

# Service Manual

## AM / FM STEREO RECEIVER

**SX-525/** KCW, KUW, FVZW, NBW, FW

### NOTE

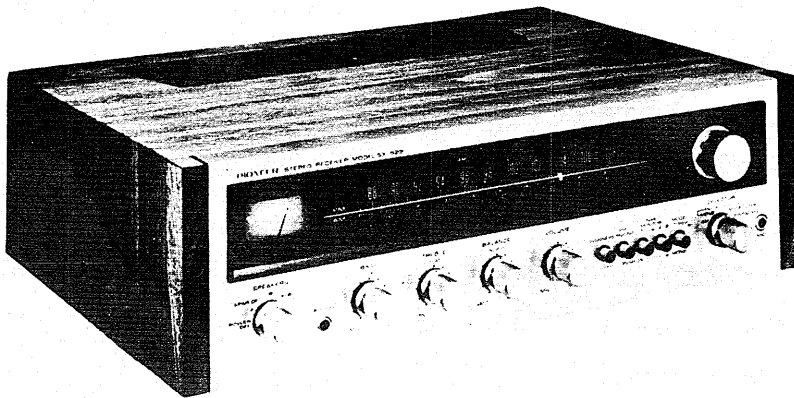
MODEL SX-525 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

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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## AMPLIFIER SECTION

Music Power Output (IHF)	72 Watts (4 $\Omega$ ) 52 Watts (8 $\Omega$ )
Continuous Power Output (each channel driven)	26W/26W (4 $\Omega$ ) 20W/20W (8 $\Omega$ )
Continuous Power Output (both channels driven)	21W + 21W (4 $\Omega$ ) 17W + 17W (8 $\Omega$ )
Power Output in the Range of 20Hz to 20kHz (both channels driven)	13W + 13W (8 $\Omega$ , Harmonic distortion less than 1%)
Harmonic Distortion	Less than 1% (Continuous power output) Less than 0.05% (8 $\Omega$ , 10W/10W power output)
Intermodulation Distortion	Less than 1% (Continuous power output) Less than 0.2% (8 $\Omega$ , 10W/10W power output)
Power Bandwidth (IHF)	10Hz to 45kHz (8 $\Omega$ , Harmonic distortion less than 1%)
Frequency Response	15Hz to 30kHz, $\pm$ 1dB
Speakers	4 to 16 $\Omega$
Damping Factor	40 (8 $\Omega$ , 1kHz)
Input Sensitivity/Impedance (1kHz, for rated output)	PHONO MAG 2.7mV/50k $\Omega$ MIC 6mV/100k $\Omega$ AUX 200mV/70k $\Omega$ TAPE MONITOR 1, 2 200mV/70k $\Omega$
Recording Output	TAPE REC 1, 2 (Pin jack) 200mV TAPE REC (DIN connector) 30mV
BASS Control	-12dB, +12.5dB/100Hz
TREBLE Control	-8.5dB, +8dB/10kHz
Equalization Curve	PHONO: RIAA S.T.D.
Loudness Contour	+11.5dB/100Hz, +6dB/10kHz with Volume Control set at -40dB position.
Hum and Noise (IHF)	PHONO More than 75dB AUX More than 85dB

## FM TUNER SECTION

Frequency Range	88MHz to 108MHz 87.5MHz to 108MHz (FTZ approved)
Usable Sensitivity (IHF)	2.2 $\mu$ V
Capture Ratio (IHF)	3dB
Selectivity (IHF)	More than 45dB
Image Rejection	More than 50dB (98MHz)
IF Rejection	More than 80dB (90MHz)
Spurious Rejection	More than 80dB (98MHz)

AM Suppression	50dB
Signal-to-Noise Ratio	65dB
Harmonic Distortion	Mono: Less than 0.6% (100% Mod.) Stereo: Less than 0.8% (100% Mod.)
Tuning Indicator	Signal strength meter
Muting	Switchable to ON-OFF
Stereo Separation	More than 40dB (1kHz)
Sub Carrier Suppression	More than 40dB
Noise Filter	Switchable to ON-OFF
De-emphasis Switch	50 $\mu$ sec., 75 $\mu$ sec. (FW model only)
Antenna Input	Impedance 300 $\Omega$ balanced and 75 $\Omega$ unbalanced.

**AM TUNER SECTION**

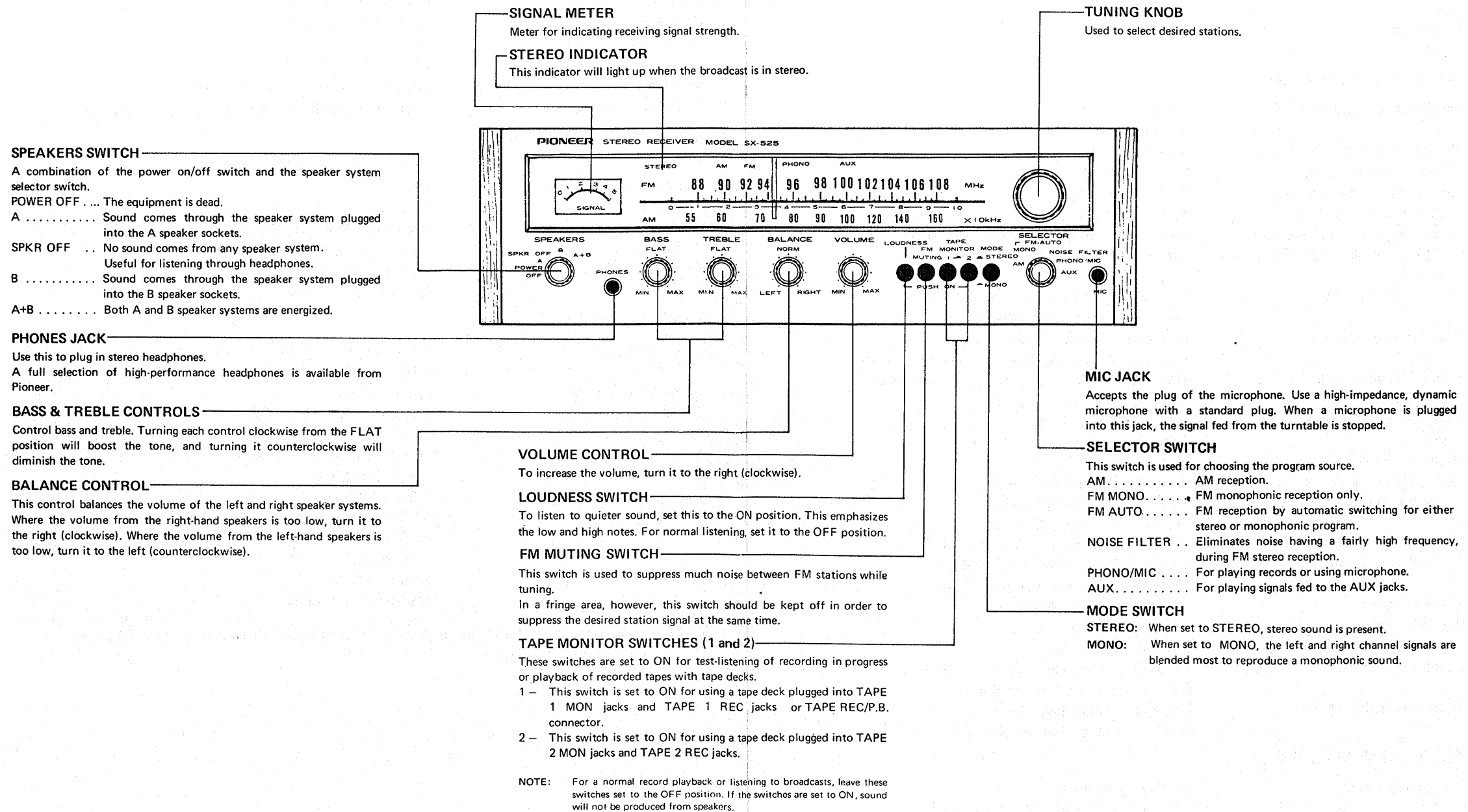
Frequency Range	525kHz to 1,605kHz
Usable Sensitivity (IHF)	15 $\mu$ V
Selectivity (IHF)	More than 22dB
Image Rejection	More than 45dB (1,000kHz)
IF Rejection	More than 35dB
Signal-to-Noise Ratio	More than 50dB
Antenna	Built-in Ferrite Loopstick Antenna

**MISCELLANEOUS**

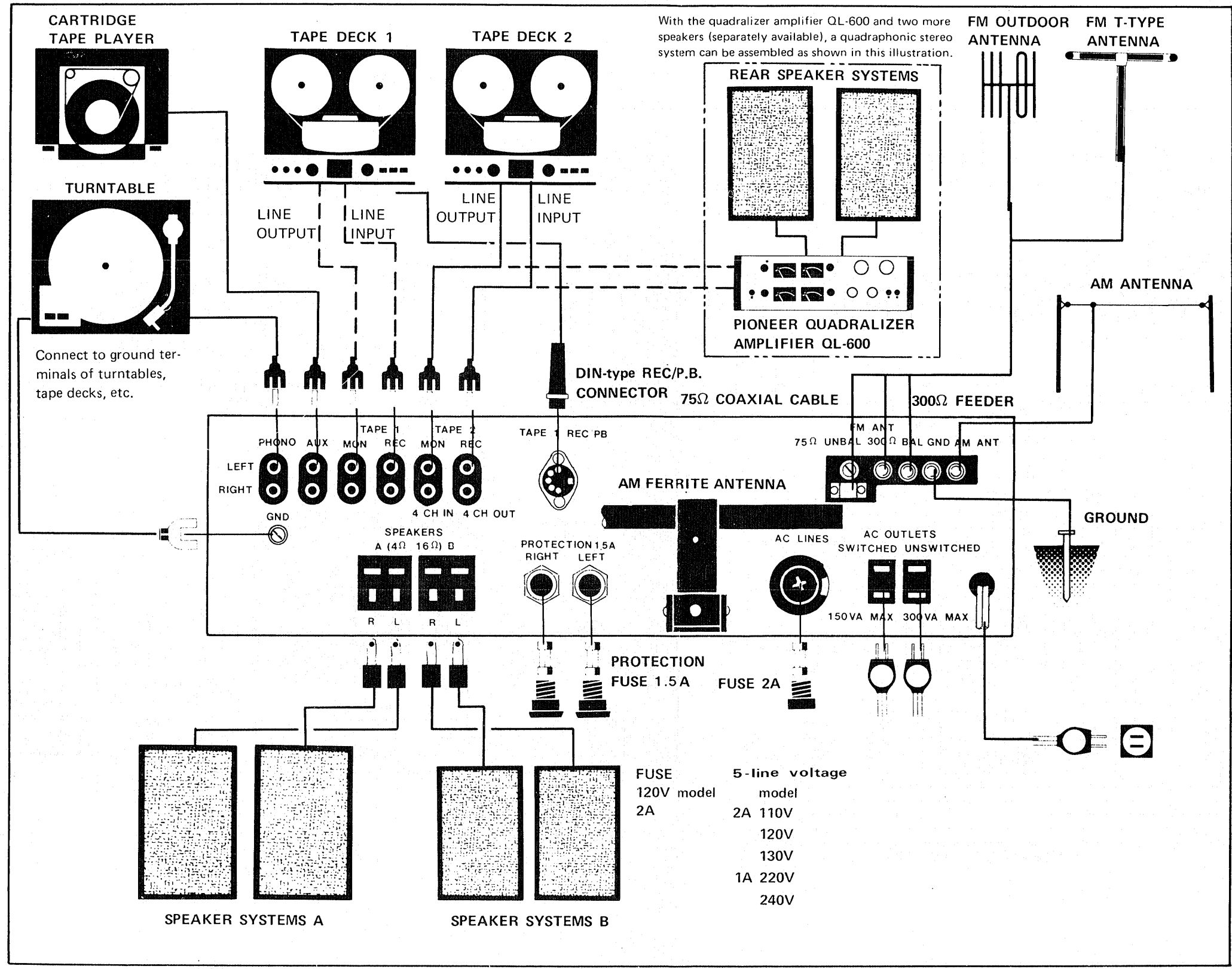
Power Requirements	120V 60Hz or 110V, 120V, 130V, 220V and 240V (Switchable) 50-60Hz
Power Consumption	120W (Max.)
Dimensions (overall)	17-11/16in./450mm (width) 5-11/16in./145mm (height) 14-3/16in./360mm (depth)
Weight Without package	17lb, 10oz/8.0kg
With package	22lb, 4oz/10.1kg
Furnished Parts	FM T-type Antenna 1 Pin Plug 2 Speaker Plug 4 Polishing Cloth 1 Operating Instructions 1

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

## 2. FRONT PANEL FACILITIES

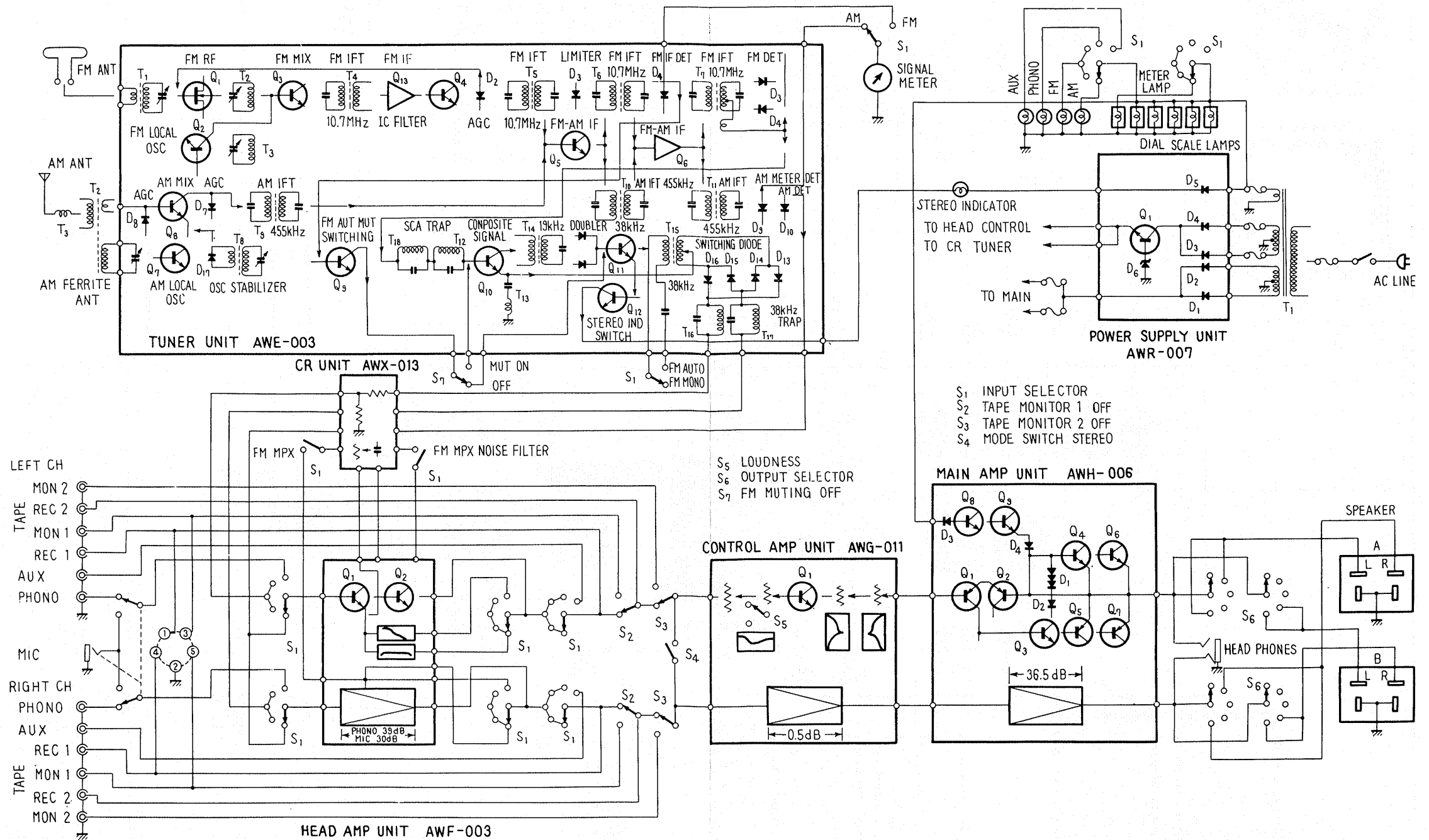


### 3. CONNECTION DIAGRAM



# 4. CIRCUIT DESCRIPTION

## 4-1 BLOCK DIAGRAM





## 4-2 MAIN AMP UNIT

### • 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, as 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>4</sub>, causing a sudden output coupling capacitor to the speaker. The common drawback just described about conventional SEPP amplifier circuits causes the starting pulse noise.

Fig. 2 shows the newly developed SX-525's muting circuit used to eliminate pulse noises (and distortion) both at the turning-on and turning-off of the power.

A rectified, negative 10 ~ 12V voltage is applied to the base of Q<sub>8</sub> when the power is turned on, keeping Q<sub>8</sub> cut off.

As Ca and Rb 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>9</sub> only gradually because of the comparatively long charge time of R/C. Therefore, Q<sub>9</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.

When the power is turned off, the above-mentioned negative voltage breaks down almost immediately, leaving only the positive +B voltage through Ra at the base of Q<sub>8</sub>. As this practically grounds collector of Q<sub>8</sub>, Ca can discharge instantly through Q<sub>8</sub>, and all speaker sound is cut off immediately.

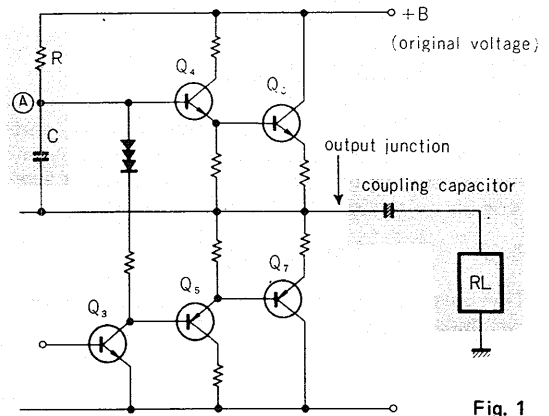


Fig. 1

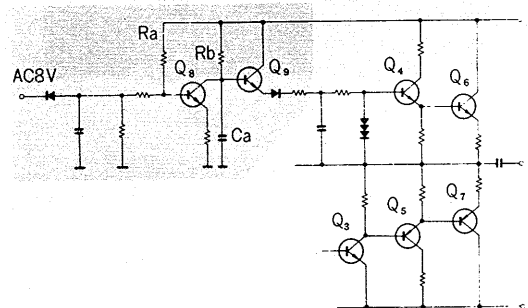


Fig. 2

## 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 the 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.

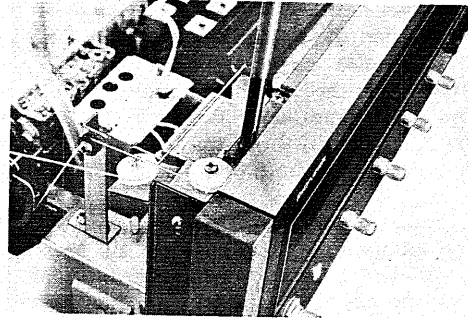


Photo 3

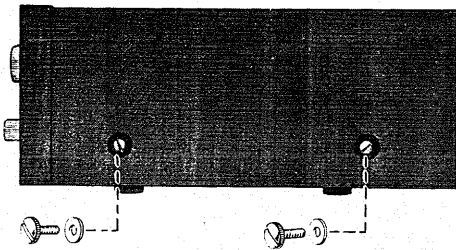


Photo 1

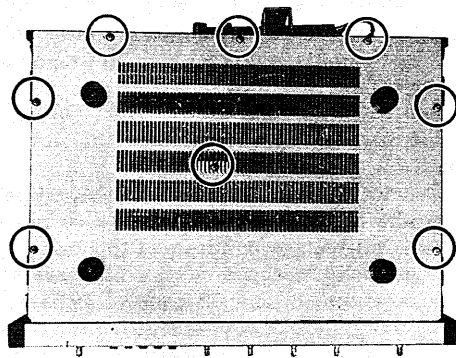


Photo 4

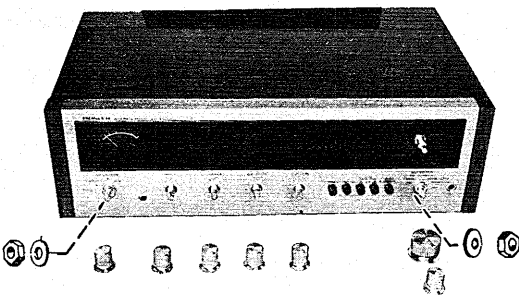
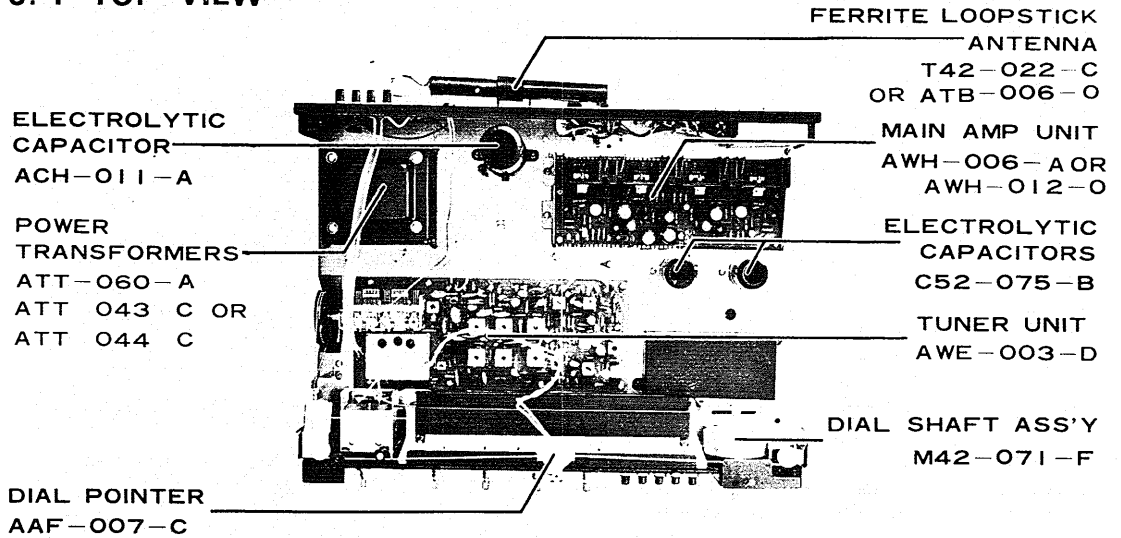


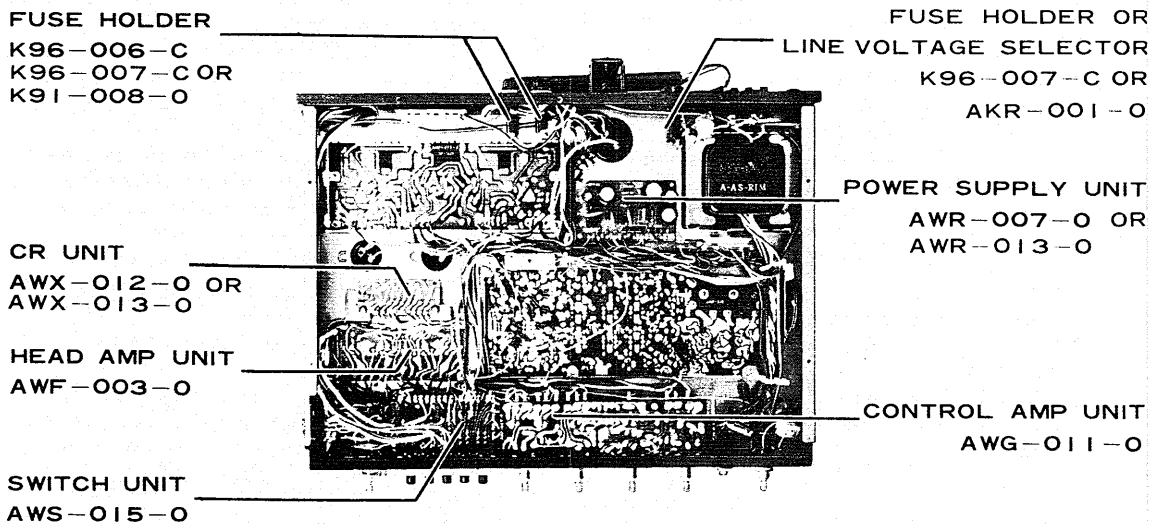
Photo 2

## 6. PARTS AND PCB LOCATION

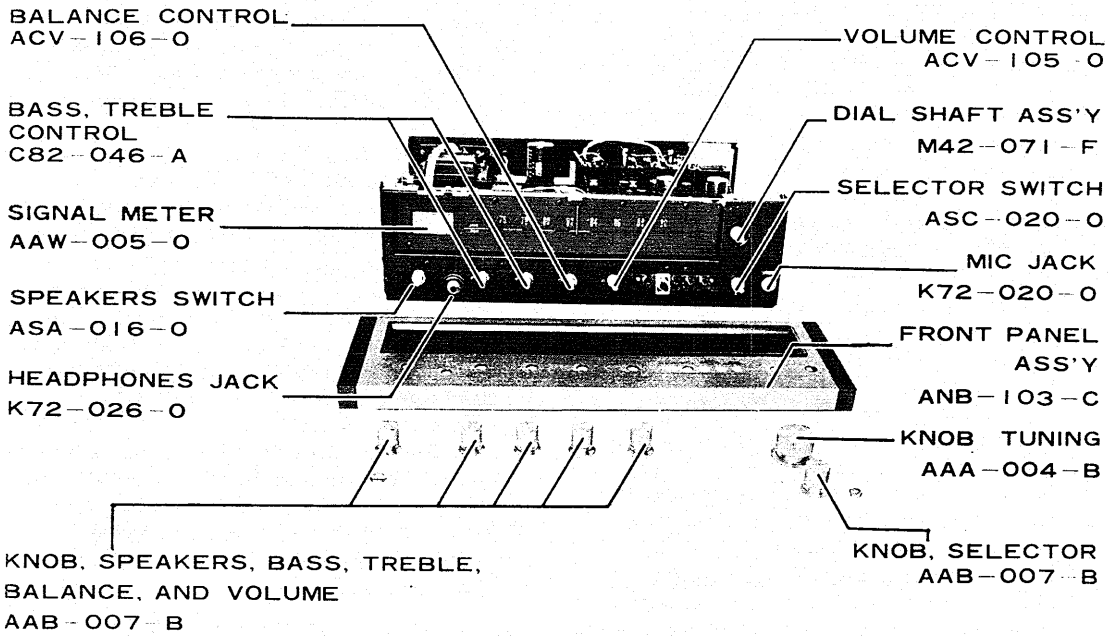
### 6.1 TOP VIEW



### 6.2 BOTTOM VIEW



6.3 FRONT VIEW



## 7. ALIGNMENT PROCEDURE

Carry out the alignments in the following order:

1. FM IF alignment
2. AM IF alignment
3. FM tracking alignment
4. AM tracking alignment
5. FM MPX decoder circuit alignment

### 7-1 FM IF ALIGNMENT

- a) Connect a  $0.01\mu\text{F}$  capacitor between TP1 and ground before the alignment.
- b) Connect a  $220\text{k}\Omega$  resistor in series with the vertical input terminals of the oscilloscope.
- c) Remove the capacitor ( $4.7\mu\text{F}$ ) from terminal 28 before the alignment.
- d) Turn the selector switch to FM MONO.
- e) Turn the tuning knob to the right to set dial at high end of scale.
- f) Connect the output leads of the FM sweep generator to the FM antenna terminals.
- g) Connect the vertical oscilloscope input to the FM meter output terminal 18. When connecting to the FM meter terminal, disconnect the meter lead, then terminate  $4.7\text{k}\Omega$  between terminal 18 and ground.
- h) Set the output level of the sweep generator to 60dB and its frequency to 10.7MHz.
- i) Adjust the FM IFT cores (T4, T5, T6) for maximum gain and symmetrical pattern (Fig. 3).
- j) Set the output level of the sweep generator to 100dB, then keep the top of the pattern flat and check that the tuning center frequency does not drift when a high level input (100dB) is supplied to the FM antenna terminals. If it drifts, repeat steps (h) and (i).
- k) Disconnect the vertical input of oscilloscope from the FM meter output terminal, reconnect to TP1.
- l) Observe the S-curve pattern when adjusting the cores of the FM IFT T7. (Linearity is improved by the primary core; symmetry by the secondary core.) (Fig. 4).
- m) Disconnect the  $0.01\mu\text{F}$  capacitor from TP1 after the alignment has been completed.
- n) Connect the capacitor ( $4.7\mu\text{F}$ ) to terminal 28 after the alignment has been completed.

### 7-2 AM IF ALIGNMENT

- a) Turn the selector switch to AM.
- b) Connect the output leads of the AM sweep generator to the AM antenna terminal.
- c) Connect the vertical input leads of the oscilloscope to the AM detector output terminal 13.
- d) Set the output level of the sweep generator to 40dB and its frequency to 455kHz.
- e) Adjust the AM IFT cores (T9, T10, T11) for maximum gain and symmetrical pattern.

Make the pattern symmetrical, with its peak on the oscilloscope screen grid.

### 7-3 FM TRACKING ALIGNMENT

- a) Turn the selector switch to FM MONO.
- b) Connect the output leads of the FM signal generator to the FM antenna terminals.
- c) Set the FM signal generator to modulation 400Hz, 100% and output level 15dB, frequency 90MHz; also set receiver dial at 90MHz.
- d) Connect the VTVM and oscilloscope (in parallel) to the TAPE REC jack.
- e) Observing the output level on the VTVM, adjust the following cores of maximum reading on the meter.  
 T3 ..... Oscillator circuit  
 T1 ..... Antenna circuit  
 T2 ..... RF circuit
- f) Set the frequency of the FM signal generator and the receiver dial to 106MHz.
- g) Adjust as follows:  
 Trimmer capacitor CT3: Oscillator circuit  
 Trimmer capacitor CT1: Antenna circuit  
 Trimmer capacitor CT2: RF circuit
- h) Repeat steps (e) to (g) several times.
- i) After the alignment, lock the trimmer capacitor with paint.

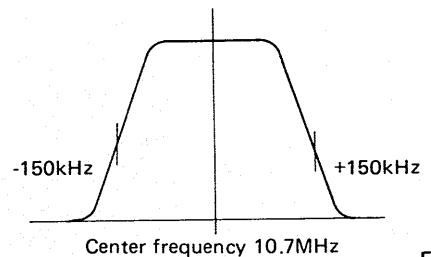


Fig. 3

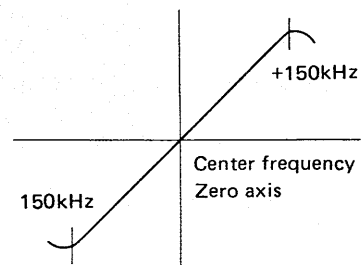
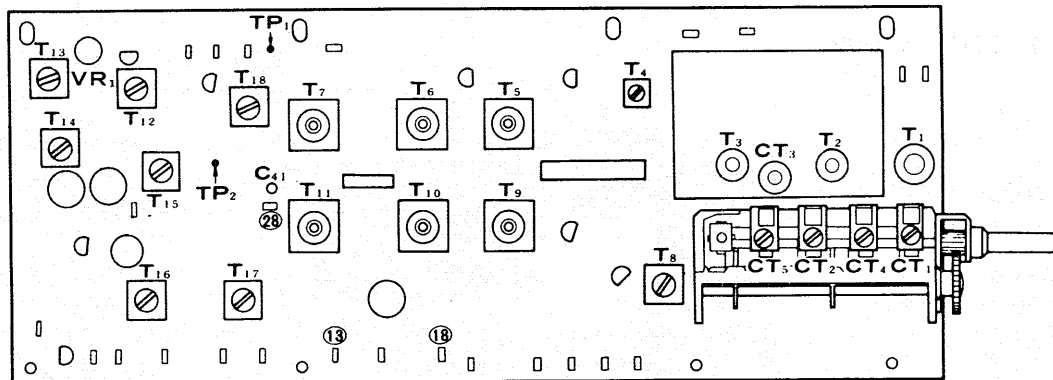


Fig. 4

## TUNER UNIT (AWE-003)



### 7-4 CHECKING OF MUTING FUNCTION

- a) Connect the output leads of the FM signal generator to the FM antenna terminals.
- b) Connect the vertical input leads of the oscilloscope to the TAPE REC jack.
- c) Set the output level of the FM signal generator to 16dB and turn the muting switch on, then check the muting function on the scope.

The muting function is designed to operate below about 16dB input.

### 7-5 AM TRACKING ALIGNMENT

- a) Turn the selector switch to AM.
- b) Connect the AM signal generator to the AM antenna terminal.
- c) Set the AM signal generator to modulation 400Hz, 30%, output level 30dB, frequency 600kHz. Set the receiver dial at 600kHz.
- d) Connect the VTVM and oscilloscope (in parallel) to the TAPE REC jack.
- e) Observing the output level on the VTVM, adjust the following cores for maximum reading.

T8 ..... Oscillator circuit  
 Ferrite loopstick antenna: Antenna circuit

- f) Set the AM signal generator and the receiver to 1,400kHz.
- g) Observing the output level on the VTVM, adjust the following trimmers for maximum reading.  
 CT5 ..... Oscillator circuit  
 CT4 ..... Antenna circuit
- h) Repeat alignments (c) to (g) several times.
- i) After these alignments, lock the trimmer capacitor with paint.

### 7-6 MPX DECODER ALIGNMENT

- a) Modulate the FM signal generator output by FM MPX modulator.
- b) Turn the selector switch to FM AUTO.
- c) Connect the FM signal generator to the FM antenna terminals.
- d) Set the FM MPX modulator to modulation: main 1kHz (L+R) 60%, pilot 8 ~ 10%.
- e) Set the output level of the FM signal generator to 60dB.
- f) Turn the tuning knob to maximum reading on the signal meter.
- g) Set the modulation of the FM MPX modulator to pilot only.
- h) Connect the oscilloscope to TP2.
- i) Adjust the transformers (T13, T14, T15) until the output level of the 19kHz becomes maximum on the scope.
- j) Set the FM MPX modulator to pilot with L or R signal.
- k) Connect the dual-trace oscilloscope and VTVM to the TAPE REC jacks.
- l) Adjust the semi-fixed potentiometer on the CR unit until the output level of the L or R signal becomes maximum on the scope.

### 7-7 CHECKING THE SCA FILTER

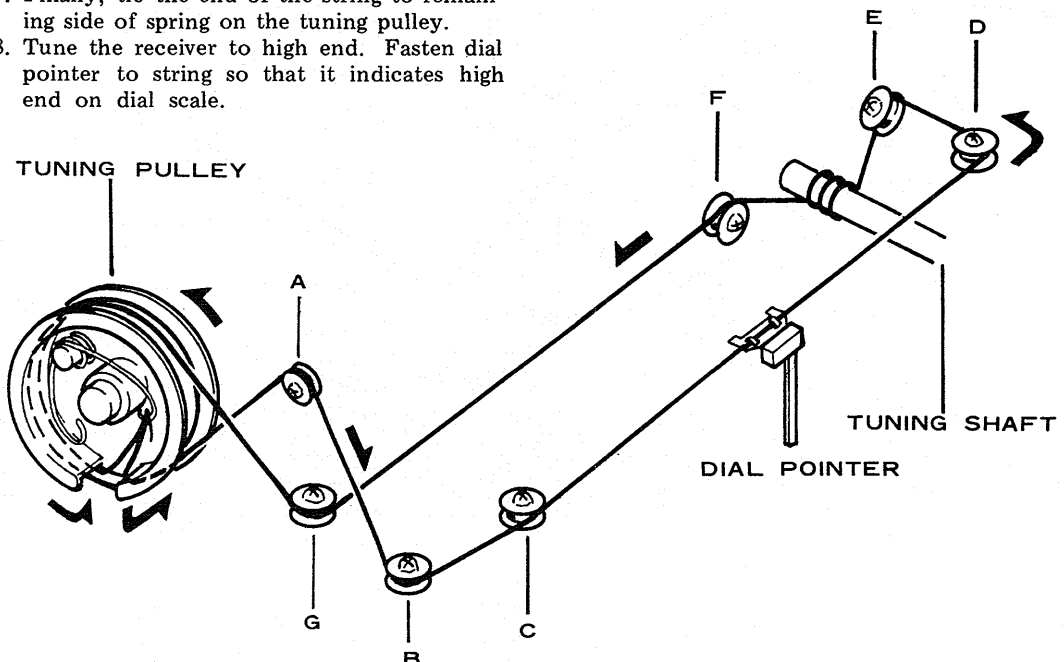
- a) Connect the FM signal generator to the FM antenna terminals.
- b) Turn the selector switch to FM AUTO.
- c) Modulate the FM signal generator connected to the audio generator, check that the frequency response shows troughs at around 67kHz and 72kHz.

## 7-8 CHECKING THE STEREO INDICATOR

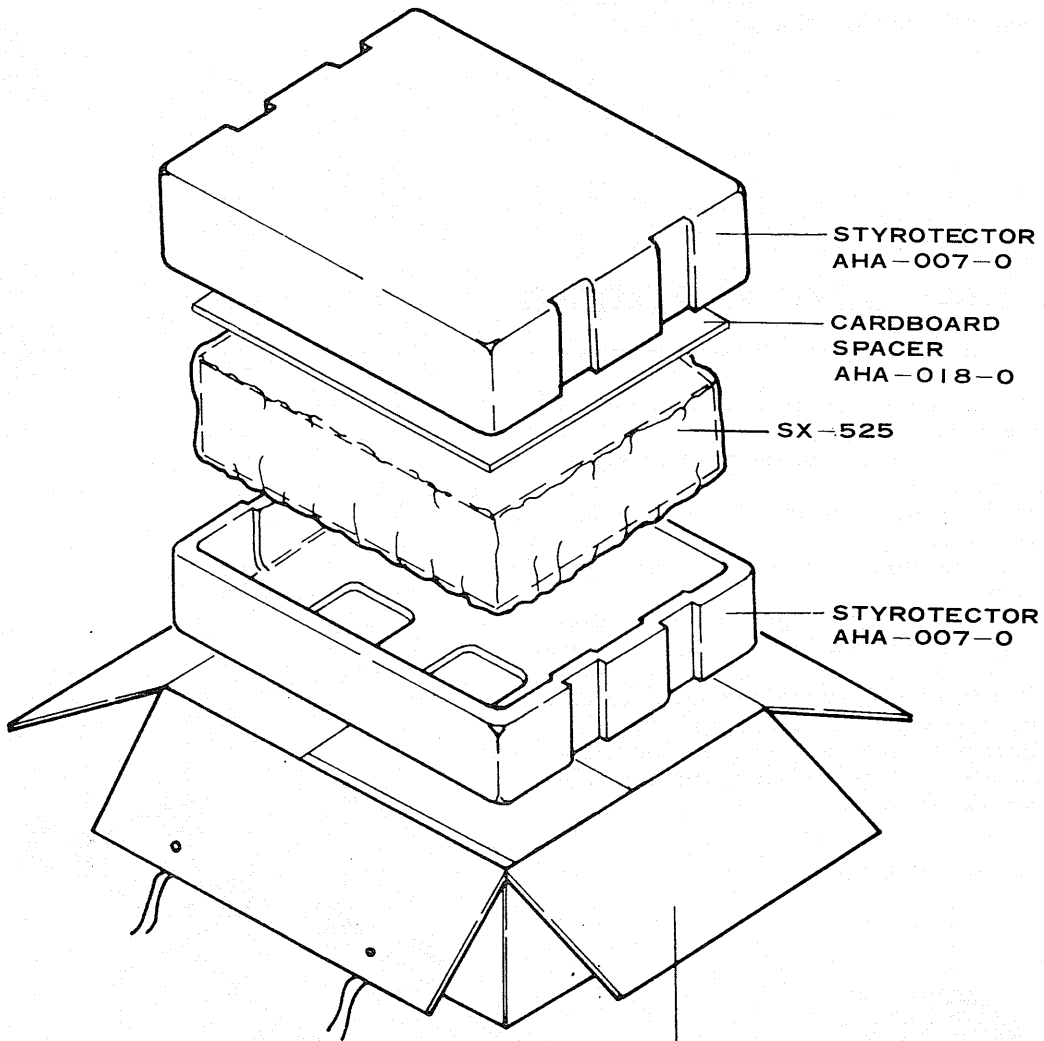
- a) Connect the FM signal generator to the FM antenna terminals.
- b) Turn the selector switch to FM AUTO.
- c) Modulate the FM signal generator connected to the FM MPX modulator, and set the FM MPX modulator pilot on. Check that the stereo indicator lamp goes on. Then set the FM MPX modulator to pilot off, and check that the stereo indicator lamp goes out.

## 8. DIAL CORD STRINGING

1. Set the tuning capacitor to minimum capacitance.
2. Tie one end of the string to the spring on the tuning pulley.
3. Pull the string around the small pulleys A, B and C.
4. Lead the string around the small pulleys D and E.
5. Wind the string 3 turns around the tuning shaft.
6. Lead the string around the small pulleys F and G, then wind it 2 turns around the tuning pulley.
7. Finally, tie the end of the string to remaining side of spring on the tuning pulley.
8. Tune the receiver to high end. Fasten dial pointer to string so that it indicates high end on dial scale.



## 9. PACKING METHOD AND PART NUMBERS



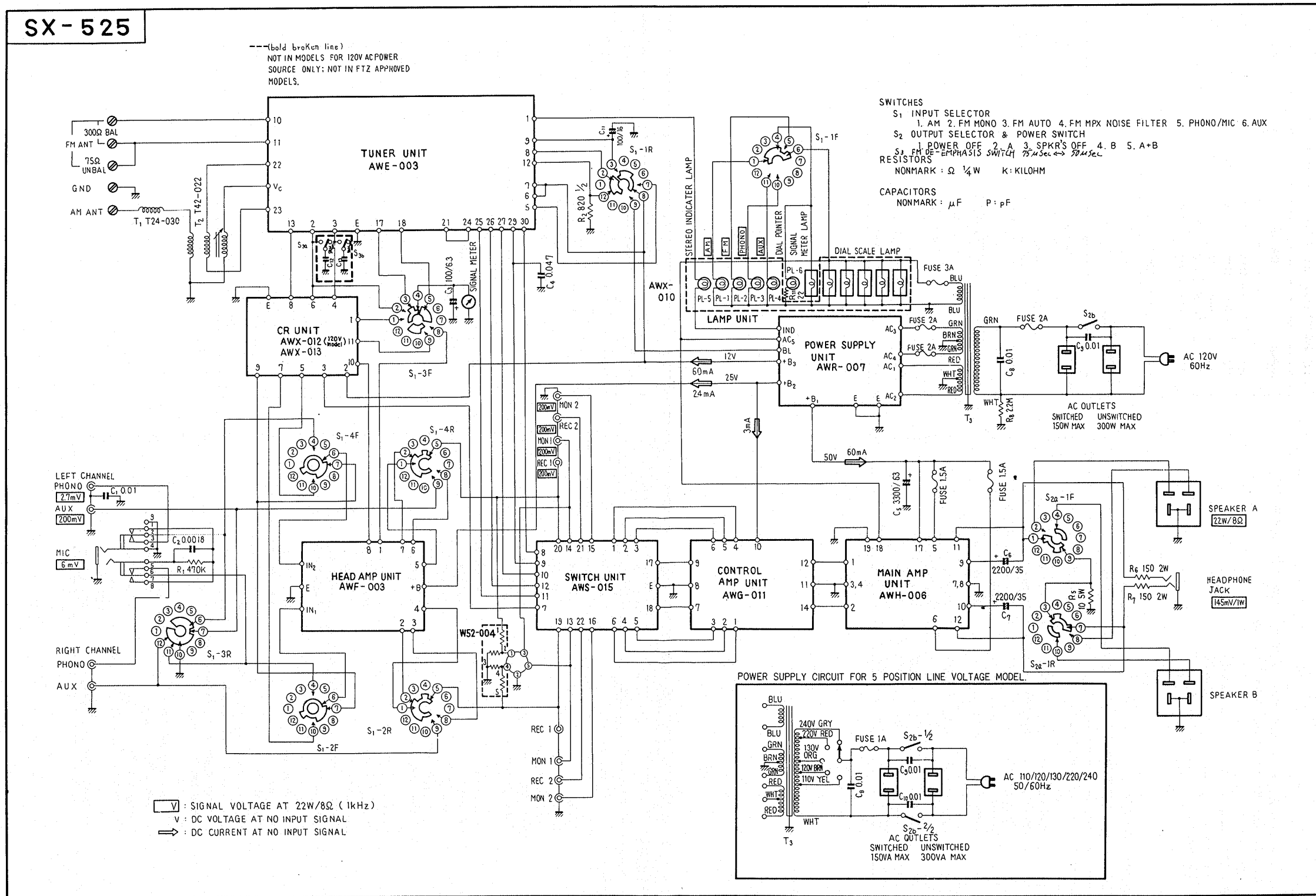
### PACKING CASE

KCW	AHD-084-0
KUW	AHD-064-0
FVZW	AHD-065-0
NBW	AHD-085-0
FW	AHD-083-0



# 10. SCHEMATIC DIAGRAMS, PCB PATTERNS AND PARTS LIST

## 10-1 UNIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS



21 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 23,
- for FVZW model ..... page 25,
- for NBW model ..... page 29,
- for FW model ..... page 31,

CAPACITORS

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

Symbol	Description	Part No.
C1	Ceramic 0.01 50V	CKDYF 103Z 50
C2	Mylar 0.0018 50V	CQMA 182K 50
C3	Electrolytic 100 6V	CEA 101P 6
C4	Mylar 0.047 50V	CQMA 473K 50
C5	Electrolytic 3300 63V	ACH-011-A
C6	Electrolytic 2200 35V	C52-075-B
C7	Electrolytic 2200 35V	C52-075-B
C8	Oil paper 0.01 800V	ACE-001-0
C9	Ceramic 0.01 DC 1.4kV	C43-003-0
C11	Electrolytic 100 16V	CEA 101P 16

RESISTORS

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

Symbol	Description	Part No.
R1	Carbon film 470k	RD $\frac{1}{4}$ PS 474J
R2	Carbon film 1.2k $\frac{1}{4}$ W	RD $\frac{1}{4}$ PS 122J
R5	Wire wound 10 5W	RT5B 100K
R6	Wire wound 150 2W	RM2P 151K
R7	Wire wound 150 2W	RM2P 151K
R11	Carbon film 22 $\frac{1}{4}$ W	RD $\frac{1}{4}$ PS 220J

SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASC-020-0
S2	Output selector	ASA-017-0

COIL AND TRANSFORMERS

Symbol	Description	Part No.
T1	Choke coil	T24-030-0
T2	Ferrite loopstick antenna	ATB-006-0
T3	Power transformer	ATT-043-C

22 OTHERS

Symbol	Description	Part No.
	Tuner unit	AWE-003-D
	Head amp unit	AWF-003-0
	Control amp unit	AWG-011-0
	Main amp unit	AWH-006-A
	Power supply unit	AWR-007-0
	Switch unit	AWS-015-0
	CR unit	AWX-012-0
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-103-C
	Wooden case	AMM-006-A
	Foot	AEC-012-0
	Dial shaft ass'y	M42-071-F
	Dial pulley	M42-080-A
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-027-A
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for tuning	AAA-004-B
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for loudness, FM muting, tape monitor, and mode	AAD-024-A
	12P input terminal board	AKB-003-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0
	Pilot lamp for dial scale and signal meter	E22-017-A
	Pilot lamp for FM stereo indicator	AEL-006-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Fuse 2A	E21-027-0
	Fuse 2A for protection	E21-026-0
	Fuse 3A for protection	E21-022-0
	Fuse 1.5A for protection	AEK-009-0
	Compound part for REC Jack	W52-004-0
	Microphone jack	K72-020-0
	Headphones jack	K72-026-0
	Spare AC outlet	K82-011-0
	Speaker socket	K72-031-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Fuse (for protection) holder	K96-007-C
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-041-A
	AC power cord	D11-003-E
	Speaker plug	K72-007-B
	Operating instructions	ARB-042-0
	Packing case	AHD-064-0
	Styrotector	AHA-007-0
	FM T-type antenna	D52-013-0

For KCW model

### CAPACITORS

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

Symbol	Description			Part No.
C1	Ceramic	0.01	50V	CKDYF 103Z 50
C2	Mylar	0.0018	50V	CQMA 182K 50
C3	Electrolytic	100	6V	CEA 101P 6
C4	Mylar	0.047	50V	CQMA 473K 50
C5	Electrolytic	3300	63V	ACH-011-A
C6	Electrolytic	2200	35V	C52-075-B
C7	Electrolytic	2200	35V	C52-075-B
C8	Oil paper	0.01	800V	ACE-001-0
C9	Ceramic	0.01	DC 1.4kV	C43-003-0
C11	Electrolytic	100	16V	CEA 101P 16
C12	Mylar	0.0033	50V	CQMA 332K 50
C13	Mylar	0.0033	50V	CQMA 332K 50

### SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASC-020-0
S2	Output selector	ASA-017-0

### COIL AND TRANSFORMERS

Symbol	Description	Part No.
T1	Choke coil	T24-030-0
T2	Ferrite loopstick antenna	T42-022-C
T3	Power transformer	ATT-043-C

### RESISTORS

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

Symbol	Description			Part No.
R1	Carbon film	470k		RD $\frac{1}{2}$ PS 474J
R2	Carbon film	1.2k	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 122J
R5	Wire wound	10	5W	RT5B 100K
R6	Wire wound	150	2W	RM2P 151K
R7	Wire wound	150	2W	RM2P 151K
R8	Carbon film	2.2M	$\frac{1}{4}\text{W}$	RD $\frac{1}{2}$ PS 225J
R11	Carbon film	22	$\frac{1}{4}\text{W}$	RD $\frac{1}{2}$ PS 220J

24 OTHERS

Symbol	Description	Part No.
	Tuner unit	AWE-003-D
	Head amp unit	AWF-003-0
	Control amp unit	AWG-011-0
	Main amp unit	AWH-006-A
	Power supply unit	AWR-007-0
	Switch unit	AWS-015-0
	CR unit	AWX-012-0
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-103-C
	Wooden case	AMM-006-A
	Foot	AEC-012-0
	Dial shaft ass'y	M42-071-F
	Dial pulley	M42-080-A
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-027-A
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for tuning	AAA-004-B
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for loudness, FM muting, tape monitor, and mode	AAD-024-A
	12P input terminal board	AKB-003-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0
	Pilot lamp for dial scale and signal meter	E22-017-A
	Pilot lamp for FM stereo indicator	AEL-006-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Fuse 2A	E21-027-0
	Fuse 2A for protection	AEK-011-0
	Fuse 3A for protection	AEK-008-0
	Fuse 1.5A for protection	AEK-009-0
	Compound part for REC jack	W52-004-0
	Microphone jack	K72-020-0
	Headphones jack	K72-026-0
	Spare AC outlet	AKP-002-0
	Speaker socket	K72-031-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Fuse (for protection and power) holder	K96-007-C
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-041-A
	AC power cord	D11-003-E
	Speaker plug	K71-032-0
	Fuse 2A	E21-005-0
	Operating instructions	ARB-042-0
	Packing case	AHD-084-0
	Styrotector	AHA-007-0
	FM T-type antenna	D52-013-0
	Pin plug	K72-015-A
	Cardboard spacer	AHA-018-0

For FVZW model

### CAPACITORS

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

Symbol	Description	Part No.
C1	Ceramic 0.01 50V	CKDYF 103Z 50
C2	Mylar 0.0018 50V	CQMA 182K 50
C3	Electrolytic 100 6V	CEA 101P 6
C4	Mylar 0.0018 50V	CQMA 182K 50
C5	Electrolytic 3300 63V	ACH-011-A
C6	Electrolytic 2200 35V	C52-075-B
C7	Electrolytic 2200 35V	C52-075-B
C8	Ceramic 0.01 DC 1.4kV	C43-003-0
C9	Ceramic 0.01 DC 1.4kV	C43-003-0
C10	Ceramic 0.01 DC 1.4kV	C43-003-0
C11	Electrolytic 100 16V	CEA 101P 16

### RESISTORS

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

Symbol	Description	Part No.
R1	Carbon film 470k	RD $\frac{1}{2}$ PS 474J
R2	Carbon film 1.2k $\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 122J
R5	Wire wound 10 5W	RT5B 100K
R6	Wire wound 150 2W	RM2P 151K
R7	Wire wound 150 2W	RM2P 151K
R11	Carbon film 22 $\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 220J

### SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASC-020-0
S2	Output selector	ASA-018-0

### COIL AND TRANSFORMERS

Symbol	Description	Part No.
T1	Choke coil	T24-030-0
T2	Ferrite loopstick antenna	T42-022-C
T3	Power transformer	ATT-044-C

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### OTHERS

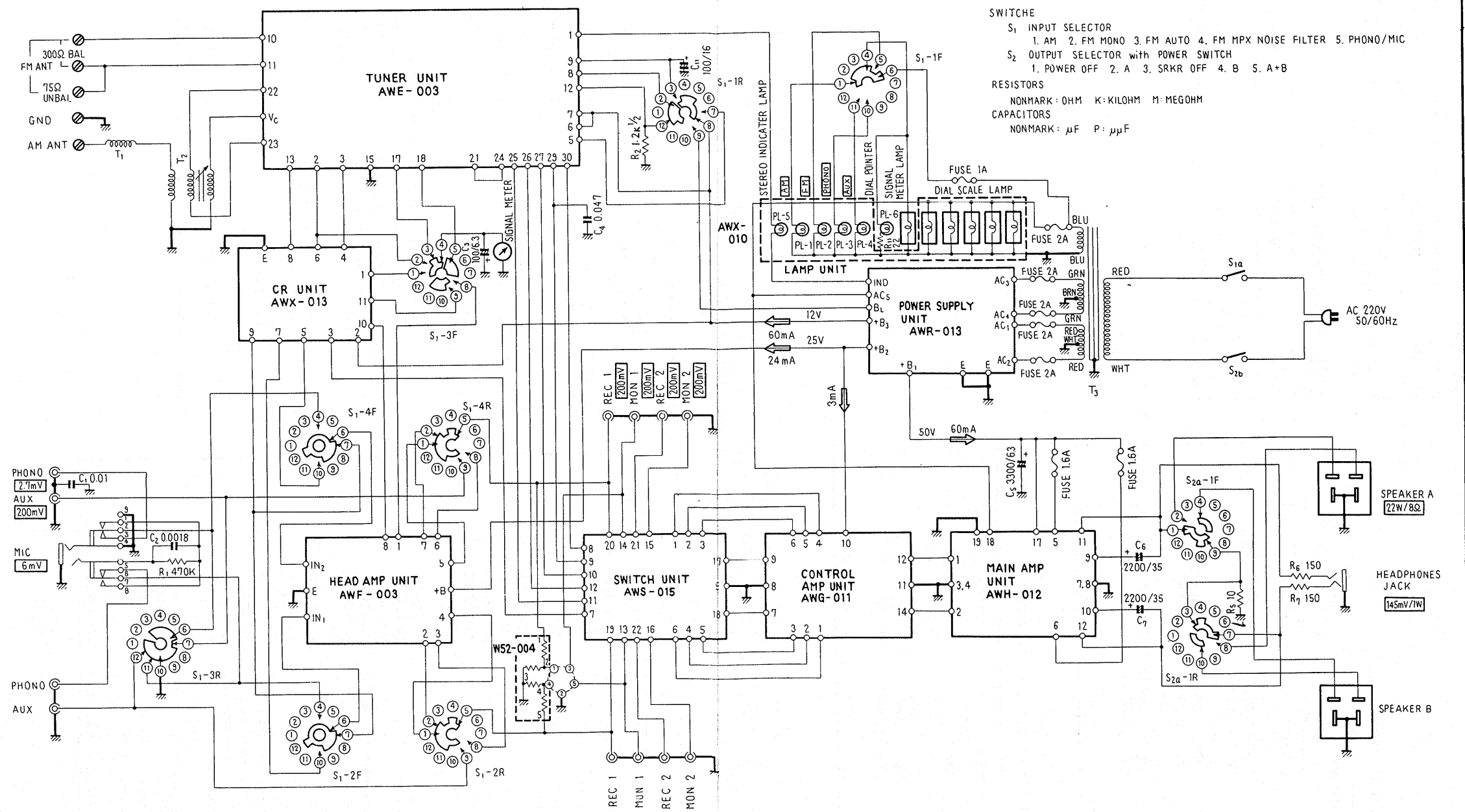
Symbol	Description	Part No.
	Tuner unit	AWE-003-D
	Head amp unit	AWF-003-0
	Control amp unit	AWG-011-0
	Main amp unit	AWH-006-A
	Power supply unit	AWR-007-0
	Switch unit	AWS-015-0
	CR unit	AWX-013-0
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-103-C
	Wooden case	AMM-006-A
	Foot	AEC-012-0
	Dial shaft ass'y	M42-071-F
	Dial pulley	M42-080-A
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-027-A
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for tuning	AAA-004-B
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for loudness, FM muting, tape monitor, and mode	AAD-024-A
	12P input terminal board	AKB-003-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0
	Pilot lamp for dial scale and signal meter	E22-017-A
	Pilot lamp for FM stereo indicator	AEL-006-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Fuse 1A	E21-004-0
	Fuse 2A for protection	E21-026-0
	Fuse 3A for protection	E21-022-0
	Fuse 1.5A for protection	AEK-009-0
	Compound part for REC jack	W52-004-0
	Microphone jack	K72-020-0
	Headphones jack	K72-026-0
	Spare AC outlet	K82-014-0
	Speaker socket	K72-031-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Fuse (for protection) holder	K96-006-C
	Line voltage selector	AKR-001-0
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-041-A
	AC power cord	D11-002-B
	Speaker plug	K72-007-B
	Fuse 2A	E21-005-0
	Operating instructions	ARB-042-0
	Packing case	AHD-065-0
	Styrotector	AHA-007-0

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UNIT CONNECTION DIAGRAM FOR NBW MODEL ONLY

**SX-525**



SWITCHES  
 S<sub>1</sub> INPUT SELECTOR  
 1. AM 2. FM MONO 3. FM AUTO 4. FM MPX NOISE FILTER 5. PHONO/MIC  
 S<sub>2</sub> OUTPUT SELECTOR with POWER SWITCH  
 1. POWER OFF 2. A 3. SRKR OFF 4. B 5. A+B

RESISTORS  
 NONMARK: Ω K: KILOHM M: MEGOHM

CAPACITORS  
 NONMARK: μF P: μμF

⤴ : SIGNAL VOLTAGE AT 22W/8Ω (at 1kHz)  
 v : NO INPUT SIGNAL DC VOLTAGE  
 ⤴ : NO INPUT SIGNAL DC CURRENT

For NBW model

### CAPACITORS

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

Symbol	Description			Part No.
C1	Ceramic	0.01	50V	CKDYF 103Z 50
C2	Mylar	0.0018	50V	CQMA 182K 50
C3	Electrolytic	100	6V	CEA 101P 6
C4	Mylar	0.047	50V	CQMA 473K 50
C5	Electrolytic	3300	63V	ACH-011-A
C6	Electrolytic	2200	35V	C52-075-B
C7	Electrolytic	2200	35V	C52-075-B
C11	Electrolytic	100	16V	CEA 101P 16

### SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASC-020-0
S2	Output selector	ASA-018-0

### COIL AND TRANSFORMERS

Symbol	Description	Part No.
T1	Choke coil	T24-030-0
T2	Ferrite loopstick antenna	T42-022-C
T3	Power transformer	ATT-060-A

### RESISTORS

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

Symbol	Description			Part No.
R1	Carbon film	470k		RD $\frac{1}{4}$ PS 474J
R2	Carbon film	1.2k	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 122J
R5	Wire wound	10	5W	RT5B 100K
R6	Wire wound	150	2W	RM2P 151K
R7	Wire wound	150	2W	RM2P 151K
R11	Carbon film	22	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 220J

30 OTHERS

Symbol	Description	Part No.
	Tuner unit	AWE-003-D
	Head amp unit	AWF-003-0
	Control amp unit	AWG-011-0
	Main amp unit	AWH-012-0
	Power supply unit	AWR-013-0
	Switch unit	AWS-015-0
	CR unit	AWX-013-0
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-103-C
	Wooden case	AMM-006-A
	Foot	AEC-012-0
	Dial shaft ass'y	M42-071-F
	Dial pulley	M42-080-A
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-027-A
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for tuning	AAA-004-B
	Knob for speakers, bass, treble, balance, volume and selector	AAB-007-B
	Knob for loudness, FM muting, tape monitor, and mode	AAD-024-A
	12P input terminal board	AKB-003-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0
	Pilot lamp for dial scale and signal meter	E22-017-A
	Pilot lamp for FM stereo indicator	AEL-006-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Fuse 1A for protection	E21-031-0
	Fuse 2A for protection	E21-029-A
	Fuse 1.6A for protection	AEK-013-0
	Compound part for REC jack	W52-004-0
	Microphone jack	K72-020-0
	Headphones jack	K72-026-0
	Fuse (for protection) holder	K91-008-0
	Speaker socket	K72-031-0
	5P connector (DIN)	K93-003-B
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-041-A
	AC power cord	D54-019-0
	Speaker plug	K72-007-B
	Operating instructions	ARB-052-0
	Packing case	AHD-085-0
	Styrotector	AHA-007-0
	FM T-type antenna	D52-013-0
	Pin plug	K72-015-A
	Cardboard spacer	AHA-018-0



For FW model

### CAPACITORS

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

Symbol	Description			Part No.
C1	Ceramic	0.01	50V	CKDYF 103Z 50
C2	Mylar	0.0018	50V	CQMA 182K 50
C3	Electrolytic	100	6V	CEA 101P 6
C4	Mylar	0.047	50V	CQMA 473K 50
C5	Electrolytic	3300	63V	ACH-011-A
C6	Electrolytic	2200	35V	C52-075-B
C7	Electrolytic	2200	35V	C52-075-B
C8	Ceramic	0.01	DC 1.4kV	C43-003-0
C9	Ceramic	0.01	DC 1.4kV	C43-003-0
C10	Ceramic	0.01	DC 1.4kV	C43-003-0
C11	Electrolytic	100	16V	CEA 101P 16
C12	Mylar	0.0033	50V	CQMA 332K 50
C13	Mylar	0.0033	50V	CQMA 332K 50

### RESISTORS

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

Symbol	Description			Part No.
R1	Carbon film	470k		RD $\frac{1}{4}$ PS 474J
R2	Carbon film	1.2k	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 122J
R5	Wire wound	10	5W	RT5B 100K
R6	Wire wound	150	2W	RM2P 151K
R7	Wire wound	150	2W	RM2P 151K
R11	Carbon film	22	$\frac{1}{2}\text{W}$	RD $\frac{1}{2}$ PS 220J

### SWITCHES

Symbol	Description	Part No.
S1	Selector switch	ASC-020-0
S2	Output selector	ASA-018-0
S3	De-emphasis switch	S41-022-A

### COIL AND TRANSFORMERS

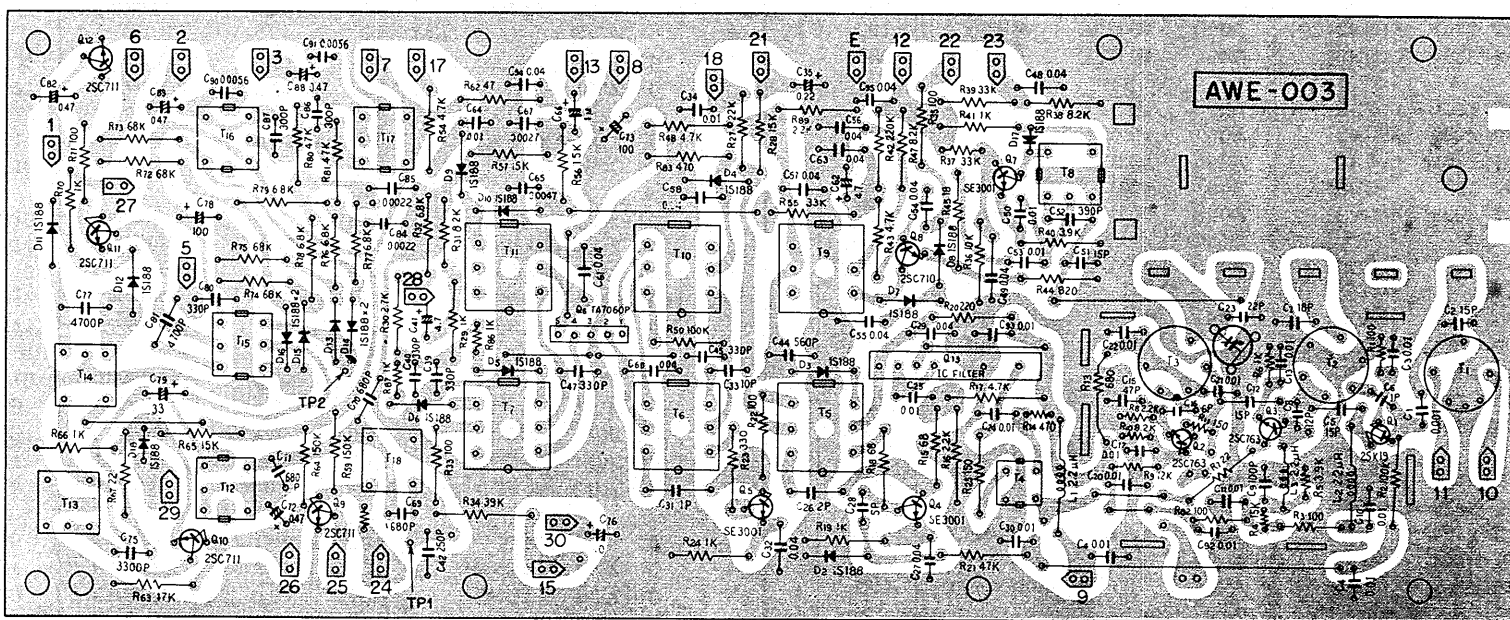
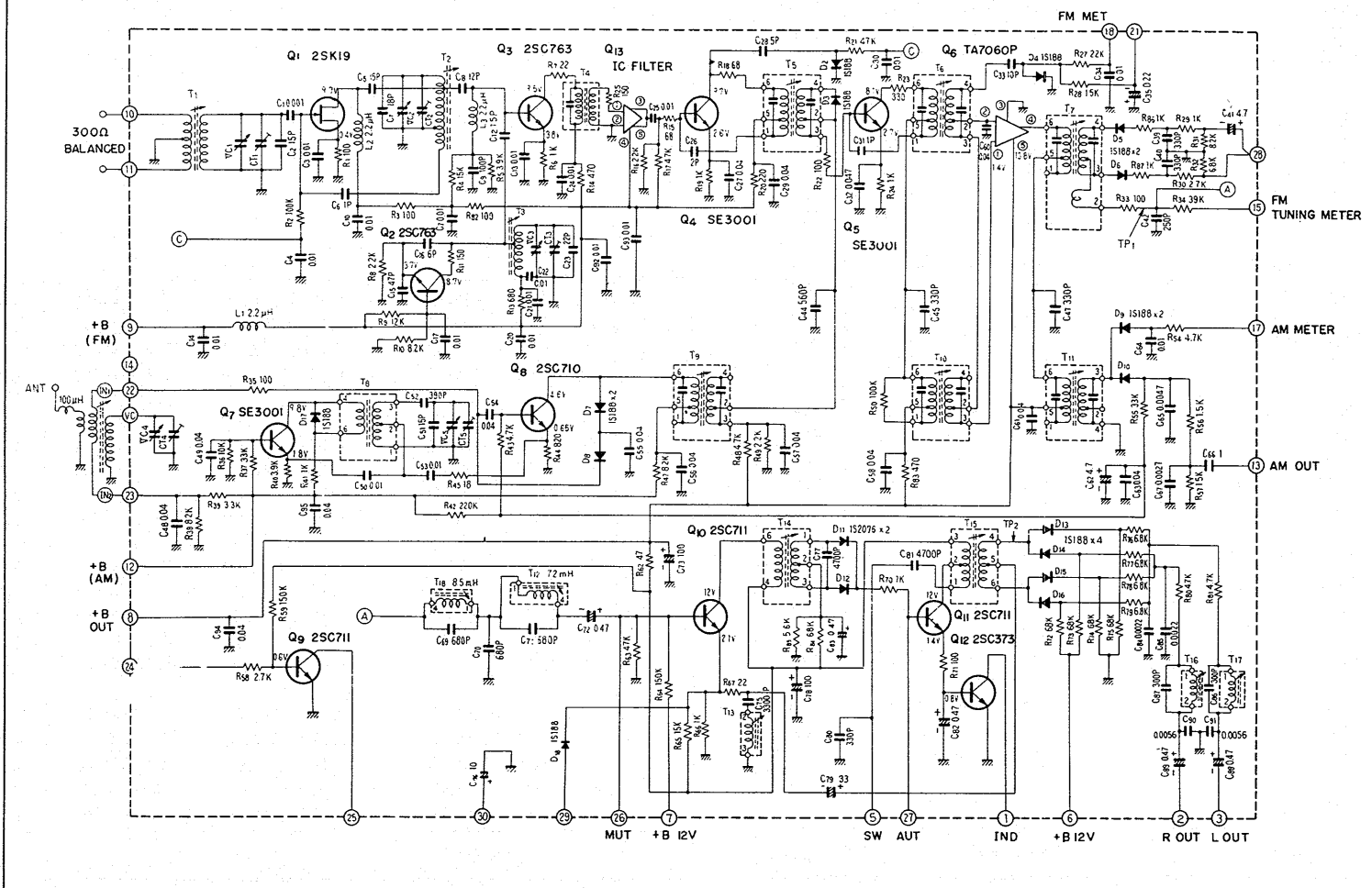
Symbol	Description	Part No.
T1	Choke coil	T24-030-0
T2	Ferrite loopstick antenna	T42-022-C
T3	Power transformer	ATT-044-C

32 OTHERS

Symbol	Description	Part No.
	Tuner unit	AWE-003-D
	Head amp unit	AWF-003-0
	Control amp unit	AWG-011-0
	Main amp unit	AWH-006-A
	Power supply unit	AWR-007-0
	Switch unit	AWS-015-0
	CR unit	AWX-013-0
	Lamp unit	AWX-010-A
	Front panel ass'y	ANB-103-C
	Wooden case	AMM-006-A
	Foot	AEC-012-0
	Dial shaft ass'y	M42-071-F
	Dial pulley	M42-080-A
	Ferrite loopstick antenna holder ass'y	AXB-001-0
	Dial scale	AAG-027-A
	Dial pointer ass'y	AAF-007-C
	Signal meter	AAW-005-0
	Knob for tuning	AAA-004-B
	Knob for speakers, bass, treble balance, volume and selector	AAB-007-B
	Knob for loudness, FM muting , tape monitor, and mode	AAD-024-A
	12P input terminal board	AKB-003-0
	Antenna terminal board	K11-043-C
	4P ground terminal	K13-047-0
	Pilot lamp for dial scale and signal meter	E22-017-A
	Pilot lamp for FM stereo indicator	AEL-006-0

Symbol	Description	Part No.
	Pilot lamp for program indicator	AEL-007-0
	Fuse 1A	E21-004-A
	Fuse 2A for protection	E21-026-0
	Fuse 3A for protection	E21-022-0
	Fuse 1.5A for protection	AEK-009-0
	Compound part for REC jack	W52-004-0
	Microphone jack	K72-020-0
	Headphones jack	K72-026-0
	Spare AC outlet	K82-014-0
	Speaker socket	K72-031-0
	Pilot lamp (for signal meter) socket	K91-005-A
	5P connector (DIN)	K93-003-B
	Fuse (for protection) holder	K96-006-C
	Line voltage selector	AKR-001-0
	Screw for grounding	B11-012-A
	Screw to fix wooden case	B11-041-A
	AC power cord	D11-002-B
	Speaker plug	K72-007-B
	Fuse 2A	E21-005-0
	Operating instructions	ARB-042-0
	Packing case	AHD-083-0
	Styrotector	AHA-007-0
	FM T-type antenna	D52-013-A
	Pin plug	K72-015-A
	Cardboard spacer	AHA-018-0

TUNER UNIT  
AWE-003



35 PARTS LIST OF TUNER UNIT  
CAPACITORS

Symbol	Description	Part No.
C1	Ceramic 0.001 50V	CKDYF 102Z 50
C2	Ceramic 15p 50V	CCDSL 150K 50
C3	Ceramic 0.01 50V	CKDYF 103Z 50
C4	Ceramic 0.01 50V	CKDYF 103Z 50
C5	Ceramic 15p 50V	CCDSL 150K 50
C6	Ceramic 1p 500V	CGB 010K 500
C7	Ceramic 18p 50V	CCDSL 180K 50
C8	Ceramic 12p 50V	CCDSL 120K 50
C9	Ceramic 100p 50V	CCDSL 101K 50
C10	Ceramic 0.01 50V	CKDYF 103Z 50
C11	Ceramic 0.01 50V	CKDYF 103Z 50
C12	Ceramic 1.5p 500V	CGB 1R5K 500
C13	Ceramic 0.01 50V	CKDYF 103Z 50
C14	Ceramic 0.01 50V	CKDYF 103Z 50
C15	Ceramic 47p 50V	CCDSL 470K 50
C16	Ceramic 6p 50V	CCDUJ 060D 50
C17	Ceramic 0.01 50V	CKDYF 103Z 50
C20	Ceramic 0.01 50V	CKDYF 103Z 50
C21	Ceramic 0.01 50V	CKDYF 103Z 50
C22	Ceramic 0.01 50V	CKDYF 103Z 50
C23	Ceramic 18p 50V	CCDTJ 180K 50
C24	Ceramic 0.01 50V	CKDYF 103Z 50
C25	Ceramic 0.01 50V	CKDYF 103Z 50
C26	Ceramic 2p 50V	CCDSL 020C 50
C27	Ceramic 0.04 50V	CKDYF 403Z 50
C28	Ceramic 5p 50V	CCDSL 050D 50
C29	Ceramic 0.04 50V	CKDYF 403Z 50
C30	Ceramic 0.01 50V	CKDYF 103Z 50
C31	Ceramic 1p 500V	CGB 010K 500
C32	Ceramic 0.04 50V	CKDYF 403Z 50

Symbol	Description	Part No.
C33	Ceramic 10p 50V	CCDSL 100F 50
C34	Ceramic 0.01 50V	CKDYF 103Z 50
C35	Electrolytic 0.22 25V	CSSA R22M 25
C39	Ceramic 330p 50V	CKDYB 331K 50
C40	Ceramic 330p 50V	CKDYB 331K 50
C41	Electrolytic 4.7 25V	CEA 4R7P 25
C42	Ceramic 250p 50V	CCDSL 251K 50
C44	Ceramic 560p 50V	CKDYB 561K 50
C45	Ceramic 330p 50V	CKDYB 331K 50
C47	Ceramic 330p 50V	CKDYB 331K 50
C48	Ceramic 0.04 50V	CKDYF 403Z 50
C49	Ceramic 0.04 50V	CKDYF 403Z 50
C50	Mylar 0.01 50V	CQMA 103K 50
C51	Ceramic 15p 50V	CCDUJ 150K 50
C52	Styrol 390p 50V	CQSA 391K 50
C53	Mylar 0.01 50V	CQMA 103K 50
C54	Ceramic 0.04 50V	CKDYF 403Z 50
C55	Ceramic 0.04 50V	CKDYF 403Z 50
C56	Ceramic 0.04 50V	CKDYF 403Z 50
C57	Ceramic 0.04 50V	CKDYF 403Z 50
C58	Ceramic 0.04 50V	CKDYF 403Z 50
C60	Ceramic 0.04 50V	CKDYF 403Z 50
C61	Ceramic 0.04 50V	CKDYF 403Z 50
C62	Electrolytic 4.7 25V	CEA 4R7P 25
C63	Ceramic 0.04 50V	CKDYF 403Z 50
C64	Ceramic 0.01 50V	CKDYF 103Z 50
C65	Mylar 0.0047 50V	CQMA 472K 50
C66	Electrolytic 1 50V	CEA 010P 50
C67	Mylar 0.0027 50V	CQMA 272K 50
C69	Styrol 680p 50V	CQSA 681J 50
C70	Styrol 680p 50V	CQSA 681J 50

RESISTORS

Symbol	Description	Part No.
C71	Styrol 680p 50V	CQSA 681J 50
C72	Electrolytic 0.47 50V	CEA R47P 50
C73	Electrolytic 100 16V	CEA 101P 16
C75	Styrol 0.0033 50V	C15-011-A
C77	Styrol 0.0047 50V	C15-013-A
C78	Electrolytic 100 16V	CEA 101P 16
C79	Electrolytic 33 16V	CEA 330P 16
C80	Ceramic 330p 50V	CKDYB 331K 50
C81	Styrol 0.0047 50V	C15-013-A
C82	Electrolytic 0.47 50V	CEA R47P 50
C83	Electrolytic 0.47 50V	CEA R47P 50
C84	Mylar 0.0022 50V	CQMA 222K 50
C85	Mylar 0.0022 50V	CQMA 222K 50
C86	Styrol 300p 50V	CQSA 301J 50
C87	Styrol 300p 50V	CQSA 301J 50
C88	Electrolytic 0.47 50V	CEA R47P 50
C89	Electrolytic 0.47 50V	CEA R47P 50
C90	Mylar 0.0056 50V	CQMA 562K 50
C91	Mylar 0.0056 50V	CQMA 562K 50

Symbol	Description	Part No.
R1	Carbon film 100	RD%VS 101J
R2	Carbon film 100k	RD%PS 104J
R3	Carbon film 100	RD%VS 101J
R4	Carbon film 15k	RD%VS 153J
R5	Carbon film 3.9k	RD%VS 392J
R6	Carbon film 1k	RD%VS 102J
R7	Carbon film 22	RD%VS 220J
R8	Carbon film 2.2k	RD%VS 222J
R9	Carbon film 12k	RD%VS 123J
R10	Carbon film 8.2k	RD%VS 822J
R11	Carbon film 150	RD%VS 151J
R13	Carbon film 680	RD%PS 681J
R14	Carbon film 470k	RD%VS 474J
R15	Carbon film 68	RD%PS 680J
R16	Carbon film 2.2k	RD%VS 222J
R17	Carbon film 4.7k	RD%VS 472J
R18	Carbon film 68	RD%VS 680J
R19	Carbon film 1k	RD%PS 102J
R20	Carbon film 220	RD%PS 221J
R21	Carbon film 47k	RD%PS 473J
R22	Carbon film 100	RD%PS 101J
R23	Carbon film 330	RD%PS 331J
R24	Carbon film 1k	RD%PS 102J
R25	Carbon film 150	RD%PS 151J
R27	Carbon film 22k	RD%PS 223J
R28	Carbon film 15k	RD%PS 153J
R29	Carbon film 1k	RD%PS 102J
R30	Carbon film 2.7k	RD%PS 272J
R31	Carbon film 8.2k	RD%PS 822J
R32	Carbon film 6.8k	RD%PS 682J

Symbol	Description	Part No.
R33	Carbon film 100	RD%PS 101J
R34	Carbon film 39k	RD%PS 393J
R35	Carbon film 100	RD%PS 101J
R36	Carbon film 10k	RD%PS 103J
R37	Carbon film 33k	RD%PS 333J
R38	Carbon film 8.2k	RD%PS 822J
R39	Carbon film 3.3k	RD%PS 332J
R40	Carbon film 3.9k	RD%PS 392J
R41	Carbon film 1k	RD%PS 102J
R42	Carbon film 220k	RD%PS 224J
R43	Carbon film 4.7k	RD%PS 472J
R44	Carbon film 820	RD%PS 821J
R45	Carbon film 18	RD%PS 180J
R47	Carbon film 8.2k	RD%PS 822J
R48	Carbon film 4.7k	RD%PS 472J
R49	Carbon film 2.2k	RD%PS 222J
R50	Carbon film 100k	RD%PS 104J
R54	Carbon film 4.7k	RD%PS 472J
R55	Carbon film 33k	RD%PS 333J
R56	Carbon film 1.5k	RD%PS 152J
R57	Carbon film 15k	RD%PS 153J
R58	Carbon film 2.7k	RD%VS 272J
R59	Carbon film 150k	RD%PS 154J
R62	Carbon film 47	RD%PS 470J
R63	Carbon film 47k	RD%PS 473J
R64	Carbon film 150k	RD%PS 154J
R65	Carbon film 15k	RD%PS 153J
R66	Carbon film 1k	RD%PS 102J
R67	Carbon film 22	RD%PS 220J
R70	Carbon film 1k	RD%PS 102J

Symbol	Description	Part No.
R71	Carbon film 100	RD%PS 101J
R72	Carbon film 68k	RD%PS 683J
R73	Carbon film 68k	RD%PS 683J
R74	Carbon film 68k	RD%PS 683J
R75	Carbon film 68k	RD%PS 683J
R76	Carbon film 6.8k	RD%PS 682J
R77	Carbon film 6.8k	RD%PS 682J
R78	Carbon film 6.8k	RD%PS 682J
R79	Carbon film 6.8k	RD%PS 682J
R80	Carbon film 4.7k	RD%PS 472J
R81	Carbon film 4.7k	RD%PS 472J
R82	Carbon film 100	RD%PS 101J
R84	Carbon film 68k	RD%PS 683J
R85	Carbon film 5.6k	RD%PS 562J
R86	Carbon film 1k	RD%PS 102J
R87	Carbon film 1k	RD%PS 102J

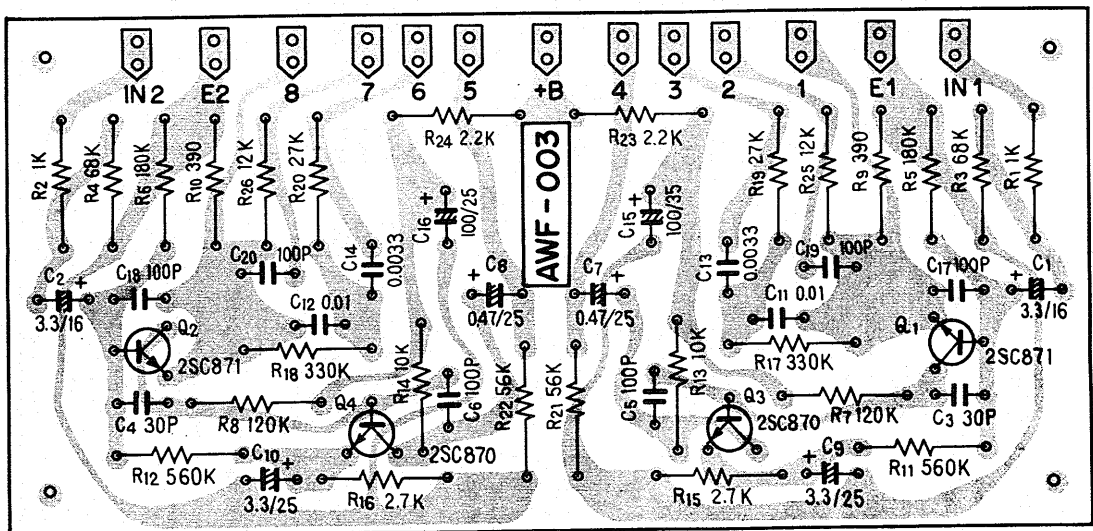
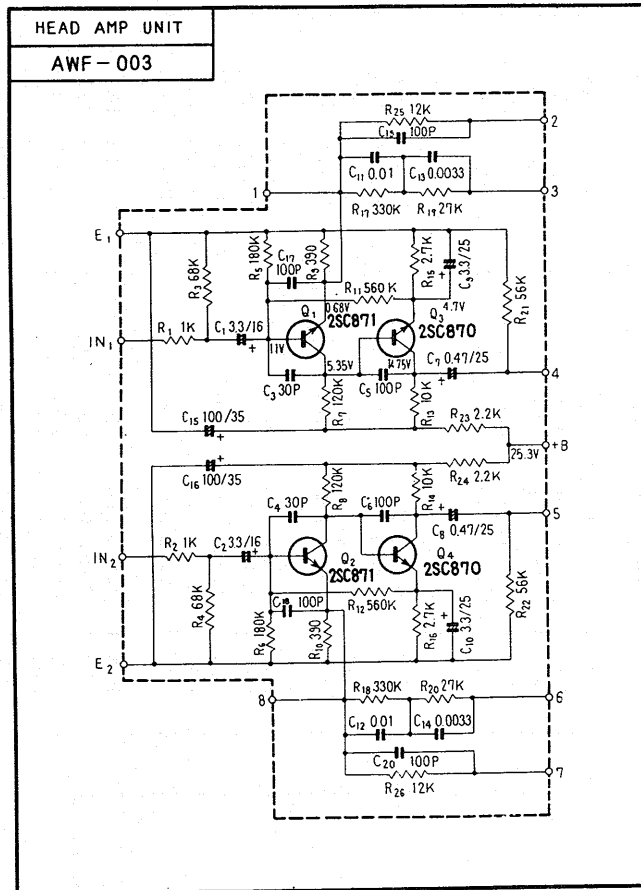
## COILS AND TRANSFORMERS

Symbol	Description	Part No.	
T1	FM antenna coil	ATC-002-0	
T2	FM RF coil	ATC-004-0	
T3	FM OSC coil	ATC-003-0	
T4	Matching transformer	ATE-001-A	
T5	FM IF transformer	T73-035-A	
T6	FM IF transformer	T73-036-0	
T7	FM IF transformer	T74-003-A	
T8	AM OSC coil	ATB-001-A	
T9	AM IF transformer	T71-028-0	
T10	AM IF transformer	T71-026-0	
T11	AM IF transformer	T72-022-0	
T12	SCA coil	T75-027-0	
T13	19kHz transformer	T75-023-B	
T14	19kHz transformer	T75-024-B	
T15	38kHz transformer	T75-025-B	
T16	38kHz filter coil	T75-028-0	
T17	38kHz filter coil	T75-028-0	
T18	SCA coil	T75-029-0	
L1	RF choke coil	T24-028-0	
L2	RF choke coil	T24-028-0	
L3	RF choke coil	T24-028-0	

## SEMICONDUCTORS

Symbol	Description	Part No.	
Q1	2SK19-Y FET		
Q2	2SC763-D or C Transistor		
Q3	2SC763-D or C Transistor		
Q4	SE3001 Transistor		
Q5	SE3001 Transistor		
Q6	TA7060P-W IC		
Q7	SE3001 Transistor		
Q8	2SC710-D or DR Transistor		
Q9	2SC711-F Transistor		
Q10	2SC711-E or F Transistor		
Q11	2SC711-E or F Transistor		
Q12	2SC373 Transistor		
Q13	IC filter		W53-046-A
D2	1S188 FM-1 Diode		
D3	1S188 FM-1 Diode		
D4	1S188 FM-1 Diode		
D5	1S188 FM-1 Diode		
D6	1S188 FM-1 Diode		
D7	1S188 FM-1 Diode		
D8	1S188 FM-1 Diode		
D9	1S188 FM-1 Diode		
D10	1S188 FM-1 Diode		
D11	1S2076 Diode		
D12	1S2076 Diode		
D13	1S188 FM-1 Diode		
D14	1S188 FM-1 Diode		
D15	1S188 FM-1 Diode		
D16	1S188 FM-1 Diode		
D17	1S188 FM-1 Diode		

10-3 HEAD AMP UNIT (AWF-003)



## ⚙️ PARTS LIST OF HEAD AMP UNIT

### CAPACITORS

Symbol	Description	Part No.	
C1	Electrolytic 3.3 16V	CSSA 3R3M 16	
C2	Electrolytic 3.3 16V	CSSA 3R3M 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 25V	CSSA R47M 25	
C8	Electrolytic 0.47 25V	CSSA R47M 25	
C9	Electrolytic 3.3 25V	CEA 3R3P 25	
C10	Electrolytic 3.3 25V	CEA 3R3P 25	
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 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	

### SEMICONDUCTORS

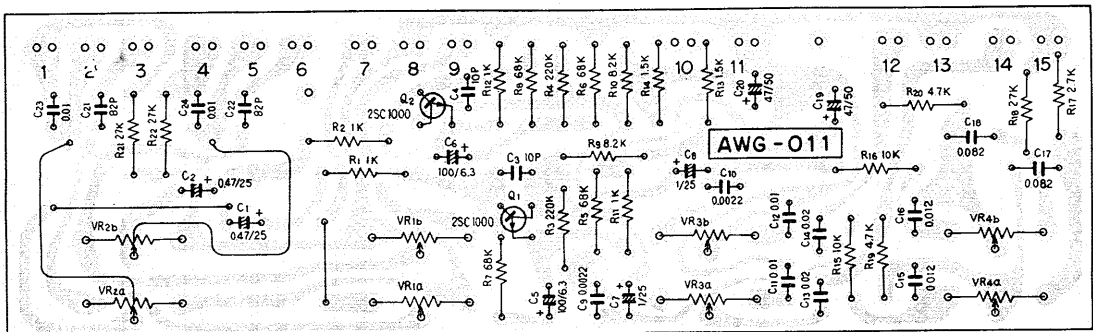
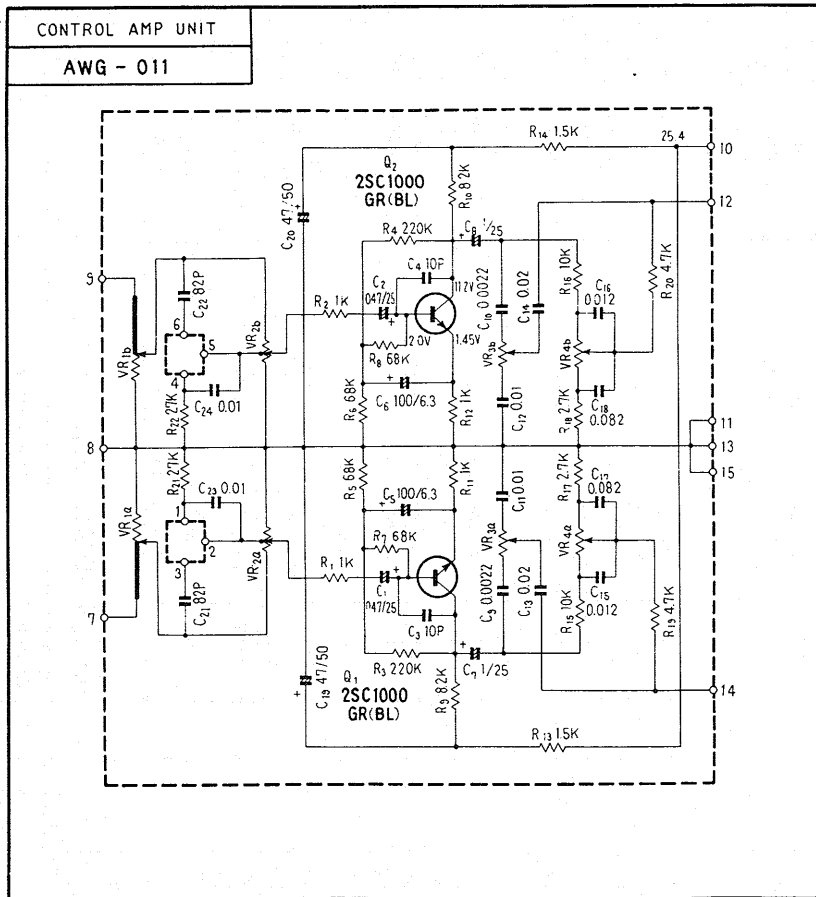
Symbol	Description	Part No.	
Q1	2SC871-E or F Transistor		
Q2	2SC871-E or F Transistor		
Q3	2SC870-E or F Transistor		
Q4	2SC870-E or F Transistor		

### 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	
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 560k	RD¼PS 564J	
R12	Carbon film 560k	RD¼PS 564J	
R13	Carbon film 10k	RD¼PS 103J	
R14	Carbon film 10k	RD¼PS 103J	
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 12k	RD¼PS 123J	
R26	Carbon film 12k	RD¼PS 123J	



10-4 CONTROL AMP UNIT (AWG-011)



42 PARTS LIST OF CONTROL AMP UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	0.47	25V	CSSA	R 47X 25
C2	Electrolytic	0.47	25V	CSSA	R 47X 25
C3	Ceramic	10p	50V	CCDSL	100K 50
C4	Ceramic	10p	50V	CCDSL	100K 50
C5	Electrolytic	100	6V	CEA	101P 6
C6	Electrolytic	100	6V	CEA	101P 6
C7	Electrolytic	1	25V	CSSA	010X 25
C8	Electrolytic	1	25V	CSSA	010X 25
C9	Mylar	0.0022	50V	CQMA	222J 50
C10	Mylar	0.0022	50V	CQMA	222J 50
C11	Mylar	0.01	50V	CQMA	103J 50
C12	Mylar	0.01	50V	CQMA	103J 50
C13	Mylar	0.02	50V	CQMA	203K 50
C14	Mylar	0.02	50V	CQMA	203K 50
C15	Mylar	0.012	50V	CQMA	123J 50
C16	Mylar	0.012	50V	CQMA	123J 50
C17	Mylar	0.082	50V	CQMA	823J 50
C18	Mylar	0.082	50V	CQMA	823J 50
C19	Electrolytic	47	50V	CEA	470P 50
C20	Electrolytic	47	50V	CEA	470P 50
C21	Ceramic	82p	50V	CCDSL	820K 50
C22	Ceramic	82p	50V	CCDSL	820K 50
C23	Mylar	0.01	50V	CQMA	103J 50
C24	Mylar	0.01	50V	CQMA	103J 50

SEMICONDUCTORS

Symbol	Description		Part No.
Q1	2SC1000-GR or BL	Transistor	
Q2	2SC1000-GR or BL	Transistor	

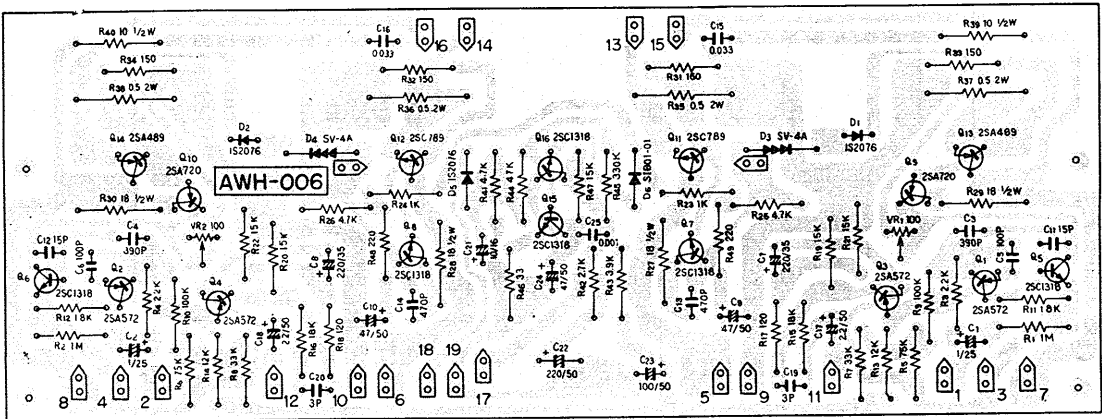
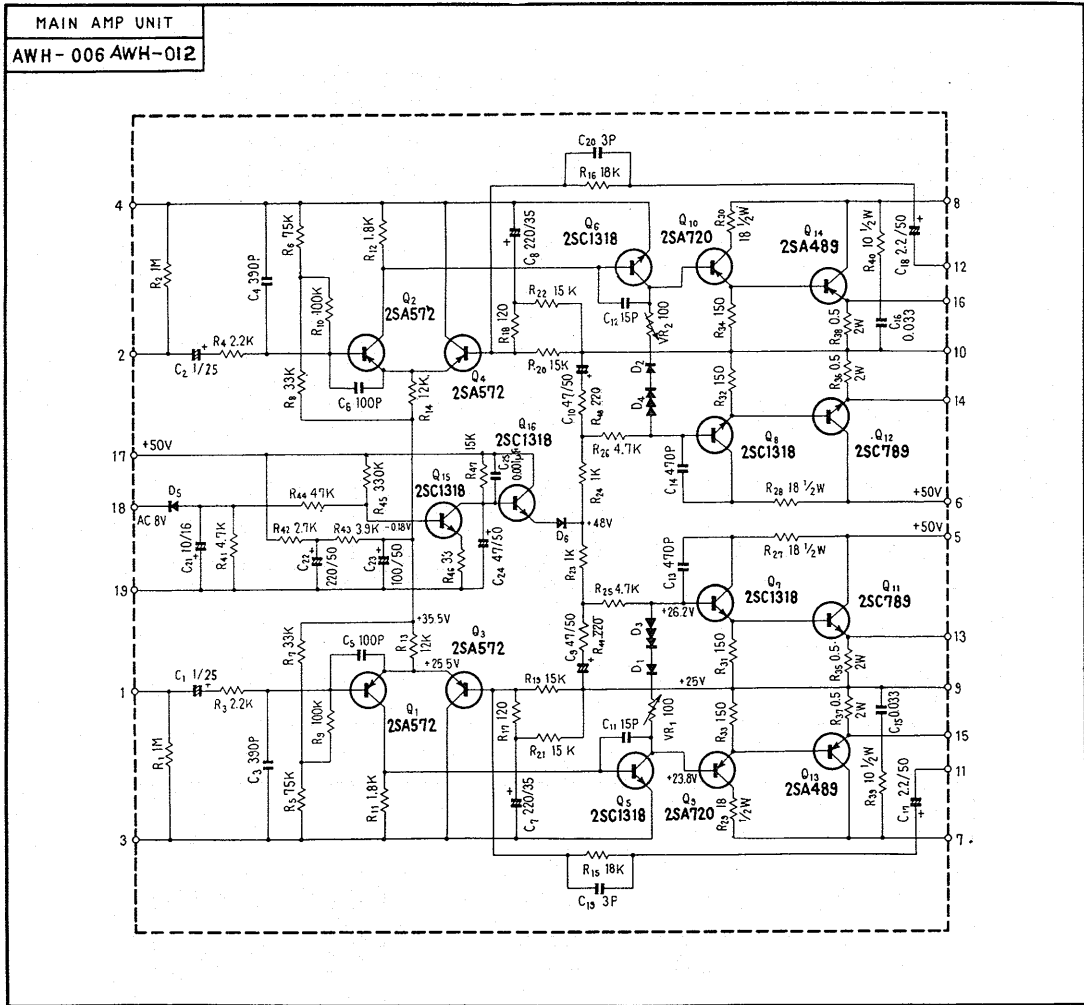
RESISTORS

Symbol	Description		Part No.
R1	Carbon film	1k	RD¼PS 102J
R2	Carbon film	1k	RD¼PS 102J
R3	Carbon film	220k	RD¼PS 224J
R4	Carbon film	220k	RD¼PS 224J
R5	Carbon film	68k	RD¼PS 683J
R6	Carbon film	68k	RD¼PS 683J
R7	Carbon film	68k	RD¼PS 683J
R8	Carbon film	68k	RD¼PS 683J
R9	Carbon film	8.2k	RD¼PS 822J
R10	Carbon film	8.2k	RD¼PS 822J
R11	Carbon film	1k	RD¼PS 102J
R12	Carbon film	1k	RD¼PS 102J
R13	Carbon film	1.5k	RD¼PS 152J
R14	Carbon film	1.5k	RD¼PS 152J
R15	Carbon film	10k	RD¼PS 103J
R16	Carbon film	10k	RD¼PS 103J
R17	Carbon film	2.7k	RD¼PS 272J
R18	Carbon film	2.7k	RD¼PS 272J
R19	Carbon film	4.7k	RD¼PS 472J
R20	Carbon film	4.7k	RD¼PS 472J
R21	Carbon film	27k	RD¼PS 273J
R22	Carbon film	27k	RD¼PS 273J

POTENTIOMETERS

Symbol	Description	Part No.
VR1	Dual, balance	ACV-106-0
VR2	Dual, volume	ACV-105-0
VR3	Dual, treble	C82-046-A
VR4	Dual, bass	C82-046-A

10-5 MAIN AMP UNIT (AWH-006) (AWH-012, for NBW model)



#### 4 PARTS LIST OF MAIN AMP UNIT

##### CAPACITORS

Symbol	Description	Part No.
C1	Electrolytic 1 25V	CSSA 010X 25
C2	Electrolytic 1 25V	CSSA 010X 25
C3	Ceramic 390p 50V	CKDYB 391K 50
C4	Ceramic 390p 50V	CKDYB 391K 50
C5	Ceramic 100p 50V	CCDSL 101K 50
C6	Ceramic 100p 50V	CCDSL 101K 50
C7	Electrolytic 220 35V	CEA 221P 35
C8	Electrolytic 220 35V	CEA 221P 35
C9	Electrolytic 47 50V	CEA 470P 50
C10	Electrolytic 47 50V	CEA 470P 50
C11	Ceramic 15p 50V	CCDSL 150K 50
C12	Ceramic 15p 50V	CCDSL 150K 50
C13	Ceramic 470p 50V	CKDYB 471K 50
C14	Ceramic 470P 50V	CKDYB 471K 50
C15	Mylar 0.033 50V	CQMA 333K 50
C16	Mylar 0.033 50V	CQMA 333K 50
C17	Electrolytic 2.2 50V	CEA 2R2P 50
C18	Electrolytic 2.2 50V	CEA 2R2P 50
C19	Ceramic 3p 50V	CCDSL 030C 50
C20	Ceramic 3p 50V	CCDSL 030C 50
C21	Electrolytic 10 16V	CEA 100P 16
C22	Electrolytic 220 50V	CEA 221P 50
C23	Electrolytic 100 50V	CEA 101P 50
C24	Electrolytic 47 50V	CEA 470P 50
C25	Mylar 0.001 50V	CQMA 102K 50

##### RESISTORS

Symbol	Description	Part No.
R1	Carbon film 1M	RD¼PS 105J
R2	Carbon film 1M	RD¼PS 105J
R3	Carbon film 2.2k	RD¼PS 222J
R4	Carbon film 2.2k	RD¼PS 222J
R5	Carbon film 75k	RD¼PS 753J
R6	Carbon film 75k	RD¼PS 753J
R7	Carbon film 33k	RD¼PS 333J
R8	Carbon film 33k	RD¼PS 333J
R9	Carbon film 100k	RD¼PS 104J
R10	Carbon film 100k	RD¼PS 104J
R11	Carbon film 1.8k	RD¼PS 182J
R12	Carbon film 1.8k	RD¼PS 182J
R13	Carbon film 12k	RD¼PS 123J
R14	Carbon film 12k	RD¼PS 123J
R15	Carbon film 18k	RD¼PS 183J
R16	Carbon film 18k	RD¼PS 183J
R17	Carbon film 120	RD¼PS 121J
R18	Carbon film 120	RD¼PS 121J
R19	Carbon film 15k	RD¼PS 153J
R20	Carbon film 15k	RD¼PS 153J
R21	Carbon film 15K	RD¼PS 153J
R22	Carbon film 15k	RD¼PS 153J
R23	Carbon film 1k	RD¼PS 102J
R24	Carbon film 1k	RD¼PS 102J
R25	Carbon film 15k	RD¼PS 153J

Symbol	Description	Part No.
R26	Carbon film 15k	RD½PS 153J
R27	Carbon film 18 ½W	RD½PS 180J
R28	Carbon film 18 ½W	RD½PS 180J
R29	Carbon film 18 ½W	RD½PS 180J
R30	Carbon film 18 ½W	RD½PS 180J
R31	Carbon film 150	RD½PS 151J
R32	Carbon film 150	RD½PS 151J
R33	Carbon film 150	RD½PS 151J
R34	Carbon film 150	RD½PS 151J
R35	Metal oxide 0.5 2W	RN2P 0R5K
R36	Metal oxide 0.5 2W	RN2P 0R5K
R37	Metal oxide 0.5 2W	RN2P 0R5K
R38	Metal oxide 0.5 2W	RN2P 0R5K
R39	Carbon film 10 ½W	RD½PS 100J
R40	Carbon film 10 ½W	RD½PS 100J
R41	Carbon film 4.7k	RD½PS 472J
R42	Carbon film 2.7k	RD½PS 272J
R43	Carbon film 3.9k	RD½PS 392J
R44	Carbon film 47k	RD½PS 473J
R45	Carbon film 330k	RD½PS 334J
R46	Carbon film 33	RD½PS 330J
R47	Carbon film 15k	RD½PS 153J

### OTHERS

Symbol	Description	Part No.
	Insulating bushing	E32-047-0
	Insulating spacer	E32-102-0

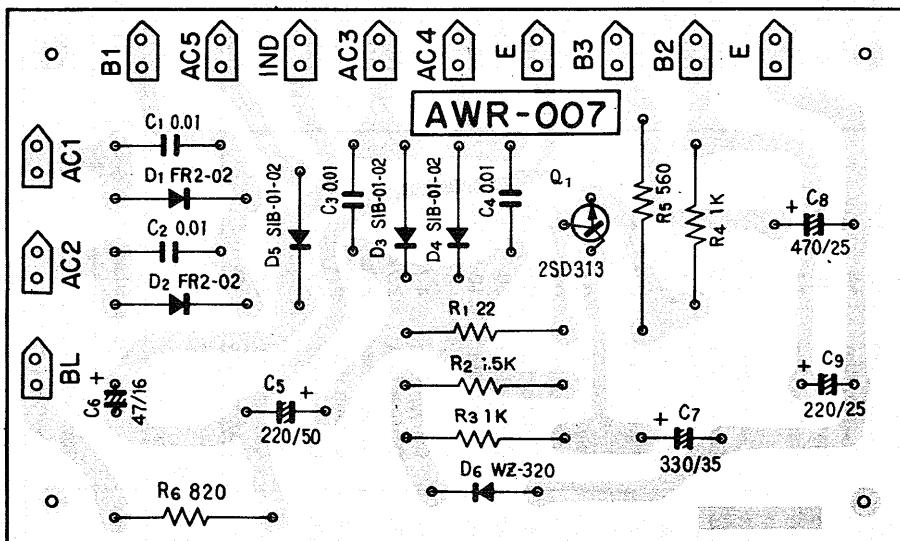
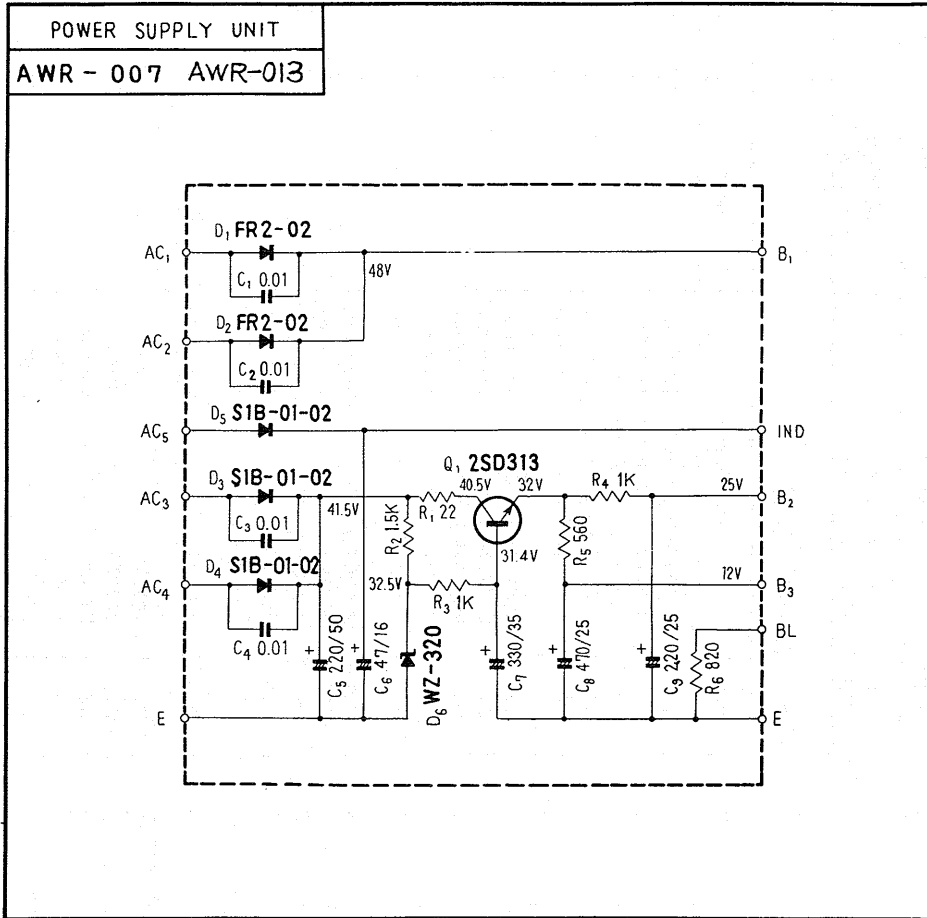
### POTENTIOMETERS

Symbol	Description	Part No.
VR1	100-B, semi-fixed	C92-063-0
VR2	100-B, semi-fixed	C92-063-0

### 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	2SC1318-R or Q Transistor	
Q6	2SC1318-R or Q Transistor	
Q7	2SC1318-R or Q Transistor	
Q8	2SC1318-R or Q Transistor	
Q9	2SA720-R or S Transistor	
Q10	2SA720-R or S Transistor	
Q11	2SC789-O Transistor	
Q12	2SC789-O Transistor	
Q13	2SA489-O Transistor	
Q14	2SA489-O Transistor	
Q15	2SC1318-R or S Transistor	
Q16	2SC1318-R or S Transistor	
D1	1S2076 Diode	
D2	1S2076 Diode	
D3	SV-4A Varistor	
D4	SV-4A Varistor	
D5	1S2076 Diode	
D6	SIB01-01 Diode	

10-6 POWER SUPPLY UNIT (AWR-007) (AWR-013, 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	220	50V	CEA 221M 50
C6	Electrolytic	47	16V	CEA 470M 16
C7	Electrolytic	330	35V	CEA 331M 35
C8	Electrolytic	470	25V	CEA 471M 25
C9	Electrolytic	220	25V	CEA 221M 25

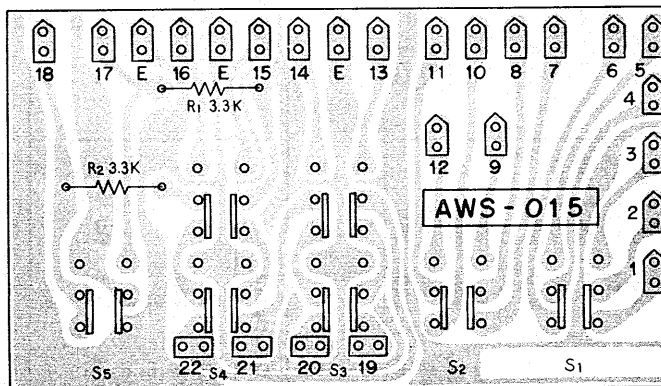
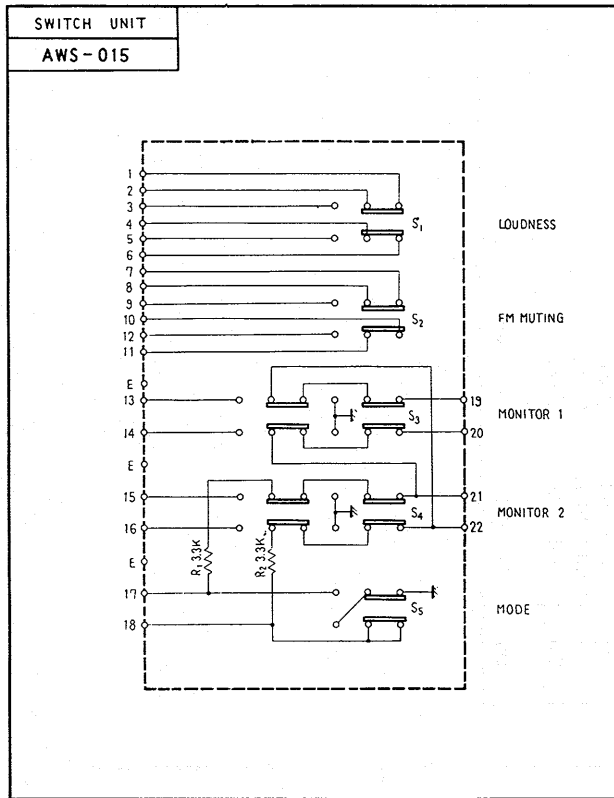
### RESISTORS

Symbol	Description			Part No.
R1	Carbon film	22		RD $\frac{1}{4}$ PS 220J
R2	Carbon film	1.5k		RD $\frac{1}{4}$ PS 152J
R3	Carbon film	1k		RD $\frac{1}{4}$ PS 102J
R4	Carbon film	1k		RD $\frac{1}{4}$ PS 102J
R5	Wire wound	560	1W	RM1P 561K
R6	Carbon film	820	$\frac{1}{2}$ W	RD $\frac{1}{2}$ PS 821J

## SEMICONDUCTORS

Symbol	Description		Part No.
Q1	2SD313-E or D	Transistor	
D1	FR2-02	Diode	
D2	FR2-02	Diode	
D3	SIB01-02	Diode	
D4	SIB01-02	Diode	
D5	SIB01-02	Diode	
D6	WZ-320	Zener diode	

# 10-7 SWITCH UNIT (AWS-015)





## PARTS LIST OF SWITCH UNIT

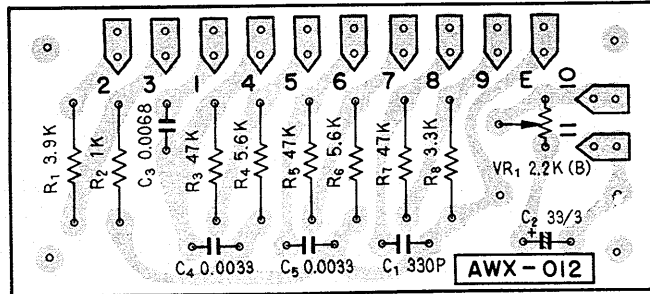
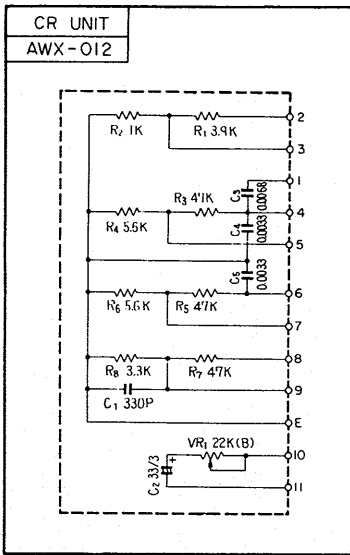
### SWITCH

Symbol	Description	Part No.	
	Mini switch	ASG-016-0	

### RESISTORS

Symbol	Description	Part No.	
R1	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332J	
R2	Carbon film 3.3k	RD $\frac{1}{4}$ PS 332J	

## 10-8 CR UNIT (AWX-012) (AWX-013)



### PARTS LIST OF CR UNIT

#### CAPACITORS

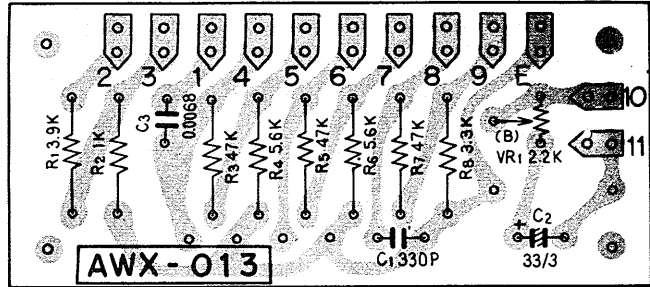
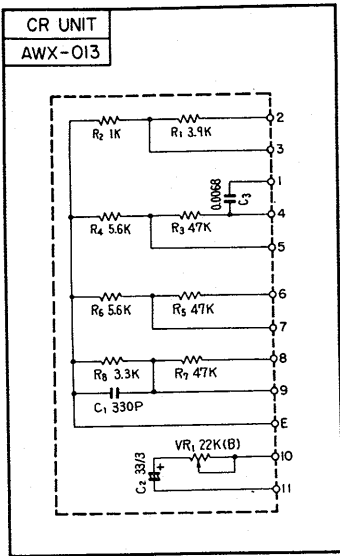
Symbol	Description		Part No.
C1	Ceramic	330p 50V	CKDYB 331K 50
C2	Electrolytic	33 10V	CEA 330P 10
C3	Mylar	0.0068 50V	CQMA 682K 50
C4	Mylar	0.0033 50V	CQMA 332K 50
C5	Mylar	0.0033 50V	CQMA 332K 50

#### RESISTORS

Symbol	Description		Part No.
R1	Carbon film	3.9k	RD½PS 392J
R2	Carbon film	1k	RD½PS 102J
R3	Carbon film	47k	RD½PS 473F
R4	Carbon film	5.6k	RD½PS 562F
R5	Carbon film	47k	RD½PS 473F
R6	Carbon film	5.6k	RD½PS 562F
R7	Carbon film	47k	RD½PS 473J
R8	Carbon film	3.3k	RD½PS 332J

#### POTENTIOMETER

Symbol	Description	Part No.
VR1	Semi-fixed, 22k-B	ACP-001-0



PARTS LISTS OF CR UNIT

CAPACITORS

Symbol	Description	Part No.
C1	Ceramic 330p 50V	CKDYB 331K 50
C2	Electrolytic 33 10V	CEA 330P 10
C3	Mylar 0.0068 50V	CQMA 682K 50

RESISTORS

Symbol	Description	Part No.
R1	Carbon film 3.9k	RD½PS 392J
R2	Carbon film 1k	RD½PS 102J
R3	Carbon film 47k	RD½PS 473J
R4	Carbon film 5.6k	RD½PS 562J
R5	Carbon film 47k	RD½PS 473J
R6	Carbon film 5.6k	RD½PS 562J
R7	Carbon film 47k	RD½PS 473J
R8	Carbon film 3.3k	RD½PS 332J

POTENTIOMETER

Symbol	Description	Part No.
VR1	Semi-fixed, 22k-B	ACP-001-0

MEMO

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