non-metallic tools must be used.

8.1 REQUIRED INSTRUMENT

- Sweep generator: Center marker frequencies 10.7MHz, 455kHz
- Oscilloscope: Flat to 250kHz minimum
- AC VTVM
- AM/FM signal generator
- FM multiplex signal generator, preferably with RF output

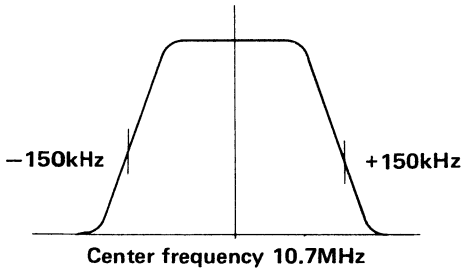


Fig. 1

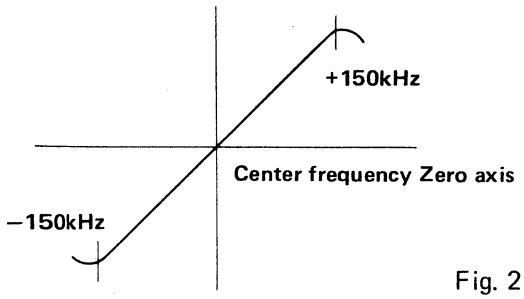


Fig. 2

8.2 FM IF ALIGNMENT

1. Confirm +B voltage and current for 12V ±1V which should be 53mA to 65mA at pin 4.
2. Disconnect leads from pin 22 (input) and 24 (MET), then connect resistor 4.7kΩ as shunted to pin 24 of tuner unit.
3. Connect 10.7MHz sweep generator to pins 22 (hot) and 23 (ground) of tuner unit. Set controls as follows:
   Center frequency: 10.7MHz
   Output: 80dB (10mV)
4. Connect vertical scope input to 24.
5. Align core of T1 for maximum gain and symmetry to obtain scope pattern as in Fig. 1.
6. Vary the generator output gradually from 45dB to 100dB, repeat step 5 realignment for every output level, if necessary.
7. Disconnect one side of C23. Disconnect oscilloscope and resistor 4.7kΩ from pin 24. Then reconnect lead to pin 24.
8. Connect scope input to pin 9.
9. Set generator output to 45dB.
10. Adjust bottom core of T2 for maximum gain and linearity.
    Adjust top core so that center frequency mark is located on zero axis, as shown in Fig. 2.
11. Reconnect C23.
12. Reconnect input lead to pin 22.

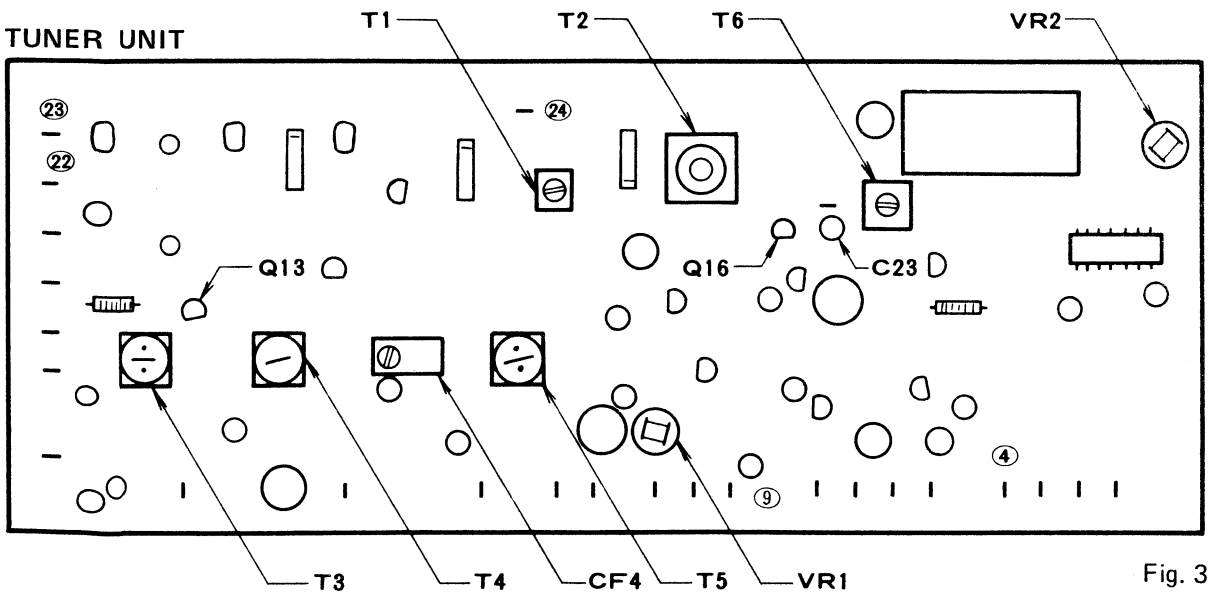
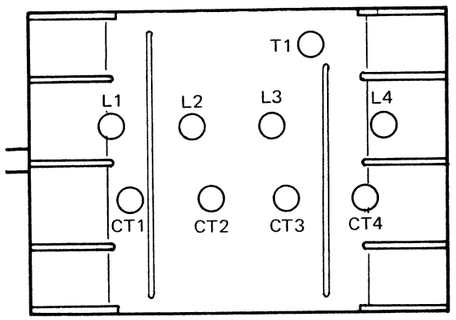


Fig. 3

8.3 FM TRACKING ALIGNMENT

1. Confirm ±Bcurrent (drain 11mA ±4mA).
2. Connect FM signal generator output to 300Ω antenna inputs.
3. Connect AC VTVM to TAPE REC jack on rear panel.
4. Adjust generator for 400Hz, 100% modulation.
5. Set SELECTOR switch on front panel to FM MONO.
6. Adjust generator frequency and tuning dial to 90MHz.
   During the following adjustments, keep the generator output as low as possible.
7. Adjust L4 core first, the adjust cores of L1, L2, L3 for maximum reading on VTVM and so that tuning meter indicates center position.
8. Set generator frequency and tuning dial to 106MHz.
9. Adjust trimmer capacitor CT4 first, then adjust CT1, CT2, CT3 for maximum reading on VTVM.
10. Repeat these alignments several times until satisfactory reading is obtained.
11. Finally, adjust T1 core for maximum reading on VTVM.



FM FRONT END

Fig. 4

8.4 FM MPX DECODER ALIGNMENT

1. Set SELECTOR switch on front panel to FM AUTO.
2. Connect RF output of FM multiplex signal generator to 300Ω antenna inputs.
3. Adjust MPX generator as follows:

Signal Mode	Deviation
L+R	40.5kHz
19kHz (pilot)	7.5kHz

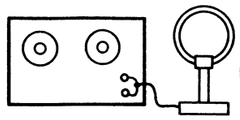
4. Connect AC VTVM to TAPE REC jack on rear panel.
5. Set generator signal mode to L-R (sub) and its output level to 100dB, adjust core of T6 (located on tuner unit) to obtain maximum reading on VTVM.
6. Set generator signal mode to L. Adjust VR2 (located on tuner unit) for minimum crosstalk on R channel TAPE REC output.
7. Set generator signal mode to R. Repeat above adjustment for minimum crosstalk on L channel.

8.5 MUTING THRESHOLD LEVEL ALIGNMENT

1. Set SELECTOR switch to FM MONO.
2. Turn MUTING switch to ON.
3. Connect FM signal generator to 300Ω antenna inputs.
4. Connect AC VTVM to TAPE REC output jack.
5. Set output level of generator to 25dB (20 μV), with ±22.5kHz deviation, and 400Hz or 1kHz modulation.
6. Tune receiver accurately to generator frequency.
7. Adjust VR1 on tuner unit exactly on the borderline between muting and non-muting.

8.6 AM IF ALIGNMENT

1. Set SELECTOR switch on front panel to AM.
2. Connect 455kHz sweep generator to pin 15. Adjust generator output level to 45dB.
3. Connect vertical oscilloscope input to either L or R of TAPE REC jack.
4. Set tuning dial to high end position.
5. Adjust cores of CF4 and T5 for maximum gain and symmetrical pattern on oscilloscope.



AM Signal generator

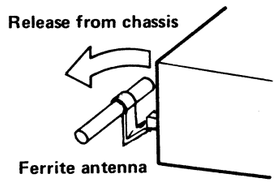
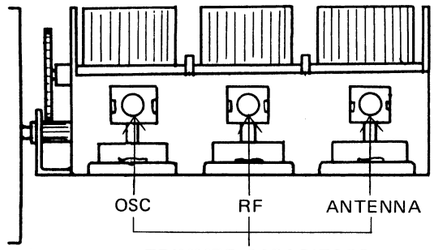


Fig. 5

8.7 AM TRACKING ALIGNMENT

1. Set SELECTOR switch to AM position.
2. Set signal generator to AM function, 30% modulation with 400Hz.
   Connect loop antenna to generator RF output and place near receiver's ferrite loopstick antenna. See Fig. 5.
3. Connect VTVM to TAPE REC jack.
4. Keep generator as low as possible for minimum VTVM reading.
5. Tune generator and receiver to 600kHz.
   Adjust core of T4 on tuner unit for maximum VTVM reading, then adjust core of T3 and ferrite antenna.
6. Re-tune generator and receiver to 1,400kHz.
7. Adjust trimmers of variable capacitor indicated in Fig. 6 to obtain maximum VTVM reading.

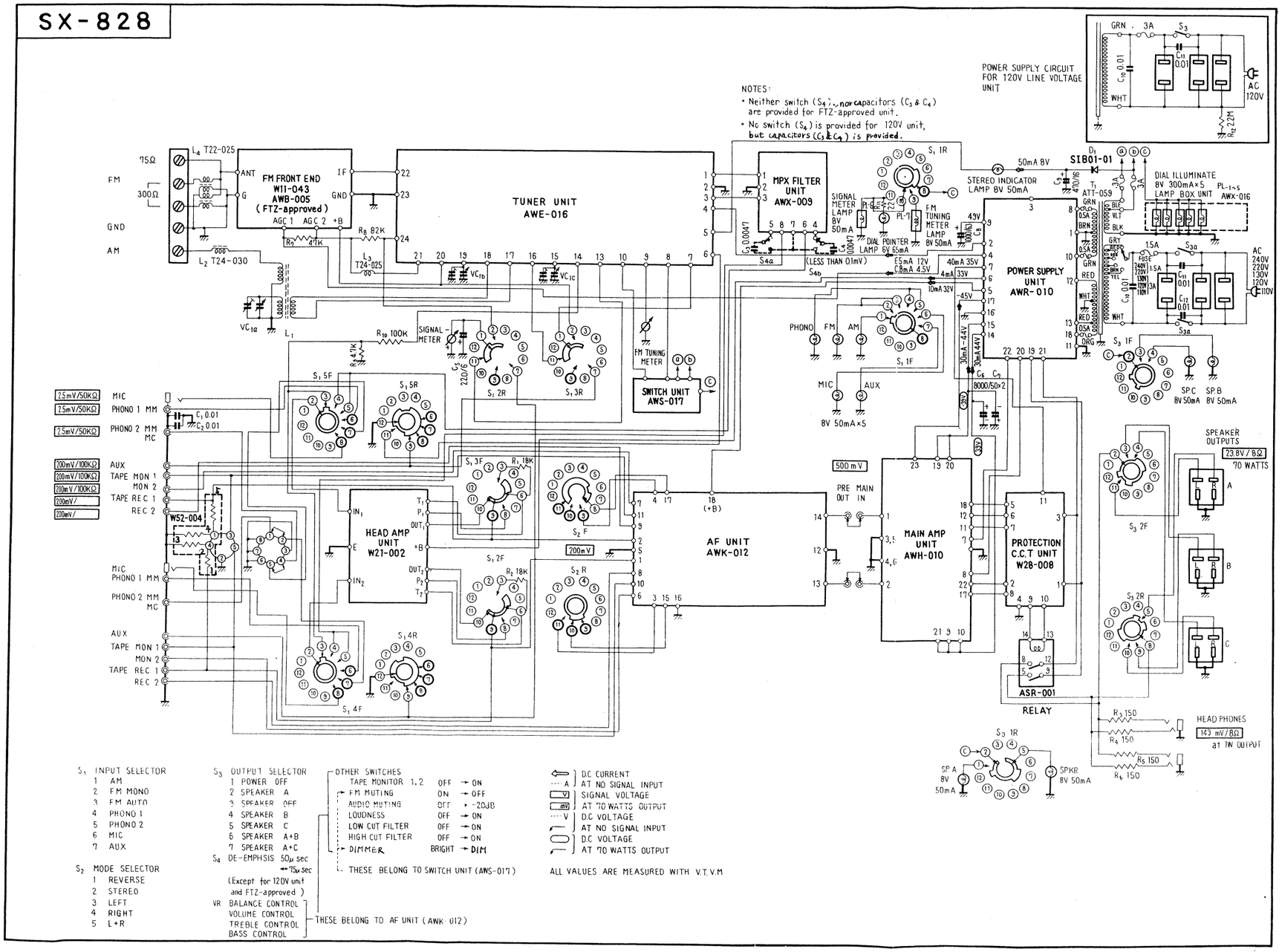


TRIMMER CAPACITORS

Fig. 6

9. SCHEMATIC DIAGRAMS, PCB PATTERNS AND PARTS LIST

9.1 UNIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS



MISCELLANEOUS PARTS

This parts list is for the KUW model, the FVZW or FW model uses some different parts as following pages:

for FVZW model ..... page 20,
for FW model ..... page 23.

CAPACITORS

IN μF UNLESS OTHERWISE NOTED. p: μμF.

Symbol	Description			Part No.	
C1	Ceramic	0.01	50V	CKDYF 103Z 50	
C2	Ceramic	0.01	50V	CKDYF 103Z 50	
C3	Mylar	0.0047	50V	CQMA 472K 50	
C4	Mylar	0.0047	50V	CQMA 472K 50	
C5	Electrolytic	220	6V	CEA 221P 6	
C6	Electrolytic	8000	50V	ACH-015-0	
C7	Electrolytic	8000	50V	ACH-015-0	
C8	Electrolytic	1000	63V	ACH-001-C	
C9	Electrolytic	470	16V	CEB 471P 16	
C10	Oil paper	0.01	800V	ACE-001-A	
C11	Ceramic	0.01	DC 1.4kV	C43-003-0	
C12	Mylar	0.022	50V	CQMA 223K 50	
VC1	AM tuning capacitor			C64-045-0	

RESISTORS

IN Ω, ¼W UNLESS OTHERWISE NOTED. k: kΩ. M: MΩ.

Symbol	Description			Part No.	
R1	Carbon film	18k		RD¼PS 183JNL	
R2	Carbon film	18k		RD¼PS 183JNL	
R3	Wire wound	150	5W	RT5B 151K	
R4	Wire wound	150	5W	RT5B 151K	
R5	Wire wound	150	5W	RT5B 151K	
R6	Wire wound	150	5W	RT5B 151K	
R7	Carbon film	47k		RD¼PS 473J	
R8	Carbon film	82k		RD¼PS 823J	
R9	Carbon film	4.7k		RD¼PS 472JNL	
R10	Carbon film	100k		RD¼PS 104JNL	
R11	Carbon film	22	½W	RD½PS 220J	
R12	Carbon film	2.2M	½W	RD½PW 225J	

SEMICONDUCTOR

Symbol	Description	Part No.	
D1	SIB01-01 Diode		

SWITCHES

Symbol	Description	Part No.	
S1	Selector switch	ASB-011-A	
S2	Mode switch	S14-035-0	
S3	Speakers switch	ASA-020-0	
	Relay	ASR-001-0	

COILS AND TRANSFORMERS

Symbol	Description	Part No.	
L1	AM ferrite loopstick antenna	ATB-002-0	
L2	Choke coil	T24-030-0	
L3	Heater choke coil	T24-025-B	
L4	Balun transformer	T22-025-A	
T1	Power transformer	ATT-058-0	

OTHERS

Symbol	Description	Part No.	
	FM front end	W11-043-A	
	Tuner unit	AWE-016-A	
	MPX filter unit	AWX-009-0	
	Head amp unit	W21-002-A	
	AFunit	AWK-012-0	
	Main amp unit	AWH-010-0	
	Protection unit	W28-008-A	
	Switch unit	AWS-017-0	
	Power supply unit	AWR-010-0	
	Lamp box unit	AWX-016-0	
	Wooden case	AMM-013-B	
	Front panel ass'y	ANB-123-C	
	Foot	AEC-027-B	
	Dial shaft ass'y	AXA-013-0	
	Dial pulley ass'y	M42-080-A	
	AM ferrite loopstick antenna holder	W72-092-B	
	Dial scale	AAG-031-A	
	Signal meter	AAW-006-0	
	Tuning meter	AAW-007-0	
	Dial pointer ass'y	AAF-011-A	

Symbol	Description	Part No.	
	Knob for tuning	AAA-006-0	
	Knob for power, selector, mode, volume and balance	AAB-007-B	
	Knob for bass and treble (L)	AAB-013-0	
	Knob for bass and treble (R)	AAB-014-0	
	Knob for lever switch	AAD-028-0	
	Knob for push switch	AAD-026-0	
	6P input terminal board (A)	AKB-007-0	
	6P input terminal board (B)	AKB-008-0	
	Antenna input terminal board	K11-043-D	
	4P ground terminal	K13-047-0	
	Pilot lamp for dial scale	E22-017-0	
	Pilot lamp for meter	E22-032-0	
	Pilot lamp for program indicator and speaker indicator	AEL-007-0	
	Fuse 3A	E21-021-0	
	Fuse 3A for protection	E21-022-A	
	Fuse 0.5A for protection	E21-019-A	
	Compound part for REC jack	W52-004-0	
	Spare AC outlet	AKP-002-0	
	Speaker socket	K72-028-0	
	Headphones jack	K72-026-0	
	Microphone jack	K72-024-0	
	5P connector (DIN)	K93-003-B	
	Pilot lamp (for meter) socket	K91-005-A	
	Fuse holder	AKR-007-0	
	Jumper plug	AKM-002-0	
	8P socket (for MC transformer)	K24-002-A	
	8P plug	K71-030-0	
	Screw for grounding	B11-012-A	
	Screw to fix wooden case	B11-016-B	
	AC power cord	D11-003-E	

Symbol	Description	Part No.	
	Speaker plug	K72-007-B	
	Pin plug	K72-015-A	
	Hexagonal wrench	ANK-018-0	
	Operating instructions	ARB-049-0	
	FM T-type antenna	D52-013-0	
	Packing case	AHD-078-0	
	Side pad (L)	AHA-012-A	
	Side pad (R)	AHA-013-A	
	Cardboard protector	AHB-006-0	
	Top pad	AHB-007-0	
	Accessory box	AHC-001-0	

For FVZW model

CAPACITORS

IN μF UNLESS OTHERWISE NOTED. p: μμF.

Symbol	Description			Part No.	
C1	Ceramic	0.01	50V	CKDYF 103Z 50	
C2	Ceramic	0.01	50V	CKDYF 103Z 50	
C5	Electrolytic	220	6V	CEA 221P 6	
C6	Electrolytic	8000	50V	ACH-015-0	
C7	Electrolytic	8000	50V	ACH-015-0	
C8	Electrolytic	1000	63V	ACH-001-C	
C9	Electrolytic	470	16V	CEB 471P 16	
C10	Ceramic	0.01	DC 1.4kV	C43-003-0	
C11	Ceramic	0.01	DC 1.4kV	C43-003-0	
C12	Ceramic	0.01	DC 1.4kV	C43-003-0	
C13	Mylar	0.022	50V	CQMA 223K 50	
VC1	AM tuning capacitor			C64-045-0	

RESISTORS

IN Ω, ¼W UNLESS OTHERWISE NOTED. k: kΩ. M: MΩ.

Symbol	Description			Part No.	
R1	Carbon film	18k		RD¼PS 183JNL	
R2	Carbon film	18k		RD¼PS 183JNL	
R3	Wire wound	150	5W	RT5B 151K	
R4	Wire wound	150	5W	RT5B 151K	
R5	Wire wound	150	5W	RT5B 151K	
R6	Wire wound	150	5W	RT5B 151K	
R7	Carbon film	47k		RD¼PS 473J	
R8	Carbon film	82k		RD¼PS 823J	
R9	Carbon film	4.7k		RD¼PS 472JNL	
R10	Carbon film	100k		RD¼PS 104JNL	
R11	Carbon film	22	½W	RD½PS 220J	

SEMICONDUCTOR

Symbol	Description	Part No.	
D1	SIB01-01 Diode		

SWITCHES

Symbol	Description	Part No.	
S1	Selector switch	ASB-011-A	
S2	Mode switch	S14-035-0	
S3	Speakers switch	ASA-021-0	
	Relay	ASR-001-0	

COILS AND TRANSFORMERS

Symbol	Description	Part No.	
L1	AM ferrite loopstick antenna	T42-024-A	
L2	Choke coil	T24-030-0	
L3	Heater choke coil	T24-025-B	
L4	Balun transformer	T22-025-A	
T1	Power transformer	ATT-059-0	

OTHERS

Symbol	Description	Part No.	
	FM front end	AWB-005-0	
	Tuner unit	AWE-016-A	
	MPX filter unit	AWX-009-0	
	Head amp unit	W21-002-A	
	AF unit	AWK-012-0	
	Main amp unit	AWH-010-0	
	Protection unit	W28-008-A	
	Switch unit	AWS-017-0	
	Power supply unit	AWR-010-0	
	Lamp box unit	AWX-016-0	
	Wooden case	AMM-013-B	
	Front panel ass'y	ANB-123-C	
	Foot	AEC-027-B	
	Dial shaft ass'y	AXA-013-0	
	Dial pulley ass'y	M42-080-A	
	AM ferrite loopstick antenna holder	W72-092-B	
	Dial scale	AAG-031-A	
	Signal meter	AAW-006-0	
	Tuning meter	AAW-007-0	
	Dial pointer ass'y	AAF-011-A	

Symbol	Description	Part No.	
	Knob for tuning	AAA-006-0	
	Knob for power, selector, mode, volume and balance	AAB-007-B	
	Knob for bass and treble (L)	AAB-013-0	
	Knob for bass and treble (R)	AAB-014-0	
	Knob for lever switch	AAD-028-0	
	Knob for push switch	AAD-026-0	
	6P input terminal board (A)	AKB-007-0	
	6P input terminal board (B)	AKB-008-0	
	Antenna input terminal board	K11-043-D	
	4P ground terminal	K13-047-0	
	Pilot lamp for dial scale	E22-017-0	
	Pilot lamp for meter	E22-032-0	
	Pilot lamp for program indicator and speaker indicator	AEL-007-0	
	Fuse 1.5A	E21-012-0	
	Fuse 3A for protection	E21-022-A	
	Fuse 0.5A for protection	E21-019-A	
	Compound part for REC jack	W52-004-0	
	Spare AC outlet	AKP-002-0	
	Speaker socket	K72-028-0	
	Headphones jack	K72-026-0	
	Microphone jack	K72-024-0	
	5P connector (DIN)	K93-003-B	
	Pilot lamp (for meter) socket	K91-005-A	
	Line voltage selector	AKR-001-0	
	Jumper plug	AKM-002-0	
	8P socket (for MC transformer)	K24-002-A	
	8P plug	K71-030-0	
	Screw for grounding	B11-012-A	
	Screw to fix wooden case	B11-016-B	
	AC power cord	D11-002-B	

Symbol	Description	Part No.	
	Speaker plug	K72-007-B	
	Pin plug	K72-015-A	
	Hexagonal wrench	ANK-018-0	
	Operating instructions	ARB-049-0	
	FM T-type antenna	D52-013-0	
	Packing case	AHD-080-0	
	Side pad (L)	AHA-012-A	
	Side pad (R)	AHA-013-A	
	Cardboard protector	AHB-006-0	
	Top pad	AHB-007-0	
	Accessory box	AHC-001-0	
	Fuse 3A	E21-006-0	

For FW model

CAPACITORS

IN μF UNLESS OTHERWISE NOTED. p: μμF.

Symbol	Description			Part No.	
C1	Ceramic	0.01	50V	CKDYF 103Z 50	
C2	Ceramic	0.01	50V	CKDYF 103Z 50	
C3	Mylar	0.0047	50V	CQMA 472K 50	
C4	Mylar	0.0047	50V	CQMA 472K 50	
C5	Electrolytic	220	6V	CEA 221P 6	
C6	Electrolytic	8000	50V	ACH-015-0	
C7	Electrolytic	8000	50V	ACH-015-0	
C8	Electrolytic	1000	63V	ACH-001-C	
C9	Electrolytic	470	16V	CEB 471P 16	
C10	Ceramic	0.01	DC 1.4kV	C43-003-0	
C11	Ceramic	0.01	DC 1.4kV	C43-003-0	
C12	Ceramic	0.01	DC 1.4kV	C43-003-0	
C13	Mylar	0.022	50V	CQMA 223K 50	
VC1	AM tuning capacitor			C64-045-0	

RESISTORS

IN Ω, ¼W UNLESS OTHERWISE NOTED. k: kΩ. M: MΩ.

Symbol	Description			Part No.	
R1	Carbon film	18k		RD¼PS 183JNL	
R2	Carbon film	18k		RD¼PS 183JNL	
R3	Wire wound	150	5W	RT5B 151K	
R4	Wire wound	150	5W	RT5B 151K	
R5	Wire wound	150	5W	RT5B 151K	
R6	Wire wound	150	5W	RT5B 151K	
R7	Carbon film	47k		RD¼PS 473J	
R8	Carbon film	82k		RD¼PS 823J	
R9	Carbon film	4.7k		RD¼PS 472JNL	
R10	Carbon film	100k		RD¼PS 104JNL	
R11	Carbon film	22	½W	RD½PS 220J	

SEMICONDUCTOR

Symbol	Description	Part No.	
D1	SIB01-01 Diode		

SWITCHES

Symbol	Description	Part No.	
S1	Selector switch	ASB-011-A	
S2	Mode switch	S14-035-0	
S3	Speakers switch	ASA-021-0	
S4	De-emphasis switch	S41-022-A	
	Relay	ASR-001-0	

COILS AND TRANSFORMERS

Symbol	Description	Part No.	
L1	AM ferrite loopstick antenna	T42-024-A	
L2	Choke coil	T24-030-0	
L3	Heater choke coil	T24-025-B	
L4	Balun transformer	T22-025-A	
T1	Power transformer	ATT-059-0	

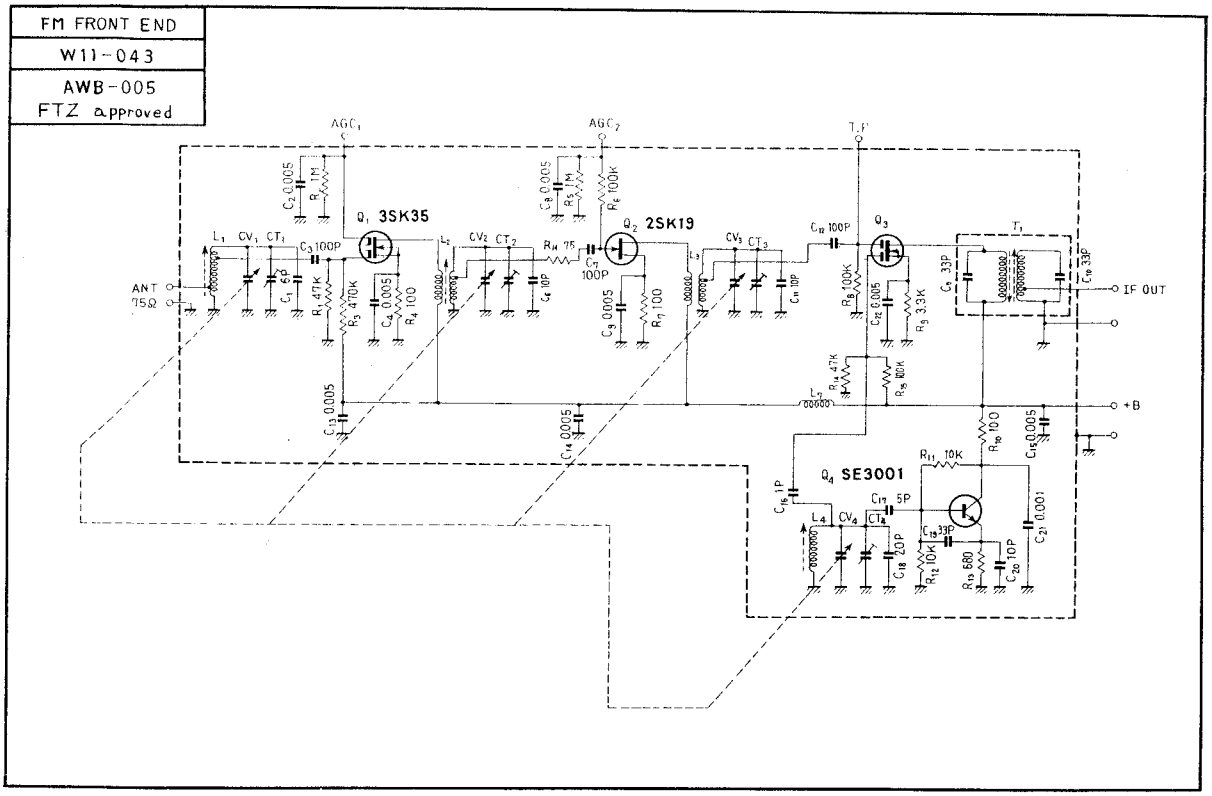
OTHERS

Symbol	Description	Part No.	
	FM front end	W11-043-A	
	Tuner unit	AWE-016-A	
	MPX filter unit	AWX-009-0	
	Head amp unit	W21-002-A	
	AF unit	AWK-012-0	
	Main amp unit	AWH-010-0	
	Protection unit	W28-008-A	
	Switch unit	AWS-017-0	
	Power supply unit	AWR-010-0	
	Lamp box unit	AWX-016-0	
	Wooden case	AMM-013-B	
	Front panel ass'y	ANB-123-C	
	Foot	AEC-027-B	
	Dial shaft ass'y	AXA-013-0	
	Dial pulley ass'y	M42-080-A	
	AM ferrite loopstick antenna holder	W72-092-B	
	Dial scale	AAG-031-A	
	Signal meter	AAW-006-0	
	Tuning meter	AAW-007-0	
	Dial pointer ass'y	AAF-011-A	

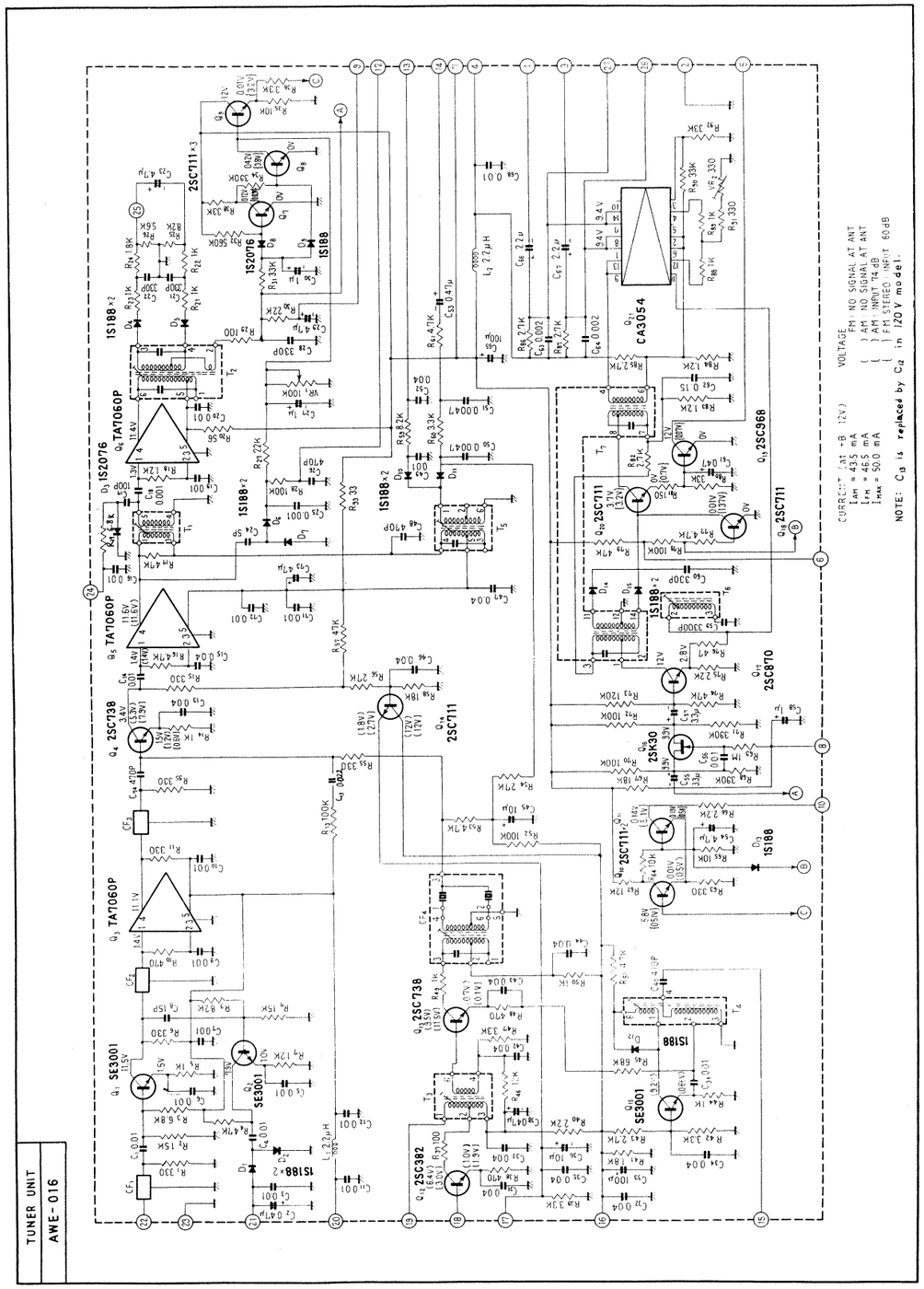
Symbol	Description	Part No.	
	Knob for tuning	AAA-006-0	
	Knob for power, selector, mode, volume and balance	AAB-007-B	
	Knob for bass and treble (L)	AAB-013-0	
	Knob for bass and treble (R)	AAB-014-0	
	Knob for lever switch	AAD-028-0	
	Knob for push switch	AAD-026-0	
	6P input terminal board (A)	AKB-007-0	
	6P input terminal board (B)	AKB-008-0	
	Antenna input terminal board	K11-043-D	
	4P ground terminal	K13-047-0	
	Pilot lamp for dial scale	E22-017-0	
	Pilot lamp for meter	E22-032-0	
	Pilot lamp for program indicator and speaker indicator	AEL-007-0	
	Fuse 1.5A	E21-012-0	
	Fuse 3A for protection	E21-022-A	
	Fuse 0.5A for protection	E21-019-A	
	Compound part for REC jack	W52-004-0	
	Spare AC outlet	AKP-002-0	
	Speaker socket	K72-028-0	
	Headphones jack	K72-026-0	
	Microphone jack	K72-024-0	
	5P connector (DIN)	K93-003-B	
	Pilot lamp (for meter) socket	K91-005-A	
	Line voltage selector	AKR-001-0	
	Jumper plug	AKM-002-0	
	8P socket (for MC transformer)	K24-002-A	
	8P plug	K71-030-0	
	Screw for grounding	B11-012-A	
	Screw to fix wooden case	B11-016-B	
	AC power cord	D11-002-B	

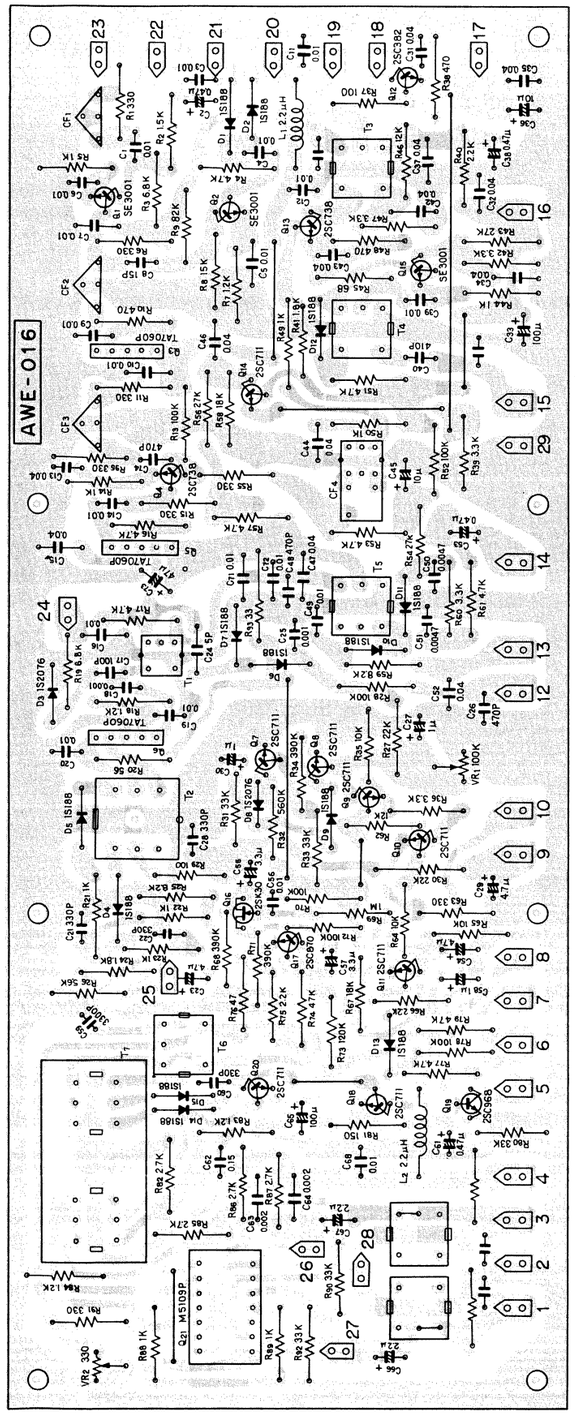
Symbol	Description	Part No.	
	Speaker plug	K72-007-B	
	Pin plug	K72-015-A	
	Hexagonal wrench	ANK-018-0	
	Operating instructions	ARB-049-0	
	FM T-type antenna	D52-013-0	
	Packing case	AHD-079-0	
	Side pad (L)	AHA-012-A	
	Side pad (R)	AHA-013-A	
	Cardboard protector	AHB-006-0	
	Top pad	AHB-007-0	
	Accessory box	AHC-001-0	
	Fuse 3A	E21-006-0	

9.2 FM FRONT END (W11-043) (AWB-005)



9.3 TUNER UNIT (AWE-016)





PARTS LIST OF TUNER UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	50V	CKDYF 103Z 50	
C2	Electrolytic	0.47	50V	CEA R47P 50	
C3	Ceramic	0.01	50V	CKDYF 103Z 50	
C4	Ceramic	0.01	50V	CKDYF 103Z 50	
C5	Ceramic	0.01	50V	CKDYF 103Z 50	
C6	Ceramic	0.01	50V	CKDYF 103Z 50	
C7	Ceramic	0.01	50V	CKDYB 103K 50	
C8	Ceramic	15p	50V	CCDSL 150K 50	
C9	Ceramic	0.01	50V	CKDYF 103Z 50	
C10	Ceramic	0.01	50V	CKDYB 103K 50	
C11	Ceramic	0.01	50V	CKDYF 103Z 50	
C12	Ceramic	0.01	50V	CKDYB 103K 50	
C13	Ceramic	0.04	50V	CKDYF 403Z 50	
C14	Ceramic	0.01	50V	CKDYF 103Z 50	
C15	Ceramic	0.04	50V	CKDYF 403Z 50	
C16	Ceramic	0.01	50V	CKDYF 103Z 50	
C17	Ceramic	100p	50V	CCDSL 101K 50	
C18	Ceramic	0.001	50V	CKDYB 102K 50	
C19	Ceramic	0.01	50V	CKDYF 103Z 50	
C20	Ceramic	0.01	50V	CKDYF 103Z 50	
C21	Ceramic	330p	50V	CKDYB 331K 50	
C22	Ceramic	330p	50V	CKDYB 331K 50	
C23	Electrolytic	4.7	50V	CEA 4R7P 50	
C24	Ceramic	5p	50V	CCDSL 050D 50	
C25	Ceramic	0.001	50V	CKDYB 102K 50	

Symbol	Description			Part No.	
C26	Ceramic	470p	50V	CKDYB 471K 50	
C27	Electrolytic	1	50V	CEA 010P 50	
C28	Ceramic	330p	50V	CKDYB 331K 50	
C29	Electrolytic	4.7	50V	CEA 4R7P 50	
C30	Electrolytic	1	50V	CEA 010P 50	
C31	Ceramic	0.04	50V	CKDYF 403Z 50	
C32	Ceramic	0.04	50V	CKDYF 403Z 50	
C33	Electrolytic	100	16V	CEA 101P 16	
C34	Ceramic	0.04	50V	CKDYF 403Z 50	
C35	Ceramic	0.04	50V	CKDYF 403Z 50	
C36	Electrolytic	10	16V	CEA 100P 16	
C37	Ceramic	0.04	50V	CKDYF 403Z 50	
C38	Electrolytic	0.47	50V	CEA R47P 50	
C39	Mylar	0.01	50V	CQMA 103K 50	
C40	Styrol	410p	50V	CQSA 411K 50	
C42	Ceramic	0.04	50V	CKDYF 403Z 50	
C43	Ceramic	0.04	50V	CKDYF 403Z 50	
C44	Ceramic	0.04	50V	CKDYF 403Z 50	
C45	Electrolytic	10	16V	CEA 100P 16	
C46	Ceramic	0.04	50V	CKDYF 403Z 50	
C47	Ceramic	0.04	50V	CKDYF 403Z 50	
C48	Ceramic	470p	50V	CKDYB 471K 50	
C49	Ceramic	0.01	50V	CKDYF 103Z 50	
C50	Mylar	0.0047	50V	CQMA 472K 50	
C51	Mylar	0.0047	50V	CQMA 472K 50	
C52	Ceramic	0.04	50V	CKDYF 403Z 50	
C53	Electrolytic	0.47	25V	CSSA R47X 25	
C54	Electrolytic	4.7	50V	CEA 4R7P 50	
C55	Electrolytic	3.3	16V	CSSA 3R3M 16	
C56	Mylar	0.01	50V	CQMA 103K 50	

Symbol	Description			Part No.	
C57	Electrolytic	3.3	16V	CSSA 3R3M 16	
C58	Electrolytic	1	50V	CEA 010P 50	
C59	Styrol	0.0033	50V	C15-011-A	
C60	Ceramic	330p	50V	CKDYB 331K 50	
C61	Electrolytic	0.47	50V	CEA R47P 50	
C62	Mylar	0.15	50V	CQMA 154K 50	
C63	Mylar	0.002	50V	CQMA 202K 50	
C64	Mylar	0.002	50V	CQMA 202K 50	
C65	Electrolytic	100	16V	CEA 101P 16	
C66	Electrolytic	2.2	16V	CSSA 2R2M 16	
C67	Electrolytic	2.2	16V	CSSA 2R2M 16	
C68	Ceramic	0.01	50V	CKDYF 103Z 50	
C71	Ceramic	0.01	50V	CKDYB 103K 50	
C72	Ceramic	0.01	50V	CKDYB 103K 50	
C73	Electrolytic	47	16V	CEA 470P 16	
C74	Ceramic	470p	50V	CKDYB 471K 50	

RESISTORS

Symbol	Description		Part No.	
VR1	Semi-fixed	100K-B	C92-047-0	
VR2	Semi-fixed	330-B	C92-065-A	
R1	Carbon film	330	RD¼PS 331J	
R2	Carbon film	1.5k	RD¼PS 152J	
R3	Carbon film	6.8k	RD¼PS 682J	
R4	Carbon film	4.7k	RD¼PS 472J	
R5	Carbon film	1k	RD¼PS 102J	
R6	Carbon film	330	RD¼PS 331J	
R7	Carbon film	1.2k	RD¼PS 122J	
R8	Carbon film	15k	RD¼PS 153J	
R9	Carbon film	82k	RD¼PS 823J	
R10	Carbon film	470	RD¼PS 471J	
R11	Carbon film	330	RD¼PS 331J	
R13	Carbon film	100k	RD¼PS 104J	
R14	Carbon film	1k	RD¼PS 102J	
R15	Carbon film	330	RD¼PS 331J	
R16	Carbon film	4.7k	RD¼PS 472J	
R17	Carbon film	4.7k	RD¼PS 472J	
R18	Carbon film	1.2k	RD¼PS 122J	
R19	Carbon film	6.8k	RD¼PS 682J	
R20	Carbon film	56	RD¼PS 560J	
R21	Carbon film	1k	RD¼PS 102J	
R22	Carbon film	1k	RD¼PS 102J	
R23	Carbon film	1k	RD¼PS 102J	
R24	Carbon film	1.8k	RD¼PS 182J	
R25	Carbon film	8.2k	RD¼PS 822J	
R26	Carbon film	5.6k	RD¼PS 562J	

Symbol	Description		Part No.	
R27	Carbon film	2.2k	RD¼PS 222J	
R28	Carbon film	100k	RD¼PS 104J	
R29	Carbon film	100	RD¼PS 101J	
R30	Carbon film	2.2k	RD¼PS 222J	
R31	Carbon film	33k	RD¼PS 333J	
R32	Carbon film	560k	RD¼PS 564J	
R33	Carbon film	33k	RD¼PS 333J	
R34	Carbon film	390k	RD¼PS 394J	
R35	Carbon film	10k	RD¼PS 103J	
R36	Carbon film	3.3k	RD¼PS 332J	
R37	Carbon film	100	RD¼PS 101J	
R38	Carbon film	470	RD¼PS 471J	
R39	Carbon film	3.3k	RD¼PS 332J	
R40	Carbon film	2.2k	RD¼PS 222J	
R41	Carbon film	1.8k	RD¼PS 182J	
R42	Carbon film	3.3k	RD¼PS 332J	
R43	Carbon film	27k	RD¼PS 273J	
R44	Carbon film	1k	RD¼PS 102J	
R45	Carbon film	68	RD¼PS 680J	
R46	Carbon film	12k	RD¼PS 123J	
R47	Carbon film	3.3k	RD¼PS 332J	
R48	Carbon film	470	RD¼PS 471J	
R49	Carbon film	1k	RD¼PS 102J	
R50	Carbon film	1k	RD¼PS 102J	
R51	Carbon film	4.7k	RD¼PS 472J	
R52	Carbon film	100k	RD¼PS 104J	
R53	Carbon film	4.7k	RD¼PS 472J	
R54	Carbon film	27k	RD¼PS 273J	
R55	Carbon film	330	RD¼PS 331J	
R56	Carbon film	27k	RD¼PS 273J	

Symbol	Description		Part No.	
R57	Carbon film	4.7k	RD¼PS 472J	
R58	Carbon film	18k	RD¼PS 183J	
R59	Carbon film	8.2k	RD¼PS 822J	
R60	Carbon film	3.3k	RD¼PS 332J	
R61	Carbon film	4.7k	RD¼PS 472J	
R62	Carbon film	12k	RD¼PS 123J	
R63	Carbon film	330	RD¼PS 331J	
R64	Carbon film	10k	RD¼PS 103J	
R65	Carbon film	10k	RD¼PS 103J	
R66	Carbon film	2.2k	RD¼PS 222J	
R67	Carbon film	18k	RD¼PS 183J	
R68	Carbon film	390k	RD¼PS 394J	
R69	Carbon film	1M	RD¼PS 105J	
R70	Carbon film	100k	RD¼PS 104J	
R71	Carbon film	390k	RD¼PS 394J	
R72	Carbon film	100k	RD¼PS 104J	
R73	Carbon film	120k	RD¼PS 124J	
R74	Carbon film	47k	RD¼PS 473J	
R75	Carbon film	2.2k	RD¼PS 222J	
R76	Carbon film	47	RD¼PS 470J	
R77	Carbon film	4.7k	RD¼PS 472J	
R78	Carbon film	100k	RD¼PS 104J	
R79	Carbon film	47k	RD¼PS 473J	
R80	Carbon film	33k	RD¼PS 333J	
R81	Carbon film	150	RD¼PS 151J	
R82	Carbon film	2.7k	RD¼PS 272J	
R83	Carbon film	1.2k	RD¼PS 122J	
R84	Carbon film	1.2k	RD¼PS 122J	
R85	Carbon film	2.7k	RD¼PS 272J	
R86	Carbon film	2.7k	RD¼PS 272J	

Symbol	Description		Part No.	
R87	Carbon film	2.7k	RD¼PS 272J	
R88	Carbon film	1k	RD¼PS 102J	
R89	Carbon film	1k	RD¼PS 102J	
R90	Carbon film	33k	RD¼PS 333J	
R91	Carbon film	330	RD¼PS 331J	
R92	Carbon film	33k	RD¼PS 333J	
R93	Carbon film	33	RD¼PS 330J	
R95	Carbon film	330	RD¼PS 331J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	SE3001	Transistor		
Q2	SE3001	Transistor		
Q3	TA7060P-R or W	IC		
Q4	2SC738-D	Transistor		
Q5	TA7060P-W	IC		
Q6	TA7060P-W	IC		
Q7	2SC711-F or E	Transistor		
Q8	2SC711-F or E	Transistor		
Q9	2SC711-F or E	Transistor		
Q10	2SC711-F or E	Transistor		
Q11	2SC711-F or E	Transistor		
Q12	2SC382	Transistor		
Q13	2SC738-D	Transistor		
Q14	2SC711-F or E	Transistor		
Q15	SE3001	Transistor		
Q16	2SK30-Y or GR	FET		
Q17	2SC870-F or E	Transistor		
Q18	2SC711-F or E	Transistor		
Q19	2SC968-Y	Transistor		
Q20	2SC711-F or E	Transistor		

Symbol	Description		Part No.	
Q21	M5109P or CA3054 IC			
D1	1S188FM-1	Diode		
D2	1S188FM-1	Diode		
D3	1S2076	Diode		
D4	1S188FM-1	Diode		
D5	1S188FM-1	Diode		
D6	1S188FM-1	Diode		
D7	1S188FM-1	Diode		
D8	1S2076	Diode		
D9	1S188FM-1	Diode		
D10	1S188FM-1	Diode		
D11	1S188FM-1	Diode		
D12	1S188FM-1	Diode		
D13	1S188FM-1	Diode		
D14	1S188FM-1	Diode		
D15	1S188FM-1	Diode		

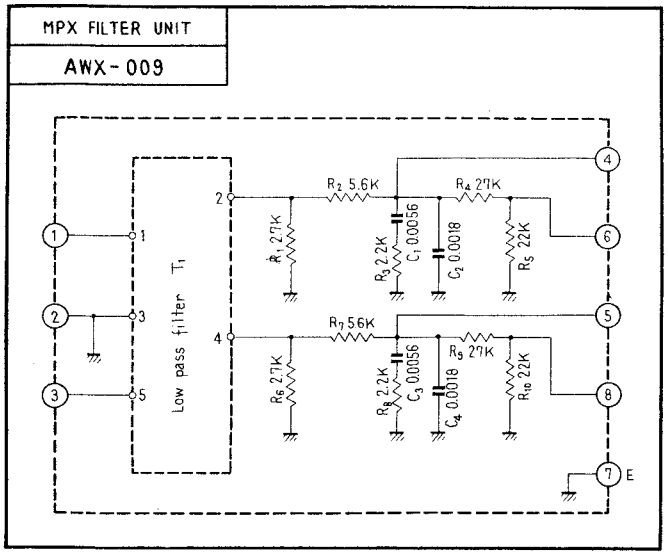
FILTERS

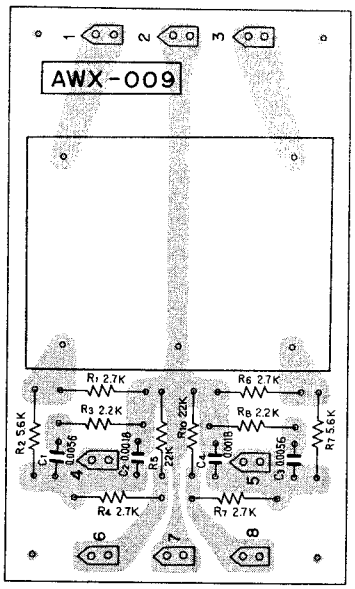
Symbol	Description	Part No.	
CF1	FM Ceramic filter	ATF-003-0	
CF2	FM Ceramic filter	ATF-001-0	
CF3	FM Ceramic filter	ATF-001-0	
CF4	AM Ceramic filter	ATF-002-A	

COILS AND TRANSFORMERS

Symbol	Description	Part No.	
T1	Matching transformer	ATE-002-0	
T2	FM IF transformer	T74-003-A	
T3	AM RF transformer	ATB-003-A	
T4	AM OSC transformer	ATB-004-B	
T5	AM IF transformer	ATE-003-B	
T6	19kHz coil	A75-023-B	
T7	MPX transformer	ATM-005-0	
L1	RF choke coil	T24-028-A	
L2	RF choke coil	T24-028-A	

9.4 MPX FILTER UNIT (AWX-009)





PARTS LIST OF MPX FILTER UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.0056	50V	CQMA 562J 50	
C2	Mylar	0.0018	50V	CQMA 182J 50	
C3	Mylar	0.0056	50V	CQMA 562J 50	
C4	Mylar	0.0018	50V	CQMA 182J 50	

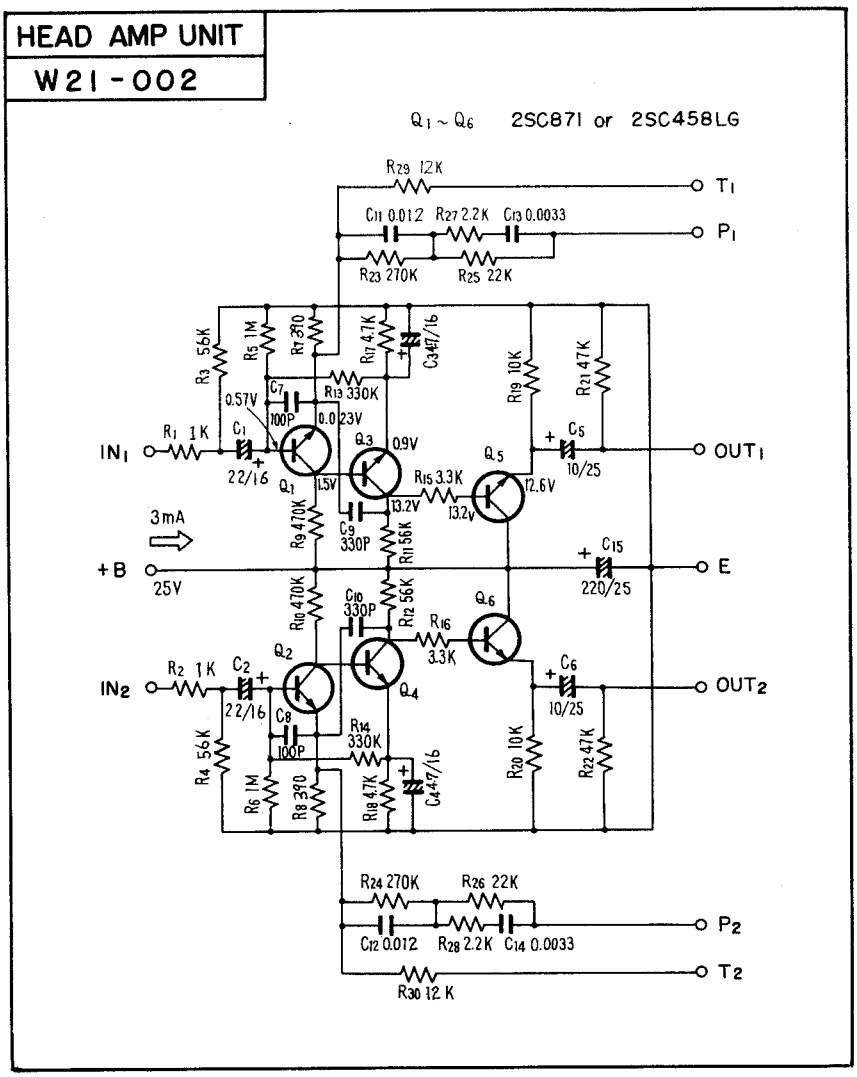
RESISTORS

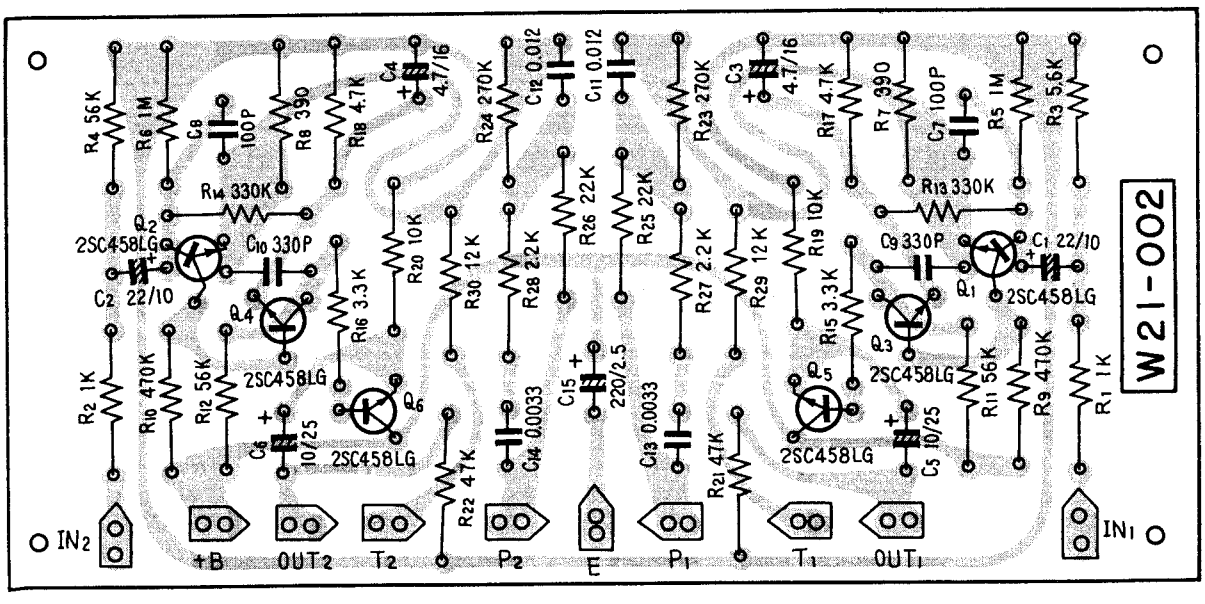
Symbol	Description		Part No.	
R1	Carbon film	2.7k	RD¼PS 272J	
R2	Carbon film	5.6k	RD¼PS 562J	
R3	Carbon film	2.2k	RD¼PS 222J	
R4	Carbon film	27k	RD¼PS 273J	
R5	Carbon film	22k	RD¼PS 223J	
R6	Carbon film	2.7k	RD¼PS 272J	
R7	Carbon film	5.6k	RD¼PS 562J	
R8	Carbon film	2.2k	RD¼PS 222J	
R9	Carbon film	27k	RD¼PS 273J	
R10	Carbon film	22k	RD¼PS 223J	

FILTER

Symbol	Description	Part No.	
T1	Low pass filter	T63-010-A	

9.5 HEAD AMP UNIT (W21-002)





PARTS LIST OF HEAD AMP UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	22	10V	CEA 220P 10	
C2	Electrolytic	22	10V	CEA 220P 10	
C3	Electrolytic	4.7	16V	CEA 4R7P 16	
C4	Electrolytic	4.7	16V	CEA 4R7P 16	
C5	Electrolytic	10	25V	CEA 100P 25	
C6	Electrolytic	10	25V	CEA 100P 25	
C7	Ceramic	100p	50V	CCDSL 101K 50	
C8	Ceramic	100p	50V	CCDSL 101K 50	
C9	Ceramic	330p	50V	CCDSL 331K 50	
C10	Ceramic	330p	50V	CCDSL 331K 50	
C11	Mylar	0.01	50V	CQMA 103K 50	
C12	Mylar	0.01	50V	CQMA 103K 50	
C13	Mylar	0.0033	50V	CQMA 332K 50	
C14	Mylar	0.0033	50V	CQMA 332K 50	
C15	Electrolytic	220	25V	CEA 221P 25	

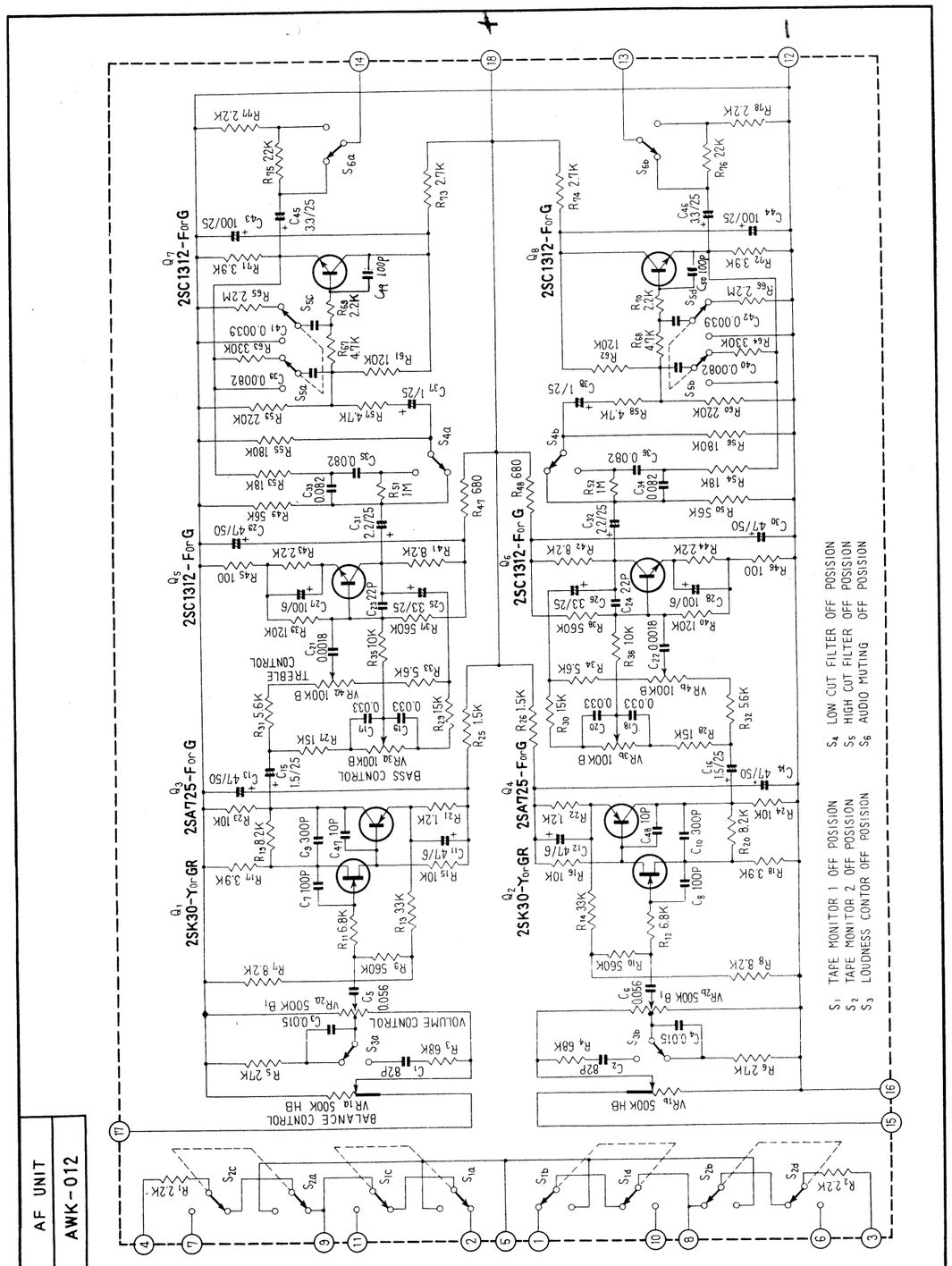
SEMICONDUCTORS

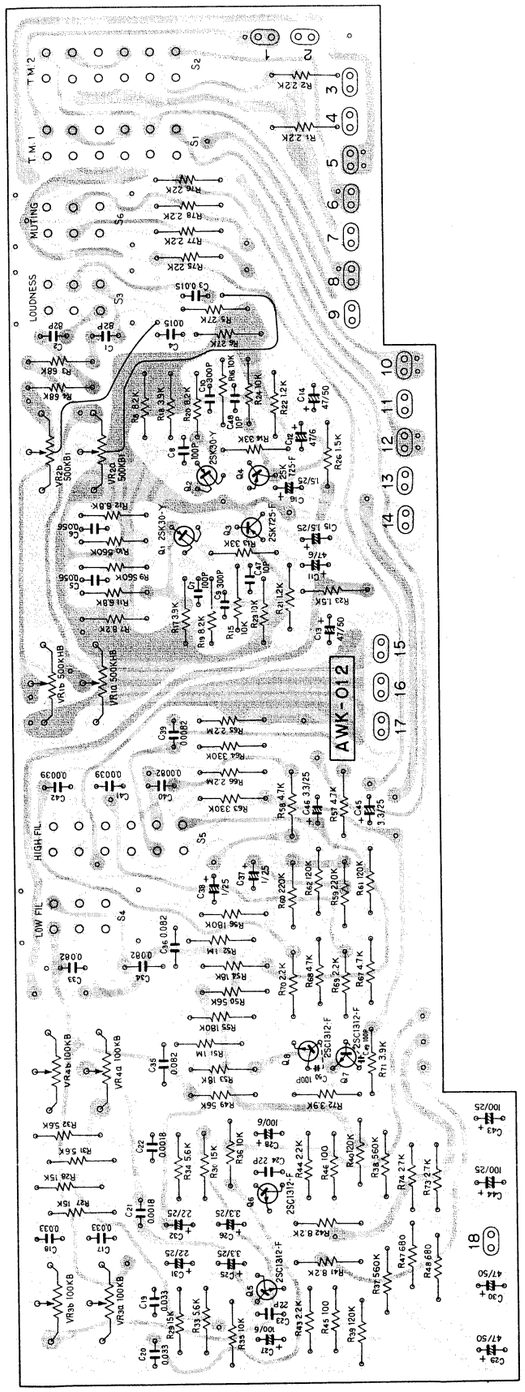
Symbol	Description	Part No.	
Q1	2SC458LG-B or C Transistor		
Q2	2SC458LG-B or C Transistor		
Q3	2SC458LG-B or C Transistor		
Q4	2SC458LG-B or C Transistor		
Q5	2SC458LG-B or C Transistor		
Q6	2SC458LG-B or C Transistor		

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	1k	RD¼PS 102JNL	
R2	Carbon film	1k	RD¼PS 102JNL	
R3	Carbon film	56k	RD¼PS 563JNL	
R4	Carbon film	56k	RD¼PS 563JNL	
R5	Carbon film	1M	RD¼PS 105JNL	
R6	Carbon film	1M	RD¼PS 105JNL	
R7	Carbon film	390	RD¼PS 391JNL	
R8	Carbon film	390	RD¼PS 391JNL	
R9	Carbon film	470k	RD¼PS 474JNL	
R10	Carbon film	470k	RD¼PS 474JNL	
R11	Carbon film	56k	RD¼PS 563JNL	
R12	Carbon film	56k	RD¼PS 563JNL	
R13	Carbon film	330k	RD¼PS 334JNL	
R14	Carbon film	330k	RD¼PS 334JNL	
R15	Carbon film	3.3k	RD¼PS 332JNL	
R16	Carbon film	3.3k	RD¼PS 332JNL	
R17	Carbon film	4.7k	RD¼PS 472JNL	
R18	Carbon film	4.7k	RD¼PS 472JNL	
R19	Carbon film	10k	RD¼PS 103JNL	
R20	Carbon film	10k	RD¼PS 103JNL	
R21	Carbon film	47k	RD¼PS 473JNL	
R22	Carbon film	47k	RD¼PS 473JNL	
R23	Carbon film	270k	RD¼PS 274JNL	
R24	Carbon film	270k	RD¼PS 274JNL	
R25	Carbon film	22k	RD¼PS 223JNL	
R26	Carbon film	22k	RD¼PS 223JNL	
R27	Carbon film	2.2k	RD¼PS 222JNL	
R28	Carbon film	2.2k	RD¼PS 222JNL	
R29	Carbon film	12k	RD¼PS 123JNL	
R30	Carbon film	12k	RD¼PS 123JNL	

9.6 AF UNIT (AWK-012)





PARTS LIST OF AF UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	82p	50V	CCDSL 820K 50	
C2	Ceramic	82p	50V	CCDSL 820K 50	
C3	Mylar	0.015	50V	CQMA 153K 50	
C4	Mylar	0.015	50V	CQMA 153K 50	
C5	Mylar	0.056	50V	CQMA 563K 50	
C6	Mylar	0.056	50V	CQMA 563K 50	
C7	Ceramic	100p	50V	CCDSL 101K 50	
C8	Ceramic	100p	50V	CCDSL 101K 50	
C9	Ceramic	300p	50V	CKDYB 301K 50	
C10	Ceramic	300p	50V	CKDYB 301K 50	
C11	Electrolytic	47	6V	CEA 470P 6	
C12	Electrolytic	47	6V	CEA 470P 6	
C13	Electrolytic	47	50V	CEA 470P 50	
C14	Electrolytic	47	50V	CEA 470P 50	
C15	Electrolytic	1.5	25V	CSSA 1R5M 25	
C16	Electrolytic	1.5	25V	CSSA 1R5M 25	
C17	Mylar	0.033	50V	CQMA 333J 50	
C18	Mylar	0.033	50V	CQMA 333J 50	
C19	Mylar	0.033	50V	CQMA 333J 50	
C20	Mylar	0.033	50V	CQMA 333J 50	
C21	Mylar	0.0018	50V	CQMA 182K 50	
C22	Mylar	0.0018	50V	CQMA 182K 50	
C23	Ceramic	22p	50V	CCDSL 220K 50	
C24	Ceramic	22p	50V	CCDSL 220K 50	
C25	Electrolytic	3.3	25V	CCSA 3R3M 25	
C26	Electrolytic	3.3	25V	CCSA 3R3M 25	
C27	Electrolytic	100	6V	CEA 101P 6	
C28	Electrolytic	100	6V	CEA 101P 6	
C29	Electrolytic	47	50V	CEA 470P 50	
C30	Electrolytic	47	50V	CEA 470P 50	
C31	Electrolytic	2.2	25V	CSSA 2R2M 25	
C32	Electrolytic	2.2	25V	CSSA 2R2M 25	
C33	Mylar	0.082	50V	CQMA 823K 50	
C34	Mylar	0.082	50V	CQMA 823K 50	
C35	Mylar	0.082	50V	CQMA 823K 50	
C36	Mylar	0.082	50V	CQMA 823K 50	
C37	Electrolytic	1	25V	CSSA 010M 25	
C38	Electrolytic	1	25V	CSSA 010M 25	
C39	Mylar	0.0082	50V	CQMA 822K 50	
C40	Mylar	0.0082	50V	CQMA 822K 50	
C41	Mylar	0.0039	50V	CQMA 392K 50	
C42	Mylar	0.0039	50V	CQMA 392K 50	
C43	Electrolytic	100	25V	CEA 101P 25	
C44	Electrolytic	100	25V	CEA 101P 25	
C45	Electrolytic	3.3	25V	CSSA 3R3M 25	
C46	Electrolytic	3.3	25V	CSSA 3R3M 25	
C47	Ceramic	10p	50V	CCDSL 100F 50	
C48	Ceramic	10p	50V	CCDSL 100F 50	
C49	Ceramic	100p	50V	CCDSL 101K 50	
C50	Ceramic	100p	50V	CCDSL 101K 50	

RESISTORS

Symbol	Description		Part No.	
VR1	500k, dual, Balance		C82-049-0	
VR2	500k, dual, Volume		ACV-105-0	
VR3	100k, dual, Bass		ACV-202-A	
VR4	100k, dual, Treble		ACV-202-A	
R1	Carbon film	2.2k	RD¼PS 222J	
R2	Carbon film	2.2k	RD¼PS 222J	
R3	Carbon film	68k	RD¼PS 683J	
R4	Carbon film	68k	RD¼PS 683J	
R5	Carbon film	27k	RD¼PS 273J	
R6	Carbon film	27k	RD¼PS 273J	
R7	Carbon film	8.2k	RD¼PS 822J	
R8	Carbon film	8.2k	RD¼PS 822J	
R9	Carbon film	560k	RD¼PS 564JNL	
R10	Carbon film	560k	RD¼PS 564JNL	
R11	Carbon film	6.8k	RD¼PS 682JNL	
R12	Carbon film	6.8k	RD¼PS 682JNL	
R13	Carbon film	33k	RD¼PS 333J	
R14	Carbon film	33k	RD¼PS 333J	
R15	Carbon film	10k	RD¼PS 103J	
R16	Carbon film	10k	RD¼PS 103J	
R17	Carbon film	3.9k	RD¼PS 392J	
R18	Carbon film	3.9k	RD¼PS 392J	
R19	Carbon film	8.2k	RD¼PS 822J	
R20	Carbon film	8.2k	RD¼PS 822J	
R21	Carbon film	1.2k	RD¼PS 122J	
R22	Carbon film	1.2k	RD¼PS 122J	
R23	Carbon film	10k	RD¼PS 103J	
R24	Carbon film	10k	RD¼PS 103J	
R25	Carbon film	1.5k	RD¼PS 152J	
R26	Carbon film	1.5k	RD¼PS 152J	
R27	Carbon film	15k	RD¼PS 153J	
R28	Carbon film	15k	RD¼PS 153J	
R29	Carbon film	15k	RD¼PS 153J	
R30	Carbon film	15k	RD¼PS 153J	
R31	Carbon film	5.6k	RD¼PS 562J	
R32	Carbon film	5.6k	RD¼PS 562J	
R33	Carbon film	5.6k	RD¼PS 562J	
R34	Carbon film	5.6k	RD¼PS 562J	
R35	Carbon film	10k	RD¼PS 103J	
R36	Carbon film	10k	RD¼PS 103J	
R37	Carbon film	560k	RD¼PS 564JNL	
R38	Carbon film	560k	RD¼PS 564JNL	
R39	Carbon film	120k	RD¼PS 124JNL	
R40	Carbon film	120k	RD¼PS 124JNL	
R41	Carbon film	8.2k	RD¼PS 822J	
R42	Carbon film	8.2k	RD¼PS 822J	
R43	Carbon film	2.2k	RD¼PS 222J	
R44	Carbon film	2.2k	RD¼PS 222J	
R45	Carbon film	100	RD¼PS 101J	
R46	Carbon film	100	RD¼PS 101J	
R47	Carbon film	680	RD¼PS 681J	
R48	Carbon film	680	RD¼PS 681J	
R49	Carbon film	56k	RD¼PS 563J	
R50	Carbon film	56k	RD¼PS 563J	
R51	Carbon film	1M	RD¼PS 105JNL	
R52	Carbon film	1M	RD¼PS 105JNL	
R53	Carbon film	18k	RD¼PS 183J	
R54	Carbon film	18k	RD¼PS 183J	
R55	Carbon film	180k	RD¼PS 184JNL	

Symbol	Description		Part No.	
R56	Carbon film	180k	RD¼PS 184JNL	
R57	Carbon film	4.7k	RD¼PS 472J	
R58	Carbon film	4.7k	RD¼PS 472J	
R59	Carbon film	220k	RD¼PS 224JNL	
R60	Carbon film	220k	RD¼PS 224JNL	
R61	Carbon film	120k	RD¼PS 124JNL	
R62	Carbon film	120k	RD¼PS 124JNL	
R63	Carbon film	330k	RD¼PS 334JNL	
R64	Carbon film	330k	RD¼PS 334JNL	
R65	Carbon film	2.2M	RD¼PS 225J	
R66	Carbon film	2.2M	RD¼PS 225J	
R67	Carbon film	4.7k	RD¼PS 472J	
R68	Carbon film	4.7k	RD¼PS 472J	
R69	Carbon film	2.2k	RD¼PS 222J	
R70	Carbon film	2.2k	RD¼PS 222J	
R71	Carbon film	3.9k	RD¼PS 392J	
R72	Carbon film	3.9k	RD¼PS 392J	
R73	Carbon film	2.7k	RD¼PS 272J	
R74	Carbon film	2.7k	RD¼PS 272J	
R75	Carbon film	22k	RD¼PS 223J	
R76	Carbon film	22k	RD¼PS 223J	
R77	Carbon film	2.2k	RD¼PS 222J	
R78	Carbon film	2.2k	RD¼PS 222J	

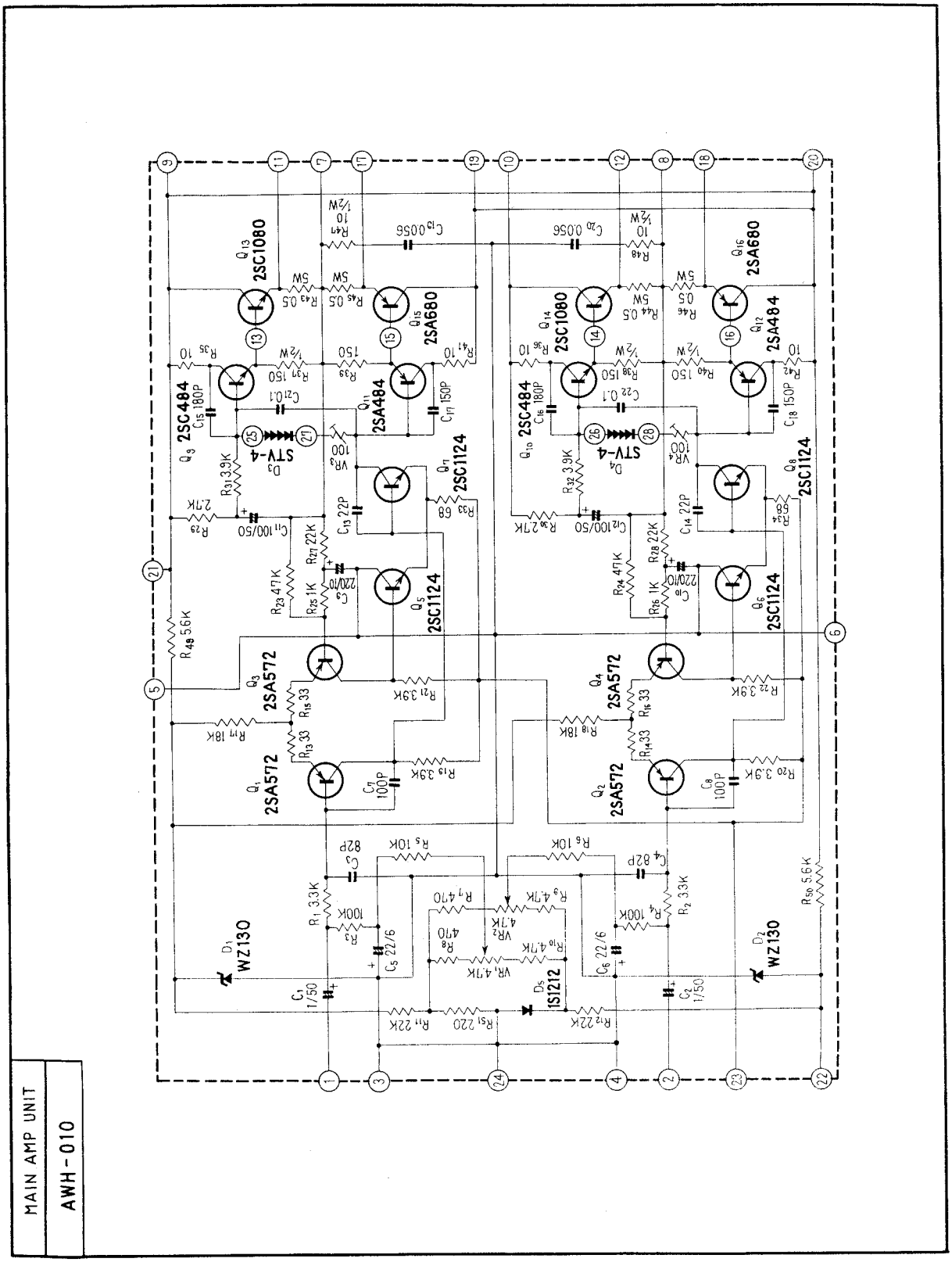
SEMICONDUCTORS

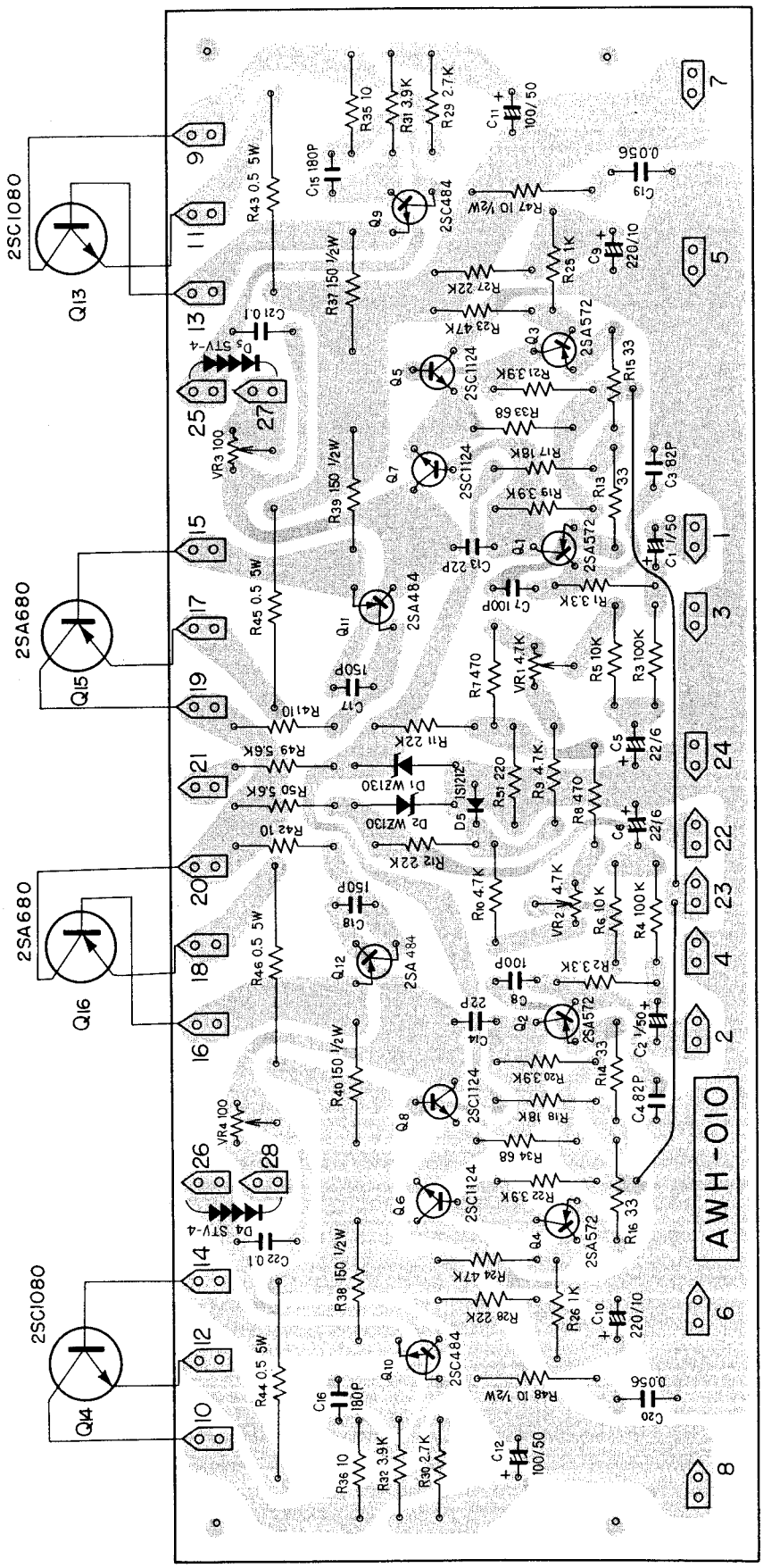
Symbol	Description	Part No.	
Q1	2SK30-Y or GR FET		
Q2	2SK30-Y or GR FET		
Q3	2SA725-F or G Transistor		
Q4	2SA725-F or G Transistor		
Q5	2SC1312-F or G Transistor		
Q6	2SC1312-F or G Transistor		
Q7	2SC1312-F or G Transistor		
Q8	2SC1312-F or G Transistor		

SWITCHES

Symbol	Description	Part No.	
S1	Lever switch (TAPE MON 1)	ASK-015-0	
S2	Lever switch (TAPE MON 2)	ASK-015-0	
S3	Lever switch (LOUDNESS)	ASK-014-0	
S4	Lever switch (LOW FILTER)	ASK-014-0	
S5	Lever switch (HIGH FILTER)	ASK-016-0	
S6	Lever switch (AUDIO MUTING)	ASK-014-0	

9.7 MAIN AMP UNIT (AWH-010)




AWH-010
2SC1080
2SA680
2SC1080
2SA680
Q13
Q15
Q16
Q14
D1 WZ130
D2 WZ130
D4 STV-4
D5 1S1212
VR1 4.7K
VR2 4.7K
VR3 100
VR4 100
R1 3.3K
R2 3.3K
R3 100K
R4 100K
R5 10K
R6 10K
R7 470
R8 470
R9 4.7K
R10 4.7K
R11 22K
R12 22K
R13 33
R14 33
R15 33
R16 33
R17 18K
R18 18K
R19 3.9K
R20 3.9K
R21 3.9K
R22 3.9K
R23 47K
R24 47K
R25 1K
R26 1K
R27 22K
R28 22K
R29 2.7K
R30 2.7K
R31 3.9K
R32 3.9K
R33 68
R34 68
R35 10
R36 10
R37 150 1/2W
R38 150 1/2W
R39 150 1/2W
R40 150 1/2W
R41 10
R42 10
R43 0.5 5W
R44 0.5 5W
R45 0.5 5W
R46 0.5 5W
R47 10 1/2W
R48 10 1/2W
R49 5.6K
R50 5.6K
R51 220
C1 1/50
C2 1/50
C3 82P
C4 82P
C5 22/6
C6 22/6
C7 100P
C8 100P
C9 220/10
C10 220/10
C11 100/50
C12 100/50
C13 22P
C14 22P
C15 180P
C16 180P
C17 150P
C18 150P
C19 0.056
C20 0.056
C21 0.1
C22 0.1
Q1 2SA572
Q2 2SA572
Q3 2SA572
Q4 2SA572
Q5 2SC1124
Q6 2SC1124
Q7 2SC1124
Q8 2SC1124
Q9 2SC484
Q10 2SC484
Q11 2SA484
Q12 2SA484
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

PARTS LIST OF MAIN AMP UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	1	50V	CEA 010P 50	
C2	Electrolytic	1	50V	CEA 010P 50	
C3	Ceramic	82p	50V	CCDSL 820K 50	
C4	Ceramic	82p	50V	CCDSL 820K 50	
C5	Electrolytic	22	6V	CEA 220P 6	
C6	Electrolytic	22	6V	CEA 220P 6	
C7	Ceramic	100p	50V	CCDSL 101K 50	
C8	Ceramic	100p	50V	CCDSL 101K 50	
C9	Electrolytic	220	10V	CEA 221P 10	
C10	Electrolytic	220	10V	CEA 221P 10	
C11	Electrolytic	100	50V	CEA 101P 50	
C12	Electrolytic	100	50V	CEA 101P 50	
C13	Ceramic	22p	50V	CCDSL 220K 50	
C14	Ceramic	22p	50V	CCDSL 220K 50	
C15	Ceramic	180p	50V	CCDSL 181K 50	
C16	Ceramic	180p	50V	CCDSL 181K 50	
C17	Ceramic	150p	50V	CCDSL 151K 50	
C18	Ceramic	150p	50V	CCDSL 151K 50	
C19	Mylar	0.056	50V	CQMA 563K 50	
C20	Mylar	0.056	50V	CQMA 563K 50	
C21	Mylar	0.1	50V	CQMA 104K 50	
C22	Mylar	0.1	50V	CQMA 104K 50	

RESISTORS

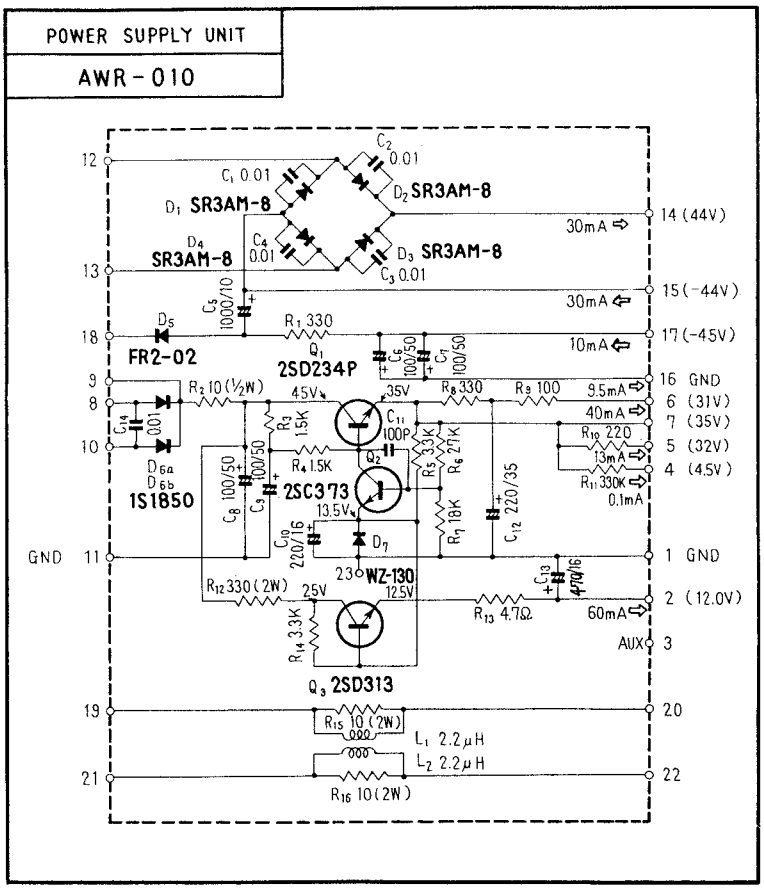
Symbol	Description		Part No.	
VR1	Semi-fixed	4.7k-B	C92-051-0	
VR2	Semi-fixed	4.7k-B	C92-051-0	
VR3	Semi-fixed	100-B	C92-063-0	
VR4	Semi-fixed	100-B	C92-063-0	
R1	Carbon film	3.3k	RD¼PS 332J	
R2	Carbon film	3.3k	RD¼PS 332J	
R3	Carbon film	100k	RD¼PS 104JNL	
R4	Carbon film	100k	RD¼PS 104JNL	
R5	Carbon film	10k	RD¼PS 103J	
R6	Carbon film	10k	RD¼PS 103J	
R7	Carbon film	470	RD¼PS 471J	
R8	Carbon film	470	RD¼PS 471J	
R9	Carbon film	4.7k	RD¼PS 472J	
R10	Carbon film	4.7k	RD¼PS 472J	
R11	Carbon film	22k	RD¼PS 223J	
R12	Carbon film	22k	RD¼PS 223J	
R13	Carbon film	33	RD¼PS 330J	
R14	Carbon film	33	RD¼PS 330J	
R15	Carbon film	33	RD¼PS 330J	
R16	Carbon film	33	RD¼PS 330J	
R17	Carbon film	18k	RD¼PS 183J	
R18	Carbon film	18k	RD¼PS 183J	
R19	Carbon film	3.9k	RD¼PS 392J	
R20	Carbon film	3.9k	RD¼PS 392J	
R21	Carbon film	3.9k	RD¼PS 392J	
R22	Carbon film	3.9k	RD¼PS 392J	
R23	Carbon film	47k	RD¼PS 473J	
R24	Carbon film	47k	RD¼PS 473J	
R25	Carbon film	1k	RD¼PS 102J	

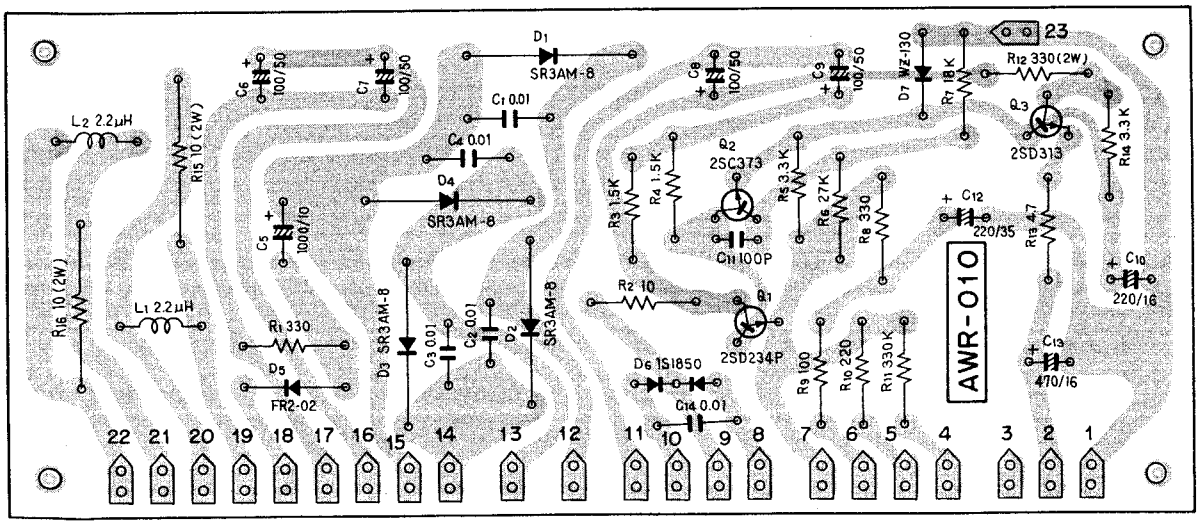
Symbol	Description			Part No.	
R26	Carbon film	1k		RD¼PS 102J	
R27	Carbon film	22k		RD¼PS 223J	
R28	Carbon film	22k		RD¼PS 223J	
R29	Carbon film	2.7k		RD¼PS 272J	
R30	Carbon film	2.7k		RD¼PS 272J	
R31	Carbon film	3.9k		RD¼PS 392J	
R32	Carbon film	3.9k		RD¼PS 392J	
R33	Carbon film	68		RD¼PS 680J	
R34	Carbon film	68		RD¼PS 680J	
R35	Carbon film	10		RD¼PS 100J	
R36	Carbon film	10		RD¼PS 100J	
R37	Carbon film	150	½W	RD½PS 151J	
R38	Carbon film	150	½W	RD½PS 151J	
R39	Carbon film	150	½W	RD½PS 151J	
R40	Carbon film	150	½W	RD½PS 151J	
R41	Carbon film	10		RD¼PS 100J	
R42	Carbon film	10		RD¼PS 100J	
R43	Wire wound	0.5	5W	RT5B 0R5K	
R44	Wire wound	0.5	5W	RT5B 0R5K	
R45	Wire wound	0.5	5W	RT5B 0R5K	
R46	Wire wound	0.5	5W	RT5B 0R5K	
R47	Carbon film	10	½W	RD½PS 100J	
R48	Carbon film	10	½W	RD½PS 100J	
R49	Carbon film	5.6k		RD¼PS 562J	
R50	Carbon film	5.6k		RD¼PS 562J	
R51	Carbon film	220		RD¼PS 221J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	2SA572-4B, 5A or 5B	Transistor		
Q2	2SA572 4B, 5A or 5B	Transistor		
Q3	2SA572-4B, 5A or 5B	Transistor		
Q4	2SA572-4B, 5A or 5B	Transistor		
Q5	2SC1124-2 or 3	Transistor		
Q6	2SC1124-2 or 3	Transistor		
Q7	2SC1124-2 or 3	Transistor		
Q8	2SC1124-2 or 3	Transistor		
Q9	2SC484-Y or BL	Transistor		
Q10	2SC484-Y or BL	Transistor		
Q11	2SA484-Y or BL	Transistor		
Q12	2SA484-Y or BL	Transistor		
Q13	2SC1080	Transistor		
Q14	2SC1080	Transistor		
Q15	2SA680	Transistor		
Q16	2SA680	Transistor		
D1	WZ-130	Zener diode		
D2	WZ-130	Zener diode		
D3	STV-4	Varistor		
D4	STV-4	Varistor		
D5	1S1212	Diode		

9.8 POWER SUPPLY UNIT (AWR-010)





PARTS LIST OF POWER SUPPLY UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	DC1.4kV	C43-003-0	
C2	Ceramic	0.01	DC1.4kV	C43-003-0	
C3	Ceramic	0.01	DC1.4kV	C43-003-0	
C4	Ceramic	0.01	DC1.4kV	C43-003-0	
C5	Electrolytic	1000	10V	CEA 102P 10	
C6	Electrolytic	100	50V	CEA 101P 50	
C7	Electrolytic	100	50V	CEA 101P 50	
C8	Electrolytic	100	50V	CEA 101P 50	
C9	Electrolytic	100	50V	CEA 101P 50	
C10	Electrolytic	220	16V	CEA 221P 16	
C11	Ceramic	100p	50V	CCDSL 101K 50	
C12	Electrolytic	220	35V	CEA 221P 35	
C13	Electrolytic	470	16V	CEA 471P 16	
C14	Ceramic	0.01	DC1.4kV	C43-003-0	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	330		RD¼PS 331J	
R2	Carbon film	10	½W	RD½PS 100J	
R3	Carbon film	1.5k		RD¼PS 152J	
R4	Carbon film	1.5k		RD¼PS 152J	
R5	Carbon film	3.3k		RD¼PS 332J	
R6	Carbon film	27k		RD¼PS 273J	
R7	Carbon film	18k		RD¼PS 183J	
R8	Carbon film	330		RD¼PS 331J	
R9	Carbon film	100		RD¼PS 101J	
R10	Carbon film	220		RD¼PS 221J	
R11	Carbon film	330k		RD¼PS 334J	
R12	Metal oxide	330	2W	RS2P 331K	
R13	Carbon film	4.7		RD¼PS 4R7J	
R14	Carbon film	3.3k		RD¼PS 332J	
R15	Metal oxide	10	2W	RN2P 100K	
R16	Metal oxide	10	2W	RN2P 100K	

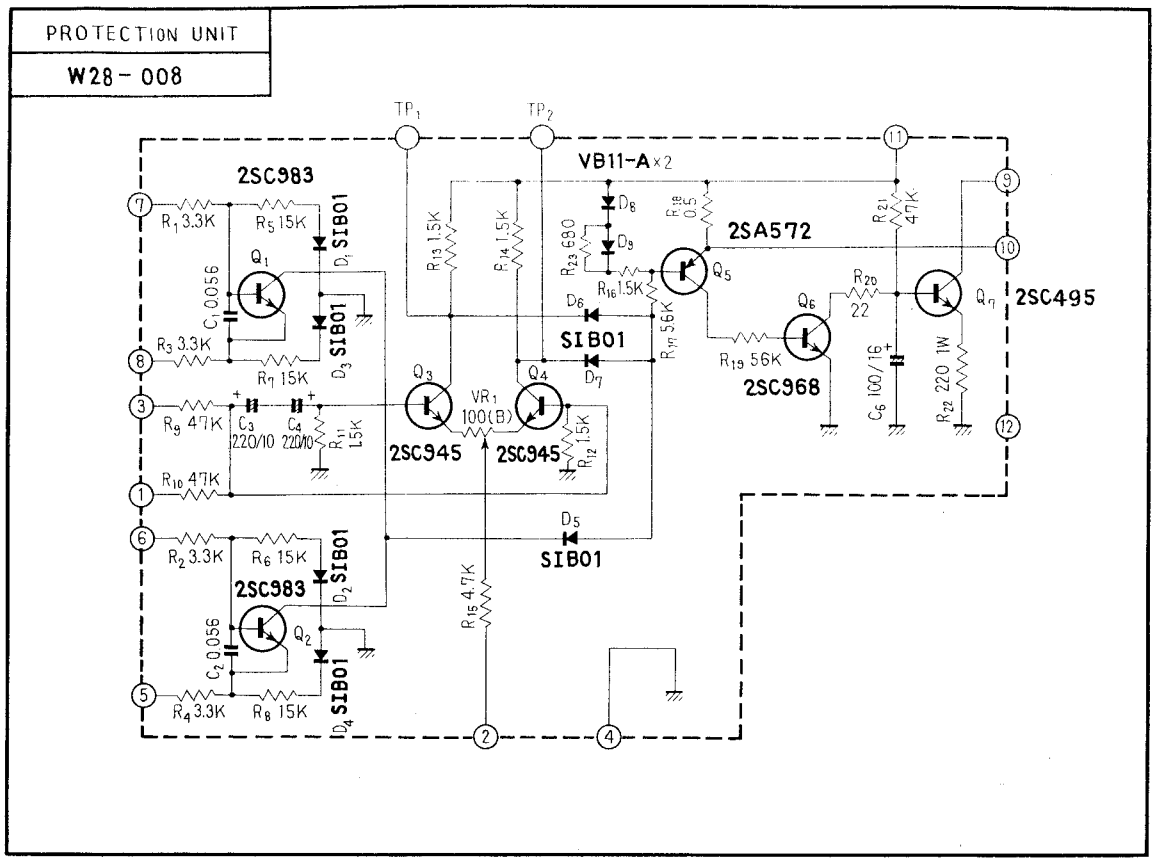
SEMICONDUCTORS

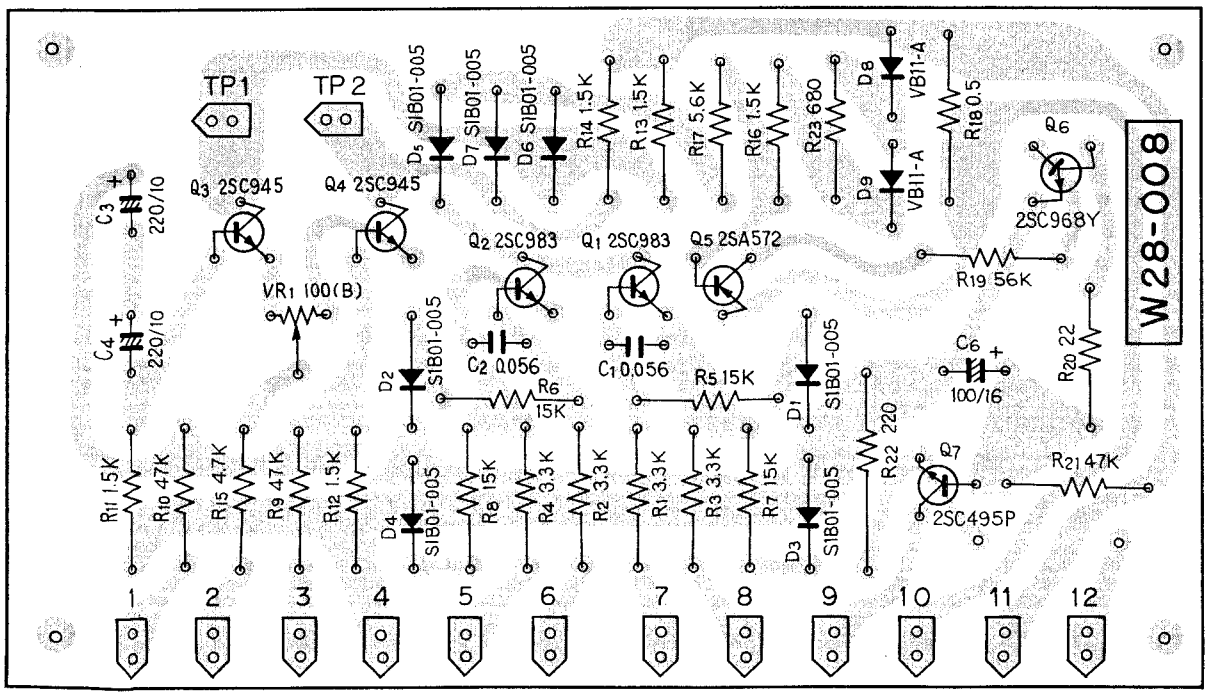
Symbol	Description		Part No.	
Q1	2SD234P-O	Transistor		
Q2	2SC373	Transistor		
Q3	2SD313	Transistor		
D1	SR3AM-8	Diode		
D2	SR3AM-8	Diode		
D3	SR3AM-8	Diode		
D4	SR3AM-8	Diode		
D5	FR2-02	Diode		
D6	1S1850	Diode		
D7	WZ-130	Zener diode		

COILS

Symbol	Description	Part No.	
L1	AF choke coil	T63-009-A	
L2	AF choke coil	T63-009-A	

9.9 PROTECTION UNIT (W28-008)





PARTS LIST OF PROTECTION UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.056	50V	CQMA 563K 50	
C2	Mylar	0.056	50V	CQMA 563K 50	
C3	Electrolytic	220	10V	CEA 221P 10	
C4	Electrolytic	220	10V	CEA 221P 10	
C5	Electrolytic	100	16V	CEA 101P 16	

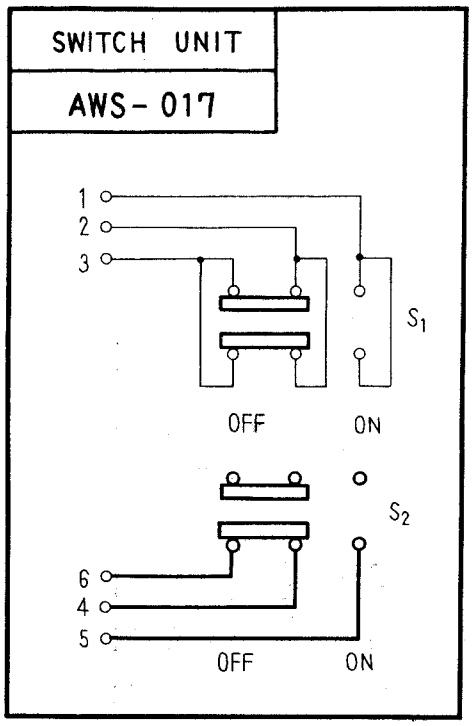
RESISTORS

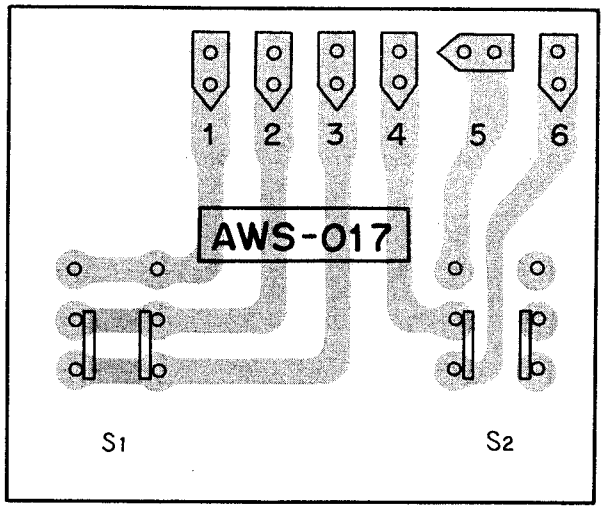
Symbol	Description		Part No.	
VR1	Semi-fixed, 100-B		C92-063-0	
R1	Carbon film	3.3k	RD¼PS 332J	
R2	Carbon film	3.3k	RD¼PS 332J	
R3	Carbon film	3.3k	RD¼PS 332J	
R4	Carbon film	3.3k	RD¼PS 332J	
R5	Carbon film	15k	RD¼PS 153J	
R6	Carbon film	15k	RD¼PS 153J	
R7	Carbon film	15k	RD¼PS 153J	
R8	Carbon film	15k	RD¼PS 153J	
R9	Carbon film	47k	RD¼PS 473J	
R10	Carbon film	47k	RD¼PS 473J	
R11	Carbon film	1.5k	RD¼PS 152J	
R12	Carbon film	1.5k	RD¼PS 152J	
R13	Carbon film	1.5k	RD¼PS 152J	
R14	Carbon film	1.5k	RD¼PS 152J	
R15	Carbon film	4.7k	RD¼PS 472J	
R16	Carbon film	1.5k	RD¼PS 152J	
R17	Carbon film	5.6k	RD¼PS 562J	
R18	Metal oxide	0.5 2W	RS2P 0R5K	
R19	Carbon film	56k	RD¼PS 563J	
R20	Carbon film	22	RD¼PS 220J	
R21	Carbon film	47k	RD¼PS 473J	
R22	Metal oxide	220 1W	RS1P 221K	
R23	Carbon film	680	RD¼PS 681J	

SEMICONDUCTORS

Symbol	Description		Part No.	
Q1	2SC983-O or Y	Transistor		
Q2	2SC983-O or Y	Transistor		
Q3	2SC945-R	Transistor		
Q4	2SC945-R	Transistor		
Q5	2SA572-4	Transistor		
Q6	2SC968Y-2 or 3	Transistor		
Q7	2SC495P-Y	Transistor		
D1	SIB01-005	Diode		
D2	SIB01-005	Diode		
D3	SIB01-005	Diode		
D4	SIB01-005	Diode		
D5	SIB01-005	Diode		
D6	SIB01-005	Diode		
D7	SIB01-005	Diode		
D8	VB11-A	Varistor		
D9	VB11-A	Varistor		

9.10 SWITCH UNIT (AWS-017)





PARTS LIST OF SWITCH UNIT

Symbol	Description	Part No.	
S1	Push switch	ASG-020-0	
S2	Push switch	ASG-020-0	

10. PACKING METHOD AND PARTS NUMBERS