

*file wkm*

# Service Manual

## AM / FM STEREO RECEIVER

**SX-626 / KCW, KUW, FVZW, NBW, FW**

### NOTE

MODEL SX-626 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Round label on rear panel	Voltage	Type
KCW KUW FVZW NBW	120V only 120V only 5-position selector 220V only	CSA approved (Canada) UL approved (U.S.A.) FTZ approved (West Germany) SEMCO (Sweden), NEMCO (Norway) and DEMCO (Denmark) approved
FW	5-position selector	General export model with de-emphasis selector switch

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# 1. SPECIFICATIONS

## SEMICONDUCTORS

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## POWER AMPLIFIER SECTION

Music Power Output (IHF)	110 Watts (4Ω) 76 Watts (8Ω)
Continuous Power Output (each channel driven)	40 W/40W (4Ω) 32 W/32W (8Ω)
Continuous Power Output (both channels driven)	30W + 30W (4Ω) 27W + 27W (8Ω)
Power Output in the range of 20Hz to 20kHz (both channels driven)	20W + 20W (8Ω, Harmonic distortion less than 1%)
Harmonic Distortion	Less than 1% (Continuous power output) Less than 0.09% (16W/16W, 8Ω output)
Intermodulation Distortion	Less than 1% (Continuous power output) Less than 0.4% (16W/16W, 8Ω output)
Power Bandwidth (IHF)	10Hz to 70kHz (8Ω, Harmonic distortion less than 1%)
Frequency Response	5Hz to 80kHz, ± 1 dB
Input Sensitivity/Impedance (1kHz, Continuous power output)	500mV/60kΩ (MAIN IN)
Speakers	4 to 16Ω
Damping Factor	40 (8Ω, 1kHz)

## PREAMPLIFIER SECTION

Output Voltage	500mV (Rated output), 3V (Max.)
Harmonic Distortion	Less than 0.5%
Frequency Response	15Hz to 20kHz, ± 1 dB
Input Sensitivity/Impedance (1kHz, for rated output)	PHONO 1 2.5mV/45kΩ PHONO 2 2.5mV/45kΩ MIC 2.2mV/22kΩ AUX 200mV/100kΩ TAPE MONITOR 1, 2 200mV/70kΩ TAPE REC 1, 2 (Pin jack) 200mV TAPE REC (DIN connector) 35mV
Recording Output	TAPE REC 1, 2 (Pin jack) 200mV TAPE REC (DIN connector) 35mV
BASS Control	-11 dB, +11 dB/100Hz
TREBLE Control	-11 dB, +10.5 dB/10kHz
LOW Filter	-8dB/50Hz (6dB/oct.)
HIGH Filter	-9dB/10kHz (6dB/oct.)
Equalization Curve	PHONO: RIAA S.T.D.
Loudness Contour	+10dB/100Hz, +6dB/10kHz with Volume Control set at -40dB position.
Hum and Noise (IHF)	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)	2.0μV
Capture Ratio (IHF)	2.5dB
Selectivity (IHF)	More than 70dB
Image Rejection	More than 80dB (98MHz)
IF Rejection	More than 100dB (90MHz)
Spurious Rejection	More than 90dB (98MHz)
AM Suppression	50dB
Signal-to-Noise Ratio	70dB
Harmonic Distortion	Mono: Less than 0.4% (100% Mod.) Stereo: Less than 0.5% (100% Mod.)
Tuning Indicator	Signal strength type
Muting	Switchable to ON-OFF
Stereo Separation	More than 40dB (1kHz)
Sub Carrier Suppression	More than 50dB
De-emphasis Switch	50μ sec., 75μ sec. (FW model only)
Antenna Input	Impedance 300Ω balanced and 75Ω unbalanced.

## AM TUNER SECTION

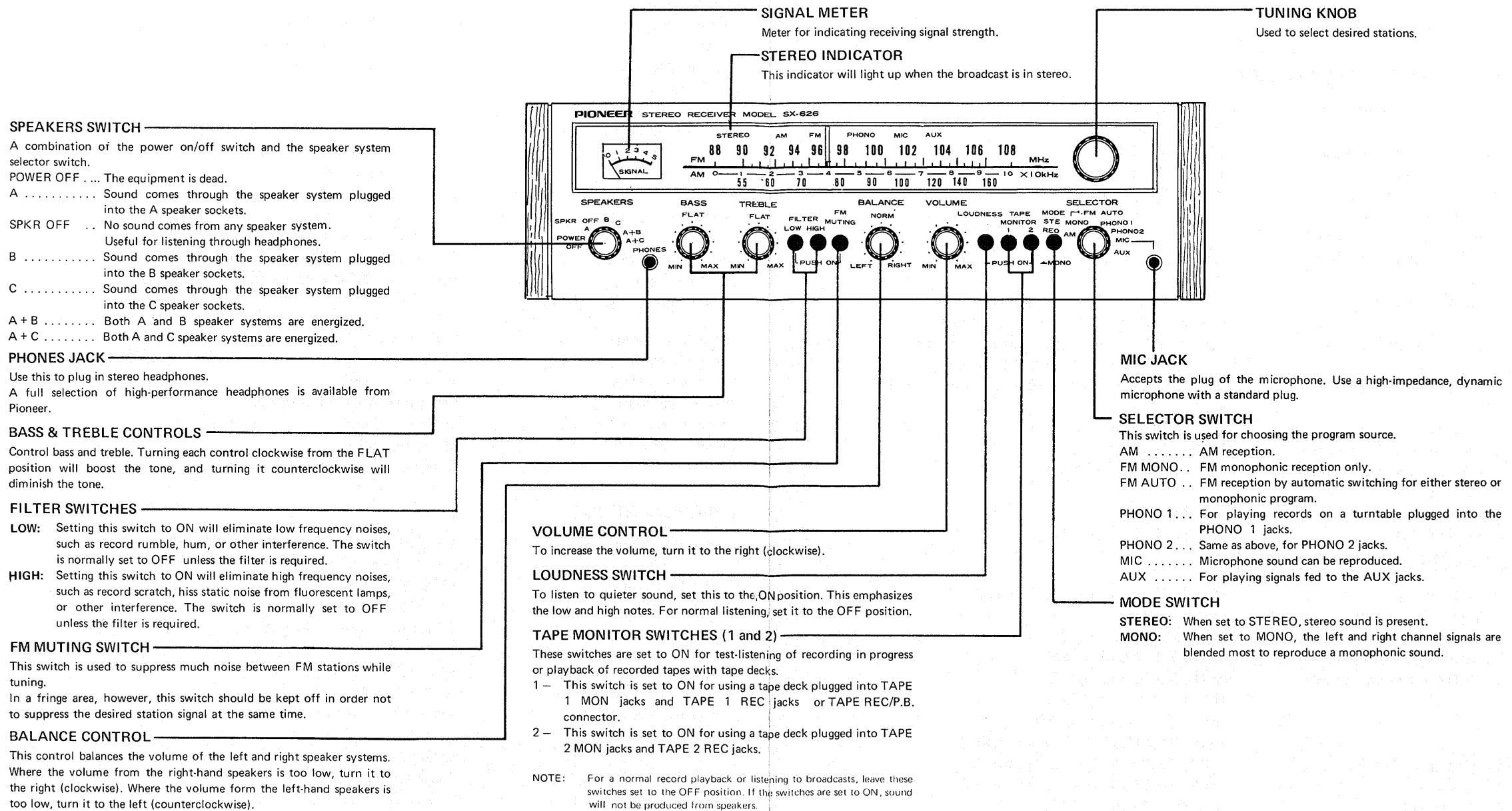
Frequency Range	525kHz to 1,605kHz
Usable Sensitivity (IHF)	10μV
Selectivity (IHF)	More than 30dB
Image Rejection	More than 80dB (1,000kHz)
IF Rejection	More than 70dB
Signal-to-Noise Ratio	More than 50dB
Antenna	Built-in, Ferrite Loopstick Antenna

## MISCELLANEOUS

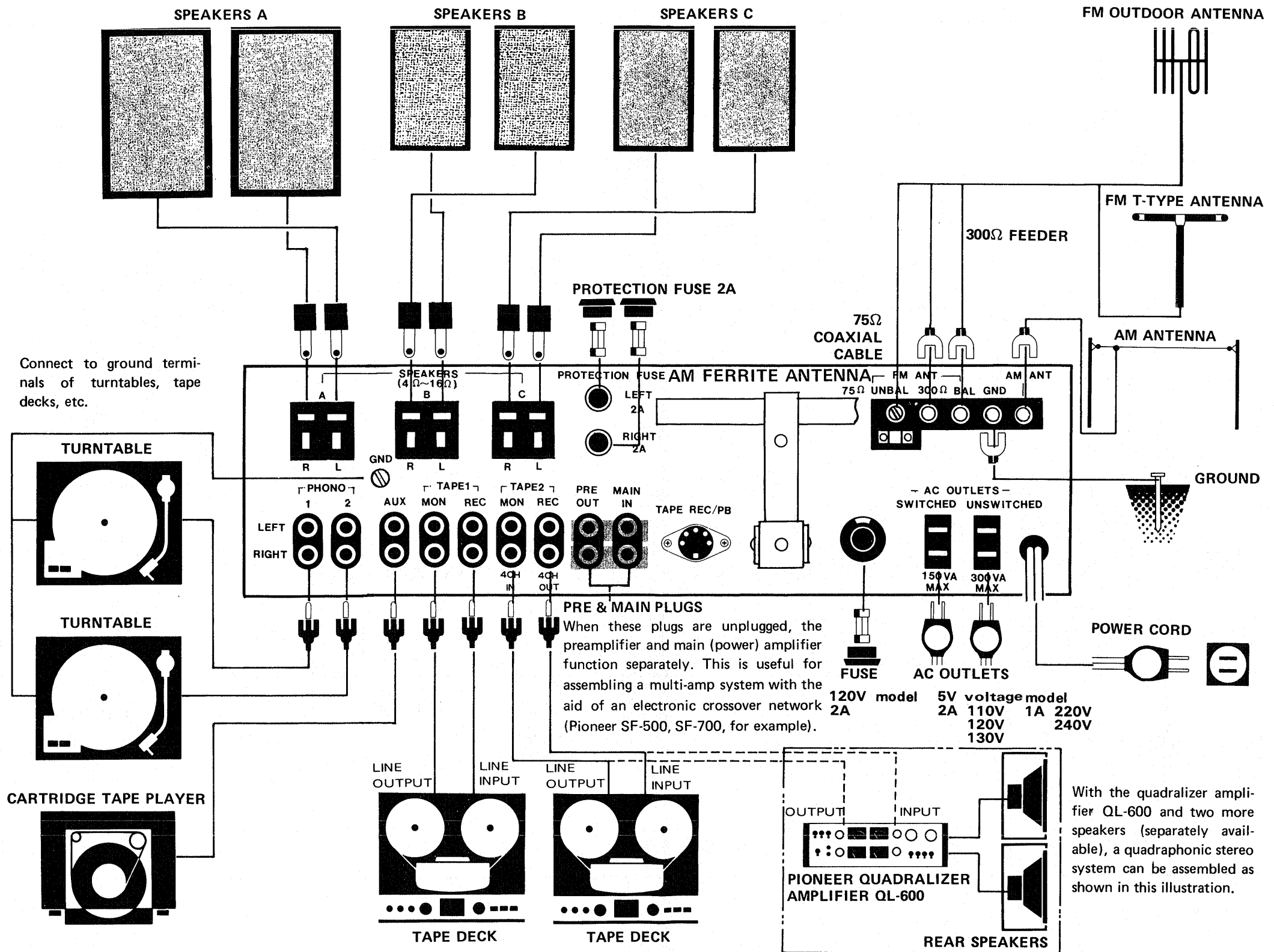
Power Requirements	120V 60Hz or 110V, 120V, 130V, 220V and 240V. (Switchable) 50 – 60Hz
Power Consumption	170W (Max.)
Dimensions (overall)	17-11/16in./450mm (width) 5-11/16in./145mm (height) 14-3/16in./360mm (depth)
Weight Without package	21lb. 13oz/9.9kg
With package	26lb. 7oz/12kg
Furnished Accessories	FM T-type Antenna 1 Pin Plug 2 Speaker Plug 6 Polishing cloth 1 Operating Instructions 1

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

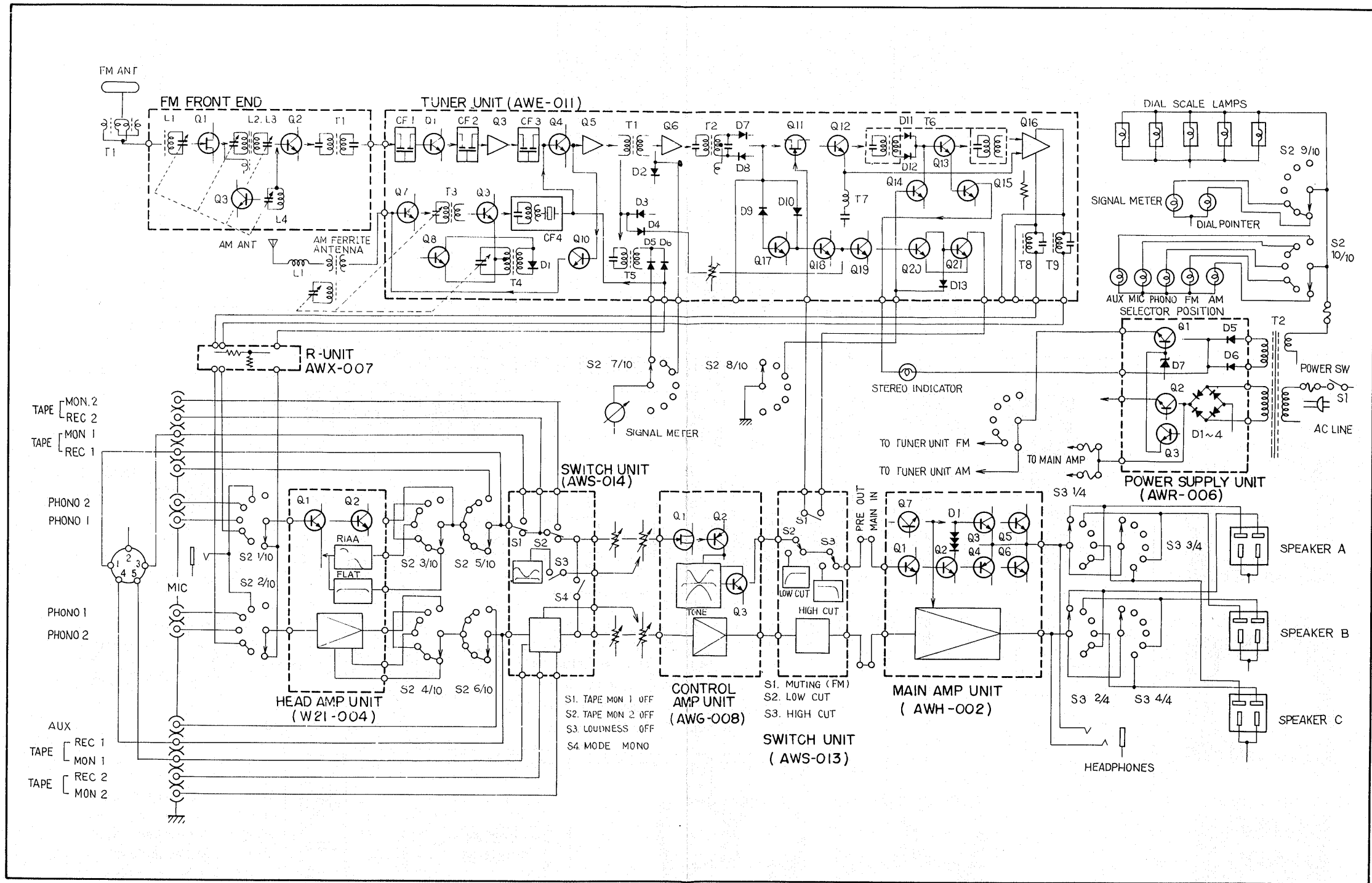
## 2. FRONT PANEL FACILITIES



### 3. CONNECTION DIAGRAM



# 4. BLOCK DIAGRAM



• MUTING CIRCUIT FOR ELIMINATION OF STARTING PULSE NOISE

A common drawback of conventional SEPP amplifier circuits is the occurrence of pulse noise when the power is turned on. The cause of this noise is the timing of the DC voltage distribution through the junctions in the circuit. The most important junction in this respect is the inner side of the output coupling capacitor. Fig. 1 shows a simplified, typical SEPP output stage. When the power is turned on, the original B voltage surges immediately, and this voltage simultaneously appears, through R at point (A). The time constant of this C/R network cannot be made as large as desired because it is part of the signal path. Therefore, voltage B appears almost instantly at the base of Q<sub>3</sub>, causing a sudden high pulse to appear at the junction point, and passing through the output coupling capacitor to the loudspeaker. This causes the starting pulse noise.

Fig. 2 shows the muting circuit used to eliminate this starting noise in PIONEER receiver model SX-626. This circuit, consisting of Q<sub>x</sub>, R<sub>x</sub> and C<sub>x</sub>, functions almost like a ripple filter and a time delay circuit. As C<sub>x</sub> and R<sub>x</sub> are not part of the signal path, their time constant can be designed as large as desired. B voltage builds up at the base of Q<sub>x</sub> only gradually because of the comparatively long charge time of R<sub>x</sub>/C<sub>x</sub>. Therefore, Q<sub>x</sub> becomes conductive rather slowly, energizing the output stage gradually and with balanced DC surge. Consequently, no abrupt pulse flows through the coupling capacitor to the speaker.

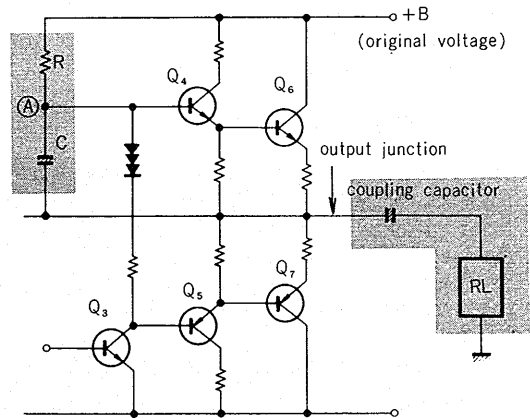


Fig. 1

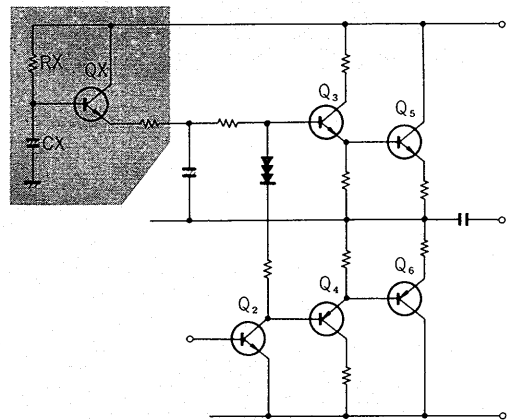


Fig. 2



## 5. DISASSEMBLY

### 5-1 WOODEN CASE

Remove 4 screws from the sides of the wooden case. Pull the case backward off from the receiver housing. See photo 1.

### 5-2 FRONT PANEL

Pull off all knobs, then remove nuts and washers from shafts and remove 2 screws from top of front panel. The front panel can now be removed. See photos 2 and 3.

### 5-3 BOTTOM PLATE

The bottom plate can be removed after loosening the 8 screws. See photo 4.

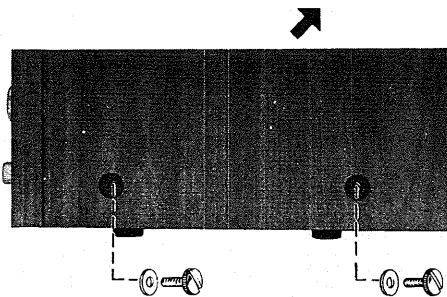


Photo 1

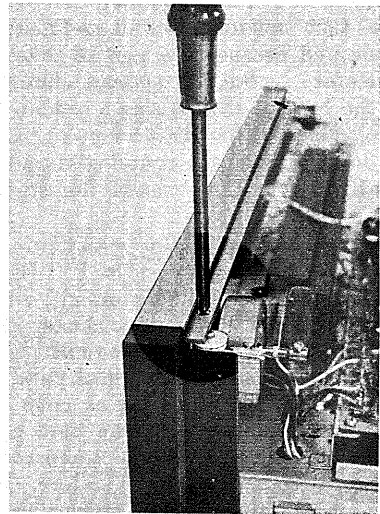


Photo 3

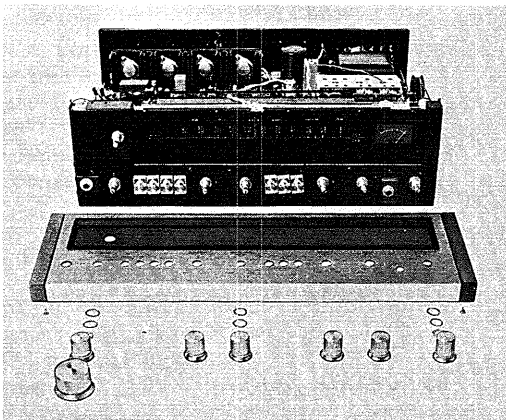


Photo 2

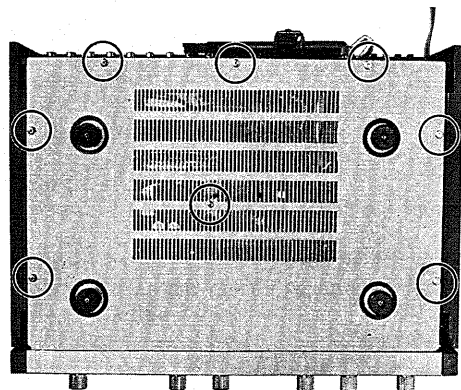
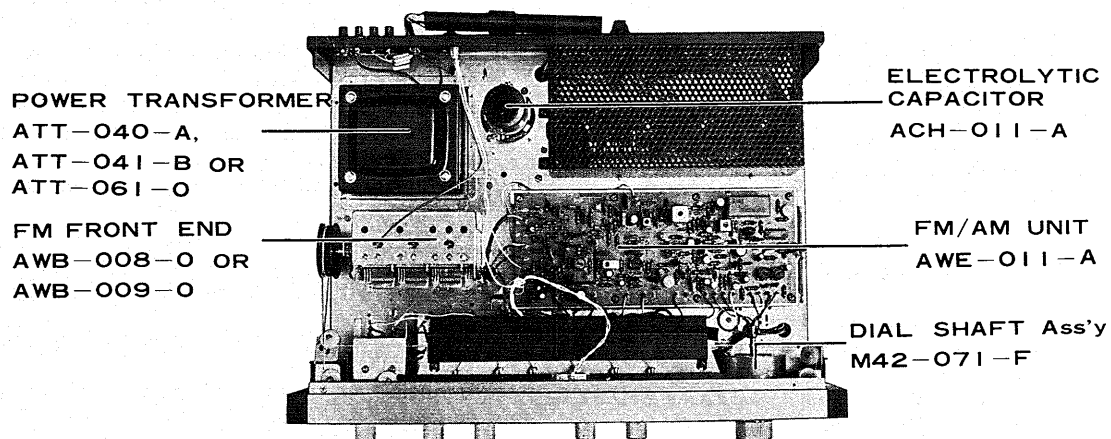


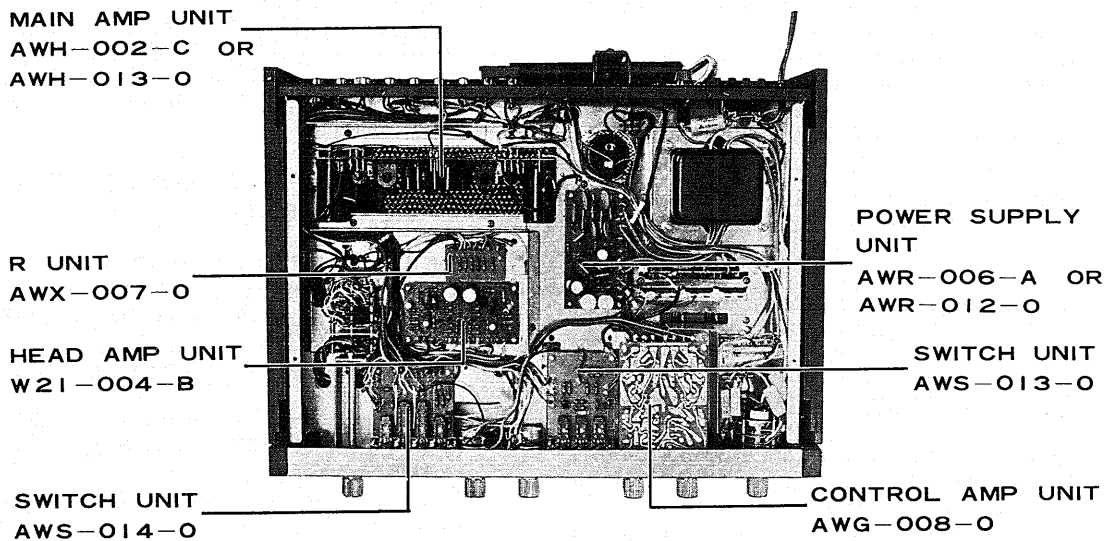
Photo 4

## 6. PARTS AND PCB LOCATION

### 6-1 TOP VIEW



### 6-2 BOTTOM VIEW



## 7. 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.

### 7-1 REQUIRED INSTRUMENT

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

### 7-2 FM IF ALIGNMENT

- a) Confirm +B voltage and current for  $12V \pm 1V$  which should be 46mA to 50mA at pin 4.
- b) Disconnect leads from pins 22 (input) and 24 (MET), then connect resistor  $2.2k\Omega$  as shunted to pin 24 of FM/AM unit.
- c) Connect 10.7MHz sweep generator to pins 22 (hot) and 23 (ground) of FM/AM unit. Set controls as follows:  
Center frequency: 10.7MHz  
Output: 55dB (500 $\mu$ V)
- d) Connect vertical scope input to pin 24.
- e) Align core of T1 for maximum gain and symmetry to obtain scope pattern.
- f) Raise generator output gradually to 80dB (10mV), repeat setp (e) realignment for each output level, if necessary.
- g) Disconnect one side of C23. Disconnect oscilloscope and resistor  $2.2k\Omega$  from pin 24. Then reconnect lead to pin 24.
- h) Connect scope input to pin 9.
- i) Set generator output back to 55dB.
- j) Adjust bottom core of T2 for maximum gain and linearity. Adjust to core so that center frequency mark is located in zero axis.
- k) Reconnect C23.
- l) Reconnect input lead to pin 22.

### 7-3 FM TRACKING ALIGNMENT

- a) Confirm +B current (drain 11mA  $\pm$ 4mA).
- b) Connect FM signal generator output to  $300\Omega$  antenna inputs.
- c) Connect AC VTVM to TAPE REC jack on rear panel.
- d) Adjust generator for 400Hz, 100% modulation.
- e) Set SELECTOR switch on front panel to FM MONO.

- f) Adjust generator frequency and tuning dial to 90MHz. During the following adjustments, keep the generator output as low as possible.
- g) Adjust L4 core first, the adjust cores of L1, L2, L3 for maximum reading on VTVM.
- h) Set generator frequency and turning dial to 106MHz.
- i) Adjust trimmer capacitor CT4 first, then adjust CT1, CT2, CT3 for maximum reading on VTVM.
- j) Repeat these alignments several times until satisfactory readings obtained.
- k) Finally, adjust T1 core for maximum reading on VTVM.

### 7-4 FM MPX DECODER ALIGNMENT

- a) Set SELECTOR switch on front panel to FM AUTO.
- b) Connect RF output of FM MPX signal generator to  $300\Omega$  antenna inputs.
- c) Adjust FM MPX generator as follows:

Signal mode	Deviation
L + R (main)	40.5kHz
19kHz (pilot)	7.5kHz
- d) Connect AC VTVM to TAPE REC jack on rear panel.
- e) Set generator signal mode to L - R (sub), adjust core of T6 (located on FM/AM unit) to obtain maximum reading on VTVM.
- f) Set generator signal mode to L. Adjust VR2 (located on FM/AM unit) for minimum crosstalk on R channel TAPE REC output.
- g) Set generator signal mode to R. Repeat above adjustment for minimum cross-talk on L channel.

### 7-5 MUTING THRESHOLD LEVEL ALIGNMENT

- a) Set SELECTOR switch to FM MONO.
- b) Turn muting switch to ON.
- c) Connect FM signal generator to  $300\Omega$  antenna inputs.
- d) Connect AC VTVM to TAPE REC output jack.
- e) Set output level of generator to 25dB (20 $\mu$ V), with  $\pm 22.5$ kHz deviation, and 400Hz or 1kHz modulation.
- f) Tune receiver accurately to generator frequency.
- g) Adjust VR1 on muting circuit exactly on the borderline between muting and non-muting.

7-6 AM IF ALIGNMENT

- a) Set SELECTOR switch on front panel to AM.
- b) Connect 455kHz sweep generator to pin 15. Adjust generator output level to 60dB (1mV).
- c) Connect vertical oscilloscope input to either L or R of TAPE REC jack.
- d) Set tuning dial to high end position.
- e) Adjust cores of CF4 and T5 for maximum gain and symmetrical pattern on oscilloscope.

- c) 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.
- d) Connect VTVM to TAPE REC jack.
- e) Keep generator as low as possible for minimum VTVM reading.
- f) Tune generator and receiver to 600kHz. Adjust core of T4 on FM/AM unit for maximum VTVM reading, then adjust core of T3 and ferrite antenna.
- g) Re-tune generator and receiver to 1,400kHz.
- h) Adjust trimmers of variable capacitor indicated in Fig. 4 to obtain maximum VTVM reading.

7-7 AM TRACKING ALIGNMENT

- a) Set SELECTOR switch to AM position.
- b) For this alignment, bottom plate must be installed.

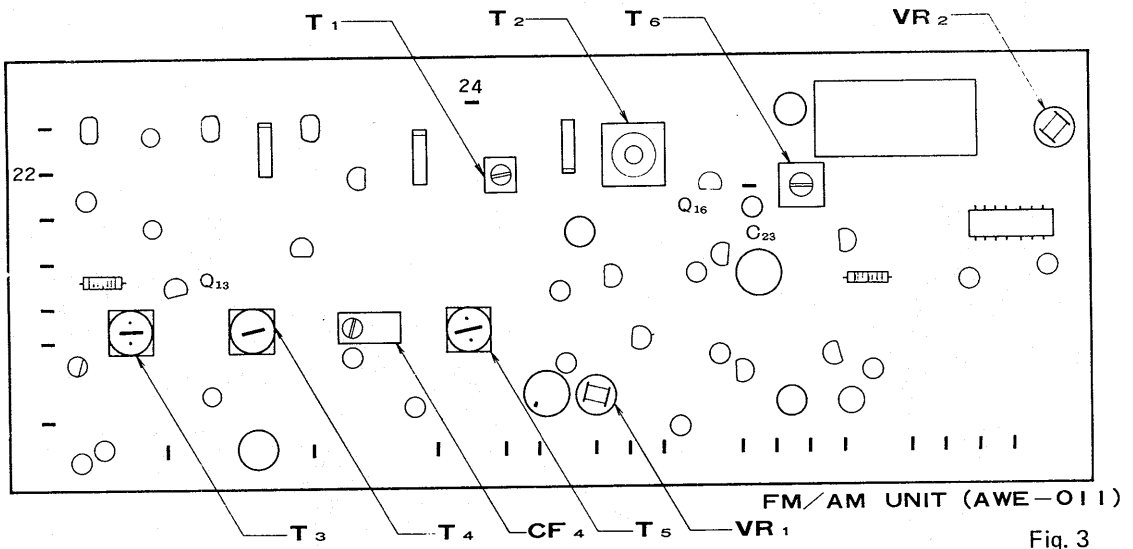


Fig. 3

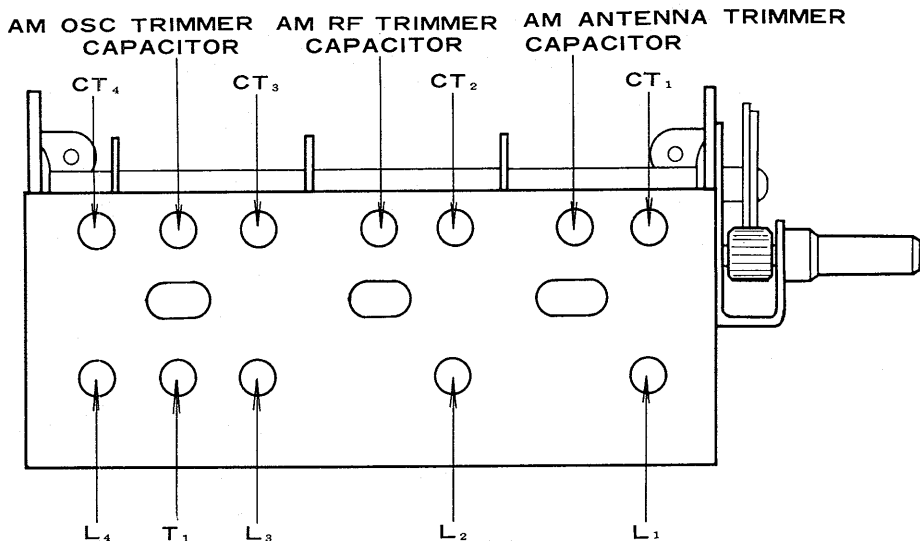
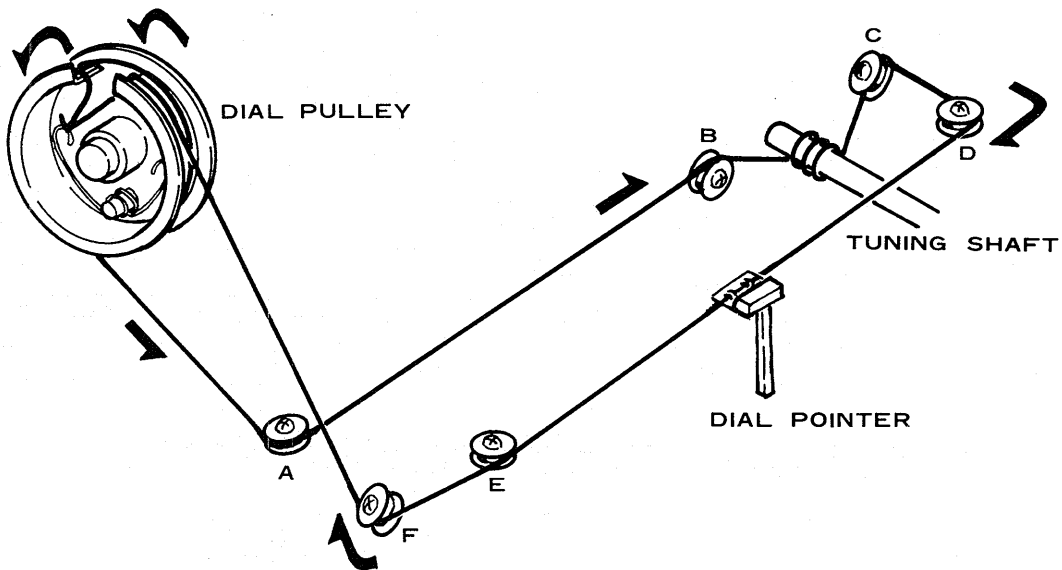


Fig. 4

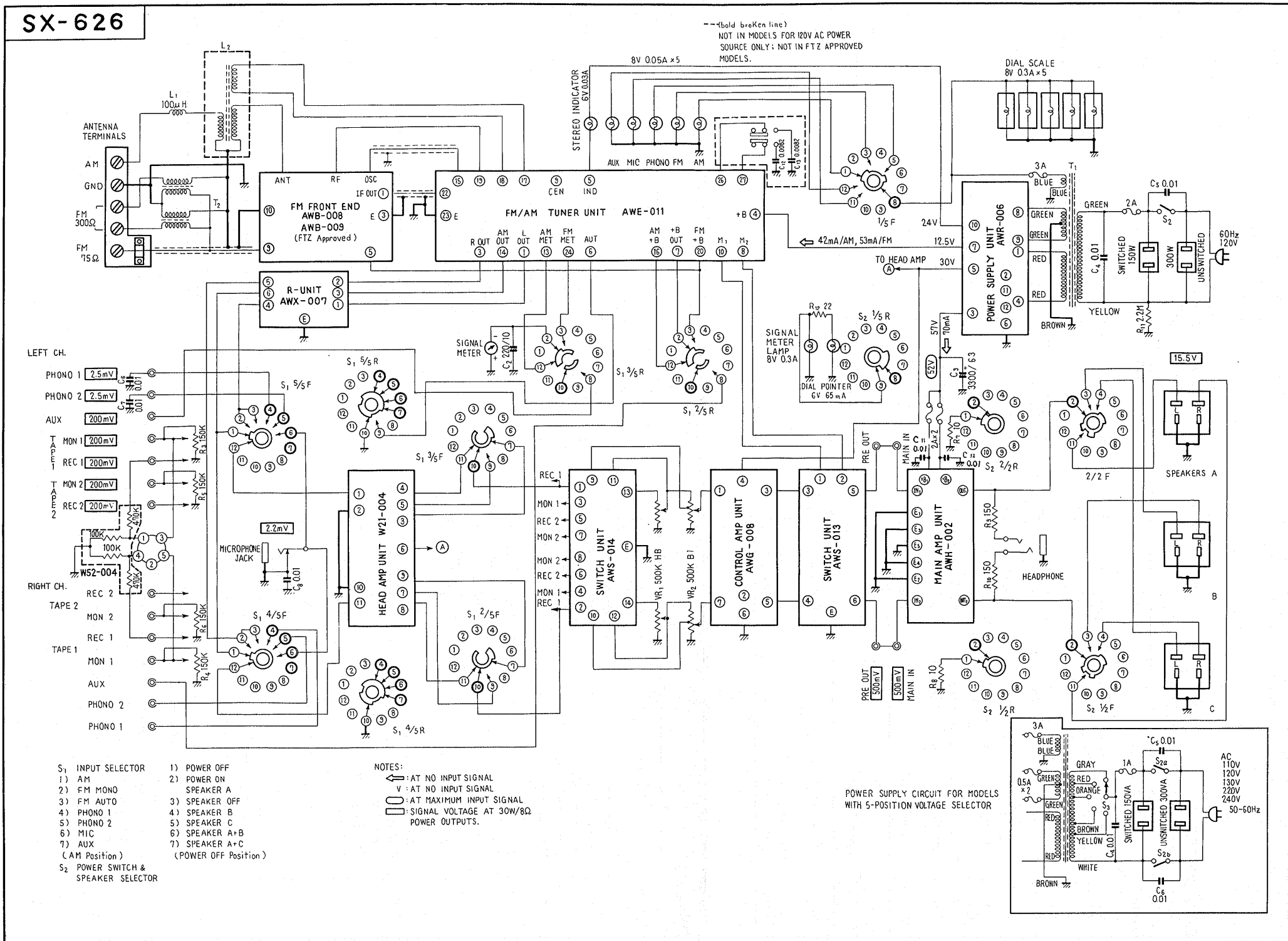
## 8. DIAL CORD STRINGING

- a) Set the tuning capacitor to minimum capacitance.
- b) Tie one end of the string to dial pulley.
- c) Wind the string  $1\frac{1}{2}$  turns around the tuning pulley.
- d) Pull the string around the small pulleys A and B, then wind 3 turns around the tuning shaft.
- e) Lead the string around the small pulleys C and D.
- f) Lead the string around the small pulleys E and F.
- g) Finally, tie the end of the string to remaining side of spring on the dial pulley.
- h) Tune receiver to high end. Fasten dial pointer to string so that it indicates high end on dial scale.



# 9. SCHEMATIC DIAGRAMS, PCB PATTERNS AND PARTS LIST

## 9-1 UNIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS



## 16 MISCELLANEOUS PARTS

### NOTE:

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

for KCW model ..... page 21.

for FVZW model ..... page 23.

for NBW model ..... page 27.

for FW model ..... page 29.

## CAPACITORS

IN  $\mu\text{F}$  UNLESS OTHERWISE NOTED. p:  $\mu\text{pF}$ .

Symbol	Description	Part No.
C2	Electrolytic 220 10V	CEB 221P 10
C3	Electrolytic 3300 63V	ACH-011-A
C4	Oil paper 0.01 800V	ACE-001-A
C5	Ceramic 0.01 DC 1.4kV	C43-003-0
C6	Ceramic 0.01 50V	CKDYF 103Z 50
C7	Ceramic 0.01 50V	CKDYF 103Z 50
C8	Ceramic 0.01 50V	CKDYF 103Z 50
C9	Mylar 0.0082 50V	CQMA 822K 50
C10	Mylar 0.0082 50V	CQMA 822K 50
C11	Ceramic 0.01 DC 1.4kV	C43-003-0
C12	Ceramic 0.01 DC 1.4kV	C43-003-0

## POTENTIOMETERS

Symbol	Description	Part No.
VR1	500k-HB, dual	ACV-104-0
VR2	500k-B1, dual	ACV-103-0

## RESISTORS

IN  $\Omega$ ,  $\frac{1}{4}\text{W}$  UNLESS OTHERWISE NOTED. k:  $\text{k}\Omega$ , M:  $\text{M}\Omega$ .

Symbol	Description	Part No.
R3	Carbon film 150k	RD $\frac{1}{4}$ PS 154J
R4	Carbon film 150k	RD $\frac{1}{4}$ PS 154J
R5	Carbon film 150k	RD $\frac{1}{4}$ PS 154J
R6	Carbon film 150k	RD $\frac{1}{4}$ PS 154J
R7	Wire wound 10 5W	RT5B 100K
R8	Wire wound 10 5W	RT5B 100K
R9	Wire wound 150 3W	RT3B 151K
R10	Wire wound 150 3W	RT3B 151K
R11	Carbon film 2.2M $\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PW 225J
R12	Carbon film 22 $\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 220J

## SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASB-007-A
S2	Output selector	ASA-026-0

## COILS AND TRANSFORMERS

Symbol	Description	Part No.
T1	Power transformer	ATT-040-A
T2	Balun transformer	T22-025-A
L1	Choke coil	T24-030-0
L2	Ferrite loopstick antenna	T42-025-0

## 20 OTHERS

Symbol	Description	Part No.
	FM front end	AWB-008-0
	FM/AM Unit	AWE-011-A
	Head amp unit	W21-004-B
	Control amp unit	AWG-008-0
	Main amp unit	AWH-002-C
	Switch unit	AWS-013-0
	Switch unit	AWS-014-0
	R unit	AWX-007-0
	Power supply unit	AWR-006-A
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-108-D
	Wooden case	AMM-006-A
	Dial pulley	M42-080-A
	Dial shaft ass'y	M42-071-F
	Foot	AEC-012-0
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-023-B
	Dial pointer ass'y	AAF-007-C
	Signal meter	A91-017-B
	Knob for filter, FM muting, loudness, tape monitor and mode switch	AAD-023-0
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for tuning	AAA-004-B
	18P input terminal board	AKB-001-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Pilot lamp for dial scale and signal meter	E22-017-0
	Fuse 2A	E21-027-0
	Fuse 3A for protection	AEK-008-0
	Fuse 2A for protection	E21-035-A
	Compound part for REC jack	W52-004-0
	Spare AC outlet	K82-012-A
	Speaker socket	K72-028-0
	Headphones jack	K72-026-0
	Microphone jack	K72-024-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Fuse holder	K96-007-C
	FM T-type antenna	D52-013-0
	Speaker plug	K72-007-B
	Packing case	AHD-057-0
	Styrotector	AHA-007-0
	AC power cord	D11-003-E
	Operating instructions	ARB-044-0
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-016-B

For KCW model

### CAPACITORS

IN  $\mu\text{F}$  UNLESS OTHERWISE NOTED. p:  $\mu\text{pF}$ .

Symbol	Description			Part No.
C2	Electrolytic	220	10V	CEB 221P 10
C3	Electrolytic	3300	63V	ACH-011-A
C4	Oil paper	0.01	800V	ACE-001-0
C5	Ceramic	0.01	DC 1.4kV	C43-003-0
C6	Ceramic	0.01	50V	CKDYF 103Z 50
C7	Ceramic	0.01	50V	CKDYF 103Z 50
C8	Ceramic	0.01	50V	CKDYF 103Z 50
C9	Mylar	0.0082	50V	CQMA 822K 50
C10	Mylar	0.0082	50V	CQMA 822K 50

### RESISTORS

IN  $\Omega$ ,  $\frac{1}{2}\text{W}$  UNLESS OTHERWISE NOTED. k:  $\text{k}\Omega$ , M:  $\text{M}\Omega$ .

Symbol	Description			Part No.
R3	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R4	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R5	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R6	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R7	Wire wound	10	5W	RT5B 100K

Symbol	Description			Part No.
R8	Wire wound	10	5W	RT5B 100K
R9	Wire wound	150	3W	RT3B 151K
R10	Wire wound	150	3W	RT3B 151K
R11	Carbon film	2.2M	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 225J
R12	Carbon film	22	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 220J

### POTENTIOMETERS

Symbol	Description	Part No.
VR1	500k-HB, dual	ACV-104-0
VR2	500k-B1, dual	ACV-103-0

### SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASB-007-A
S2	Output selector	ASA-014-0

### COILS AND TRANSFORMERS

Symbol	Description	Part No.
T1	Power transformer	ATT-040-A
T2	Balun transformer	T22-025-A
L1	Choke coil	T24-030-0
L2	Ferrite loopstick antenna	ATB-005-0



## 22 OTHERS

Symbol	Description	Part No.
	FM front end	AWB-009-0
	FM/AM unit	AWE-011-A
	Head amp unit	W21-004-B
	Control amp unit	AWG-008-0
	Main amp unit	AWH-002-C
	Switch unit	AWS-013-0
	Switch unit	AWS-014-0
	R unit	AWX-007-0
	Power supply unit	AWR-006-A
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-108-D
	Wooden case	AMM-006-A
	Dial pulley	M42-080-A
	Dial shaft ass'y	M42-071-F
	Foot	AEC-012-0
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-023-B
	Dial pointer ass'y	AAF-007-C
	Signal meter	A91-017-B
	Knob for filter, FM muting, loudness, tape monitor and mode switch	AAD-023-0
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for tuning	AAA-004-B
	18P input terminal board	AKB-001-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Pilot lamp for dial scale and signal meter	E22-017-0
	Fuse 2A	E21-005-0
	Fuse 3A for protection	E21-022-0
	Fuse 2A for protection	E21-035-A
	Fuse 0.5A for protection	E21-019-A
	Compound part for REC jack	W52-004-0
	Spare AC outlet	K82-012-A
	Speaker socket	K72-028-0
	Headphones jack	K72-026-0
	Microphone jack	K72-024-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Line voltage selector	AKR-001-0
	Fuse (for protection) holder	K96-007-C
	FM T-type antenna	D52-013-0
	Speaker plug	K72-007-B
	Fuse 1A	E21-004-0
	Packing case	AHD-058-0
	Styrotector	AHA-007-0
	AC power cord	D11-002-B
	Operating instructions	ARB-044-0
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-016-B

For FVZW model

### CAPACITORS

IN  $\mu\text{F}$  UNLESS OTHERWISE NOTED. p:  $\mu\text{pF}$ .

Symbol	Description			Part No.
C2	Electrolytic	220	10V	CEB 221P 10
C3	Electrolytic	3300	63V	ACH-011-A
C4	Ceramic	0.01	DC 1.4kV	C43-003-0
C5	Ceramic	0.01	DC 1.4kV	C43-003-0
C6	Ceramic	0.01	DC 1.4kV	C43-003-0
C7	Ceramic	0.01	50V	CKDYF 103Z 50
C8	Ceramic	0.01	50V	CKDYF 103Z 50
C9	Ceramic	0.01	50V	CKDYF 103Z 50

### RESISTORS

IN  $\Omega$ ,  $\frac{1}{2}\text{W}$  UNLESS OTHERWISE NOTED. k:  $k\Omega$ , M:  $M\Omega$ .

Symbol	Description			Part No.
R3	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R4	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R5	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R6	Carbon film	150k		RD $\frac{1}{2}$ PS 154J
R7	Wire wound	10	5W	RT5B 100K
R8	Wire wound	10	5W	RT5B 100K
R9	Wire wound	150	3W	RT3B 151K
R10	Wire wound	150	3W	RT3B 151K
R11	Carbon film	22	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 220J

### POTENTIOMETERS

Symbol	Description	Part No.
VR1	500k-HB, dual	ACV-104-0
VR2	500k-B1, dual	ACV-103-0

### SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASB-007-A
S2	Output selector	ASA-015-0

### COILS AND TRANSFORMERS

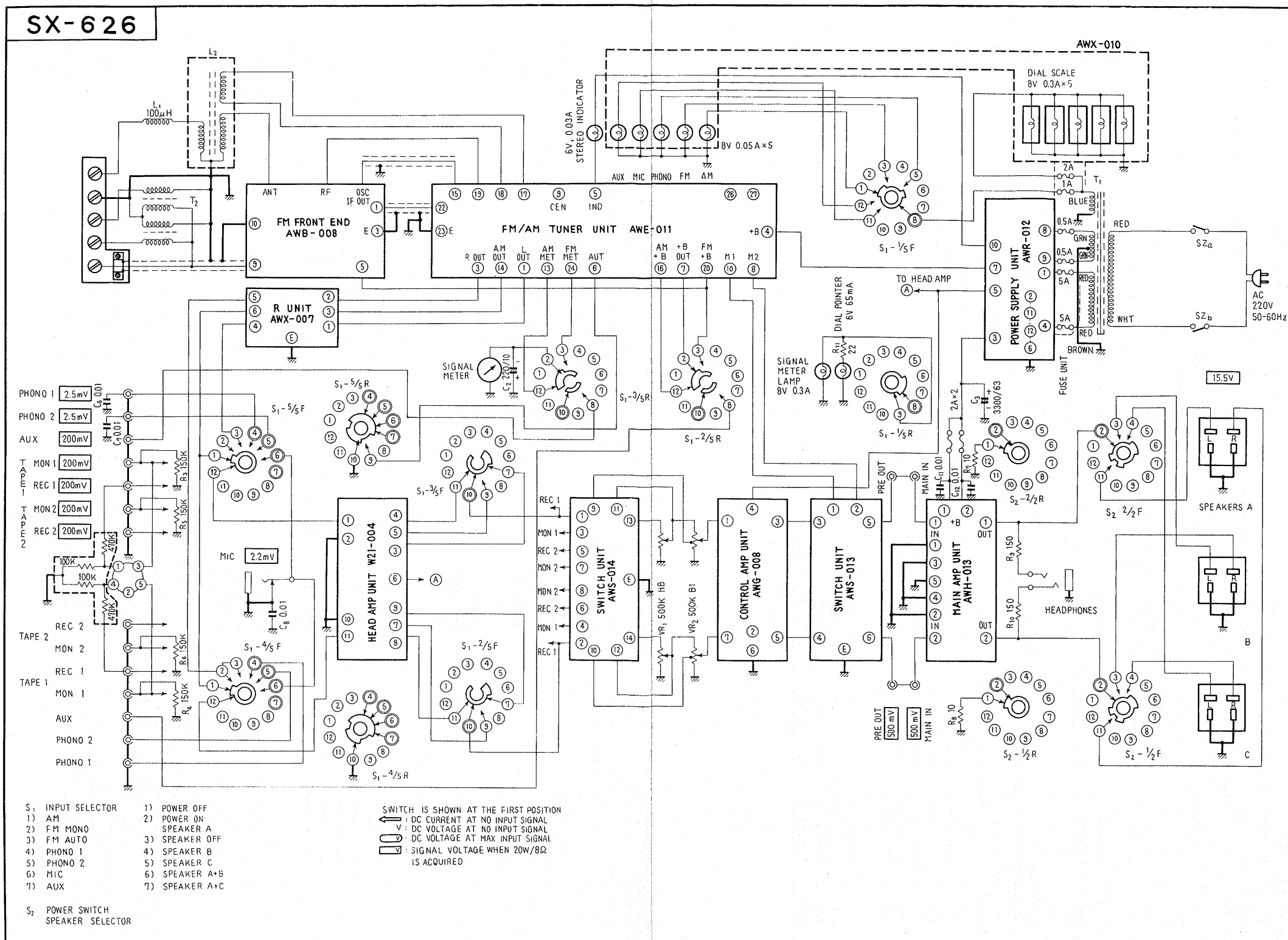
Symbol	Description	Part No.
T1	Power transformer	ATT-041-B
T2	Balun transformer	T22-025-A
L1	Choke coil	T24-030-0
L2	Ferrite loopstick antenna	T42-025-0

## OTHERS

Symbol	Description	Part No.
	FM front end	AWB-008-0
	FM/AM unit	AWE-011-A
	Head amp unit	W21-004-B
	Control amp unit	AWG-008-0
	Main amp unit	AWH-002-C
	Switch unit	AWS-013-0
	Switch unit	AWS-014-0
	R unit	AWX-007-0
	Power supply unit	AWR-006-A
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-108-D
	Wooden case	AMM-006-A
	Dial pulley	M42-080-A
	Dial shaft ass'y	M42-071-F
	Foot	AEC-012-0
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-023-B
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for filter, FM muting, loudness, tape monitor and mode switch	AAD-023-0
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for tuning	AAA-004-B
	18P input terminal board	AKB-001-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Pilot lamp for dial scale and signal meter	E22-017-0
	Fuse 2A	E21-027-0
	Fuse 3A for protection	AEK-008-0
	Fuse 2A for protection	E21-035-A
	Pilot lamp for FM stereo indicator	AEL-006-0
	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
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Fuse holder	AKR-006-0
	Fuse (for protection) holder	K96-007-C
	FM T-type antenna	D52-013-0
	Speaker plug	K71-032-0
	Packing case	AHD-082-0
	Styrorector	AHA-007-0
	AC power cord	D11-003-E
	Operating instructions	ARB-044-0
	Screw for grounding	B11-012-A
	Screw for fix wooden case	B11-016-B

UNIT CONNECTION DIAGRAM FOR NBW MODEL ONLY



**CAPACITORS**

IN  $\mu$ F UNLESS OTHERWISE NOTED. p:  $\mu$  $\mu$ F

Symbol	Description	Part No.
C2	Electrolytic 220 10V	CEB 221P 10
C3	Electrolytic 3300 63V	ACH-011-A
C6	Ceramic 0.01 50V	CKDYF 103Z 50
C7	Ceramic 0.01 50V	CKDYF 103Z 50
C8	Ceramic 0.01 50V	CKDYF 103Z 50
C11	Ceramic 0.01 DC 1.4kV	C43-003-0
C12	Ceramic 0.01 DC 1.4kV	C43-003-0

**RESISTORS**

IN  $\Omega$ ,  $\frac{1}{2}$ W UNLESS OTHERWISE NOTED. k: k $\Omega$ , M: M $\Omega$ .

Symbol	Description	Part No.
R3	Carbon film 150k	RD $\frac{1}{2}$ PS 154J
R4	Carbon film 150k	RD $\frac{1}{2}$ PS 154J
R5	Carbon film 150k	RD $\frac{1}{2}$ PS 154J
R6	Carbon film 150k	RD $\frac{1}{2}$ PS 154J
R7	Wire wound 10 5W	RT5B 100K
R8	Wire wound 10 5W	RT5B 100K
R9	Wire wound 150 3W	RT3B 151K
R10	Wire wound 150 3W	RT3B 151K
R11	Carbon film 22 $\frac{1}{2}$ W	RD $\frac{1}{2}$ PS 220J

**POTENTIOMETERS**

Symbol	Description	Part No.
VR1	500k-HB, dual	ACV-104-0
VR2	500k-B1, dual	ACV-103-0

**SWITCHES**

Symbol	Description	Part No.
S1	Selector switch	ASB-007-A
S2	Output selector	ASA-015-0

**COILS AND TRANSFORMERS**

Symbol	Description	Part No.
T1	Power transformer	ATT-061-0
T2	Balun transformer	T22-025-A
L1	Choke coil	T24-030-0
L2	Ferrite loopstick antenna	T42-025-0

28 **OTHERS**

Symbol	Description	Part No.
	FM front end	AWB-008-0
	FM/AM unit	AWE-011-A
	Head amp unit	W21-004-B
	Control amp unit	AWG-008-0
	Main amp unit	AWH-013-0
	Switch unit	AWS-013-0
	Switch unit	AWS-014-0
	R unit	AWX-007-0
	Power supply unit	AWR-012-0
	Lamp unit	AWX-010-A
	Fuse unit	AWX-018-0
	Front panel ass'y	ANB-108-D
	Wooden case	AMM-006-A
	Dial pulley	M42-080-A
	Dial shaft ass'y	M42-071-F
	Foot	AEC-012-0
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-023-B
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for filter, FM muting, loudness, tape monitor and mode switch	AAD-023-0
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for tuning	AAA-004-B
	18P input terminal board	AKB-001-0
	Antenna terminal board	K11-043-C

Symbol	Description	Part No.
	4P ground terminal	K13-047-0
	Pilot lamp for FM stereo indicator	AEL-006-0
	Pilot lamp for program indicator	AEL-007-0
	Pilot lamp for dial scale and signal meter	E22-017-0
	Fuse 2A for protection	E21-029-A
	Fuse 5A for protection	AEK-015-0
	Fuse 1A for protection	E21-031-0
	Jumper plug	K71-026-0
	Fuse 0.5A for protection	AEK-014-0
	Compound part for REC jack	W52-004-0
	Speaker socket	K72-028-0
	Headphones jack	K72-026-0
	Microphone jack	K72-024-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Fuse (for protection) holder	K91-008-0
	FM T-type antenna	D52-013-0
	Speaker plug	K72-007-B
	Fuse 1A	E21-004-0
	Packing case	AHD-086-0
	Styrotector	AHA-007-0
	AC power cord	D54-013-0
	Operating instructions	ARB-053-0
	Screw for grounding	B11-012-0
	Screw to fix wooden case	B11-016-B
	Pin plug	K72-007-B

## For FW model

### CAPACITORS

IN  $\mu\text{F}$  UNLESS OTHERWISE NOTED. p:  $\mu\text{pF}$ .

Symbol	Description			Part No.
C2	Electrolytic	220	10V	CEB 221P 10
C3	Electrolytic	3300	63V	ACH-011-A
C4	Ceramic	0.01	DC 1.4kV	C43-003-0
C5	Ceramic	0.01	DC 1.4kV	C43-003-0
C6	Ceramic	0.01	DC 1.4kV	C43-003-0
C7	Ceramic	0.01	50V	CKDYF 103Z 50
C8	Ceramic	0.01	50V	CKDYF 103Z 50
C9	Ceramic	0.01	50V	CKDYF 103Z 50
C10	Ceramic	0.01	DC 1.4kV	C43-003-0
C11	Ceramic	0.01	DC 1.4kV	C43-003-0
C12	Mylar	0.0082	50V	CQMA 822K 50
C13	Mylar	0.0082	50V	CQMA 822K 50

### RESISTORS

IN  $\Omega$ ,  $\frac{1}{4}\text{W}$  UNLESS OTHERWISE NOTED. k:  $\text{k}\Omega$ , M:  $\text{M}\Omega$ .

Symbol	Description			Part No.
R3	Carbon film	150k		RD $\frac{1}{4}$ PS 154J
R4	Carbon film	150k		RD $\frac{1}{4}$ PS 154J
R5	Carbon film	150k		RD $\frac{1}{4}$ PS 154J
R6	Carbon film	150k		RD $\frac{1}{4}$ PS 154J
R7	Wire wound	10	5W	RT5B 100K
R8	Wire wound	10	5W	RT5B 100K
R9	Wire wound	150	3W	RT3B 151K
R10	Wire wound	150	3W	RT3B 151K
R11	Carbon film	22	$\frac{1}{4}\text{W}$	RD $\frac{1}{4}$ PS 220J

### POTENTIOMETERS

Symbol	Description	Part No.
VR1	500k-HB, dual	ACV-104-0
VR2	500k-B1, dual	ACV-103-0

### SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASB-007-A
S2	Output selector	ASA-015-0
S4	De-emphasis switch	S41-022-A

### COILS AND TRANSFORMERS

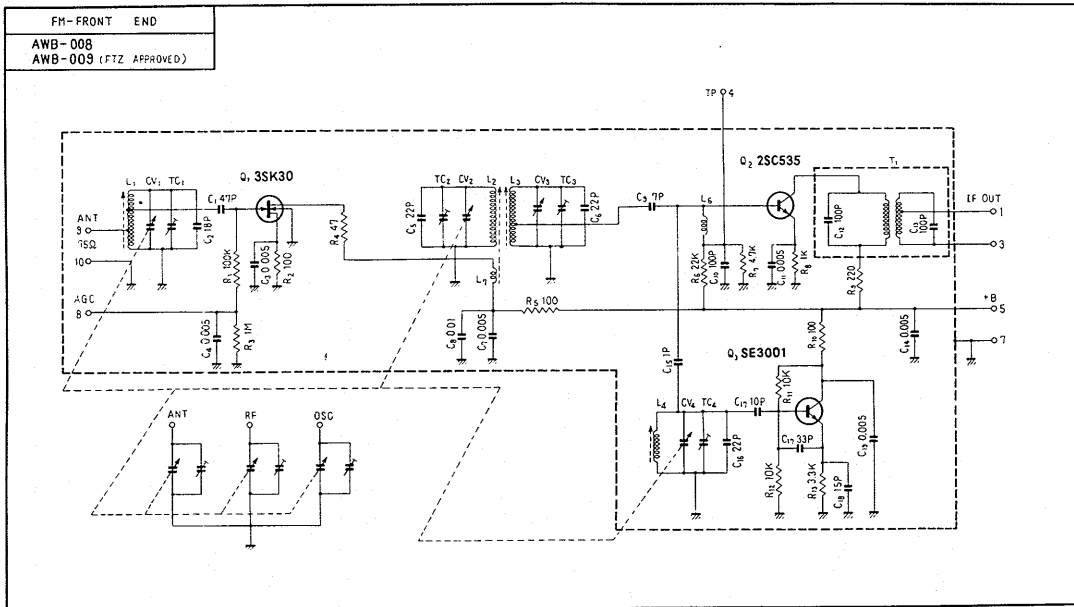
Symbol	Description	Part No.
T1	Power transformer	ATT-041-B
T2	Balun transformer	T22-025-A
L1	Choke coil	T24-030-0
L2	Ferrite loopstick antenna	T42-025-0

## 30 OTHERS

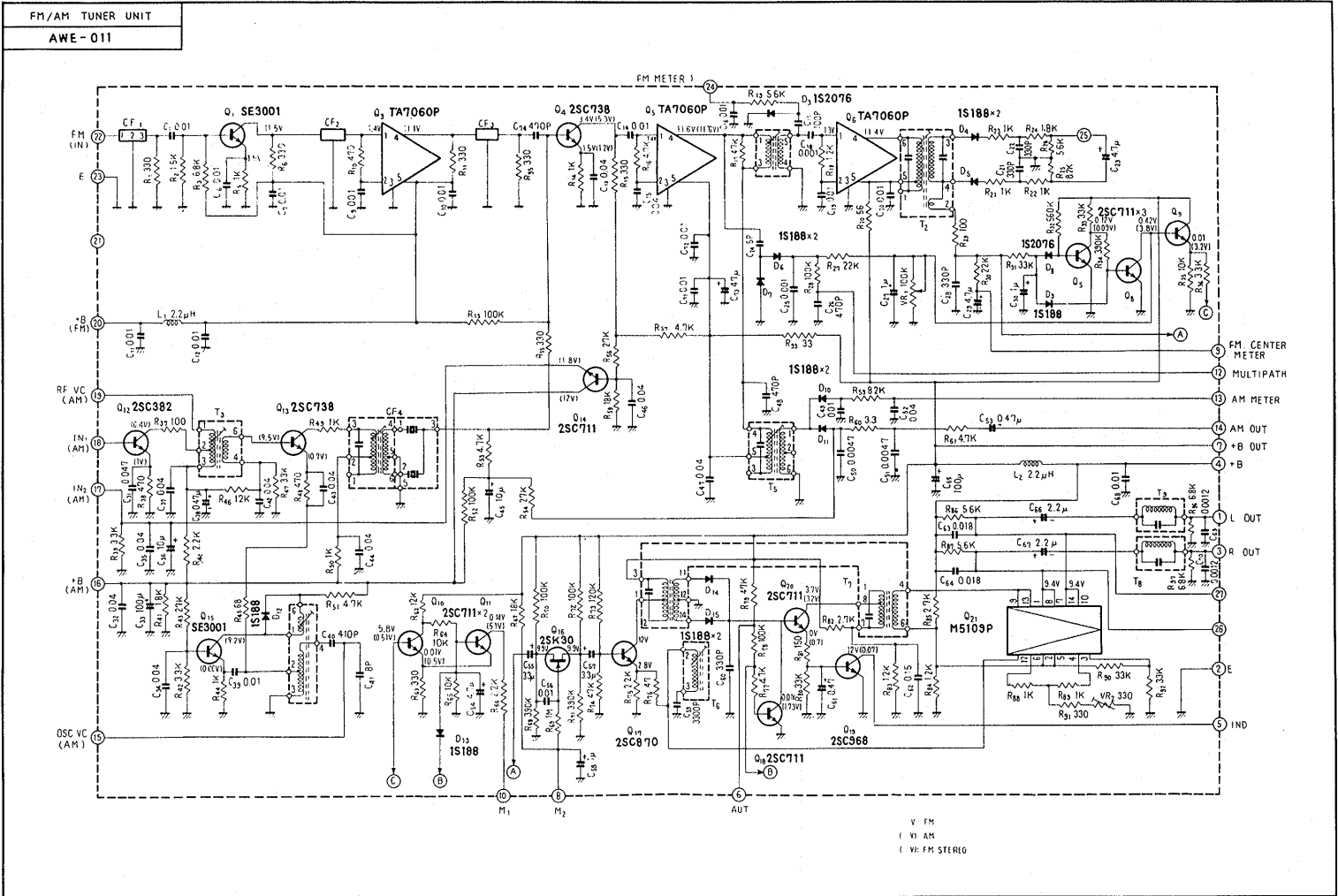
Symbol	Description	Part No.
	FM front end	AWB-008-0
	FM/AM unit	AWE-011-A
	Head amp unit	W21-004-B
	Control amp unit	AWG-008-0
	Main amp unit	AWH-002-C
	Switch unit	AWS-013-0
	Switch unit	AWS-014-0
	R unit	AWX-007-0
	Power supply unit	AWR-006-A
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-108-D
	Wooden case	AMM-006-A
	Dial pulley	M42-080-A
	Dial shaft ass'y	M42-071-F
	Foot	AEC-012-0
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-023-B
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for filter, FM muting, loudness, tape monitor and mode switch	AAD-023-0
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for tuning	AAA-004-B
	18P input terminal board	AKB-001-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0

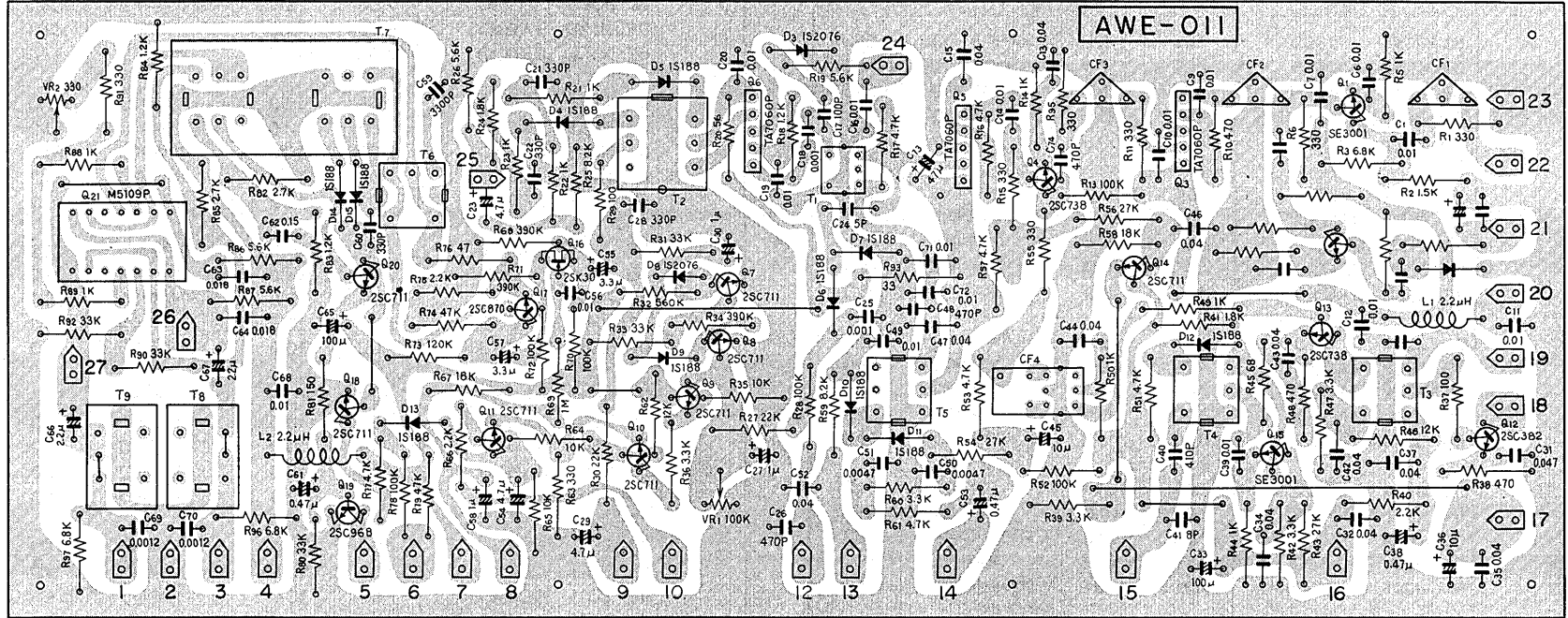
Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Pilot lamp for dial scale and signal meter	E22-017-0
	Fuse 2A	E21-005-0
	Fuse 3A for protection	E21-022-0
	Fuse 2A for protection	E21-035-A
	Fuse 0.5A for protection	E21-019-A
	Compound part for REC terminal	W52-004-0
	Spare AC outlet	AKP-002-0
	Speaker socket	K72-028-0
	Headphones jack	K72-026-0
	Microphone jack	K72-024-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Line voltage selector	AKR-001-0
	Fuse (for protection) holder	K96-007-C
	FM T-type antenna	D52-013-0
	Speaker plug	K72-007-B
	Fuse 1A	E21-004-0
	Packing case	AHD-081-0
	Styrotector	AHA-007-0
	AC power cord	D11-002-B
	Operating instructions	ARB-044-A
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-041-A
	Pilot lamp for FM stereo indicator	AEL-006-0
	Pin plug	K72-015-A
	Fuse 2A	E21-005-0

9-2 FM FRONT END (AWB-008) (AWB-009)









## PARTS LIST OF FM/AM UNIT

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## CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	50V	CKDYF 103Z 50
C2	Ceramic	0.01	50V	CKDYF 103Z 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	0.01	50V	CKDYB 103K 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	25V✓	CEA 4R7P 25
C24	Ceramic	5p	50V	CCDSL 050D 50
C25	Ceramic	0.001	50V	CKDYB 102K 50
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	25V	CEA 4R7P 25
C30	Electrolytic	1	50V	CEA 010P 50

Symbol	Description			Part No.
C31	Ceramic	0.047	25V	CKDBC 473Z 25
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
C41	Ceramic	8p	50V	CCDSL 080D 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	25V	CEA 4R7P 25
C55	Electrolytic	3.3	16V	CSSA 3R3M 16
C56	Mylar	0.01	50V	CQMA 103K 50
C57	Electrolytic	3.3	16V	CSSA 3R3M 16
C58	Electrolytic	1	50V	CEA 010P 50
C59	Styrol	330p	50V	C15-011-A
C60	Ceramic	330p	50V	CKDYB 331K 50

Symbol	Description	Part No.
C61	Electroytic 0.47 50V	CEA R47P 50
C62	Mylar 0.15 50V	CQMA 154K 50
C63	Mylar 0.018 50V	CQMA 183K 50
C64	Mylar 0.018 50V	CQMA 183K 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
C69	Mylar 0.0012 50V	CQMA 122K 50
C70	Mylar 0.0012 50V	CQMA 122K 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.
R1	Carbon film 330	RD¼PS 331J
R2	Carbon film 1.5k	RD¼PS 152J
R3	Carbon film 6.8k	RD¼PS 682J
R5	Carbon film 1k	RD¼PS 102J
R6	Carbon film 330	RD¼PS 331J
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 5.6k	RD¼PS 562J
R20	Carbon film 56	RD¼PS 560J

Symbol	Description	Part No.
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
R27	Carbon film 22k	RD¼PS 223J
R28	Carbon film 100k	RD¼PS 104J
R29	Carbon film 100	RD¼PS 101J
R30	Carbon film 22k	RD¼PS 223J
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

Symbol	Description	Part No.
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
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

Symbol	Description	Part No.
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 5.6k	RD¼PS 562J
R87	Carbon film 5.6k	RD¼PS 562J
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
R96	Carbon film 6.8k	RD¼PS 682J
R97	Carbon film 6.8k	RD¼PS 682J

## POTENTIOMETERS

Symbol	Description	Part No.
VR1	Semi-fixed, 100k-B	C92-047-0
VR2	Semi-fixed, 330-B	C92-065-A

## SEMICONDUCTORS

Symbol	Description	Part No.
Q1	SE3001 Transistor	
Q3	TA7060P-R 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	
Q21	M5109P or CA3054 IC	
D3	1S2076 Diode	
D4	1S188FM-1 Diode	
D5	1S188FM-1 Diode	
D6	1S188FM-1 Diode	
D7	1S188FM-1 Diode	

Symbol	Description	Part No.
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	

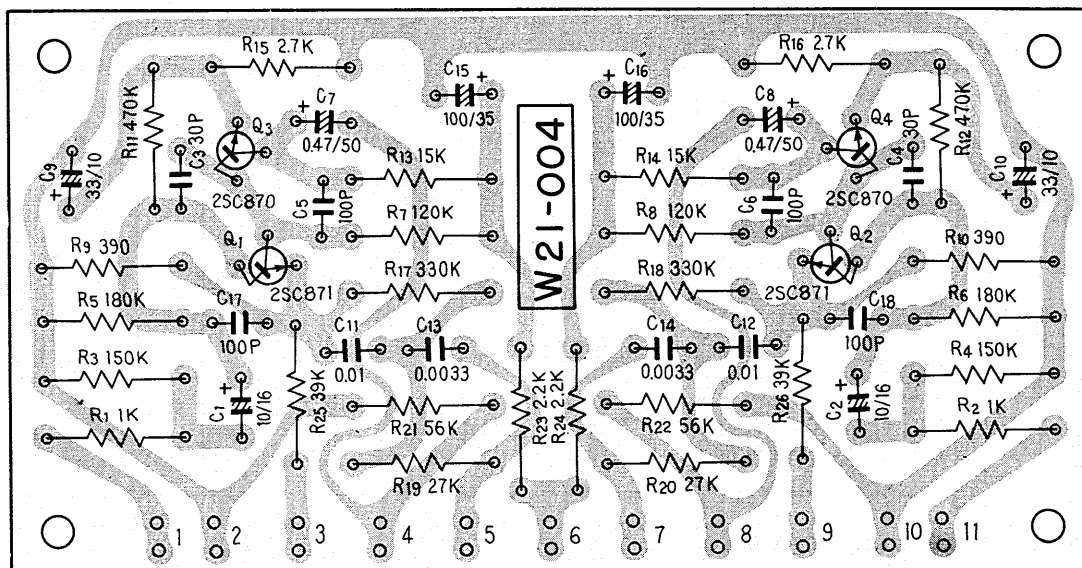
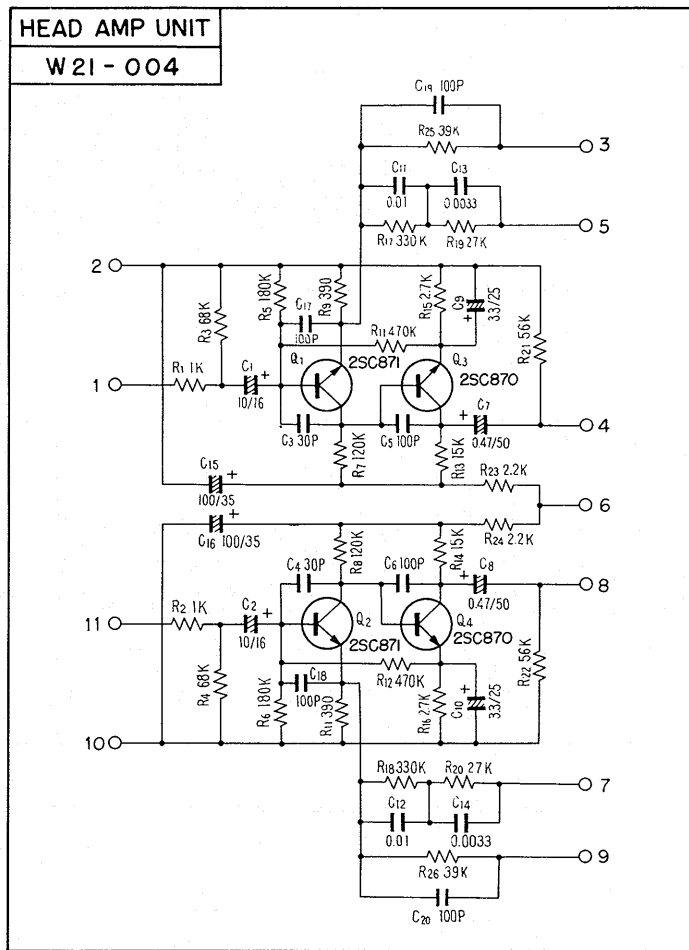
## COILS AND TRANSFORMERS

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	T75-023-B
T7	MPX transformer	T75-026-0
T8	38kHz filter	ATM-004-0
T9	38kHz filter	ATM-004-0
L1	RF choke coil	T24-028-A
L2	RF choke coil	T24-028-A

## 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

9-4 HEAD AMP UNIT (W21-004)



## PARTS LIST OF HEAD AMP UNIT

### CAPACITORS ✓

Symbol	Description	Part No.
C1	Electrolytic 10 16V	CEA 100P 16
C2	Electrolytic 10 16V	CEA 100P 16
C3	Ceramic 30p 50V	CCDSL 300K 50
C4	Ceramic 30p 50V	CCDSL 300K 50
C5	Ceramic 100p 50V	CCDSL 101K 50
C6	Ceramic 100p 50V	CCDSL 101K 50
C7	Electrolytic 0.47 50V	CEA R47P 50
C8	Electrolytic 0.47 50V	CEA R47P 50
C9	Electrolytic 3.3 25V	CEA 3R3P 25
C10	Electrolytic 3.3 25V	CEA 3R3P 25
C11	Mylar 0.01 50V	CQMA 103M 50
C12	Mylar 0.01 50V	CQMA 103M 50
C13	Mylar 0.0033 50V	CQMA 332M 50
C14	Mylar 0.0033 50V	CQMA 332M 50
C15	Electrolytic 100 35V	CEA 101P 35
C16	Electrolytic 100 35V	CEA 101P 35
C17	Ceramic 100p 50V	CCDSL 101K 50
C18	Ceramic 100p 50V	CCDSL 101K 50
C19	Ceramic 100p 50V	CCDSL 101K 50
C20	Ceramic 100p 50V	CCDSL 101K 50

### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 1k	RD¼PS 102J
R2	Carbon film 1k	RD¼PS 102J
R3	Carbon film 68k	RD¼PS 683J
R4	Carbon film 68k	RD¼PS 683J
R5	Carbon film 180k	RD¼PS 184J

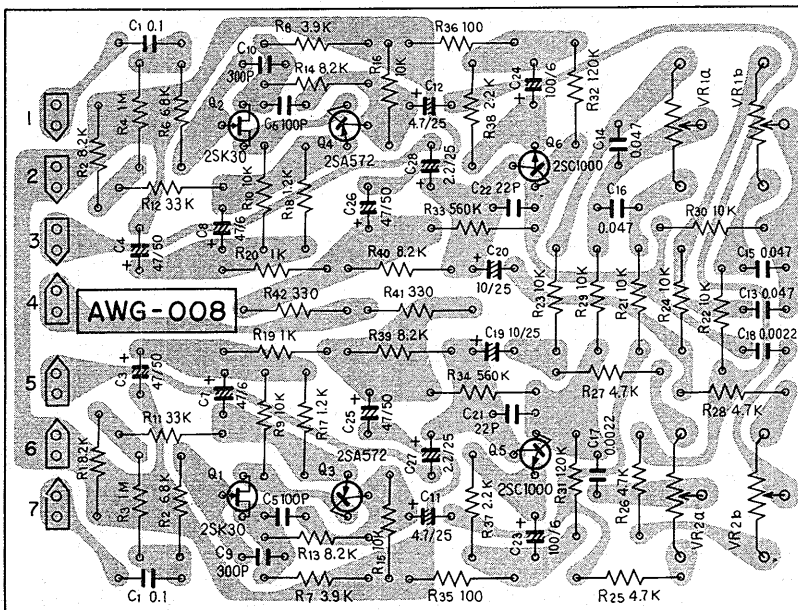
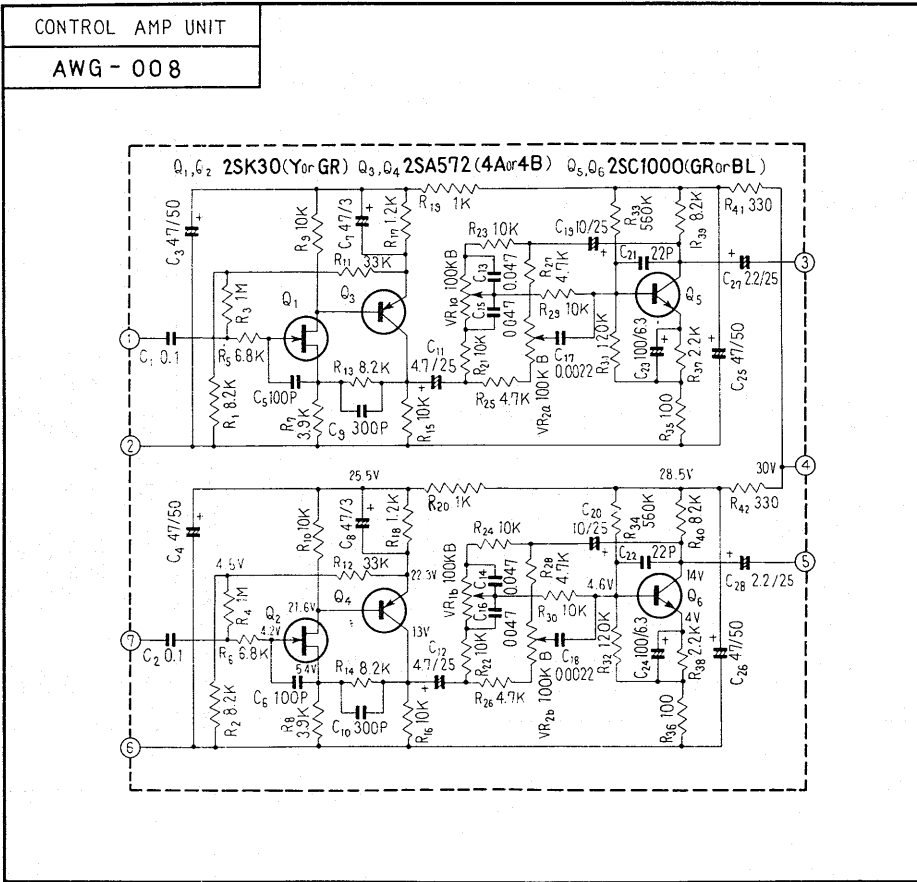
Symbol	Description	Part No.
R6	Carbon film 180k	RD¼PS 184J
R7	Carbon film 120k	RD¼PS 124J
R8	Carbon film 120k	RD¼PS 124J
R9	Carbon film 390	RD¼PS 391J
R10	Carbon film 390	RD¼PS 391J
R11	Carbon film 470k	RD¼PS 474J
R12	Carbon film 470k	RD¼PS 474J
R13	Carbon film 15k	RD¼PS 153J
R14	Carbon film 15k	RD¼PS 153J
R15	Carbon film 2.7k	RD¼PS 272J
R16	Carbon film 2.7k	RD¼PS 272J
R17	Carbon film 330k	RD¼PS 334J
R18	Carbon film 330k	RD¼PS 334J
R19	Carbon film 27k	RD¼PS 273J
R20	Carbon film 27k	RD¼PS 273J
R21	Carbon film 56k	RD¼PS 563J
R22	Carbon film 56k	RD¼PS 563J
R23	Carbon film 2.2k	RD¼PS 222J
R24	Carbon film 2.2k	RD¼PS 222J
R25	Carbon film 39k	RD¼PS 393J
R26	Carbon film 39k	RD¼PS 393J

### SEMICONDUCTORS

Symbol	Description	Part No.
Q1	2SC871-E or F Transistor	
Q2	2SC871-E or F Transistor	
Q3	2SC870 Transistor	
Q4	2SC870 Transistor	



9-5 CONTROL AMP UNIT (AWG-008)



## PARTS LIST OF CONTROL AMP UNIT

### CAPACITORS ✓

Symbol	Description			Part No.	
C1	Mylar	0.1	50V	CQMA	104K 50
C2	Mylar	0.1	50V	CQMA	104K 50
C3	Electrolytic	47	50V	CEA	470P 50
C4	Electrolytic	47	50V	CEA	470P 50
C5	Ceramic	100p	50V	CCDSL	101K 50
C6	Ceramic	100p	50V	CCDSL	101K 50
C7	Electrolytic	47	6V	CEA	470P 6
C8	Electrolytic	47	6V	CEA	470P 6
C9	Ceramic	300p	50V	CCDSL	301K 50
C10	Ceramic	300p	50V	CCDSL	301K 50
C11	Electrolytic	4.7	25V	CEA	4R7P 25
C12	Electrolytic	4.7	25V	CEA	4R7P 25
C13	Mylar	0.047	50V	CQMA	473J 50
C14	Mylar	0.047	50V	CQMA	473J 50
C15	Mylar	0.047	50V	CQMA	473J 50
C16	Mylar	0.047	50V	CQMA	473J 50
C17	Mylar	0.0022	50V	CQMA	222K 50
C18	Mylar	0.0022	50V	CQMA	222K 50
C19	Electrolytic	10	25V	CEA	100P 25
C20	Electrolytic	10	25V	CEA	100P 25
C21	Ceramic	22p	50V	CCDSL	220K 50
C22	Ceramic	22p	50V	CCDSL	220K 50
C23	Electrolytic	100	6V	CEA	101P 6
C24	Electrolytic	100	6V	CEA	101P 6
C25	Electrolytic	47	50V	CEA	470P 50
C26	Electrolytic	47	50V	CEA	470P 50
C27	Electrolytic	2.2	25V	CSSA	2R2X 25
C28	Electrolytic	2.2	25V	CSSA	2R2X 25

### RESISTORS

Symbol	Description		Part No	
R1	Carbon film	8.2k	RD¼PS	822J
R2	Carbon film	8.2k	RD¼PS	822J
R3	Carbon film	1M	RD¼PS	105JNL
R4	Carbon film	1M	RD¼PS	105JNL
R5	Carbon film	6.8k	RD¼PS	682J
R6	Carbon film	6.8k	RD¼PS	682J
R7	Carbon film	3.9k	RD¼PS	392J
R8	Carbon film	3.9k	RD¼PS	392J
R9	Carbon film	10k	RD¼PS	103J
R10	Carbon film	10k	RD¼PS	103J
R11	Carbon film	33k	RD¼PS	333J
R12	Carbon film	33k	RD¼PS	333J
R13	Carbon film	8.2k	RD¼PS	822J
R14	Carbon film	8.2k	RD¼PS	822J
R15	Carbon film	10k	RD¼PS	103J
R16	Carbon film	10k	RD¼PS	103J
R17	Carbon film	1.2k	RD¼PS	122J
R18	Carbon film	1.2k	RD¼PS	122J
R19	Carbon film	1k	RD¼PS	102J
R20	Carbon film	1k	RD¼PS	102J
R21	Carbon film	10k	RD¼PS	103J
R22	Carbon film	10k	RD¼PS	103J
R23	Carbon film	10k	RD¼PS	103J
R24	Carbon film	10k	RD¼PS	103J
R25	Carbon film	4.7k	RD¼PS	472J
R26	Carbon film	4.7k	RD¼PS	472J
R27	Carbon film	4.7k	RD¼PS	472J
R28	Carbon film	4.7k	RD¼PS	472J
R29	Carbon film	10k	RD¼PS	103J
R30	Carbon film	10k	RD¼PS	103J

Symbol	Description	Part No.
R31	Carbon film 120k	RD¼PS 124JNL
R32	Carbon film 120k	RD¼PS 124JNL
R33	Carbon film 560k	RD¼PS 564JNL
R34	Carbon film 560k	RD¼PS 564JNL
R35	Carbon film 100	RD¼PS 101J
R36	Carbon film 100	RD¼PS 101J
R37	Carbon film 2.2k	RD¼PS 222J
R38	Carbon film 2.2k	RD¼PS 222J
R39	Carbon film 8.2k	RD¼PS 822J
R40	Carbon film 8.2k	RD¼PS 822J
R41	Carbon film 330	RD¼PS 331J
R42	Carbon film 330	RD¼PS 331J

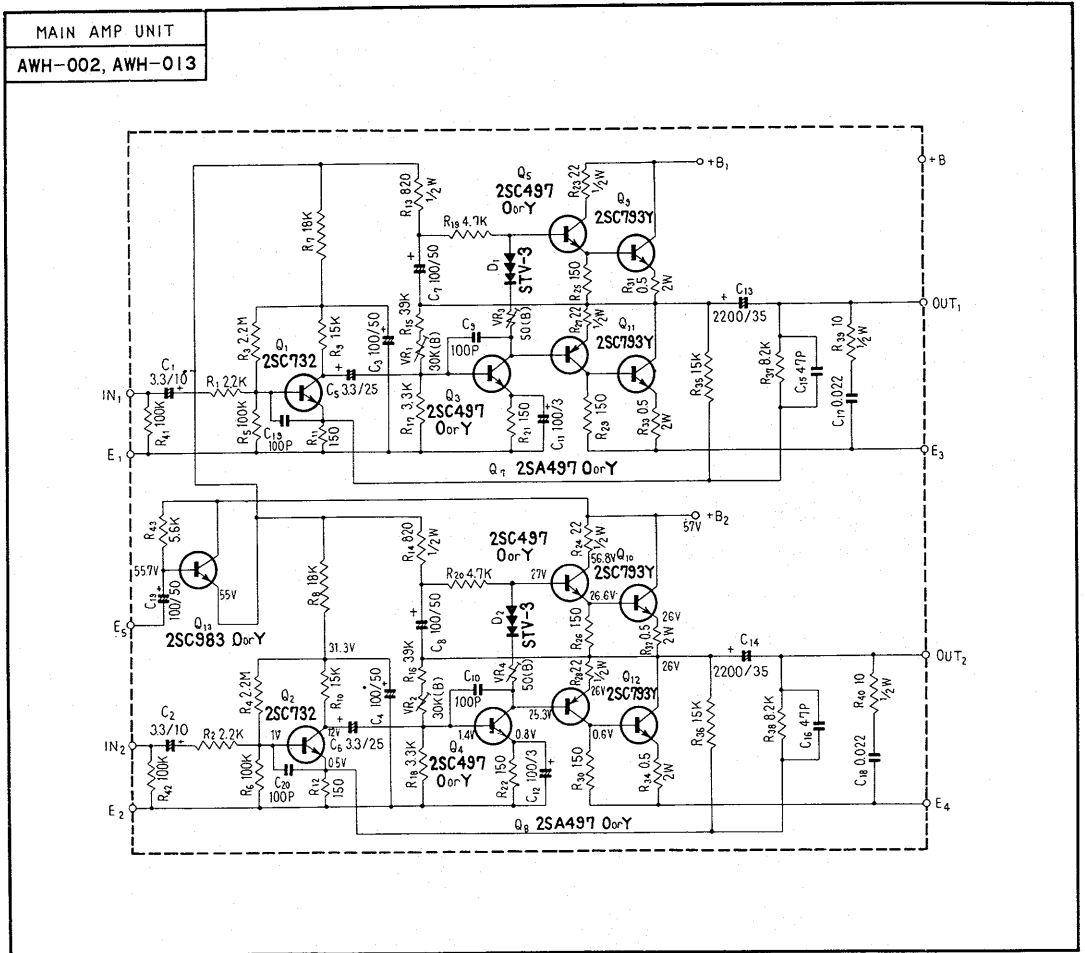
## SEMICONDUCTORS

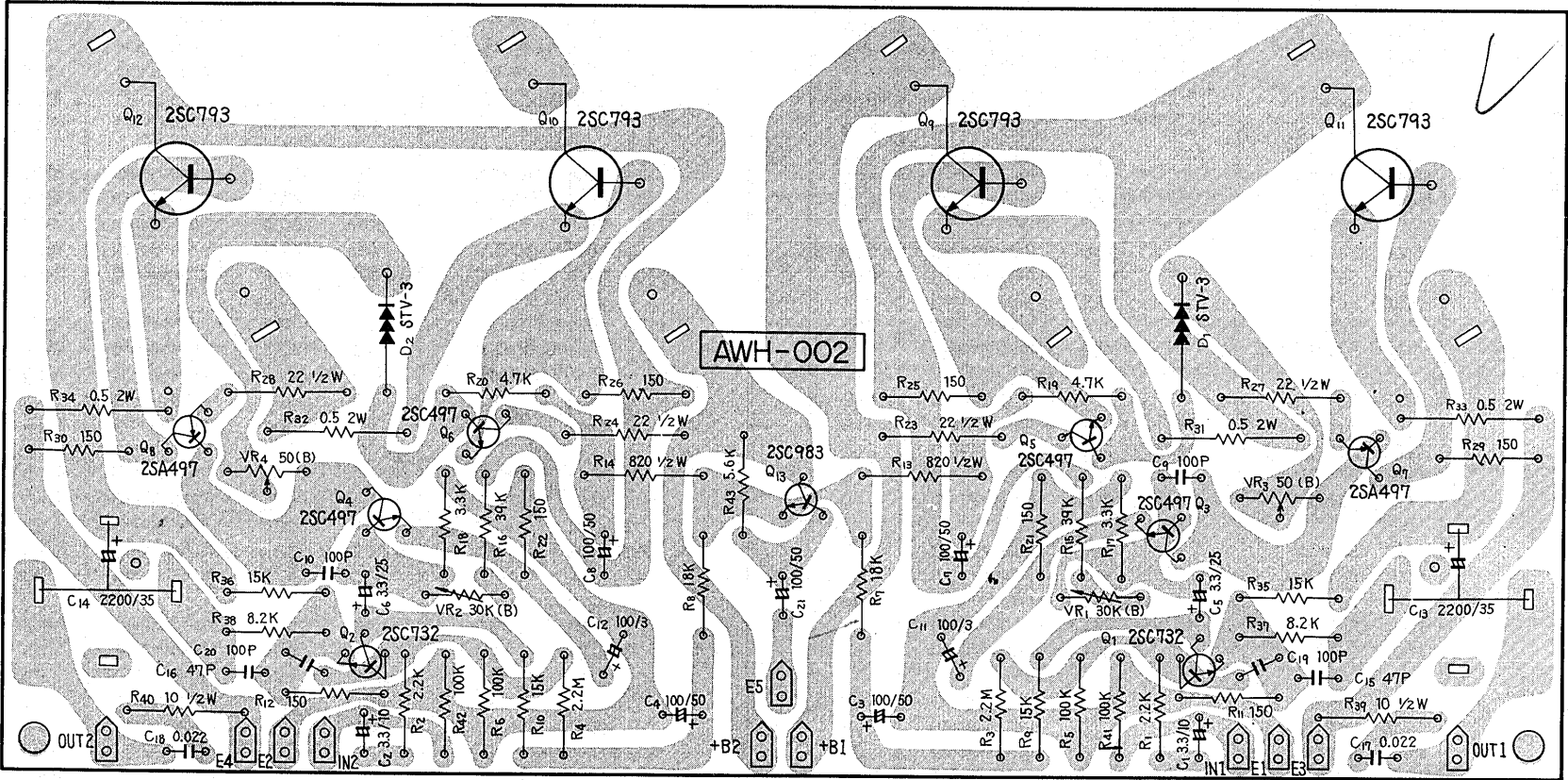
Symbol	Description	Part No.
Q1	2SK30-Y or GR FET	
Q2	2SK30-Y or GR FET	
Q3	2SA572-4A or 4B Transistor	
Q4	2SA572-4A or 4B Transistor	
Q5	2SC1000-GR or BL Transistor	
Q6	2SC1000-GR or BL Transistor	

## POTENTIOMETERS

Symbol	Description	Part No.
VR1	100k-B, dual	C82-050-0
VR2	100k-B, dual	C82-050-0

9-6 MAIN AMP UNIT (AWH-002) (AWH-013, for NBW model)





CAPACITORS

Symbol	Description			Part No.
C1	Electrolytic	3.3	10V	CEA 3R3P 10
C2	Electrolytic	3.3	10V	CEA 3R3P 10
C3	Electrolytic	100	50V	CEA 101P 50
C4	Electrolytic	100	50V	CEA 101P 50
C5	Electrolytic	3.3	25V	CEA 3R3P 25
C6	Electrolytic	3.3	25V	CEA 3R3P 25
C7	Electrolytic	100	50V	CEA 101P 50
C8	Electrolytic	100	50V	CEA 101P 50
C9	Ceramic	100p	50V	CCDSL 101K 50
C10	Ceramic	100p	50V	CCDSL 101K 50
C11	Electrolytic	100	6V	CEA 101P 6
C12	Electrolytic	100	6V	CEA 101P 6
C13	Electrolytic	2200	35V	ACH-004-A
C14	Electrolytic	2200	35V	ACH-004-A
C15	Ceramic	47p	50V	CCDSL 470K 50
C16	Ceramic	47p	50V	CCDSL 470K 50
C17	Mylar	0.022	50V	CQMA 223M 50
C18	Mylar	0.022	50V	CQMA 223M 50
C19	Ceramic	100p	50V	CCDSL 101K 50
C20	Ceramic	100p	50V	CCDSL 101K 50
C21	Electrolytic	100	50V	CEA 101P 50

RESISTORS

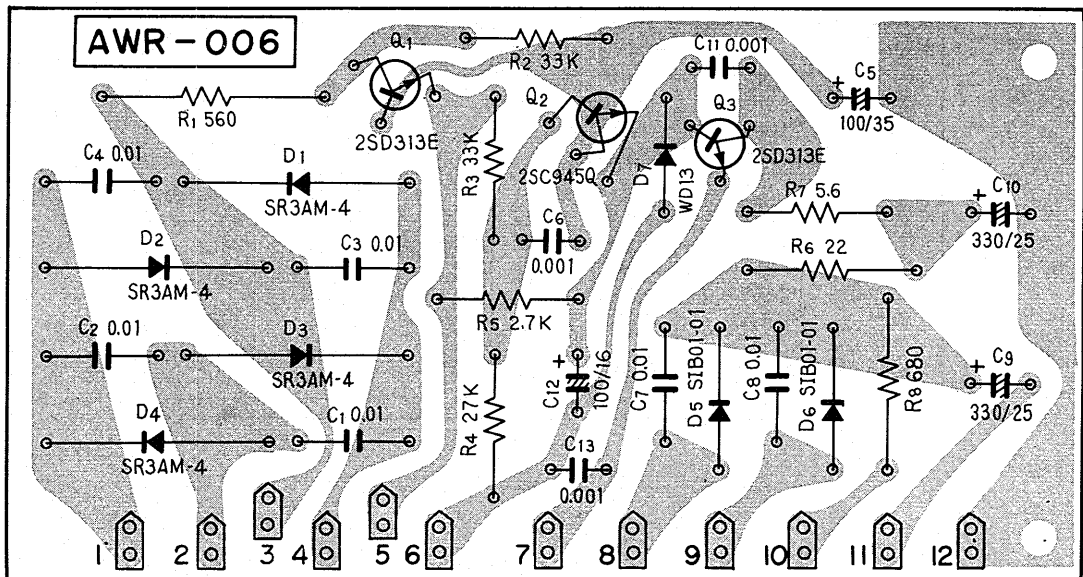
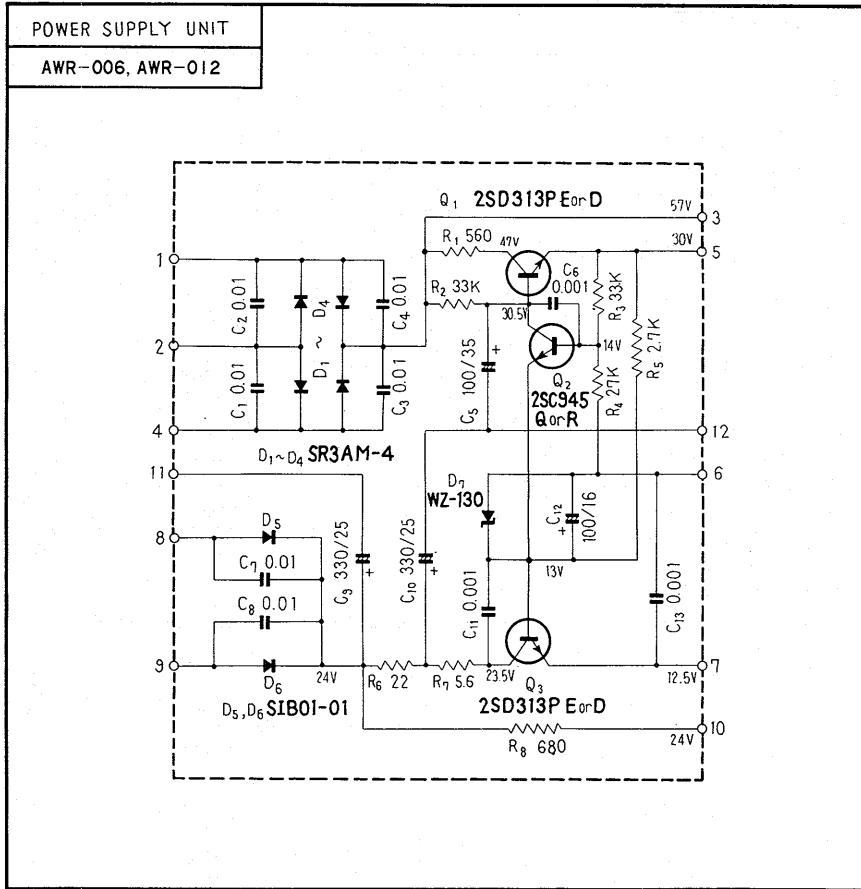
Symbol	Description		Part No.
R1	Carbon film	2.2k	RD¼PS 222J
R2	Carbon film	2.2k	RD¼PS 222J
R3	Carbon film	2.2M	RD¼PS 225J
R4	Carbon film	2.2M	RD¼PS 225J
R5	Carbon film	100k	RD¼PS 104J
R6	Carbon film	100k	RD¼PS 104J
R7	Carbon film	18k	RD¼PS 183J
R8	Carbon film	18k	RD¼PS 183J
R9	Carbon film	15k	RD¼PS 153J
R10	Carbon film	15k	RD¼PS 153J
R11	Carbon film	150	RD¼PS 151J
R12	Carbon film	150	RD¼PS 151J
R13	Carbon film	820 ½W	RD½PS 821J
R14	Carbon film	820 ½W	RD½PS 821J
R15	Carbon film	39k	RD¼PS 393J
R16	Carbon film	39k	RD¼PS 393J
R17	Carbon film	3.3k	RD¼PS 332J
R18	Carbon film	3.3k	RD¼PS 332J
R19	Carbon film	4.7k	RD¼PS 472J
R20	Carbon film	4.7k	RD¼PS 472J
R21	Carbon film	150	RD¼PS 151J
R22	Carbon film	150	RD¼PS 151J
R23	Carbon film	22 ½W	RD½PS 220J
R24	Carbon film	22 ½W	RD½PS 220J
R25	Carbon film	150	RD¼PS 151J
R26	Carbon film	150	RD¼PS 151J
R27	Carbon film	22 ½W	RD½PS 220J
R28	Carbon film	22 ½W	RD½PS 220J
R29	Carbon film	150	RD¼PS 151J
R30	Carbon film	150	RD¼PS 151J

SEMICONDUCTORS

Symbol	Description			Part No.
R31	Wire wound	0.5	2W	RT2P 0R5K
R32	Wire wound	0.5	2W	RT2P 0R5K
R33	Wire wound	0.5	2W	RT2P 0R5K
R34	Wire wound	0.5	2W	RT2P 0R5K
R35	Wire wound	15k		RD¼PS 153J
R36	Carbon film	15k		RD¼PS 153J
R37	Carbon film	8.2k		RD¼PS 822J
R38	Carbon film	8.2k		RD¼PS 822J
R39	Carbon film	10	½W	RD½PS 100J
R40	Carbon film	10	½W	RD½PS 100J
R41	Carbon film	100k		RD¼PS 104J
R42	Carbon film	100k		RD¼PS 104J
R43	Carbon film	5.6k		RD¼PS 562J
VR1	Semi-fixed	30k (B)		C92-024-B
VR2	Semi-fixed	30k (B)		C92-024-B
VR3	Semi-fixed	50 (B)		C92-043-A
VR4	Semi-fixed	50 (B)		C92-043-A

Symbol	Description		Part No.
Q1	2SC732	Transistor	
Q2	2SC732	Transistor	
Q3	2SC497-O or Y	Transistor	
Q4	2SC497-O or Y	Transistor	
Q5	2SC497-O or Y	Transistor	
Q6	2SC497-O or Y	Transistor	
Q7	2SA497-O or Y	Transistor	
Q8	2SA497-O or Y	Transistor	
Q9	2SC793-Y	Transistor	
Q10	2SC793-Y	Transistor	
Q11	2SC793-Y	Transistor	
Q12	2SC793-Y	Transistor	
Q13	2SC983-O or Y	Transistor	
D1	STV-3	Varistor	
D2	STV-3	Varistor	

9-7 POWER SUPPLY UNIT (AWR-006) (AWR-012, for NBW model)



## PARTS LIST OF POWER SUPPLY UNIT

### CAPACITORS

Symbol	Description			Part No.
C1	Ceramic	0.01	DC 1.4kV	C43-003-0
C2	Ceramic	0.01	DC 1.4kV	C43-003-0
C3	Ceramic	0.01	DC 1.4kV	C43-003-0
C4	Ceramic	0.01	DC 1.4kV	C43-003-0
C5	Electrolytic	100	35V	CEA 101P 35
C6	Mylar	0.001	50V	CQMA 102K 50
C7	Ceramic	0.01	DC 1.4kV	C43-003-0
C8	Ceramic	0.01	DC 1.4kV	C43-003-0
C9	Electrolytic	330	25V	CEA 331P 25
C10	Electrolytic	330	25V	CEA 331P 25
C11	Mylar	0.001	50V	CQMA 102K 50
C12	Electrolytic	100	16V	CEA 101P 16
C13	Mylar	0.001	50V	CQMA 102K 50

### RESISTORS

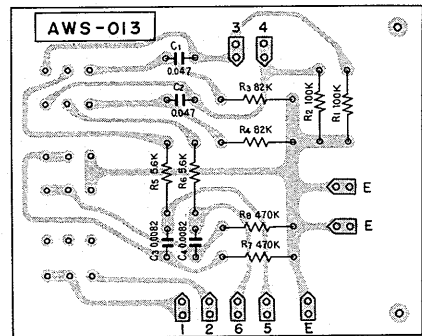
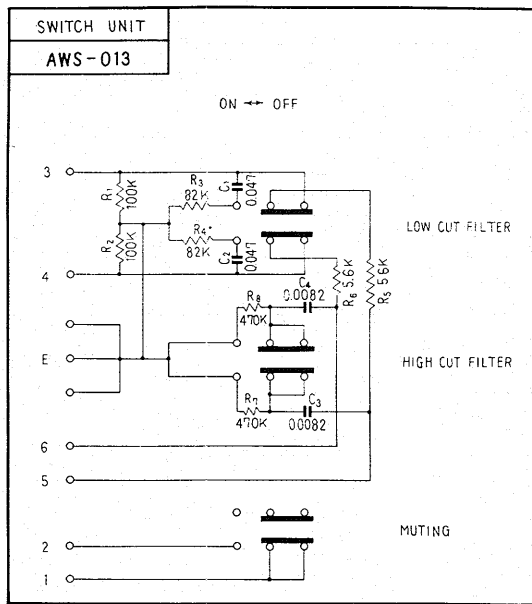
Symbol	Description			Part No.
R1	Metal oxide	560	2W	RS2P 561K
R2	Carbon film	33k		RD½PS 333J
R3	Carbon film	33k		RD½PS 333J
R4	Carbon film	27k		RD½PS 273J
R5	Carbon film	2.7k		RD½PS 272J
R6	Carbon film	22	½W	RD½PS 220J
R7	Carbon film	5.6		RD½PS 5R6J
R8	Metal oxide	680	1W	RS1P 681K

### SEMICONDUCTORS

Symbol	Description		Part No.
Q1	2SD313	Transistor	
Q2	2SC945	Transistor	
Q3	2SD313	Transistor	
D1	SR3AM-4	Diode	
D2	SR3AM-4	Diode	
D3	SR3AM-4	Diode	
D4	SR3AM-4	Diode	
D5	SIB01-01	Diode	
D6	SIB01-01	Diode	
D7	WZ-130	Zener diode	



9-8 SWITCH UNIT (AWS-013)



PARTS LIST OF SWITCH UNIT

CAPACITORS

Symbol	Description			Part No.
C1	Mylar	0.047	50V	CQMA 473K 50
C2	Mylar	0.047	50V	CQMA 473K 50
C3	Mylar	0.0082	50V	CQMA 822K 50
C4	Mylar	0.0082	50V	CQMA 822K 50

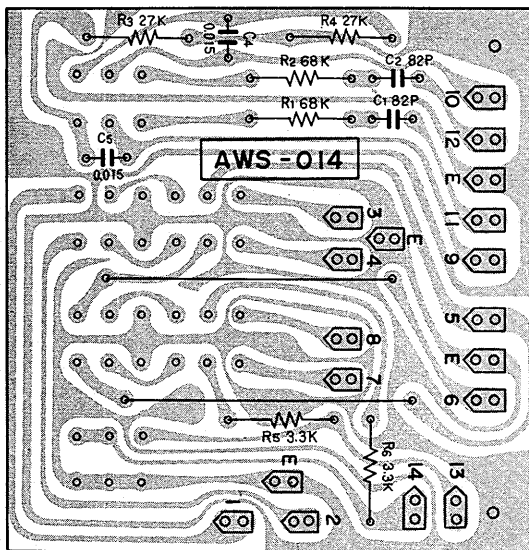
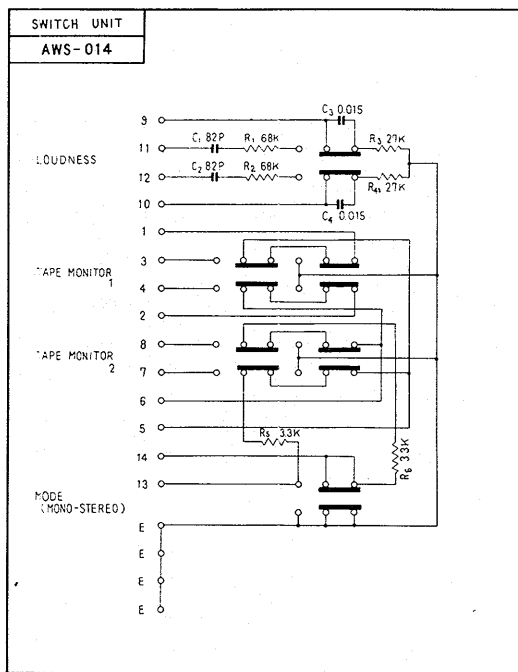
RESISTORS

Symbol	Description			Part No.
R1	Carbon film	100k		RD¼PS 104J
R2	Carbon film	100k		RD¼PS 104J
R3	Carbon film	82k		RD¼PS 823J
R4	Carbon film	82k		RD¼PS 823J
R5	Carbon film	5.6k		RD¼PS 562J
R6	Carbon film	5.6k		RD¼PS 562J
R7	Carbon film	470k		RD¼PS 474J
R8	Carbon film	470k		RD¼PS 474J

SWITCH

Symbol	Description	Part No.
	Mini switch	S31-035-0

## 9-9 SWITCH UNIT (AWS-014)



### PARTS LIST OF SWITCH 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

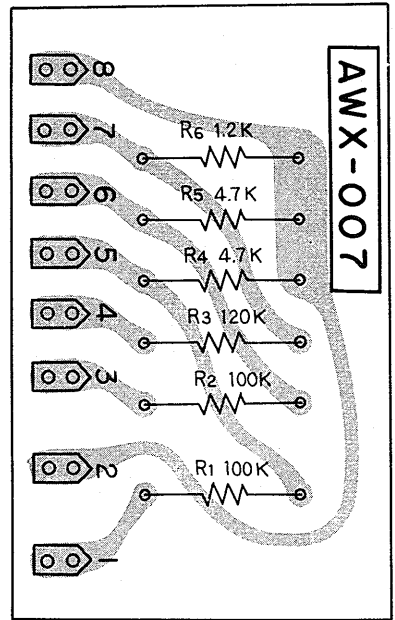
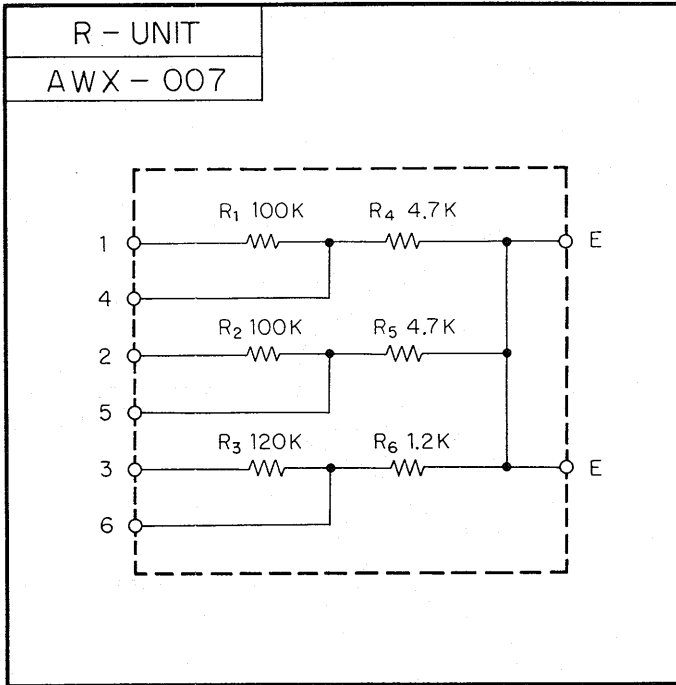
#### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 68k	RD¼PS 683J
R2	Carbon film 68k	RD¼PS 683J
R3	Carbon film 27k	RD¼PS 273J
R4	Carbon film 27k	RD¼PS 273J
R5	Carbon film 3.3k	RD¼PS 332J
R6	Carbon film 3.3k	RD¼PS 332J

#### SWITCH

Symbol	Description	Part No.
	Mini switch	ASG-012-0

9-10 R UNIT (AWX-007)

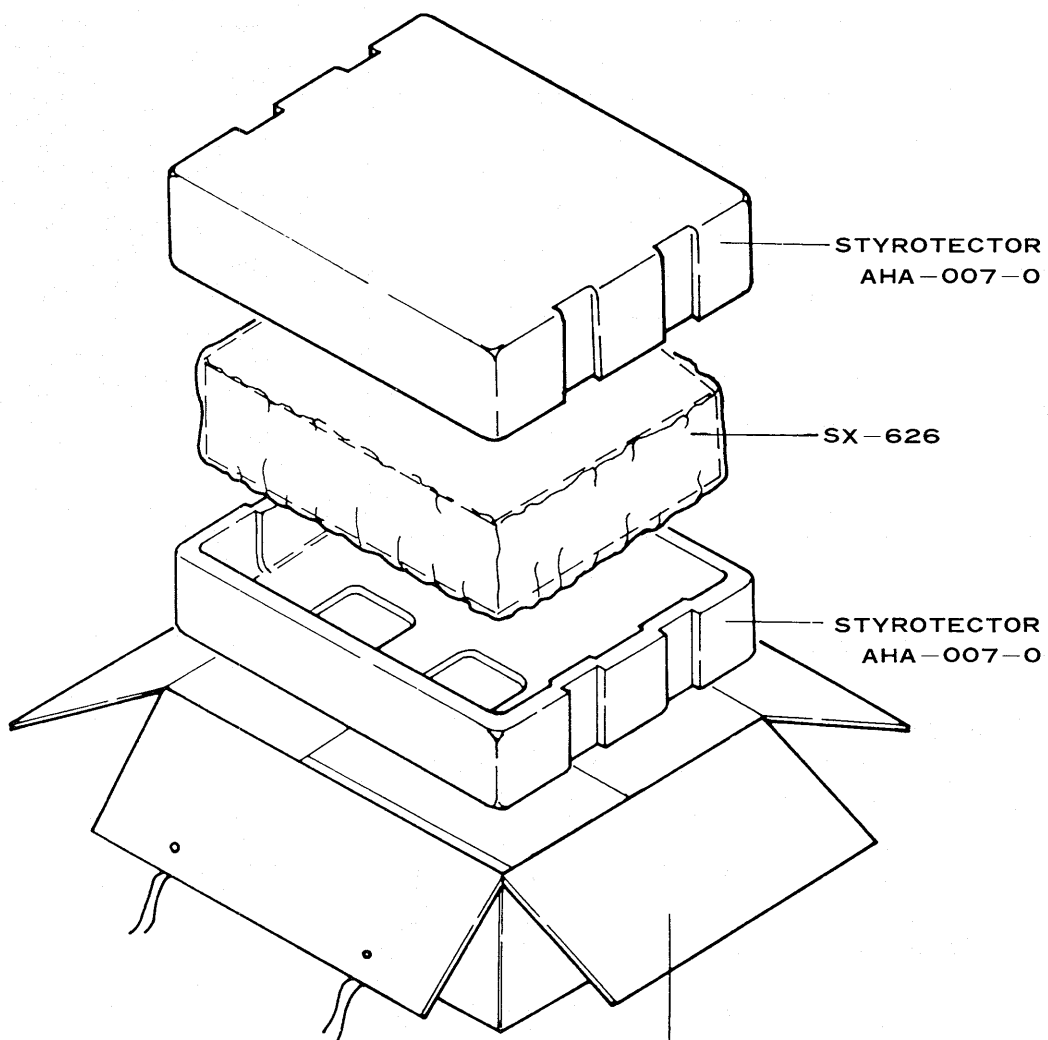


PARTS LIST OF R UNIT

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 100k	RD¼PS 104J
R2	Carbon film 100k	RD¼PS 104J
R3	Carbon film 120k	RD¼PS 124J
R4	Carbon film 4.7k	RD¼PS 472J
R5	Carbon film 4.7k	RD¼PS 472J
R6	Carbon film 1.2k	RD¼PS 122J

## 10. PACKING METHOD AND PART NUMBERS



### PACKING CASE

KCW	AHD-082-0
KUW	AHD-057-0
FVZW	AHD-058-0
NBW	AHD-086-0
FW	AHD-081-0

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