〈R42-241-0〉

Service Manual

AM/FM STEREO RECEIVER

SX-424/KUW, FVZW

NOTE

MODEL SX-424 COMES IN TWO VERSIONS DISTINGUISHED AS FOLLOWS:

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

〈72C03MI0D〉

PIONEER®

CONTENTS

1. SPECIFICATIONS

SEMICONDUCTORS

FETs	1
Transistors	30
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AMPLIFIER SECTION

Music Power Output (IHF)	50W (4Ω)	
	37W (8Ω)	
Continuous Power Output (1kHz each channel driven)	18W/18W (4Ω)	
	14W/14W (8Ω)	
Continuous Power Output (1kHz both channels driven)	13W + 13W (4Ω)	
	12W + 12W (8Ω)	
Harmonic Distortion	Less than 1% (Continuous power output)	
Intermodulation Distortion	Less than 1% (Continuous power output)	
Power Bandwith (IHF)	20Hz to 45kHz (8Ω, Harmonic distortion less than 1%)	
Frequency Response	20Hz to 70kHz, ±3dB	
Speakers	4 to 16Ω	
Damping Factor	40 (8Ω, 1kHz)	
Input Sensitivity/Impedance	PHONO MAG	3mV/50kΩ
	MIC	4.5mV/50kΩ
	AUX	180mV/100kΩ
	TAPE MONITOR	180mV/100kΩ
	TAPE MONITOR (DIN)	180mV/100kΩ
Recording Output	TAPE REC (Pin Jack)	180mV
	TAPE REC (DIN connector)	36mV
BASS Control	−9dB, +9dB/100Hz	
TREBLE Control	−9dB, +6dB/10kHz	
Equalization Curve	PHONO: RIAA S.T.D.	
Loudness Contour	+9.5dB/100Hz, +5.5dB/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)	2.3μV
Capture Ratio (IHF)	3.5dB
Image Rejection	More than 50dB (98MHz)
IF Rejection	More than 80dB (90MHz)
Spurious Rejection	More than 70dB (98MHz)
AM Suppression	45dB
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 type
Stereo Separation	More than 40dB (1kHz)
Sub Carrier Suppression	More than 35dB
Noise Filter	Switchable to ON-OFF
Antenna Input	Impedance 300Ω balanced and 75Ω unbalanced

AM TUNER SECTION

Frequency Range	525kHz to 1,605kHz
Usable Sensitivity (IHF)	15μV
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, 220V 50-60Hz or 110V, 120V, 130V 220V and 240V. (Switchable) 50-60Hz
Power Consumption	90W (Max.)
AC Outlets	Switched 1, Unswitched 1.
Dimensions (overall)	16-31/32 in./431 mm (width) 5-3/4 in./146 mm (height) 13-21/32 in./347 mm (depth)
Weight (Without package)	16 lb, 8oz/7.5 kg (120 voltage model) 17 lb, 6oz/7.9 kg
(With package)	20 lb, 14oz/9.5 kg (120 voltage model) 21 lb, 13oz/9.9 kg

Furnished Parts		
	FM T-type Antenna	1
	Fuse: 1A	1
	0.5A (5 line voltage model only)	2
	Pin Plug	2
	Speaker Plug	4
	Polishing Cloth	1
	Operating Instructions	1

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

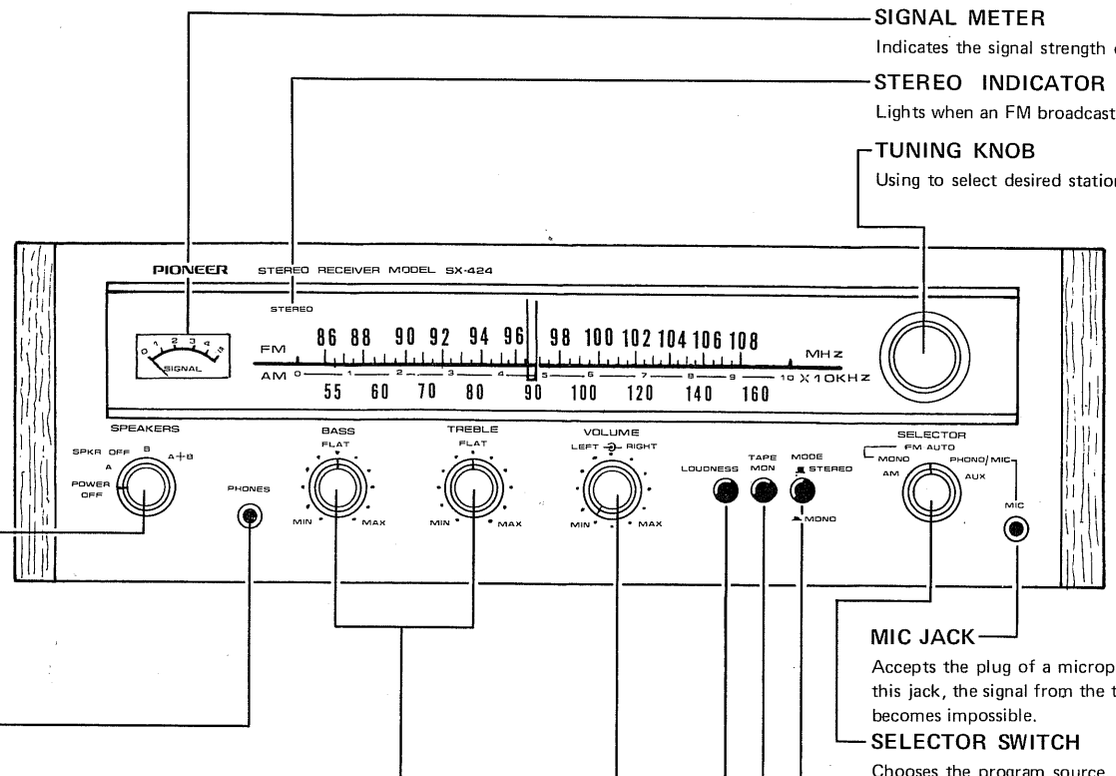
2. FRONT PANEL FACILITIES

SPEAKERS SWITCH

A combination of the power on/off switch and the speaker system selector switch.

POWER

OFF . . . . The equipment is dead.
A . . . . . Sound comes through the speaker system A.
SPKR OFF . . . . . No sound from any speaker system.
Useful for listening through headphones.
B . . . . . Speaker system B is in operation.
A+B . . . . . Both speaker systems A and B are in operation.



SIGNAL METER

Indicates the signal strength of the received AM or FM station.

STEREO INDICATOR

Lights when an FM broadcast is in stereo.

TUNING KNOB

Using to select desired stations.

PHONES JACK

For plugging in stereo headphones.
A variety of high-performance headphones is available from Pioneer.

BASS & TREBLE CONTROLS

Control bass and treble. Turning each control clockwise from the FLAT position will boost the tone, and turning it counterclockwise will diminish the tone.

VOLUME CONTROL

The volume increases when this dual-concentric control is turned clockwise and decreases when the control is turned counterclockwise. Both parts of the knob usually rotate together. To adjust the volume of either the right or left channel alone, hold one part of the control knob with one hand and turn the other with the other hand. Convenient in balancing the volume of both channels. The front knob is for the left channel, the rear one for the right.

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

MIC JACK

Accepts the plug of a microphone. When a microphone is plugged into this jack, the signal from the turntable is interrupted, i.e. record playing becomes impossible.

SELECTOR SWITCH

Chooses the program source.

AM . . . . . AM reception.
FM MONO . . . . . FM monophonic reception only.
FM AUTO . . . . . FM reception with automatic switching for either stereo or monophonic programs.
PHONO/MIC . . . . . For playing records or using a microphone.
AUX . . . . . Program source plugged into the AUX jacks.

MODE SWITCH

STEREO: Stereo sound, left and right channels separated.
MONO: Left and right channels blended. Monophonic sound.

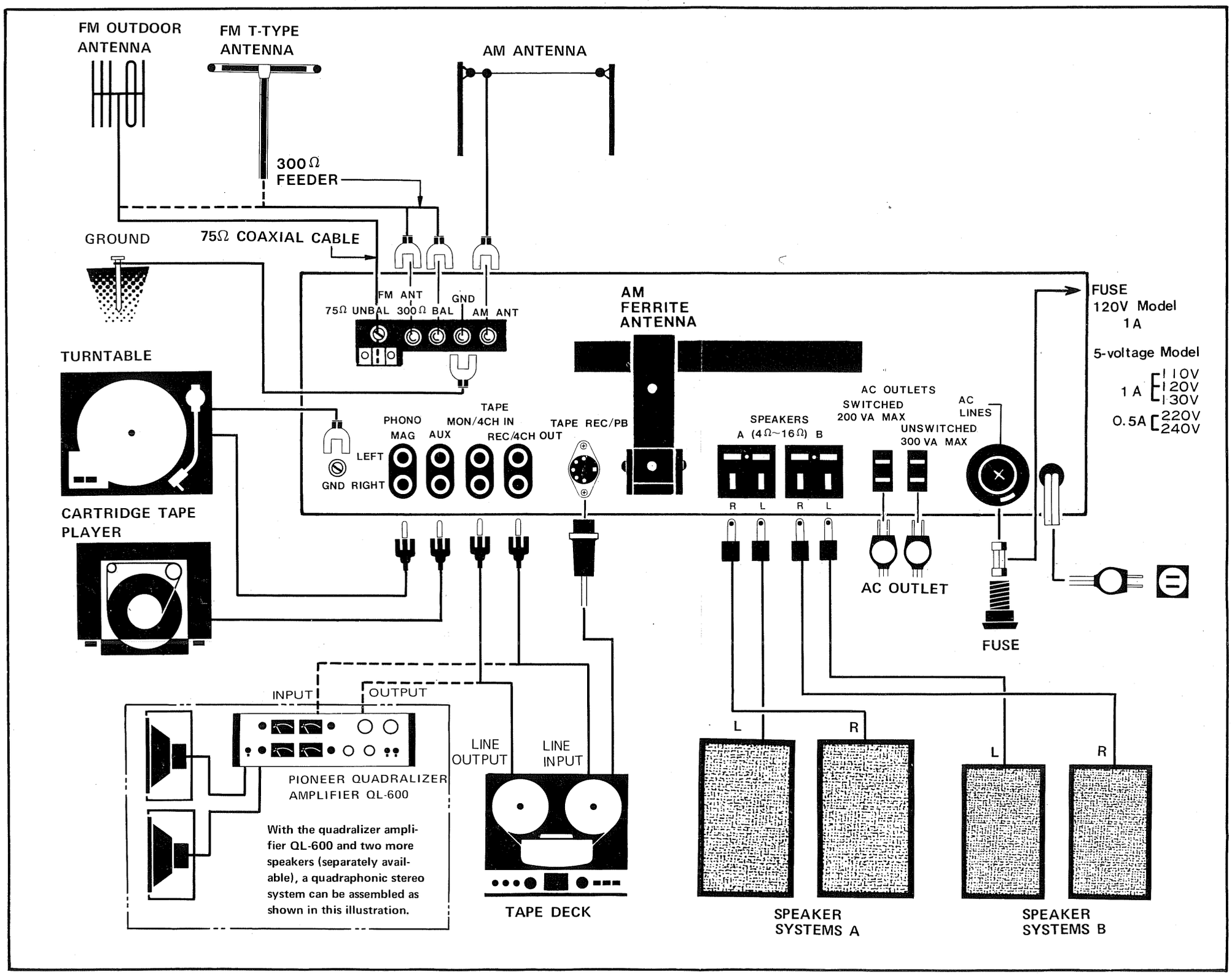
TAPE MONITOR SWITCH

This switch is set to ON (pushed) for monitoring a recording in progress and for playback of recorded tapes, when the tape deck is connected to the TAPE MON jacks and TAPE REC jacks or TAPE REC/P.B. socket.

LOUDNESS SWITCH

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

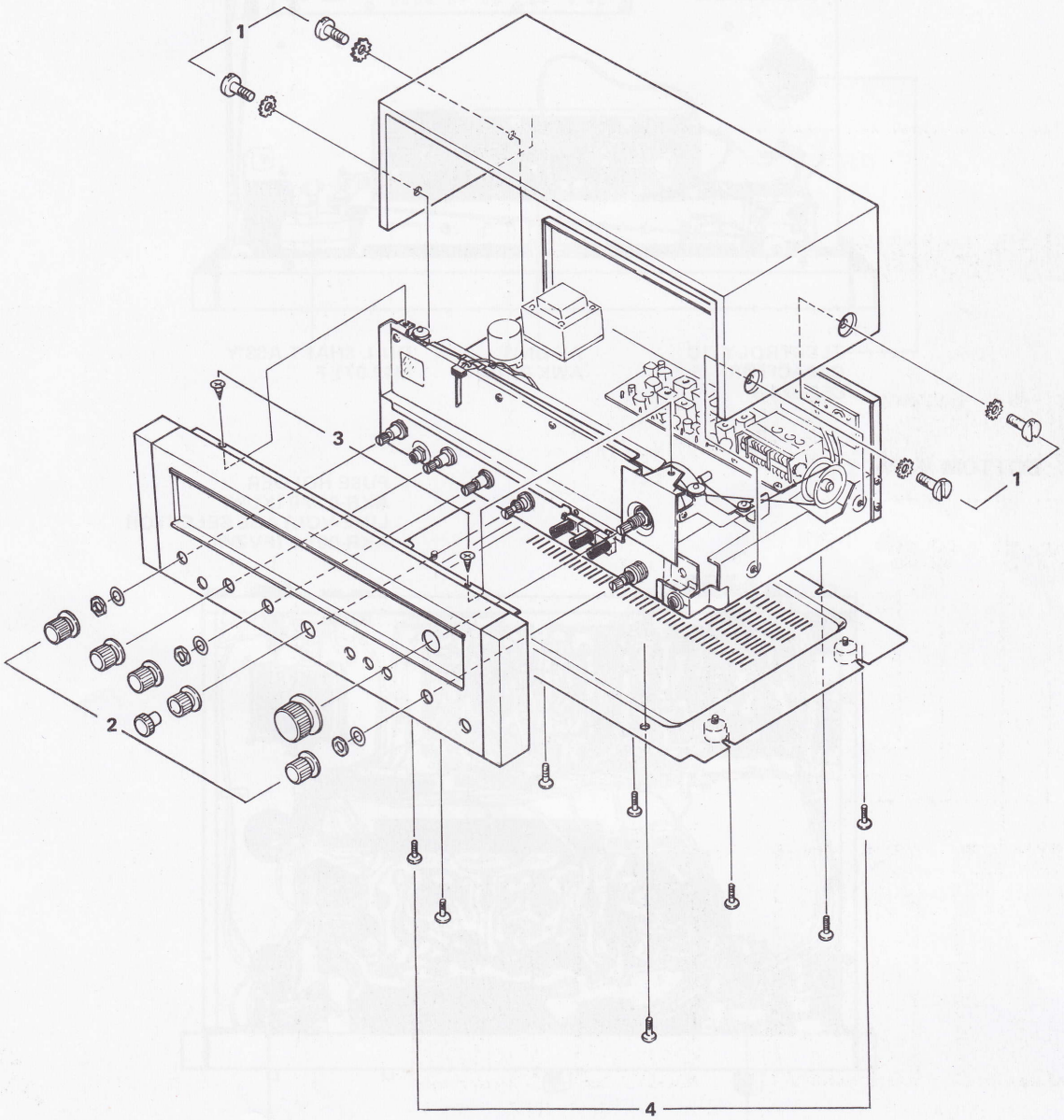
3. CONNECTION DIAGRAM



4. DISASSEMBLY

- Numbers indicate order of disassembly

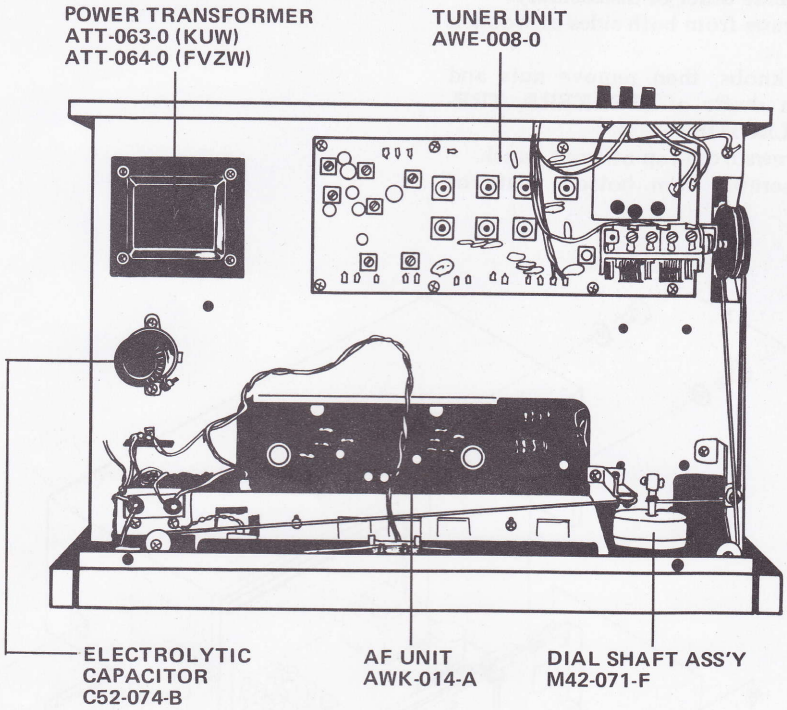
1. Remove 4 screws from both sides of wooden case.
2. Pull off all knobs, then remove nuts and washers from shafts of SPEAKERS, TREBLE, and SELECTOR.
3. Remove 2 screws from top of front panel.
4. Remove 8 screws from bottom plate of receiver.



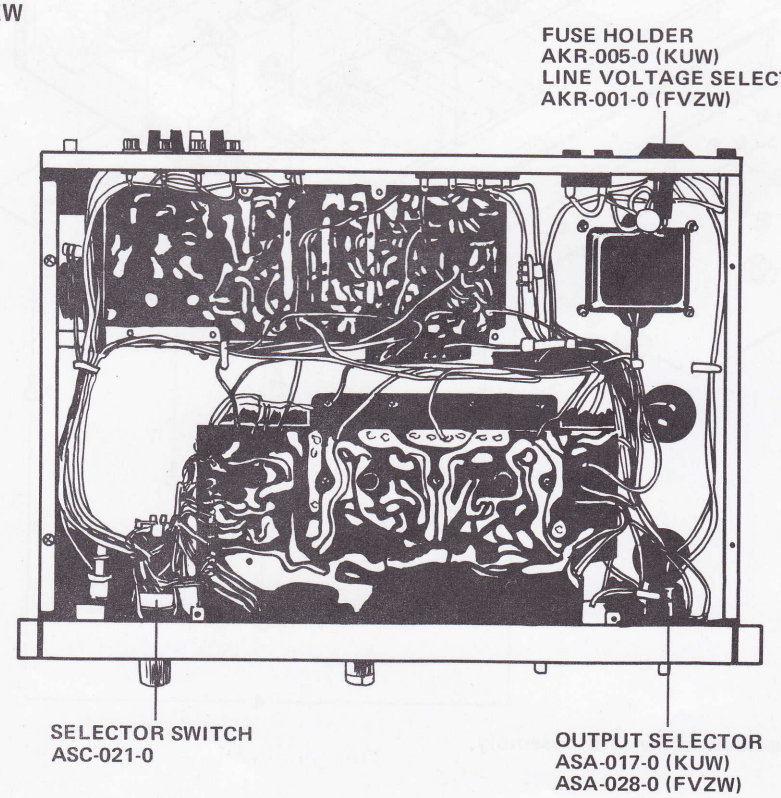
- Numbers indicate order of disassembly.

5. PARTS AND PCB LOCATION

TOP VIEW

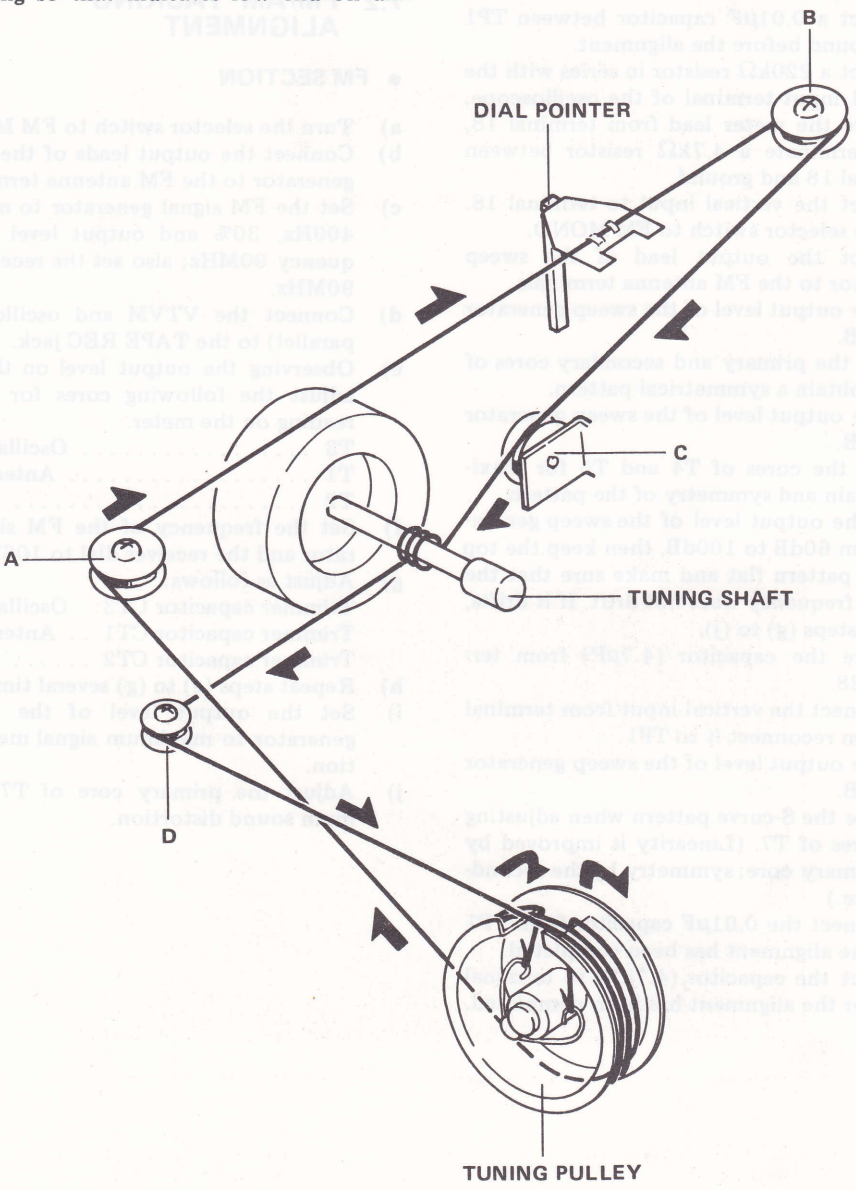


BOTTOM VIEW



6. DIAL CORD STRINGING

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



7. ALIGNMENT PROCEDURE

REQUIRED INSTRUMENTS

- FM/AM Signal generator
- FM/AM Sweep generator: Center frequency 10.7MHz, 455kHz
- Oscilloscope
- AC VTVM
- FM multiplex signal generator preferbly with RF output

7.1 FM/AM IF ALIGNMENT

• FM SECTION

a) Connect a 0.01μF capacitor between TP1 and ground before the alignment.
b) Connect a 220kΩ resistor in series with the vertical input terminal of the oscilloscope.
c) Remove the meter lead from terminal 18, then terminate a 4.7kΩ resistor between terminal 18 and ground.
d) Connect the vertical input to terminal 18.
e) Set the selector switch to FM MONO.
f) Connect the output lead of the sweep generator to the FM antenna terminals.
g) Set the output level of the sweep generator to 90dB.
h) Adjust the primary and secondary cores of T6 to obtain a symmetrical pattern.
i) Set the output level of the sweep generator to 70dB.
j) Adjust the cores of T4 and T5 for maximum gain and symmetry of the pattern.
k) Vary the output level of the sweep ger a-tor from 60dB to 100dB, then keep the top of the pattern flat and make sure that the center frequency does not drift. If it drifts, repeat steps (g) to (j).
l) Remove the capacitor (4.7μF) from terminal 28.
m) Disconnect the vertical input from terminal 18, then reconnect it to TP1.
n) Set the output level of the sweep generator to 70dB.
o) Observe the S-curve pattern when adjusting the cores of T7. (Linearity is improved by the primary core; symmetry by the secondary core.)
p) Disconnect the 0.01μF capacitor from TP1 after the alignment has been completed.
q) Connect the capacitor (4.7μF) to terminal 28 after the alignment has been completed.

• AM SECTION

a) Turn the selector switch to AM.
b) Connect the output lead of the sweep generator to the AM antenna terminal.
c) Connect the vertical input of the oscilloscope to the TAPE REC jack.
d) Set the output level of the sweep generator to 75dB.
e) Adjust the IFT cores (T9, T10, T11) as shown in Fig. 1, for maximum gain and symmetrical pattern.

7.2 FM/AM TACKING ALIGNMENT

• FM SECTION

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, 30% and output level 15dB frequency 90MHz; also set the 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 for 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) Set the output level of the FM signal generator to maximum signal meter deflection.
j) Adjust the primary core of T7 for minimum sound distortion.

• AM SECTION

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

7.3 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 tuner unit until the output level of the L or R signal becomes maximum on the scope.

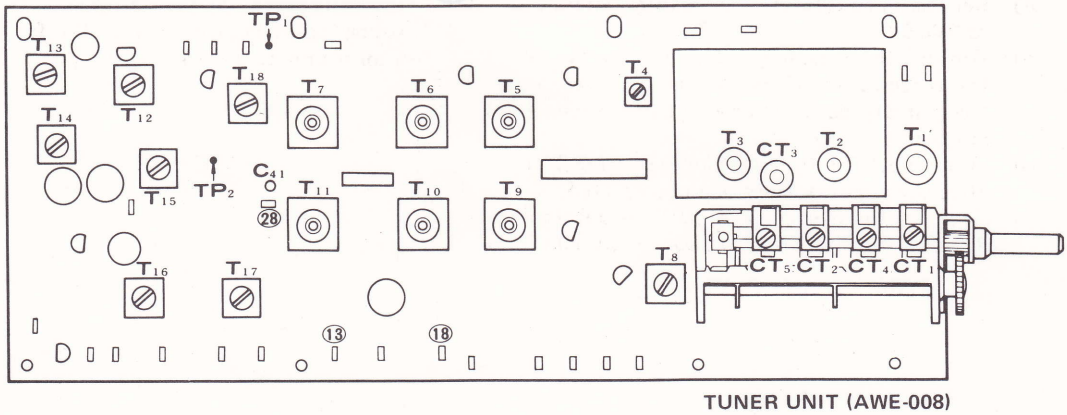
7.4 OTHER ALIGNMENT

• CHECKING THE SCA FILTER

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

• CHECKING THE STEREO INDICATOR

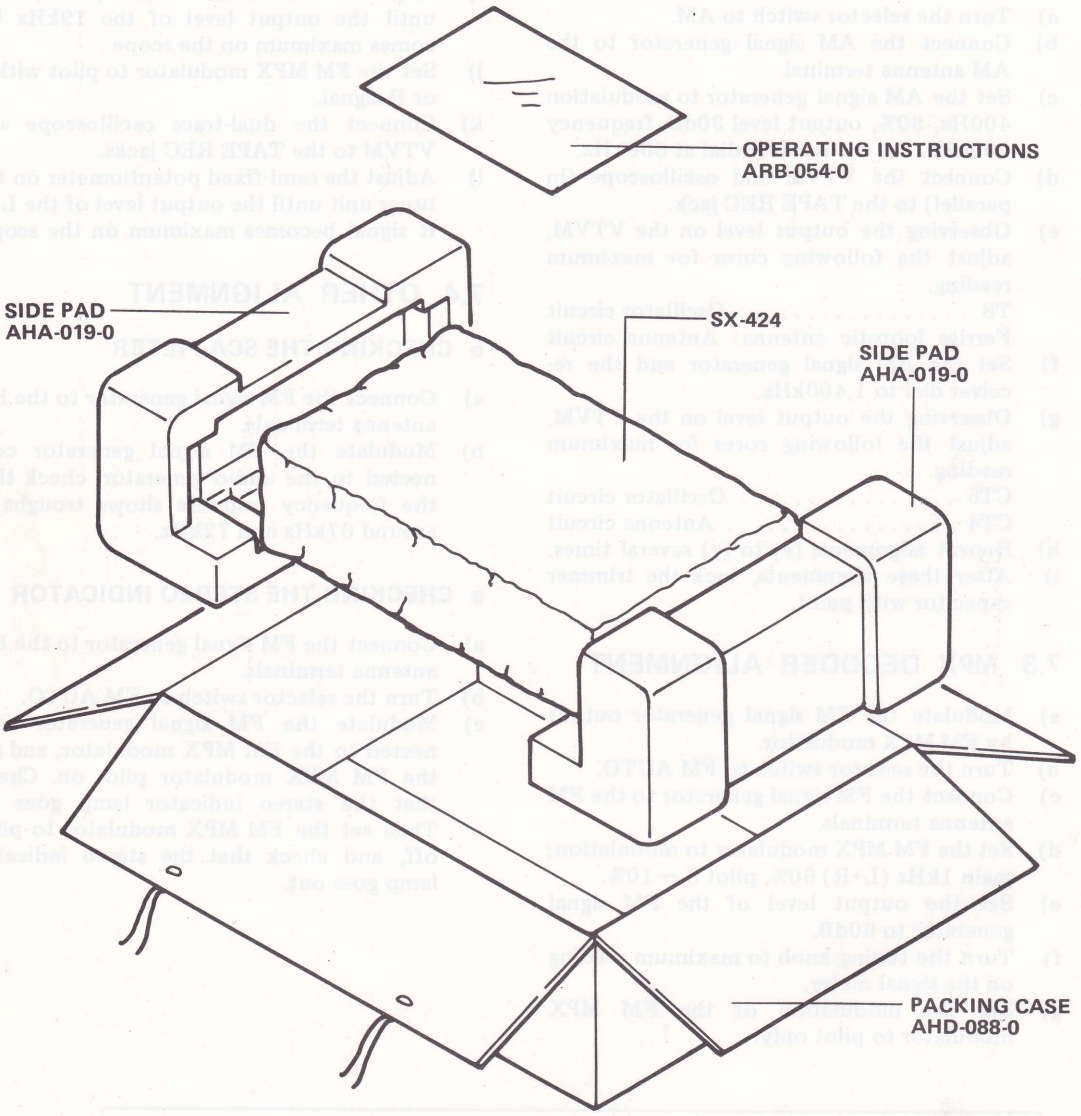
a) Connect the FM signal generator to the FM antenna terminals.
b) Turn the selector switch to FM AUTO.
c) Modulate the FM signal generator connected to the FM MPX modulator, and set the FM MPX modulator pilot on. Check that the stereo indicator lamp goes in. Then set the FM MPX modulator to pilot off,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



TUNER UNIT (AWE-008)

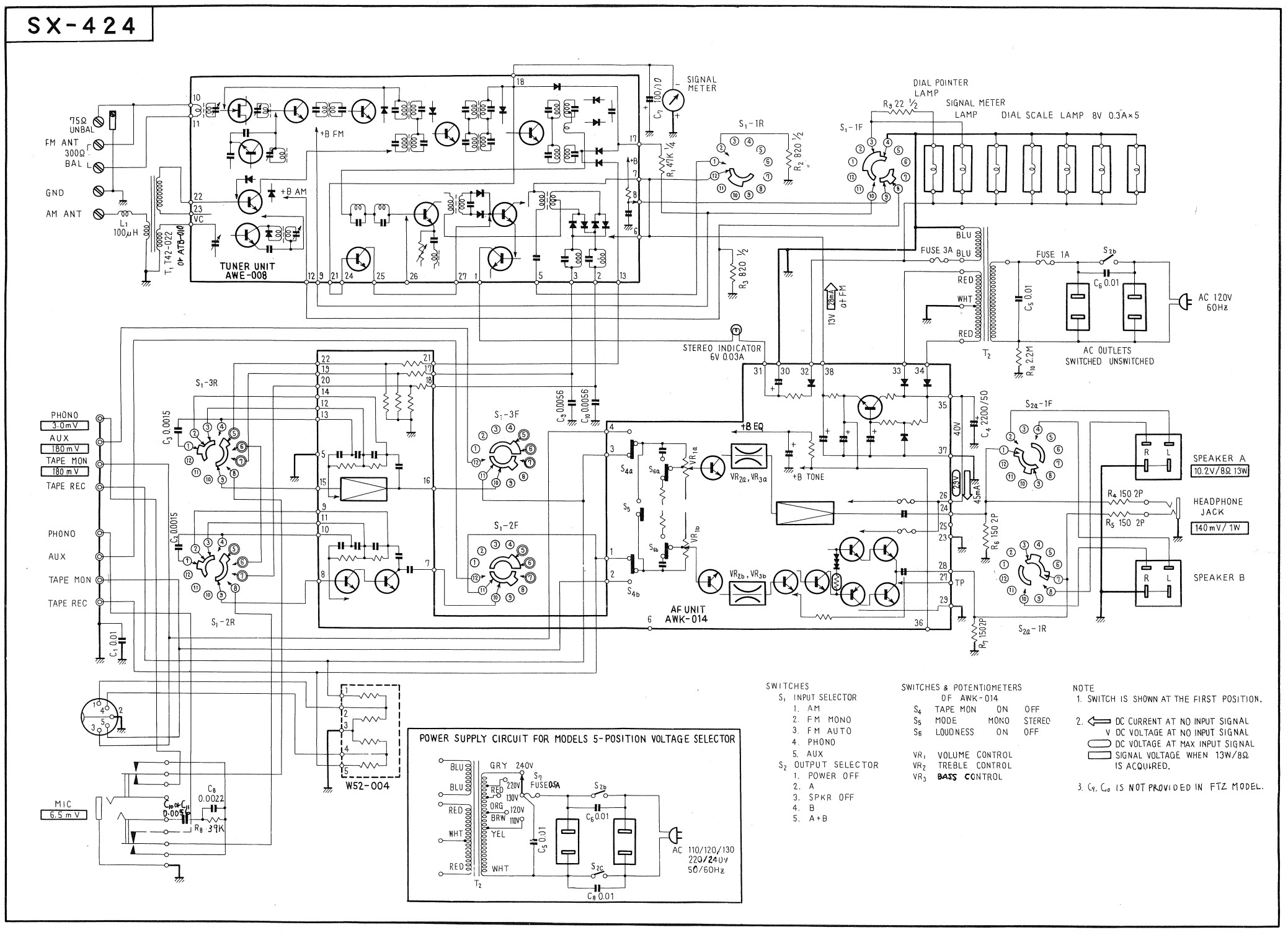
Fig. 1

8. PACKING METHOD AND PART NUMBERS



9. SCHEMATIC DIAGRAMS, PCB PATTERNS AND PARTS LIST

9.1 UNIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS



SWITCHES
- S_1 INPUT SELECTOR
  1. AM
  2. FM MONO
  3. FM AUTO
  4. PHONO
  5. AUX
- S_2 OUTPUT SELECTOR
  1. POWER OFF
  2. A
  3. SPKR OFF
  4. B
  5. A+B

SWITCHES & POTENTIOMETERS OF AWK-014

S_4	TAPE MON	ON	OFF
S_5	MODE	MONO	STEREO
S_6	LOUDNESS	ON	OFF
VR_1	VOLUME CONTROL		
VR_2	TREBLE CONTROL		
VR_3	BASS CONTROL		

NOTE
1. SWITCH IS SHOWN AT THE FIRST POSITION.
2. ⇦ DC CURRENT AT NO INPUT SIGNAL
   V DC VOLTAGE AT NO INPUT SIGNAL
   ⬭ DC VOLTAGE AT MAX INPUT SIGNAL
   ▭ SIGNAL VOLTAGE WHEN 13W/8Ω IS ACQUIRED.
3. C_{11}, C_{10} IS NOT PROVIDED IN FTZ MODEL.

MISCELLANEOUS PRATS LIST

- CAPACITORS: IN μF UNLESS OTHERWISE NOTED. p: μμF.
- RESISTORS: IN Ω, ¼W UNLESS OTHERWISE NOTED. k: kΩ, M: MΩ.

NOTE

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

for FVZW model ..... 17.

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	50V	CKDYF 103Z 50	
C2	Mylar	0.0015	50V	CQMA 152K 50	
C3	Mylar	0.0015	50V	CQMA 152K 50	
C4	Electrolytic	2200	50V	C52-074-B	
C5	Oil paper	0.01	800V	ACE-001-A	
C6	Ceramic	0.01	DC 1.4kV	C43-003-0	
C7	Electrolytic	100	10V	CEA 101P 10	
C8	Mylar	0.0018	50V	CQMA 182K 50	
C9	Mylar	0.0056	50V	CQMA 562K 50	
C10	Mylar	0.0056	50V	CQMA 562K 50	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	47k		RD¼PS 473J	
R2	Carbon film	820	½W	RD½PS 821J	
R3	Carbon film	820	½W	RD½PS 821J	
R4	Wire wound	150	2W	RM2P 151K	
R5	Wire wound	150	2W	RM2P 151K	
R6	Wire wound	150	2W	RM2P 151K	
R7	Wire wound	150	2W	RM2P 151K	
R8	Carbon film	470k		RD¼PS 474J	
R9	Carbon film	22	½W	RD½PS 220J	
R10	Carbon film	2.2M	½W	RD½PS 225J	

SWITCHES

Symbol	Description	Part No.	
S1	Selector switch	ASC-021-0	
S2	Output selector	ASA-017-0	

COIL AND TRANSFORMERS

Symbol	Description	Part No.	
L1	Choke coil	T24-030-0	
T1	AM ferrite loopstic antenna	ATB-010-0	
T2	Power transformer	ATT-063-0	

OTHERS

Symbol	Description	Part No.	
	Tuner unit	AWE-008-0	
	AF unit	AWK-014-A	
	Front panel ass'y	ANB-127-A	
	Foot	AEC-012-0	
	Dial shaft ass'y	M42-071-F	
	Dial pulley	M42-080-A	
	Wooden case	AMM-014-A	
	AM ferrite loopstick antenna holder ass'y	AXB-001-0	
	Knob for tuning	AAA-004-B	
	Knob for selector, output selector, bass, and treble	AAB-007-B	
	Knob for volume (L)	AAB-013-0	
	Knob for volume (R)	AAB-014-0	
	Knob for mode, tape monitor, and loudness	AAD-029-0	
	Dial pointer	AAF-007-B	
	Dial scale	AAG-035-0	
	Signal meter	AAW-003-A	
	Antenna input terminal board	K11-043-A	
	4P ground terminal	K13-047-0	
	4P input terminal board	AKB-005-0	
	Fuse 1A	E21-033-0	
	Fuse 3A for protection	E21-022-0	
	Pilot lamp for dial scale	E22-017-0	
	Pilot lamp for signal meter	AEL-006-0	
	Compound part for REC jack	W52-004-0	
	Microphone jack	K72-020-0	

Symbol	Description	Part No.	
	Headphones jack	K72-026-0	
	Speaker socket	K72-031-0	
	Spare AC outlet	AKP-002-0	
	Pilot lamp (for dial scale) socket	K91-005-A	
	5P connector (DIN)	K93-003-B	
	Fuse holder	AKR-005-0	
	FM T-type antenna	D52-013-0	
	Pin plug	K72-015-A	
	Speaker plug	K72-007-B	
	AC power cord	D11-003-E	
	Screw for ground	B11-012-A	
	Screw to fix wooden case	B11-041-A	
	Operating instructions	ARB-054-0	
	Packing case	AHD-088-0	
	Side pad	AHA-019-0	

For FVZW model

CAPACITORS

Symbol	Description			Part No.	
C1	Ceramic	0.01	50V	CKDYF 103Z 50	
C2	Mylar	0.0015	50V	CQMA 152K 50	
C3	Mylar	0.0015	50V	CQMA 152K 50	
C4	Electrolytic	2200	50V	C52-074-B	
C5	Ceramic	0.01	DC 1.4kV	C43-003-0	
C6	Ceramic	0.01	DC 1.4kV	C43-003-0	
C7	Electrolytic	100	10V	CEA 101P 10	
C8	Mylar	0.0018	50V	CQMA 182K 50	
C9	Ceramic	0.01	DC 1.4kV	C43-003-0	

RESISTORS

Symbol	Description			Part No.	
R1	Carbon film	47k		RD¼PS 473J	
R2	Carbon film	820	½W	RD½PS 821J	
R3	Carbon film	820	½W	RD½PS 821J	
R4	Wire wound	150	2W	RM2P 151K	
R5	Wire wound	150	2W	RM2P 151K	
R6	Wire wound	150	2W	RM2P 151K	
R7	Wire wound	150	2W	RM2P 151K	
R8	Carbon film	470k		RD¼PS 474J	
R9	Carbon film	22	½W	RD½PS 220J	

SWITCHES

Symbol	Description	Part No.	
S1	Selector switch	ASC-021-0	
S2	Output selector	ASA-028-0	

COIL AND TRANSFORMERS

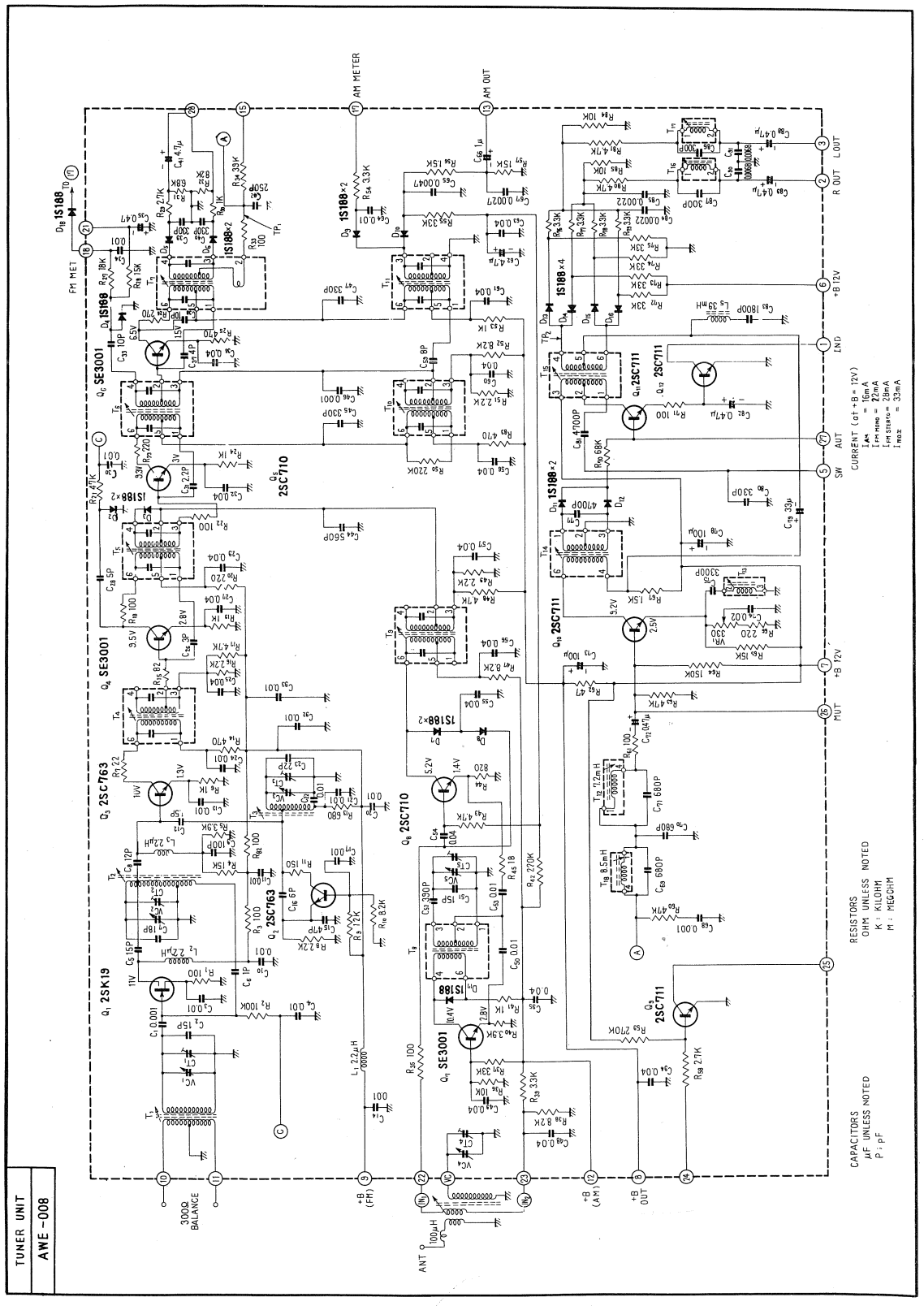
Symbol	Description	Part No.	
L1	Choke coil	T24-030-0	
T1	AM ferrite loopstick antenna	T42-022-B	
T2	Power transformer	ATT-064-0	

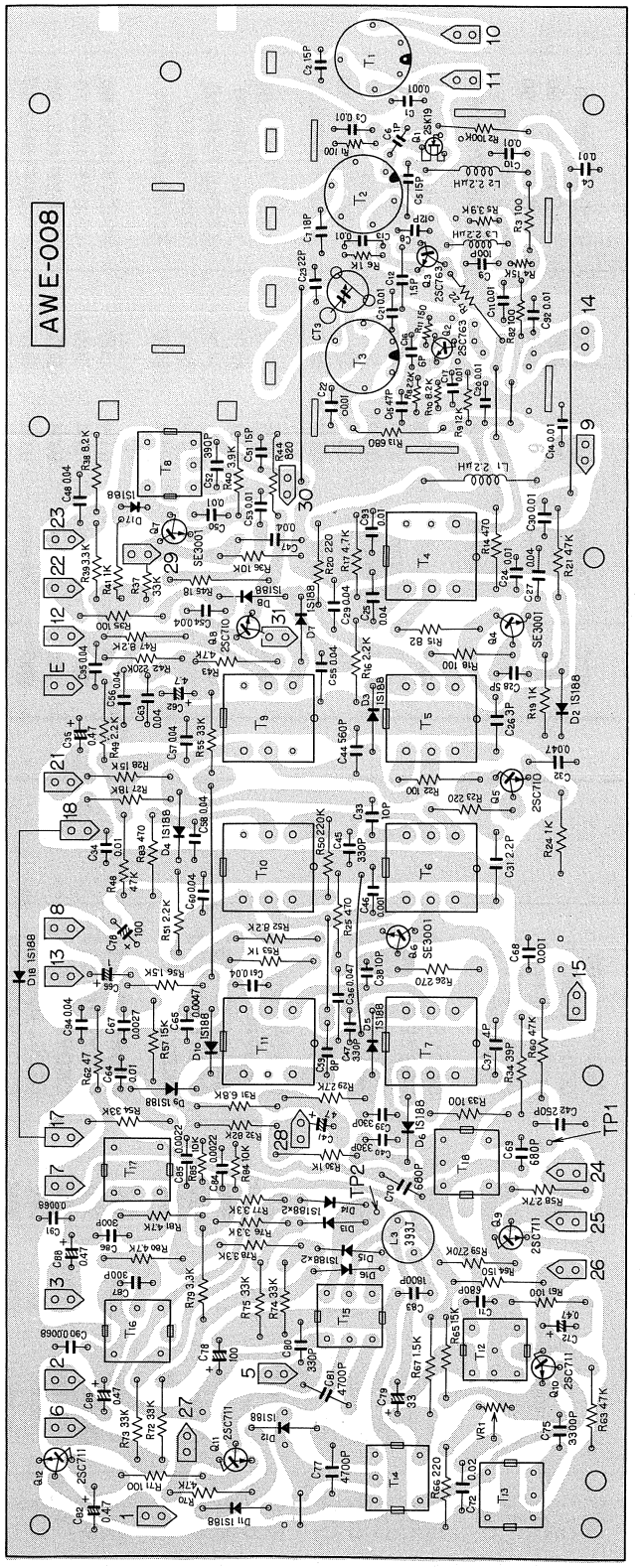
OTHERS

Symbol	Description	Part No.	
	Tuner unit	AWE-008-0	
	AF unit	AWK-014-A	
	Front panel ass'y	ANB-127-A	
	Foot	AEC-012-0	
	Dial shaft ass'y	M42-071-F	
	Dial pulley	M42-080-A	
	Wooden case	AMM-014-A	
	AM ferrite loopstick antenna holder ass'y	AXB-001-0	
	Knob tuning	AAA-004-B	
	Knob for selector, output selector, bass, and treble	AAB-007-B	
	Knob for volume (L)	AAB-013-0	
	Knob for volume (R)	AAB-014-0	
	Knob for mode, tape monitor, and loudness	AAD-029-0	
	Dial pointer	AAF-007-B	
	Dial scale	AAG-035-0	
	Signal meter	AAW-003-A	
	Antenna input terminal board	K11-043-A	
	4P ground terminal	K13-047-0	
	4P input terminal board	AKB-005-0	
	Fuse 0.5A	E21-007-0	
	Fuse 3A for protection	E21-022-0	
	Pilot lamp for dial scale	E22-017-0	
	Pilot lamp for signal meter	AEL-006-0	
	Compound part for REC jack	W52-004-0	
	Microphone jack	K72-020-0	

Symbol	Description	Part No.	
	Headphones jack	K72-026-0	
	Speaker socket	K72-031-0	
	Spare AC outlet	K82-014-0	
	Pilot lamp (for dial scale) socket	K91-005-A	
	5P connector (DIN)	K93-003-B	
	Line voltage selector	AKR-001-0	
	FM T-type antenna	D52-013-0	
	Pin plug	K72-015-A	
	Speaker plug	K72-007-B	
	AC power cord	D11-002-B	
	Screw for ground	B11-012-A	
	Screw to fix wooden case	B11-041-A	
	Operating instructions	ARB-054-0	
	Packing case	AHD-089-0	
	Side pad	AHA-019-0	
	Fuse 1A	E21-004-0	

9.2 TUNER UNIT (AWE-008)





PARTS LIST OF TUNER UNIT

CAPACITORS

Symbol	Description			Part No.	
VC	Tuning Capacitor			C64-046-A	
CT3	Ceramic Trimmer			C43-007-A	
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	CCDTH 060D 50	
C17	Ceramic	0.01	50V	CKDYF 103Z 50	
C20	Ceramic	0.01	50V	CKDYF 103Z 50	
C21	Ceramic	0.01	50V	CKDYB 103K 50	
C22	Ceramic	0.01	50V	CKDYB 103K 50	
C23	Ceramic	22p	50V	CCDRH 220K 50	
C24	Ceramic	0.01	50V	CKDYF 103Z 50	
C25	Ceramic	0.04	50V	CKDYF 403Z 50	
C26	Ceramic	3p	50V	CCDSL 030C 50	
C27	Ceramic	0.04	50V	CKDYF 403Z 50	

Symbol	Description			Part No.	
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	2.2p	500V	CGB 2R2K 500	
C32	Ceramic	0.047	25V	CKDBC 473Z 25	
C33	Ceramic	10p	50V	CCDSL 100F 50	
C34	Ceramic	0.01	50V	CKDYF 103Z 50	
C35	Electrolytic	0.47	50V	CEA R47P 50	
C36	Ceramic	0.047	25V	CKDBC 473Z 25	
C37	Ceramic	4p	50V	CCDSL 040D 50	
C38	Ceramic	10p	50V	CCDSL 100F 50	
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	
C46	Ceramic	0.001	50V	CKDYB 102K 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 391J 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	

Symbol	Description			Part No.	
C59	Ceramic	8p	50V	CCDSL 080F 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	
C68	Ceramic	0.001	50V	CKDYB 102K 50	
C69	Styrol	680p	50V	CQSA 681J 50	
C70	Styrol	680p	50V	CQSA 681J 50	
C71	Styrol	680p	50V	CQSA 681J 50	
C72	Electrolytic	0.47	50V	CEA R47P 50	
C73	Electrolytic	100	16V	CEA 101P 16	
C74	Mylar	0.02	50V	CQMA 203K 50	
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	Styrol	0.0018	50V	CQSA 182J 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	

Symbol	Description			Part No.	
C90	Mylar	0.0068	50V	CQMA 682K 50	
C91	Mylar	0.0068	50V	CQMA 682K 50	
C92	Ceramic	0.01	50V	CKDYF 103Z 50	
C93	Ceramic	0.01	50V	CKDYF 103Z 50	
C94	Ceramic	0.04	50V	CKDYF 403Z 50	
C95	Ceramic	0.04	50V	CKDYF 403Z 50	

RESISTORS

Symbol	Description		Part No.	
VR1	Semi-fixed	330-B	C92-065-A	
R1	Carbon film	100	RD¼VS 101J	
R2	Carbon film	100k	RD¼PS 104J	
R3	Carbon film	100	RD¼VS 101J	
R4	Carbon film	15k	RD¼VS 153J	
R5	Carbon film	3.9k	RD¼VS 392J	
R6	Carbon film	1k	RD¼VS 102J	
R7	Carbon film	22	RD¼PS 220J	
R8	Carbon film	2.2k	RD¼VS 222J	
R9	Carbon film	12k	RD¼VS 123J	
R10	Carbon film	8.2k	RD¼VS 822J	
R11	Carbon film	150	RD¼VS 151J	
R13	Carbon film	680	RD¼PS 681J	
R14	Carbon film	470	RD¼PS 471J	
R15	Carbon film	82	RD¼PS 820J	
R16	Carbon film	2.2k	RD¼PS 222J	
R17	Carbon film	4.7k	RD¼PS 472J	
R18	Carbon film	100	RD¼PS 101J	
R19	Carbon film	1k	RD¼PS 102J	
R20	Carbon film	220	RD¼PS 221J	
R21	Carbon film	47k	RD¼PS 473J	

Symbol	Description		Part No.	
R22	Carbon film	100	RD¼PS 101J	
R23	Carbon film	220	RD¼PS 221J	
R24	Carbon film	1k	RD¼PS 102J	
R25	Carbon film	470	RD¼PS 471J	
R26	Carbon film	270	RD¼PS 271J	
R27	Carbon film	18k	RD¼PS 183J	
R28	Carbon film	15k	RD¼PS 153J	
R29	Carbon film	2.7k	RD¼PS 272J	
R30	Carbon film	1k	RD¼PS 102J	
R31	Carbon film	6.8k	RD¼PS 682J	
R32	Carbon film	8.2k	RD¼PS 822J	
R33	Carbon film	100	RD¼PS 101J	
R34	Carbon film	39k	RD¼PS 393J	
R35	Carbon film	100	RD¼PS 101J	
R36	Carbon film	10k	RD¼PS 103J	
R37	Carbon film	33k	RD¼VS 333J	
R38	Carbon film	8.2k	RD¼PS 822J	
R39	Carbon film	3.3k	RD¼PS 332J	
R40	Carbon film	3.9k	RD¼PS 392J	
R41	Carbon film	1k	RD¼PS 102J	
R42	Carbon film	220k	RD¼PS 224J	
R43	Carbon film	4.7k	RD¼PS 472J	
R44	Carbon film	820	RD¼PS 821J	
R45	Carbon film	18	RD¼PS 180J	
R47	Carbon film	8.2k	RD¼PS 822J	
R48	Carbon film	4.7k	RD¼PS 472J	
R49	Carbon film	2.2k	RD¼PS 222J	
R50	Carbon film	220k	RD¼PS 224J	
R51	Carbon film	2.2k	RD¼PS 222J	
R52	Carbon film	8.2k	RD¼PS 822J	

Symbol	Description		Part No.	
R53	Carbon film	1k	RD¼PS 102J	
R54	Carbon film	3.3k	RD¼PS 332J	
R55	Carbon film	33k	RD¼PS 333J	
R56	Carbon film	1.5k	RD¼PS 152J	
R57	Carbon film	15k	RD¼PS 153J	
R58	Carbon film	2.7k	RD¼PS 272J	
R59	Carbon film	270k	RD¼PS 274J	
R60	Carbon film	47k	RD¼PS 473J	
R61	Carbon film	100	RD¼PS 101J	
R62	Carbon film	47	RD¼PS 470J	
R63	Carbon film	47k	RD¼PS 473J	
R64	Carbon film	150k	RD¼PS 154J	
R65	Carbon film	15k	RD¼PS 153J	
R66	Carbon film	220	RD¼PS 221J	
R67	Carbon film	1.5k	RD¼PS 152J	
R70	Carbon film	4.7k	RD¼PS 472J	
R71	Carbon film	100	RD¼PS 101J	
R72	Carbon film	33k	RD¼PS 333J	
R73	Carbon film	33k	RD¼PS 333J	
R74	Carbon film	33k	RD¼PS 333J	
R75	Carbon film	33k	RD¼PS 333J	
R76	Carbon film	3.3k	RD¼PS 332J	
R77	Carbon film	3.3k	RD¼PS 332J	
R78	Carbon film	3.3k	RD¼PS 332J	
R79	Carbon film	3.3k	RD¼PS 332J	
R80	Carbon film	4.7k	RD¼PS 472J	
R81	Carbon film	4.7k	RD¼PS 472J	
R82	Carbon film	100	RD¼VS 101J	
R83	Carbon film	470	RD¼PS 471J	
R84	Carbon film	10k	RD¼VS 103J	
R85	Carbon film	10k	RD¼VS 103J	

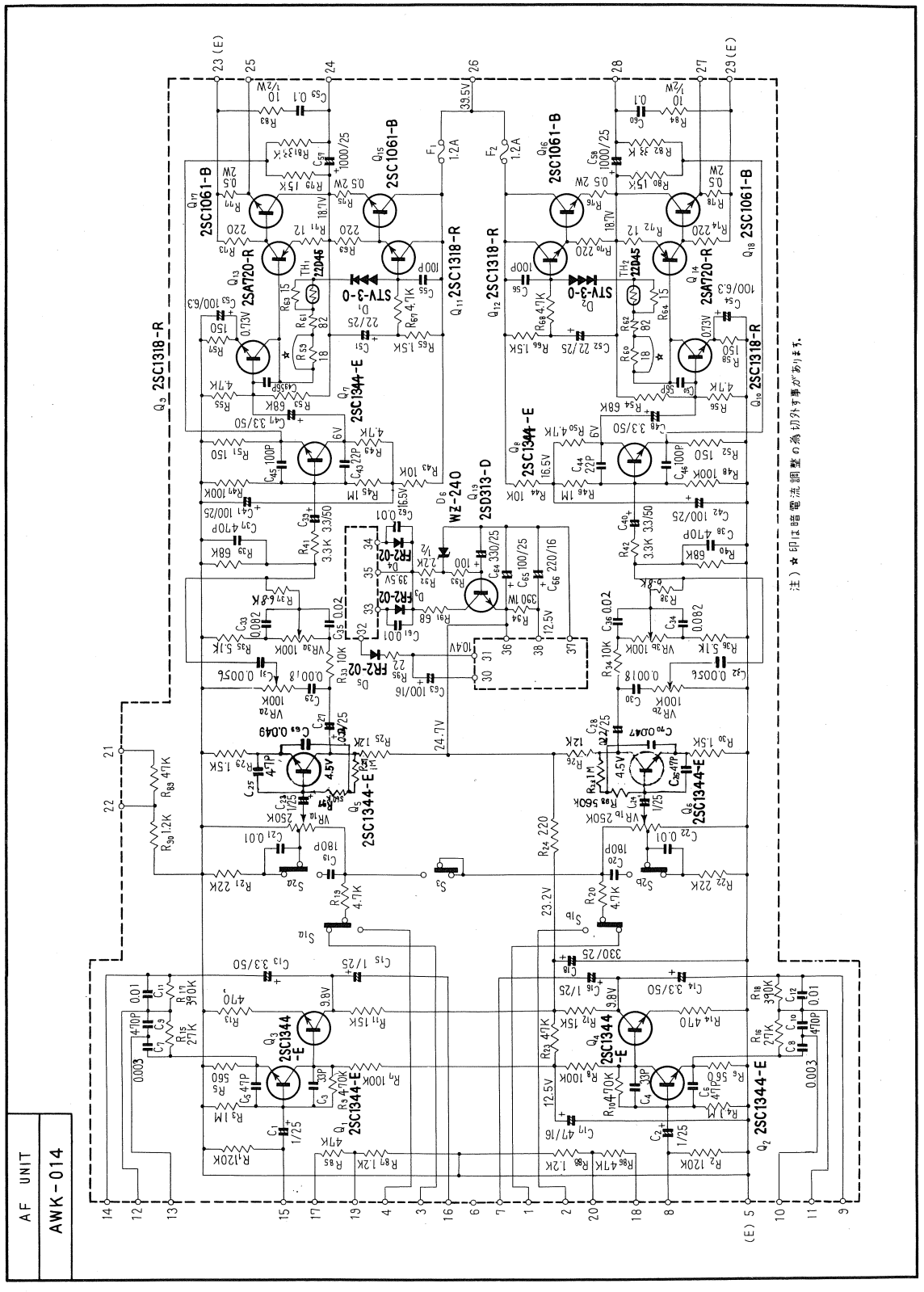
SEMICONDUCTORS

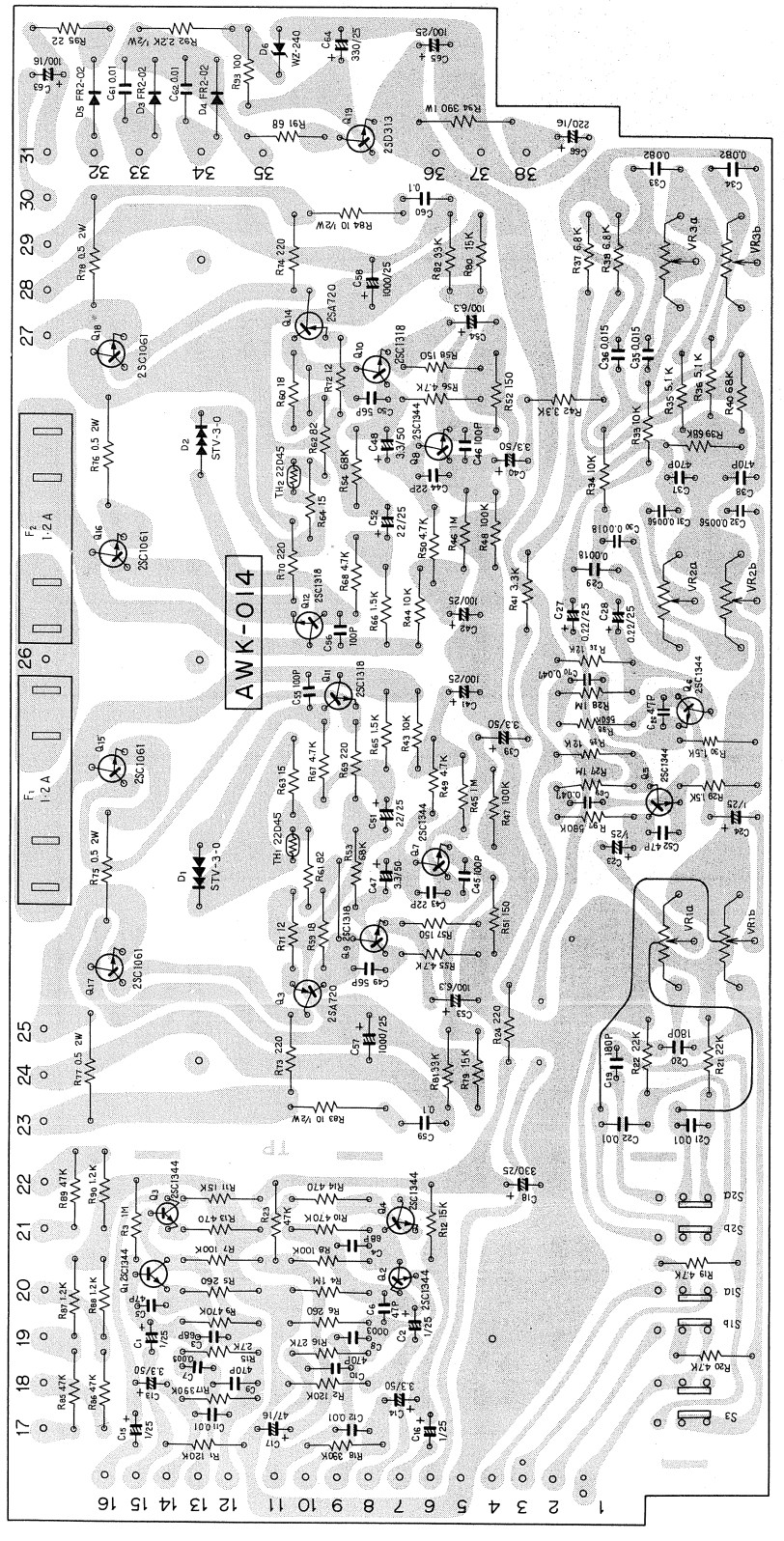
Symbol	Description		Part No.	
Q1	2SK19-Y	FET		
Q2	2SC763-D or C	Transistor		
Q3	2SC763-D or C	Transistor		
Q4	SE3001	Transistor		
Q5	2SC710R-D or C	Transistor		
Q6	SE3001	Transistor		
Q7	SE3001	Transistor		
Q8	2SC710-D or R-D	Transistor		
Q9	2SC711-F	Transistor		
Q10	2SC711-E or F	Transistor		
Q11	2SC711-E or F	Transistor		
Q12	2SC711-F	Transistor		
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	1S188 FM-1	Diode		
D12	1S188 FM-1	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		
D18	1S188 FM-1	Diode		

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	FM IF Transformer	T73-034-0	
T5	FM IF Transformer	T73-035-A	
T6	FM IF Transformer	T73-036-0	
T7	FM IF Transformer	T74-011-0	
T8	AM OSC Coil	ATB-001-A	
T9	AM IF Transformer	T71-028-0	
T10	AM IF Transformer	T71-028-0	
T11	AM IF Transformer	T72-022-0	
T12	SCA Coil	T75-027-0	
T13	19kHz Transformer	T75-023-0	
T14	19kHz Transformer	T75-024-0	
T15	38kHz Transformer	T75-025-0	
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-A	
L2	RF Choke Coil	T24-028-A	
L3	RF Choke Coil	T24-028-A	
L5	Choke Coil	T75-006-B	

9.3 AF UNIT (AWK-014)





PRATS LIST OF AF UNIT

CAPACITORS

Symbol	Description			Part No.	
C1	Electrolytic	1	25V	CSSA 010M 25	
C2	Electrolytic	1	25V	CSSA 010M 25	
C3	Ceramic	68p	50V	CCDSL 680K 50	
C4	Ceramic	68p	50V	CCDSL 680K 50	
C5	Ceramic	47p	50V	CCDSL 470K 50	
C6	Ceramic	47p	50V	CCDSL 470K 50	
C7	Mylar	0.003	50V	CQMA 302K 50	
C8	Mylar	0.003	50V	CQMA 302K 50	
C9	Ceramic	470p	50V	CKDYB 471K 50	
C10	Ceramic	470p	50V	CKDYB 471K 50	
C11	Mylar	0.01	50V	CQMA 103K 50	
C12	Mylar	0.01	50V	CQMA 103K 50	
C13	Electrolytic	3.3	50V	CEA 3R3P 50	
C14	Electrolytic	3.3	50V	CEA 3R3P 50	
C15	Electrolytic	1	25V	CSSA 010M 25	
C16	Electrolytic	1	25V	CSSA 010M 25	
C17	Electrolytic	47	16V	CEA 470P 16	
C19	Ceramic	180p	50V	CCDSL 181K 50	
C20	Ceramic	180p	50V	CCDSL 181K 50	
C21	Mylar	0.01	50V	CQMA 103K 50	
C22	Mylar	0.01	50V	CQMA 103K 50	
C23	Electrolytic	1	25V	CSSA 010M 25	
C24	Electrolytic	1	25V	CSSA 010M 25	
C25	Ceramic	47p	50V	CCDSL 470K 50	
C26	Ceramic	47p	50V	CCDSL 470K 50	

Symbol	Description			Part No.	
C27	Electrolytic	0.22	25V	CSSA R22M 25	
C28	Electrolytic	0.22	25V	CSSA R22M 25	
C29	Mylar	0.0018	50V	CQMA 182K 50	
C30	Mylar	0.0018	50V	CQMA 182K 50	
C31	Mylar	0.0056	50V	CQMA 562K 50	
C32	Mylar	0.0056	50V	CQMA 562K 50	
C33	Mylar	0.082	50V	CQMA 823K 50	
C34	Mylar	0.082	50V	CQMA 823K 50	
C35	Mylar	0.02	50V	CQMA 203K 50	
C36	Mylar	0.02	50V	CQMA 203K 50	
C37	Ceramic	470p	50V	CKDYB 471K 50	
C38	Ceramic	470p	50V	CKDYB 471K 50	
C39	Electrolytic	3.3	50V	CEA 3R3P 50	
C40	Electrolytic	3.3	50V	CEA 3R3P 50	
C41	Electrolytic	100	25V	CEA 101P 25	
C42	Electrolytic	100	25V	CEA 101P 25	
C43	Ceramic	22p	50V	CCDSL 220K 50	
C44	Ceramic	22p	50V	CCDSL 220K 50	
C45	Ceramic	100p	50V	CCDSL 101K 50	
C46	Ceramic	100p	50V	CCDSL 101K 50	
C47	Electrolytic	3.3	50V	CEA 3R3P 50	
C48	Electrolytic	3.3	50V	CEA 3R3P 50	
C49	Ceramic	56p	50V	CCDSL 560K 50	
C50	Ceramic	56p	50V	CCDSL 560K 50	
C51	Electrolytic	22	25V	CEA 220P 25	

Symbol	Description			Part No.	
C52	Electrolytic	22	25V	CEA 220P 25	
C53	Electrolytic	100	6V	CEA 101P 6	
C54	Electrolytic	100	6V	CEA 101P 6	
C55	Ceramic	100p	50V	CCDSL 101K 50	
C56	Ceramic	100p	50V	CCDSL 101K 50	
C57	Electrolytic	1000	25V	CEA 102P 25	
C58	Electrolytic	1000	25V	CEA 102P 25	
C59	Mylar	0.1	50V	CQMA 104K 50	
C60	Mylar	0.1	50V	CQMA 104K 50	
C61	Ceramic	0.01	DC 1.4kV	C43-003-0	
C62	Ceramic	0.01	DC 1.4kV	C43-003-0	
C63	Electrolytic	100	16V	CEA 101P 16	
C64	Electrolytic	330	25V	CEA 331P 25	
C65	Electrolytic	100	25V	CEA 101P 25	
C66	Electrolytic	220	16V	CEA 221P 16	
C69	Mylar	0.047	50V	CQMA 473K 50	
C70	Mylar	0.047	50V	CQMA 473K 50	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	120k	RD¼PS 124J	
R2	Carbon film	120k	RD¼PS 124J	
R3	Carbon film	1M	RD¼PS 105J	
R4	Carbon film	1M	RD¼PS 105J	
R5	Carbon film	560	RD¼PS 561J	
R6	Carbon film	560	RD¼PS 561J	
R7	Carbon film	100k	RD¼PS 104J	
R8	Carbon film	100k	RD¼PS 104J	
R9	Carbon film	470k	RD¼PS 474J	
R10	Carbon film	470k	RD¼PS 474J	
R11	Carbon film	15k	RD¼PS 153J	
R12	Carbon film	15k	RD¼PS 153J	
R13	Carbon film	470	RD¼PS 471J	
R14	Carbon film	470	RD¼PS 471J	
R15	Carbon film	27k	RD¼PS 273J	
R16	Carbon film	27k	RD¼PS 273J	
R17	Carbon film	390k	RD¼PS 394J	
R18	Carbon film	390k	RD¼PS 394J	
R19	Carbon film	4.7k	RD¼PS 472J	
R20	Carbon film	4.7k	RD¼PS 472J	
R21	Carbon film	22k	RD¼PS 223J	
R22	Carbon film	22k	RD¼PS 223J	
R23	Carbon film	47k	RD¼PS 473J	
R24	Carbon film	220	RD¼PS 221J	
R25	Carbon film	12k	RD¼PS 123J	
R26	Carbon film	12k	RD¼PS 123J	
R27	Carbon film	1M	RD¼PS 105J	
R28	Carbon film	1M	RD¼PS 105J	
R29	Carbon film	1.5k	RD¼PS 152J	
R30	Carbon film	1.5k	RD¼PS 152J	
R33	Carbon film	10k	RD¼PS 103J	
R34	Carbon film	10k	RD¼PS 103J	
R35	Carbon film	5.1k	RD¼PS 512J	
R36	Carbon film	5.1k	RD¼PS 512J	
R37	Carbon film	6.8k	RD¼PS 682J	
R38	Carbon film	6.8k	RD¼PS 682J	
R39	Carbon film	68k	RD¼PS 683J	
R40	Carbon film	68k	RD¼PS 683J	
R41	Carbon film	3.3k	RD¼PS 332J	
R42	Carbon film	3.3k	RD¼PS 332J	

Symbol	Description		Part No.	
R43	Carbon film	10k	RD¼PS 103J	
R44	Carbon film	10k	RD¼PS 103J	
R45	Carbon film	1M	RD¼PS 105J	
R46	Carbon film	1M	RD¼PS 105J	
R47	Carbon film	100k	RD¼PS 104J	
R48	Carbon film	100k	RD¼PS 104J	
R49	Carbon film	4.7k	RD¼PS 472J	
R50	Carbon film	4.7k	RD¼PS 472J	
R51	Carbon film	150	RD¼PS 151J	
R52	Carbon film	150	RD¼PS 151J	
R53	Carbon film	68k	RD¼PS 683J	
R54	Carbon film	68k	RD¼PS 683J	
R55	Carbon film	4.7k	RD¼PS 472J	
R56	Carbon film	4.7k	RD¼PS 472J	
R57	Carbon film	150	RD¼PS 151J	
R58	Carbon film	150	RD¼PS 151J	
R59	Carbon film	18	RD¼PS 180J	
R60	Carbon film	18	RD¼PS 180J	
R61	Carbon film	82	RD¼PS 820J	
R62	Carbon film	82	RD¼PS 820J	
R63	Carbon film	15	RD¼PS 150J	
R64	Carbon film	15	RD¼PS 150J	
R65	Carbon film	1.5k	RD¼PS 152J	
R66	Carbon film	1.5k	RD¼PS 152J	
R67	Carbon film	4.7k	RD¼PS 472J	
R68	Carbon film	4.7k	RD¼PS 472J	
R69	Carbon film	220	RD¼PS 221J	
R70	Carbon film	220	RD¼PS 221J	
R71	Carbon film	12	RD¼PS 120J	
R72	Carbon film	12	RD¼PS 120J	

Symbol	Description			Part No.	
R73	Carbon film	220		RD¼PS 221J	
R74	Carbon film	220		RD¼PS 221J	
R75	Metal oxide	0.5	2W	RN2H 0R5K	
R76	Metal oxide	0.5	2W	RN2H 0R5K	
R77	Metal oxide	0.5	2W	RN2H 0R5K	
R78	Metal oxide	0.5	2W	RN2H 0R5K	
R79	Carbon film	15k		RD¼PS 153J	
R80	Carbon film	15k		RD¼PS 153J	
R81	Carbon film	33k		RD¼PS 333J	
R82	Carbon film	33k		RD¼PS 333J	
R83	Carbon film	10	½W	RD½PS 100J	
R84	Carbon film	10	½W	RD½PS 100J	
R85	Carbon film	47k		RD¼PS 473J	
R86	Carbon film	47k		RD¼PS 473J	
R87	Carbon film	1.2k		RD¼PS 122J	
R88	Carbon film	1.2k		RD¼PS 122J	
R89	Carbon film	47k		RD¼PS 473J	
R90	Carbon film	1.2k		RD¼PS 122J	
R91	Carbon film	68		RD¼PS 680J	
R92	Carbon film	2.2k	½W	RD½PS 222J	
R93	Carbon film	100		RD¼PS 101J	
R94	Metal oxide	390	1W	RS1P 391J	
R95	Carbon film	22		RD¼PS 220J	
VR1	250k dual, Volume			C87-025-0	
VR2	100k dual, Treble			C82-046-A	
VR3	100k dual, Bass			C82-046-A	

SEMICONDUCTORS

Symbol	Description	Part No.	
Q1	2SC1344-E or D Transistor		
Q2	2SC1344-E or D Transistor		
Q3	2SC1344-E or D Transistor		
Q4	2SC1344-E or D Transistor		
Q5	2SC1344-E or D Transistor		
Q6	2SC1344-E or D Transistor		
Q7	2SC1344-E or D Transistor		
Q8	2SC1344-E or D Transistor		
Q9	2SC1318-R or Q Transistor		
Q10	2SC1318-R or Q Transistor		
Q11	2SC1318-R or Q Transistor		
Q12	2SC1318-R or Q Transistor		
Q13	2SA720-R or Q Transistor		
Q14	2SA720-R or Q Transistor		
Q15	2SC1061-B or C Transistor		
Q16	2SC1061-B or C Transistor		
Q17	2SC1061-B or C Transistor		
Q18	2SC1061-B or C Transistor		
Q19	2SD313-D or E Transistor		
D1	STV-3-0 Varistor		
D2	STV-3-0 Varistor		
D3	FR2-02 Diode		
D4	FR2-02 Diode		
D5	FR2-02 Diode		
D6	WZ-240 Zener diode		
TH1	22D45 Thermistor		
TH2	22D45 Thermistor		

SWITCHES

Symbol	Description	Part No.	
S1	Push switch	ASG-017-0	
S2	Push switch	ASG-017-0	
S3	Push switch	ASG-017-0	

OTHERS

Symbol	Description	Part No.	
F1	Fuse 1.2A for protection	AEK-010-0	
F2	Fuse 1.2A for protection	AEK-010-0	
	Fuse holder	K91-006-0	
	Insulating bushing	AEC-042-0	
	Insulating spacer	AEC-043-0	

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