

Service Manual

AM/FM STEREO RECEIVER

SX-424 / KUW, FVZW, KCW, FW, NBW

NOTE

MODEL SX-424 COMES IN FIVE 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) |
| KCW | 120V only | CSA approved (Canada) |
| NBW | 220V only | SEMCO (Sweden), DEMCO (Denmark), and NEMCO (Norway) approved |
| FW | 5-position selector | General export model with de-emphasis selector switch |

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HOW TO USE SERVICE MANUAL FOR MODEL SX-424

This service manual applies to five models as follows:

- FVZW model numbered on and after Serial No. 1602501
- KUW model numbered on and after Serial No. 3802601
- KUW, FW, NBW models available at all serial numbers without any limit.

As for FVZW and KUW models numbered before Serial Nos. 1602501 and 3802601, respectively, refer to the manual (R42-241-0 printed on the cover's upper right) for model SX-424/KUW, FVZW.

1. SPECIFICATIONS

SEMICONDUCTORS

| | |
|-------------------|----|
| FETs | 1 |
| Transistors | 30 |
| Diodes | 24 |

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 Bandwidth (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 6.5mV/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) | 2.3 μ V |
| 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 300 Ω balanced and 75 Ω unbalanced |
| De-emphasis selector | 50 μ S - 75 μ S (FW model only) |

AM TUNER SECTION

| | |
|--------------------------|------------------------------------|
| Frequency Range | 525kHz to 1,605kHz |
| Usable Sensitivity (IHF) | 15 μ V |
| 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) 1 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.

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.

SIGNAL METER

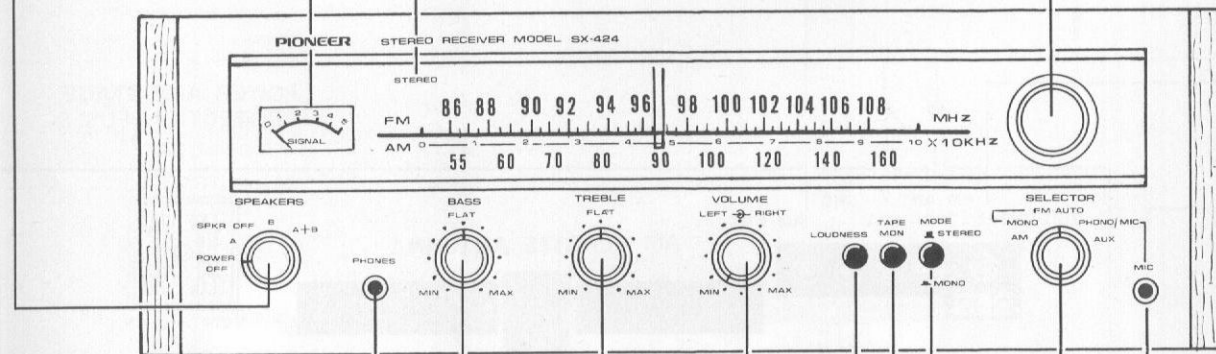
Indicates the signal strength of the received AM or FM station.

STEREO INDICATOR

Lights when an FM broadcast is in stereo.

TUNING KNOB

Using to select desired stations.



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

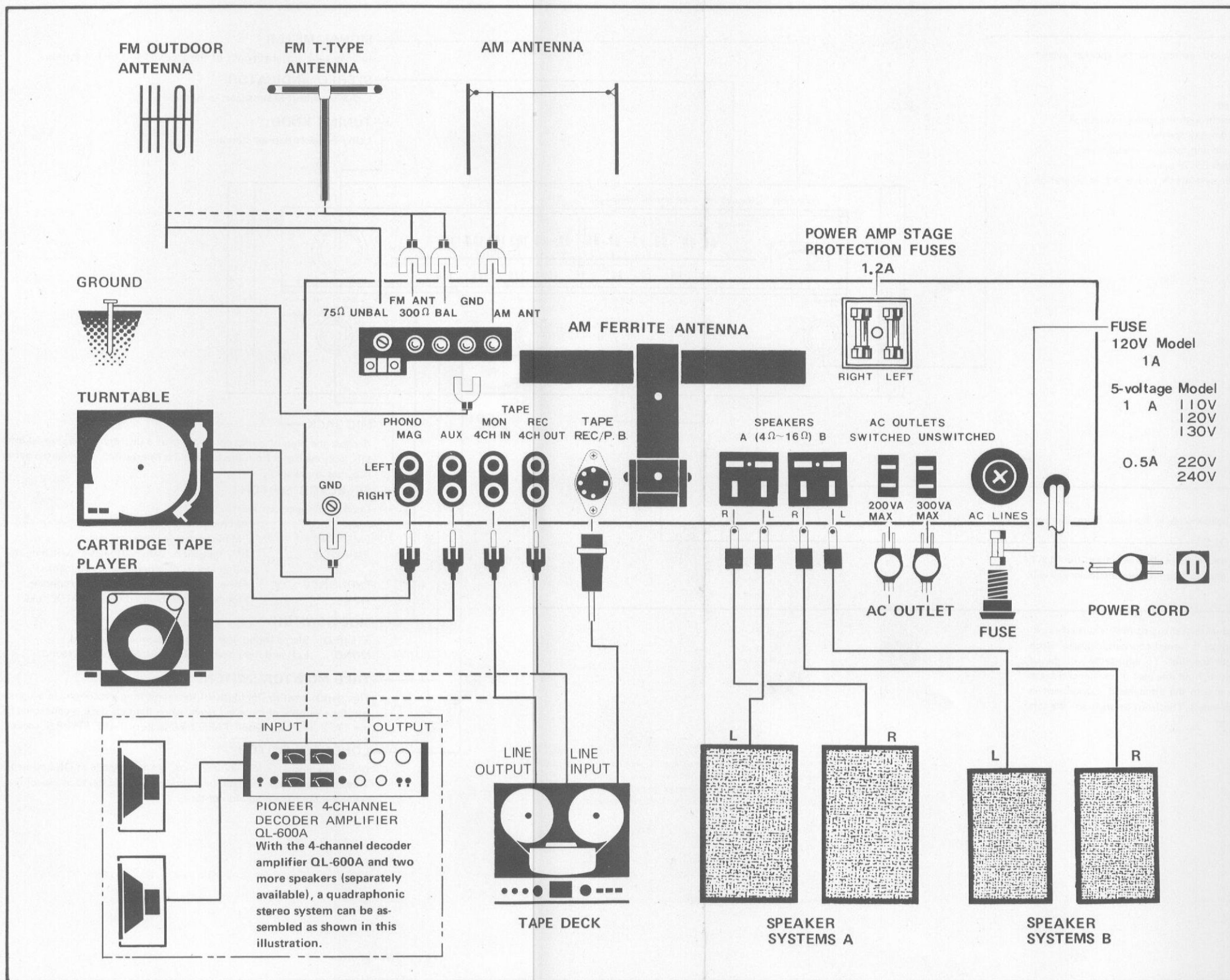
This switch is set to ON (pushed) for monitoring a recording in progress and for playback of recorded tapes, when the tape deck is connected to the TAPE MON jacks and TAPE REC jacks or TAPE REC/P.B. socket.

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.

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

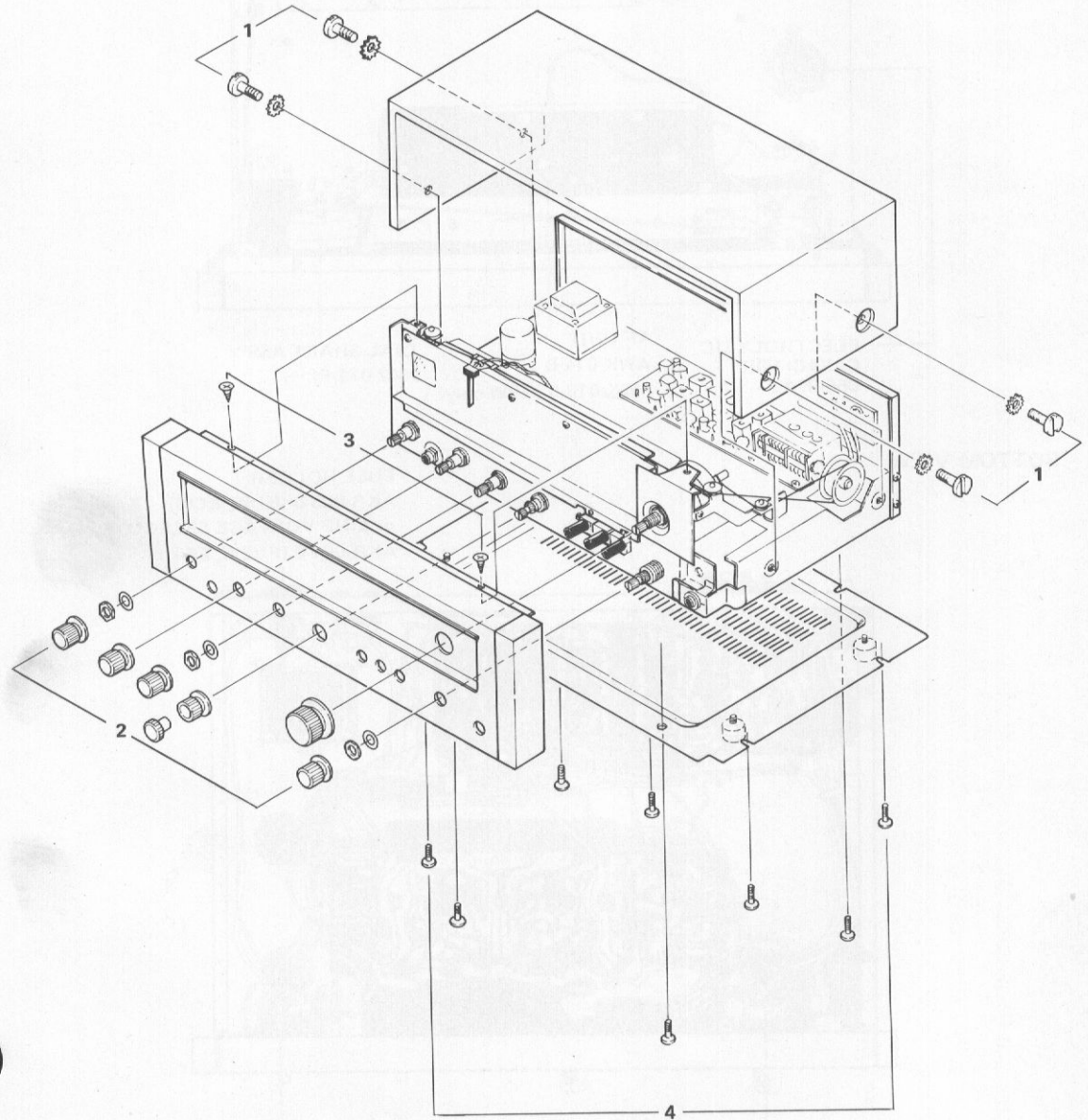
3. CONNECTION DIAGRAM



4. 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.

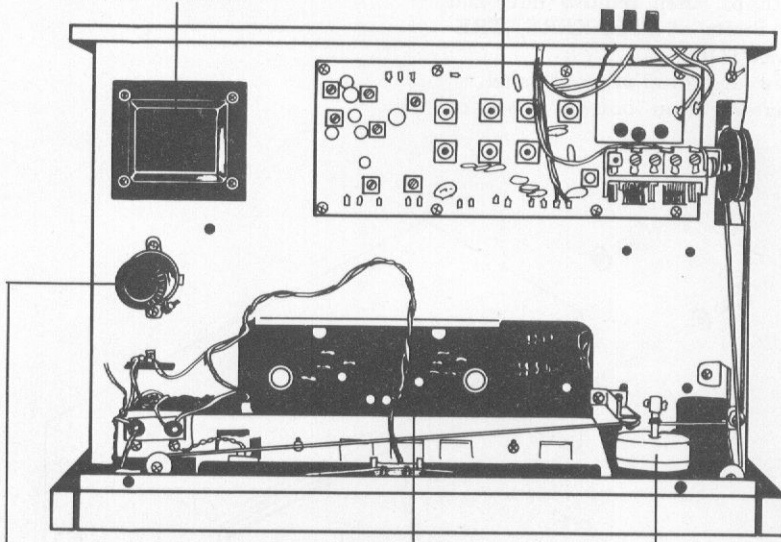


5. PARTS AND PCB LOCATION

TOP VIEW

POWER TRANSFORMER
 ATT-063-A (KUW)
 ATT-064-A (FVZW, FW)
 ATT-092-0 (KCW)
 ATT-093-0 (NBW)

TUNER UNIT
 AWE-008-A



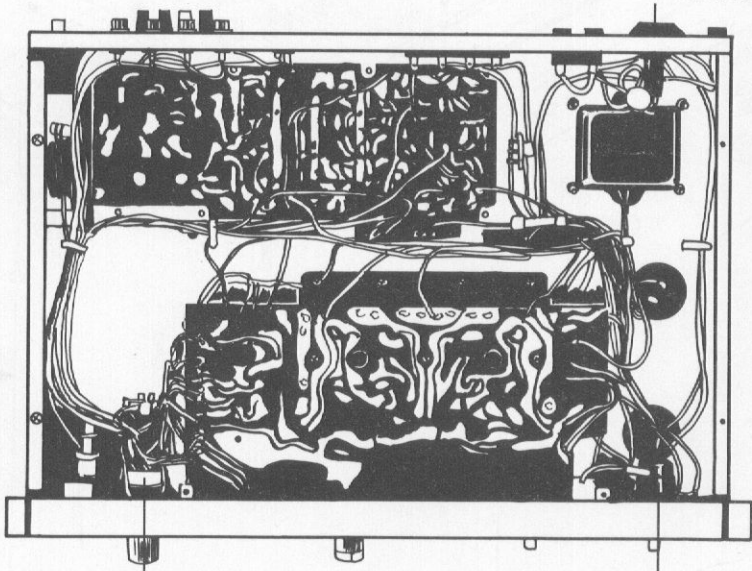
ELECTROLYTIC CAPACITOR
 C52-074-B

AF UNIT
 AWK-014-B
 AWK-018-0 (NBW only)

DIAL SHAFT ASS'Y
 M42-071-F

BOTTOM VIEW

FUSE HOLDER
 AKR-005-0 (KUW, KCW)
 or LINE VOLTAGE SELECTOR
 AKR-001-0 (FVZW, FW)

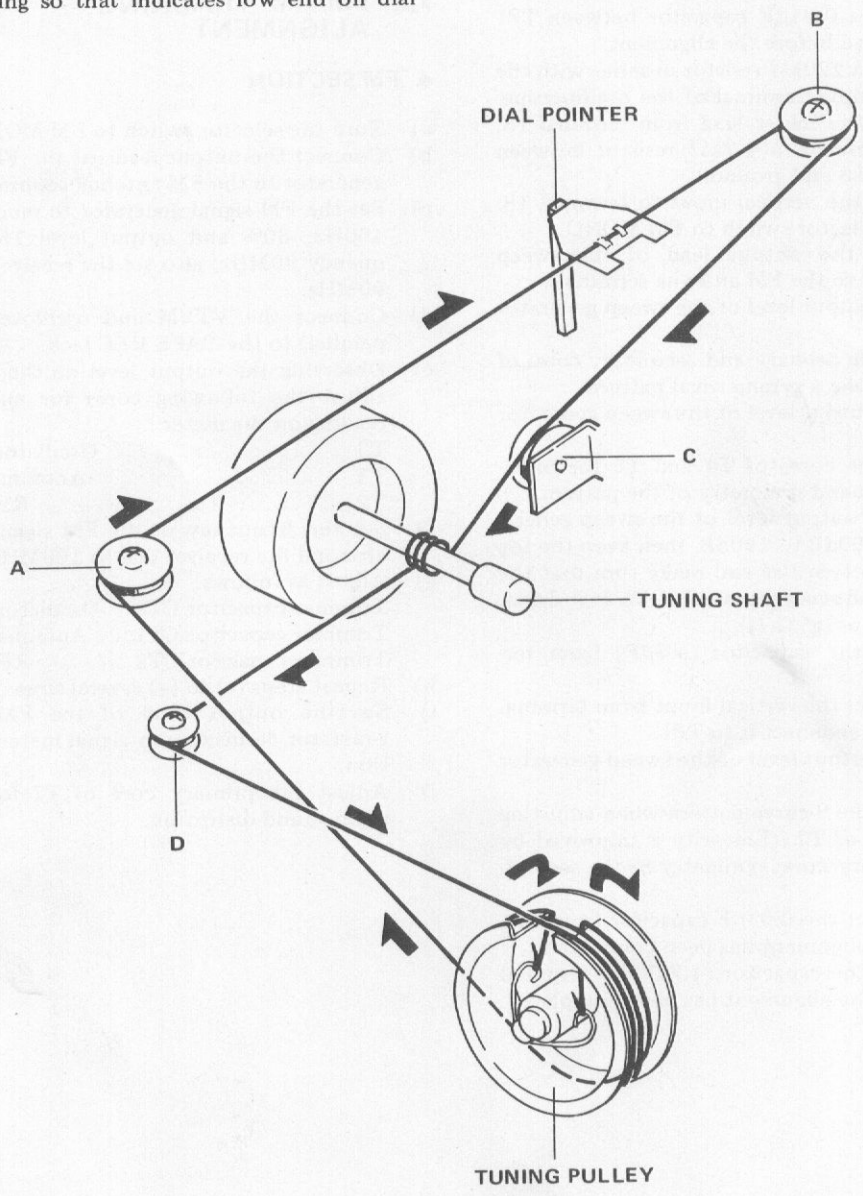


SELECTOR SWITCH
 ASC-021-0

OUTPUT SELECTOR
 ASA-025-0 (KUW, KCW)
 ASA-028-0 (FVZW, NBW, FW)

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 preferably with RF output

7.1 FM/AM IF ALIGNMENT

● FM SECTION

- a) Connect a 0.01 μ F capacitor between TP1 and ground before the alignment.
- b) Connect a 220k Ω resistor in series with the vertical input terminal of the oscilloscope.
- c) Remove the meter lead from terminal 18, then terminate a 4.7k Ω 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 generator 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 (4.7 μ F) 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 0.01 μ F capacitor from TP1 after the alignment has been completed.
- q) Connect the capacitor (4.7 μ F) 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 TRACKING 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 to 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 to 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 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.

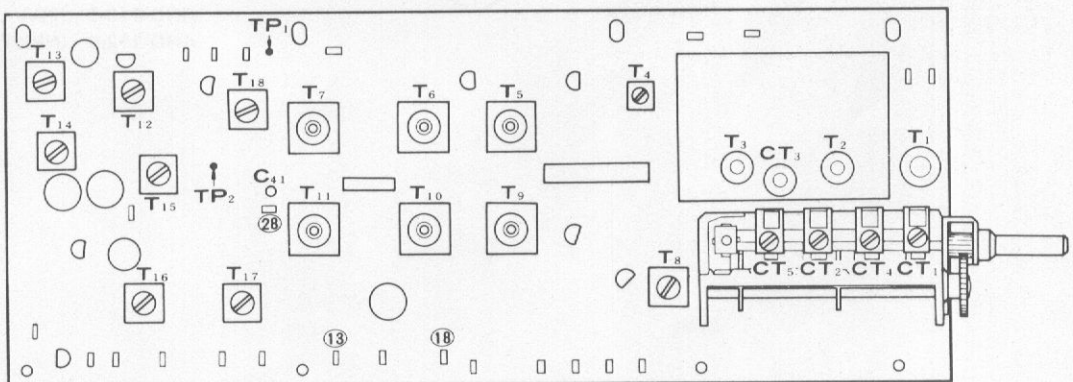
7.4 OTHER ALIGNMENT

● 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

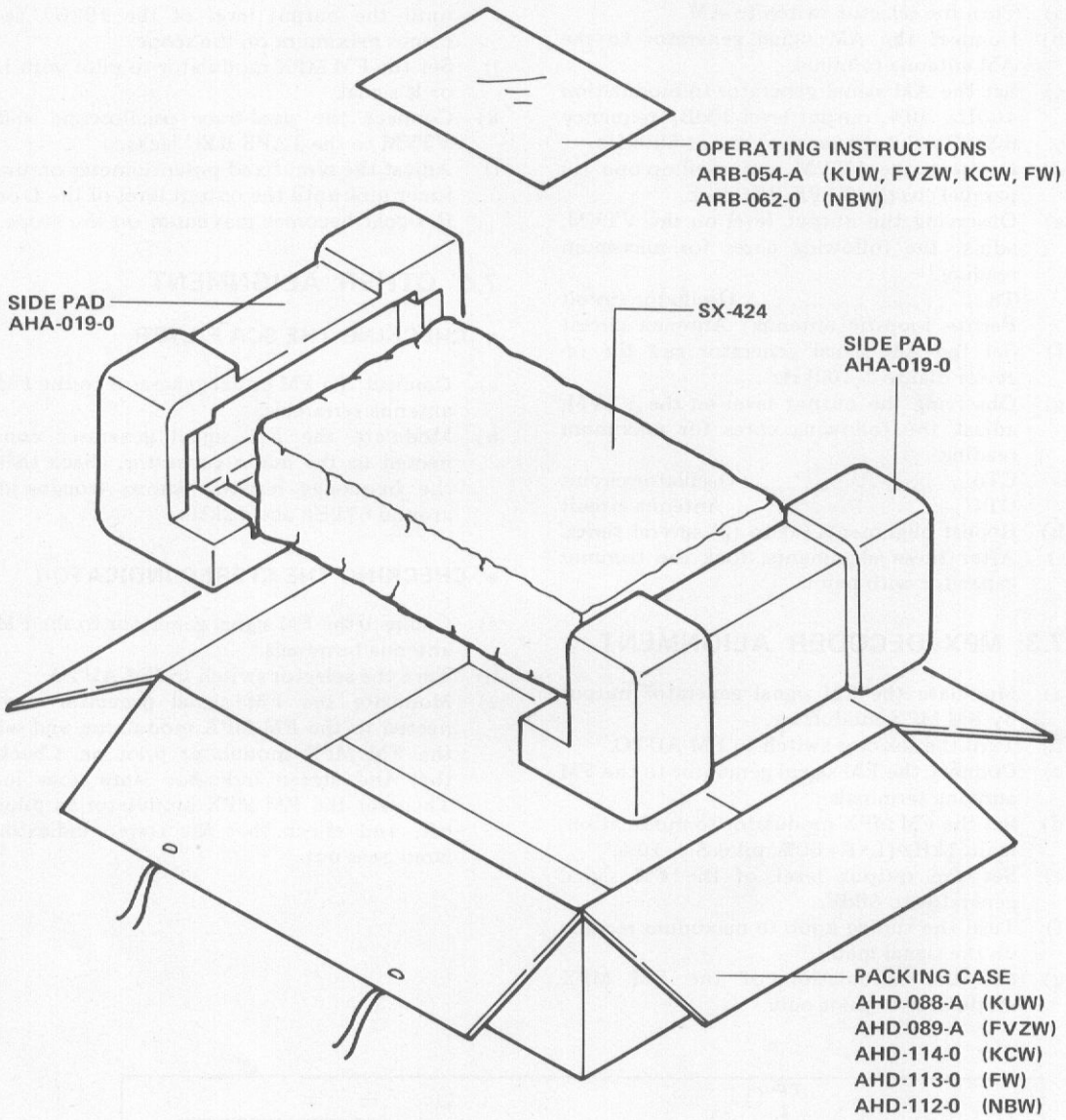
- a) Connect the FM signal generator to the FM antenna terminals.
- b) Turn the selector switch to FM AUTO.
- c) Modulate the FM signal generator connected to the FM MPX modulator, and set the FM MPX modulator pilot on. Check that the stereo indicator lamp goes in. Then set the FM MPX modulator to pilot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



TUNER UNIT (AWE-008)

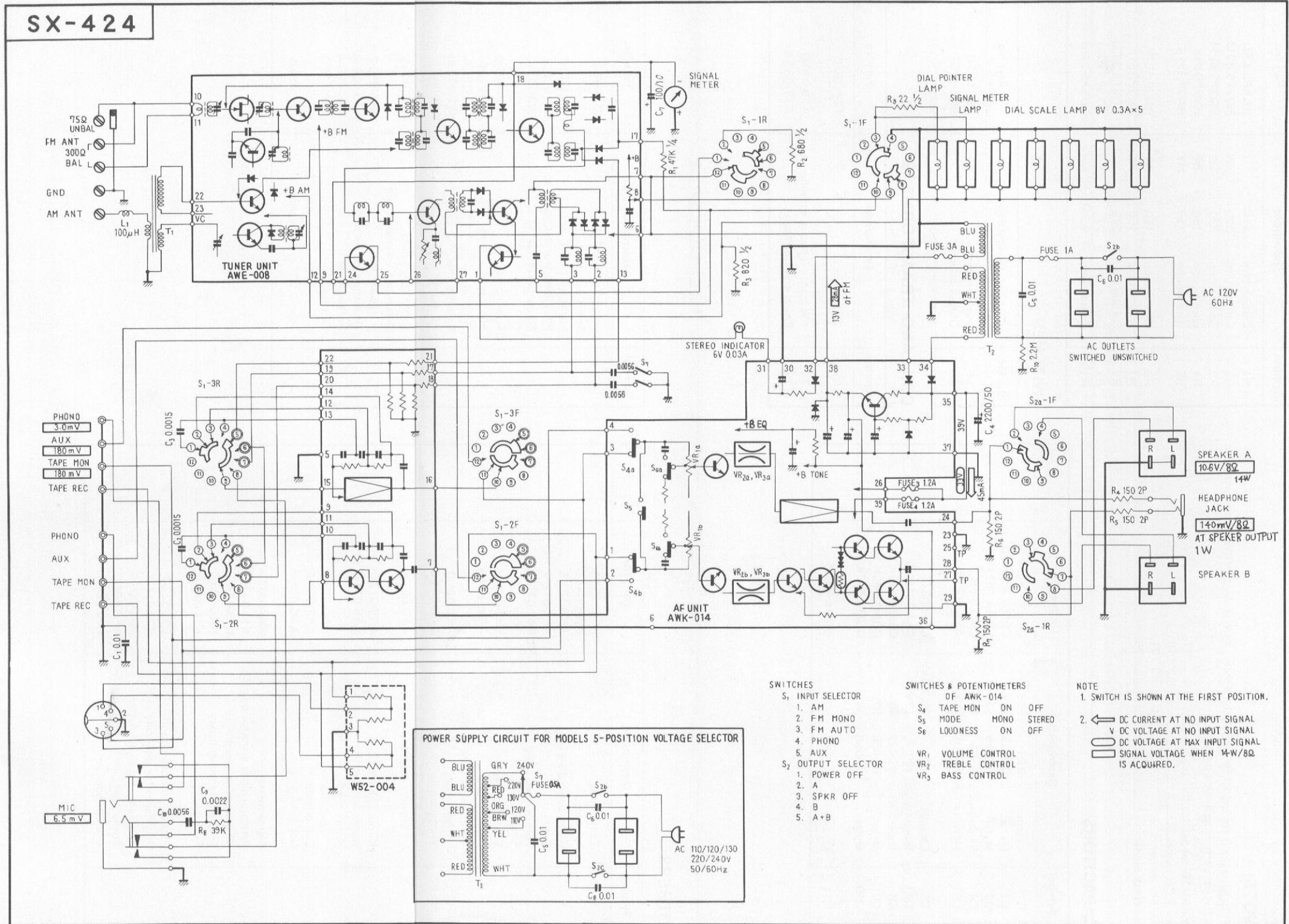
Fig. 1

8. PACKING METHOD AND PART NUMBERS



9. SCHEMATIC DIAGRAMS, PCB PATTERNS AND PARTS LIST

9.1 UNIT CONNECTION DIAGRAM AND MISCELLANEOUS PARTS



MISCELLANEOUS PARTS LIST

- CAPACITORS: IN μF UNLESS OTHERWISE NOTED. p: $\mu\mu\text{F}$.
- RESISTORS: IN Ω , $\frac{1}{4}\text{W}$ UNLESS OTHERWISE NOTED. k: $\text{k}\Omega$, M: $\text{M}\Omega$.

NOTE:

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

for FVZW model 17,
 for KCW model..... 19,
 for FW model 21,
 for NBW model 25.

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 | Metalized mylar | 0.01 | 250V | ACE-002-0 |
| C6 | Ceramic | 0.01 | DC 1.4kV | C43-003-0 |
| C7 | Electrolytic | 100 | 10V | CEA 101P 10 |
| C8 | Mylar | 0.0022 | 50V | CQMA 222K 50 |
| C9 | Mylar | 0.0056 | 50V | CQMA 562K 50 |
| C10 | Mylar | 0.0056 | 50V | CQMA 562K 50 |
| C11 | Mylar | 0.0056 | 50V | CQMA 562K 50 |

RESISTORS

| Symbol | Description | | | Part No. |
|--------|-------------|------|-----------------------|--------------------------|
| R1 | Carbon film | 47k | | RD $\frac{1}{4}$ PS 473J |
| R2 | Carbon film | 820 | $\frac{1}{4}\text{W}$ | RD $\frac{1}{4}$ PS 821J |
| R3 | Carbon film | 820 | $\frac{1}{4}\text{W}$ | RD $\frac{1}{4}$ PS 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 | 39k | | RD $\frac{1}{4}$ PS 393J |
| R9 | Carbon film | 22 | $\frac{1}{2}\text{W}$ | RD $\frac{1}{2}$ PS 220J |
| R10 | Carbon film | 2.2M | $\frac{1}{2}\text{W}$ | RD $\frac{1}{2}$ PS 225J |

SWITCHES

| Symbol | Description | Part No. |
|--------|-----------------|-----------|
| S1 | Selector switch | ASC-021-0 |
| S2 | Output selector | ASA-025-0 |

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-A |

| Symbol | Description | Part No. | |
|--------|--|-----------|--|
| | Tuner unit | AWE-008-A | |
| | AF unit | AWK-014-B | |
| | Front panel ass'y | ANB-127-B | |
| | Foot | AEC-012-0 | |
| | Tuning shaft ass'y | M42-071-F | |
| | Tuning pulley | M42-080-A | |
| | Wooden case | AMM-014-B | |
| | AM ferrite loopstick antenna holder ass'y | AXB-001-0 | |
| | Knob, tuning | AAA-004-B | |
| | Knob, selector, output selector bass, and treble | AAB-007-B | |
| | Knob, volume (L) | AAB-013-0 | |
| | Knob, volume (R) | AAB-014-0 | |
| | Knob, 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 | E21-034-A | |
| | 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 (M4 x 15) | ABA-010-0 | |
| | Operating instructions | ARB-054-A | |
| | Packing case | AHD-088-A | |
| | Side pad | AHA-019-0 | |
| | Fuse 1.2A for protection | AEC-010-0 | |

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 | 0.0022 | 50V | CQMA 222K 50 |
| C9 | Ceramic | 0.01 | DC 1.4kV | C43-003-0 |
| C10 | Mylar | 0.0056 | 50V | CQMA 562K 50 |

RESISTORS

| Symbol | Description | | | Part No. |
|--------|-------------|-----|-----------------|--------------------------|
| R1 | Carbon film | 47k | | RD $\frac{1}{2}$ PS 473J |
| R2 | Carbon film | 820 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 821J |
| R3 | Carbon film | 820 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 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 | 39k | | RD $\frac{1}{2}$ PS 393J |
| R9 | Carbon film | 22 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 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-A |

OTHERS

| Symbol | Description | Part No. | |
|--------|---|-----------|--|
| | Tuner unit | AWE-008-A | |
| | AF unit | AWK-014-B | |
| | Front panel ass'y | ANB-127-B | |
| | Foot | AEC-012-0 | |
| | Tuning shaft ass'y | M42-071-F | |
| | Tuning pulley | M42-080-A | |
| | Wooden case | AMM-014-B | |
| | AM ferrite loopstick antenna holder ass'y | AXB-001-0 | |
| | Knob, tuning | AAA-004-B | |
| | Knob, selector, output selector, bass, and treble | AAB-007-B | |
| | Knob, volume (L) | AAB-013-0 | |
| | Knob, volume (R) | AAB-014-0 | |
| | Knob, 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 (M4 x 15) | ABA-010-0 | |
| | Operating instructions | ARB-054-A | |
| | Packing case | AHD-089-A | |
| | Side pad | AHA-019-0 | |
| | Fuse 1A | E21-004-0 | |
| | Fuse 1.2A for protection | AEC-010-0 | |

For KCW 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 | DC1.4kV | C43-003-0 |
| C6 | Ceramic | 0.01 | DC1.4kV | C43-003-0 |
| C7 | Electrolytic | 100 | 10V | CEA 101P 10 |
| C8 | Ceramic | 0.01 | DC1.4kV | C43-003-0 |
| C9 | Mylar | 0.0022 | 50V | CQMA 222K 50 |
| C10 | Mylar | 0.0056 | 50V | CQMA 562K 50 |
| C11 | Mylar | 0.0056 | 50V | CQMA 562K 50 |
| C12 | Mylar | 0.0056 | 50V | CQMA 562K 50 |
| C13 | Metalized mylar | 0.01 | 250V | ACE-002-0 |

SWITCHES

| Symbol | Description | Part No. |
|--------|-----------------|-----------|
| S1 | Selector switch | ASC-021-0 |
| S2 | Output selector | ASA-025-0 |

COIL AND TRANSFORMERS

| Symbol | Description | Part No. |
|--------|------------------------------|-----------|
| L1 | Choke coil | T24-030-0 |
| T1 | AM ferrite loopstick antenna | ATB-010-0 |
| T2 | Power transformer | ATT-092-0 |

RESISTORS

| Symbol | Description | | | Part No. |
|--------|-------------|------|----------------|--------------------------|
| R1 | Carbon film | 47k | | RD $\frac{1}{2}$ PS 473J |
| R2 | Carbon film | 680 | $\frac{1}{2}W$ | RD $\frac{1}{2}$ PS 681J |
| R3 | Carbon film | 820 | $\frac{1}{2}W$ | RD $\frac{1}{2}$ PS 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 | 39k | | RD $\frac{1}{2}$ PS 393J |
| R9 | Carbon film | 22 | $\frac{1}{2}W$ | RD $\frac{1}{2}$ PS 220J |
| R10 | Carbon film | 2.2M | $\frac{1}{2}W$ | RD $\frac{1}{2}$ PS 225J |

OTHERS

| Symbol | Description | Part No. |
|--------|---|-----------|
| | Tuner unit | AWE-008-A |
| | AF unit | AWK-014-B |
| | Front panel ass'y | ANB-127-B |
| | Foot | AEC-012-0 |
| | Tuning shaft ass'y | M42-071-F |
| | Tuning pulley | M42-080-A |
| | Wooden case | AMM-014-B |
| | AM ferrite loopstick antenna holder ass'y | AXB-001-0 |
| | Knob, tuning | AAA-004-B |
| | Knob, selector, bass, treble, and output selector | AAB-007-B |
| | Knob, volume (L) | AAB-013-0 |
| | Knob, volume (R) | AAB-014-0 |
| | Knob, mode, tape monitor, and loudness | AAD-029-0 |
| | Dial scale | AAG-035-0 |
| | Signal meter | AAW-003-A |
| | Dial pointer | AAF-007-B |
| | Antenna input terminal board | K11-043-A |
| | 4P input terminal board | AKB-005-0 |
| | 4P ground terminal | K13-047-0 |
| | 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 |
| | Fuse 1.2A for protection | AEK-010-0 |
| | Compound part for REC jack | W52-004-0 |

| Symbol | Description | Part No. |
|--------|------------------------------------|-----------|
| | Microphone jack | K72-020-0 |
| | 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 |
| | Fuse (for protection) holder | AKR-011-0 |
| | Fuse cover | AEC-058-0 |
| | AC power cord | D11-003-E |
| | Screw for ground | B11-012-A |
| | Screw to fix wooden case (M4 x 15) | ABA-010-0 |
| | FM T-type antenna | D52-013-0 |
| | Pin plug | K72-015-A |
| | Speaker plug | K72-007-B |
| | Fuse 1A for protection | E21-020-0 |
| | Operating instructions | ARB-054-A |
| | Packing case | AHD-114-0 |
| | Side pad | AHD-019-0 |

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 | DC1.4kV | C43-003-0 |
| C6 | Ceramic | 0.01 | DC1.4kV | C43-003-0 |
| C7 | Electrolytic | 100 | 10V | CEA 101P 10 |
| C8 | Ceramic | 0.01 | DC1.4kV | C43-003-0 |
| C9 | Mylar | 0.0022 | 50V | CQMA 222K 50 |
| C10 | Mylar | 0.0056 | 50V | CQMA 562K 50 |
| C11 | Mylar | 0.0056 | 50V | CQMA 562K 50 |
| C12 | Mylar | 0.0056 | 50V | CQMA 562K 50 |

RESISTORS

| Symbol | Description | | | Part No. |
|--------|-------------|-----|-----------------|--------------------------|
| R1 | Carbon film | 47k | | RD $\frac{1}{2}$ PS 473J |
| R2 | Carbon film | 680 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 681J |
| R3 | Carbon film | 820 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 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 | 39k | | RD $\frac{1}{2}$ PS 393J |
| R9 | Carbon film | 22 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 220J |

SWITCHES

| Symbol | Description | Part No. |
|--------|----------------------|-----------|
| S1 | Selector switch | ASC-021-0 |
| S2 | Output selector | ASA-028-0 |
| S7 | De-emphasis selector | S41-022-A |

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-A |

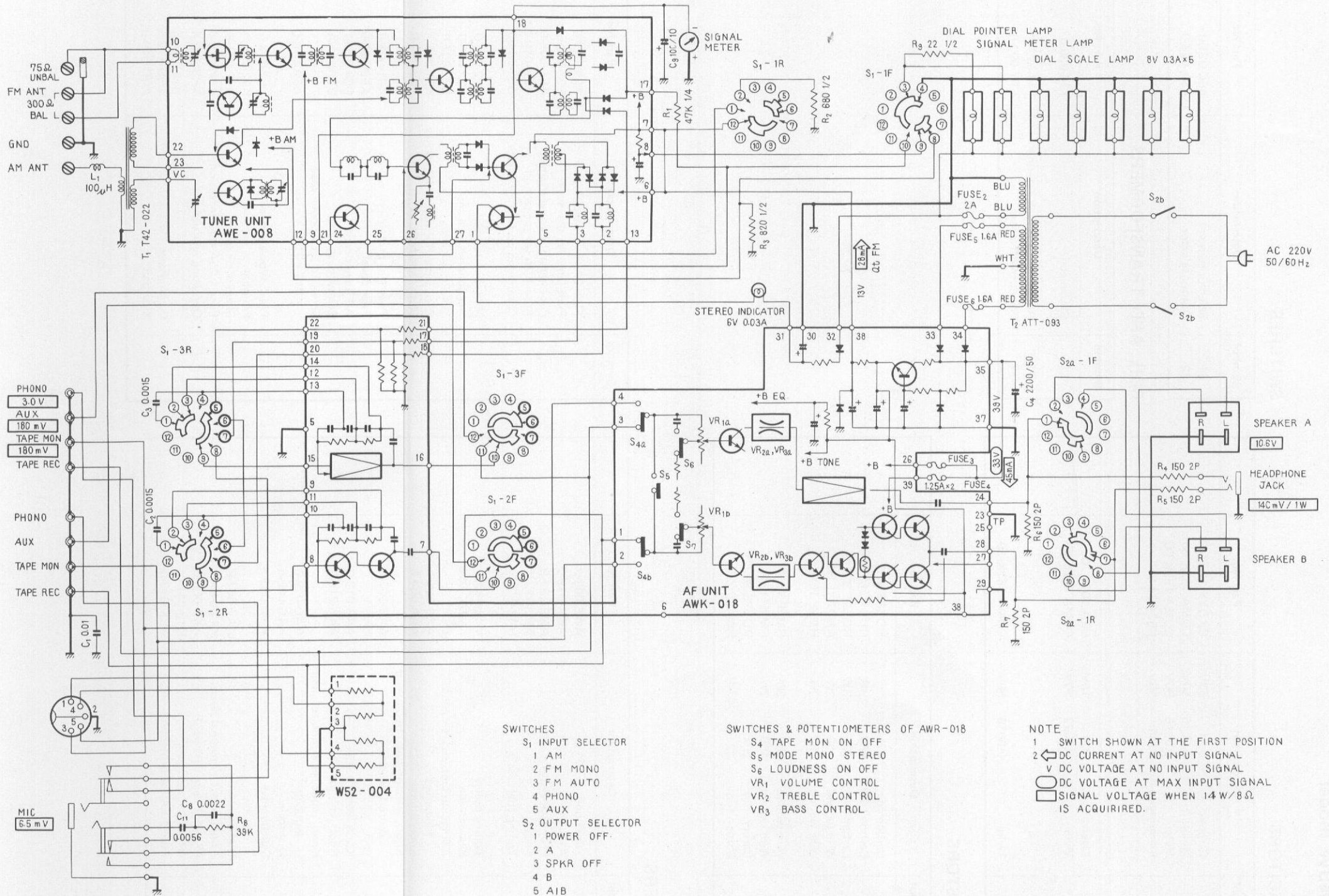
OTHERS

| Symbol | Description | Part No. |
|--------|---|-----------|
| | Tuner unit | AWE-008-A |
| | AF unit | AWK-014-B |
| | Front panel ass'y | ANB-127-B |
| | Foot | AEC-012-0 |
| | Tuning shaft ass'y | M42-071-F |
| | Tuning pulley | M42-080-A |
| | Wooden case | AMM-014-B |
| | AM ferrite loopstick antenna holder ass'y | AXB-001-0 |
| | Knob, tuning | AAA-004-B |
| | Knob, selector, bass, treble, and output selector | AAB-007-B |
| | Knob, volume (L) | AAB-013-0 |
| | Knob, volume (R) | AAB-014-0 |
| | Knob, mode, tape monitor, and loudness | AAD-029-0 |
| | Dial scale | AAG-035-0 |
| | Signal meter | AAW-003-A |
| | Dial pointer | AAF-007-B |
| | Antenna input terminal board | K11-043-A |
| | 4P input terminal board | AKB-005-0 |
| | 4P ground terminal | K13-047-0 |
| | 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 |
| | Fuse 1.2A for protection | AEK-010-0 |
| | Compound part for REC jack | W52-004-0 |

| Symbol | Description | Part No. |
|--------|------------------------------------|-----------|
| | Microphone jack | K72-020-0 |
| | 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 |
| | Line voltage selector | AKR-001-0 |
| | Fuse (for protection) holder | AKR-011-0 |
| | Fuse cover | AEC-058-0 |
| | AC power cord | D11-002-B |
| | Screw for ground | B11-012-A |
| | Screw to fix wooden case (M4 x 15) | ABA-010-0 |
| | FM T-type antenna | D52-013-0 |
| | Pin plug | K72-015-A |
| | Speaker plug | K72-007-B |
| | Fuse 1A | E21-004-0 |
| | Operating instructions | ARB-054-A |
| | Packing case | AHD-113-0 |
| | Side pad | AHD-019-0 |

UNIT CONNECTION DIAGRAM FOR NBW MODEL

SX-424/NBW



MISCELLANEOUS PARTS LIST

For NBW 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 | | | | |
| C6 | | | | |
| C7 | Electrolytic | 100 | 10V | CEA 101P 10 |
| C8 | Mylar | 0.0022 | 50V | CQMA 222K 50 |
| C9 | | | | |
| C10 | | | | |
| C11 | Mylar | 0.0056 | 50V | CQMA 562K 50 |

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-093-0 |

RESISTORS

| Symbol | Description | | | Part No. |
|--------|-------------|-----|-----------------|--------------------------|
| R1 | Carbon film | 47k | | RD $\frac{1}{4}$ PS 473J |
| R2 | Carbon film | 680 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 681J |
| R3 | Carbon film | 820 | $\frac{1}{2}$ W | RD $\frac{1}{2}$ PS 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 | 39k | | RD $\frac{1}{4}$ PS 393J |
| R9 | Carbon film | 22 | $\frac{1}{2}$ W | RD $\frac{1}{4}$ PS 220J |

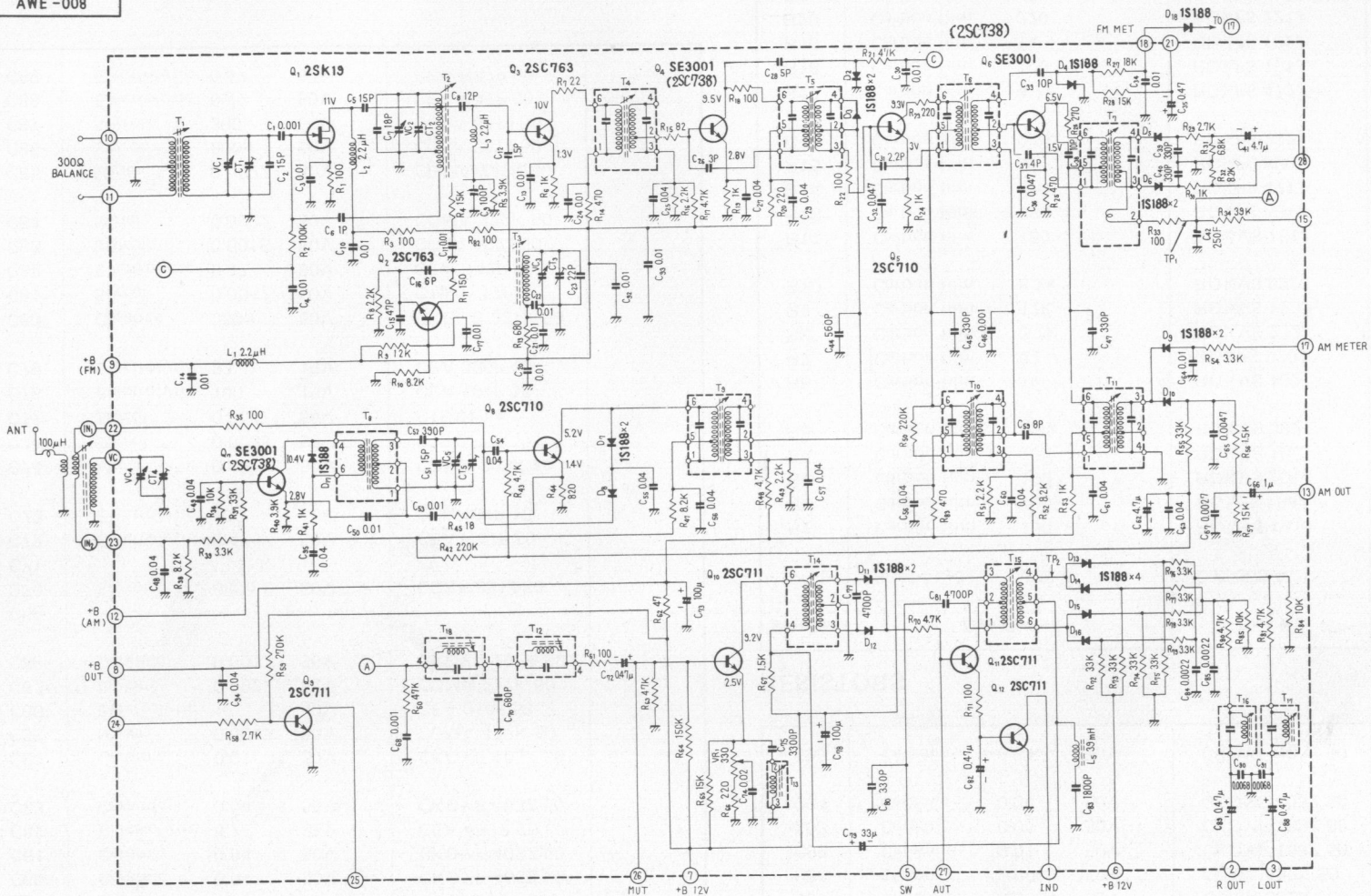
OTHERS

| Symbol | Description | Part No. | |
|--------|---|-----------|--|
| | Tuner unit | AWE-008-A | |
| | AF unit | AWK-018-0 | |
| | Front panel ass'y | ANB-127-B | |
| | Foot | AEC-012-0 | |
| | Tuning shaft ass'y | M42-071-F | |
| | Tuning pulley | M42-080-A | |
| | Wooden case | AMM-014-B | |
| | AM ferrite loopstick antenna holder ass'y | AXB-001-0 | |
| | Knob tuning | AAA-004-B | |
| | Knob, selector, bass, treble, and output selector | AAB-007-B | |
| | Knob, volume (L) | AAB-013-0 | |
| | Knob, volume (R) | AAB-014-0 | |
| | Knob, mode, tape monitor, and loudness | AAD-029-0 | |
| | Dial scale | AAG-035-0 | |
| | Signal meter | AAW-003-A | |
| | Dial pointer | AAF-007-B | |
| | Antenna input terminal board | K11-043-A | |
| | 4P input terminal board | AKB-005-0 | |
| | 4P ground terminal | K13-047-0 | |
| | Fuse 1.6A for protection | AEK-013-0 | |

| Symbol | Description | Part No. | |
|--------|------------------------------------|-----------|--|
| | Fuse 2A for protection | AEK-017-0 | |
| | Pilot lamp for dial scale | E22-017-0 | |
| | Pilot lamp for signal meter | AEL-006-0 | |
| | Fuse 1.2A for protection | AEK-010-0 | |
| | Compound part for REC jack | W52-004-0 | |
| | Microphone jack | K72-020-0 | |
| | Headphones jack | K72-026-0 | |
| | Speaker socket | K72-031-0 | |
| | Pilot lamp (for dial scale) socket | K91-005-A | |
| | 5P connector (DIN) | K93-003-B | |
| | Fuse (for protection) holder | K91-008-0 | |
| | Fuse cover | AEC-058-0 | |
| | AC power cord | D54-019-0 | |
| | Screw for ground | B11-012-A | |
| | Screw to fix wooden case (M4 x 15) | ABA-010-0 | |
| | FM T-type antenna | D52-013-0 | |
| | Pin plug | K72-015-A | |
| | Speaker plug | K72-007-B | |
| | Fuse 1.25A for protection | AEK-018-0 | |
| | Operating instructions | ARB-062-0 | |
| | Parking case | AHD-112-0 | |
| | Side pad | AHD-019-0 | |

9.2 TUNER UNIT (AWE-008)

TUNER UNIT
AWE-008

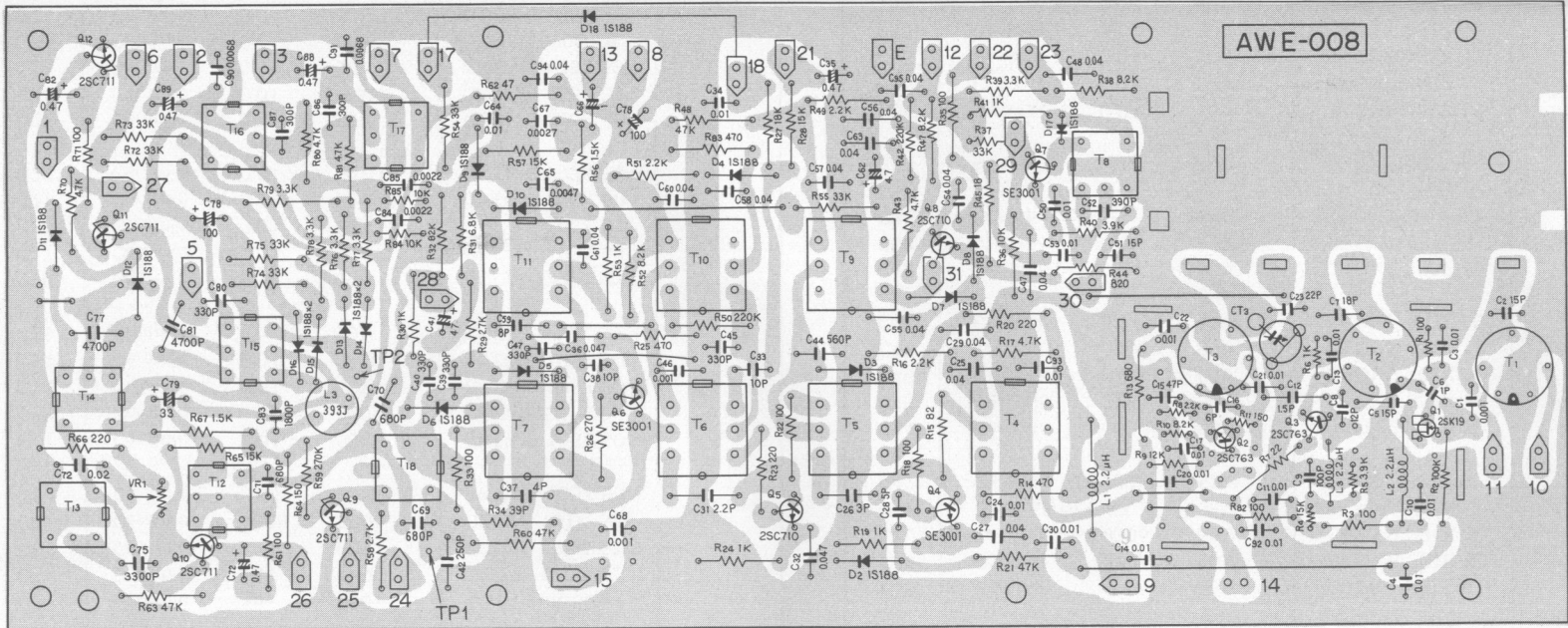


CAPACITORS
μF UNLESS NOTED
P, pF

RESISTORS
OHM UNLESS NOTED
K : KILOHM
M : MEGOHM

CURRENT (at +B = 12V)
I_{AM} = 16mA
I_{FM mono} = 22mA
I_{FM stereo} = 28mA
I_{msz} = 33mA

AWE-008



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 | CCDUJ 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 | | |
| 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 | | |
| C70 | Styrol 680p 50V | CQSA 681J 50 |
| C71 | | |
| 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 | RD $\frac{1}{2}$ VS 101J |
| R2 | Carbon film 100k | RD $\frac{1}{2}$ PS 104J |
| R3 | Carbon film 100 | RD $\frac{1}{2}$ VS 101J |
| R4 | Carbon film 15k | RD $\frac{1}{2}$ VS 153J |
| R5 | Carbon film 3.9k | RD $\frac{1}{2}$ VS 392J |
| R6 | Carbon film 1k | RD $\frac{1}{2}$ VS 102J |
| R7 | Carbon film 22 | RD $\frac{1}{2}$ PS 220J |
| R8 | Carbon film 2.2k | RD $\frac{1}{2}$ VS 222J |
| R9 | Carbon film 12k | RD $\frac{1}{2}$ VS 123J |
| R10 | Carbon film 8.2k | RD $\frac{1}{2}$ VS 822J |
| R11 | Carbon film 150 | RD $\frac{1}{2}$ VS 151J |
| R13 | Carbon film 680 | RD $\frac{1}{2}$ PS 681J |
| R14 | Carbon film 470 | RD $\frac{1}{2}$ PS 471J |
| R15 | Carbon film 82 | RD $\frac{1}{2}$ PS 820J |
| R16 | Carbon film 2.2k | RD $\frac{1}{2}$ PS 222J |
| R17 | Carbon film 4.7k | RD $\frac{1}{2}$ PS 472J |
| R18 | Carbon film 100 | RD $\frac{1}{2}$ PS 101J |
| R19 | Carbon film 1k | RD $\frac{1}{2}$ PS 102J |
| R20 | Carbon film 220 | RD $\frac{1}{2}$ PS 221J |
| R21 | Carbon film 47k | RD $\frac{1}{2}$ PS 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 or 2SC738 Transistor | |
| Q5 | 2SC710R-D or C Transistor | |
| Q6 | SE3001 or 2SC738 Transistor | |
| Q7 | SE3001 or 2SC738 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

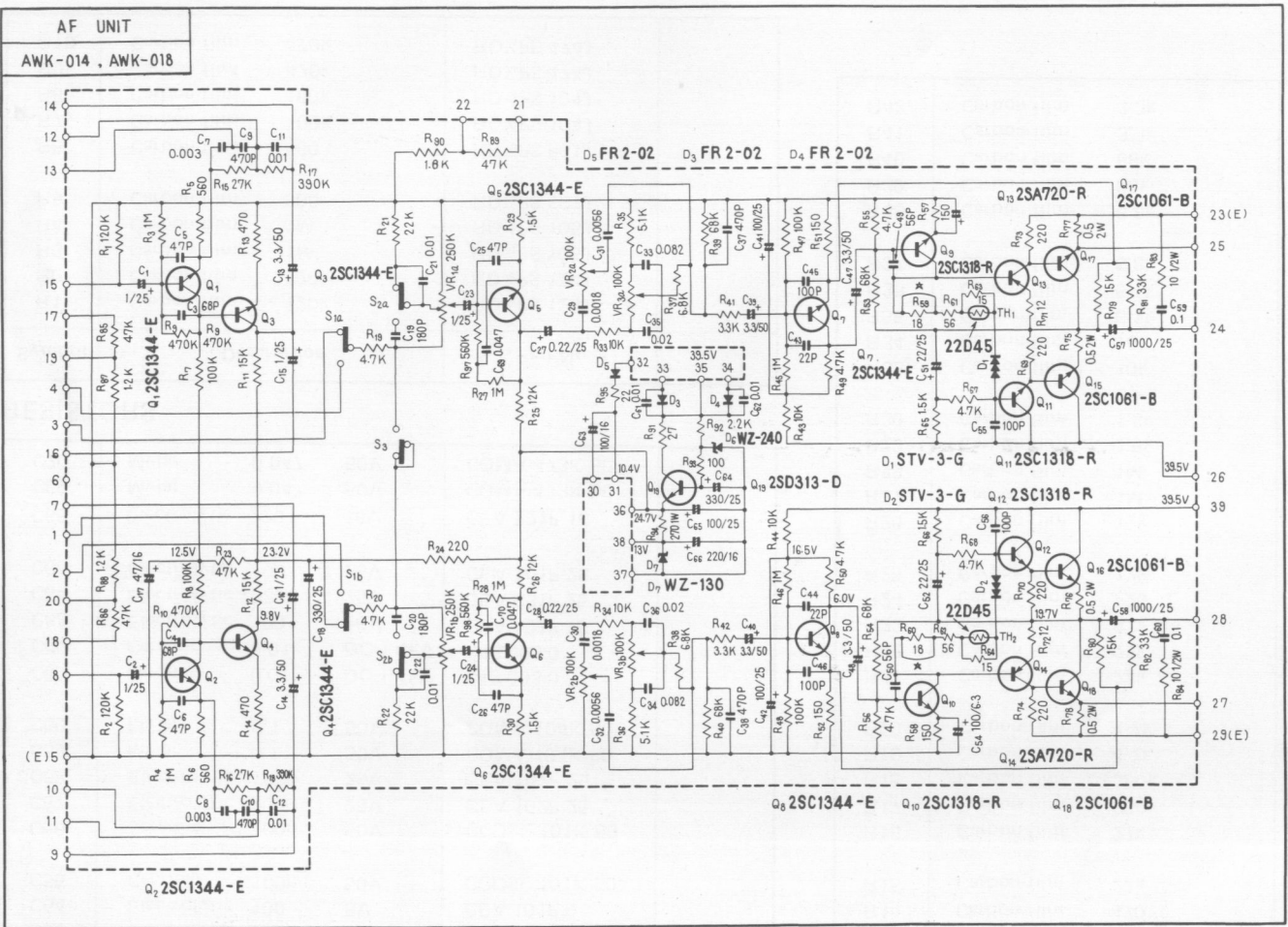
| Symbol | Description | Part No. |
|--------|-------------------|-----------|
| T1 | FM Antenna Coil | ATC-002-0 |
| T2 | FM RF Coil | ATC-004-0 |
| T3 | FM OSC Coil | ATC-003-0 |
| T4 | FM IF Transformer | T73-034-0 |
| T5 | FM IF Transformer | T73-035-A |
| T6 | FM IF Transformer | T73-036-0 |
| T7 | 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 | ATM-006-0 |
| T13 | 19kHz Transformer | T75-023-0 |
| T14 | 19kHz Transformer | T75-024-0 |
| T15 | 38kHz Transformer | T75-025-0 |
| T16 | 38kHz Filter Coil | ATM-004-0 |
| T17 | 38kHz Filter Coil | ATM-004-0 |
| T18 | SCA Coil | ATM-007-0 |
| 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 |

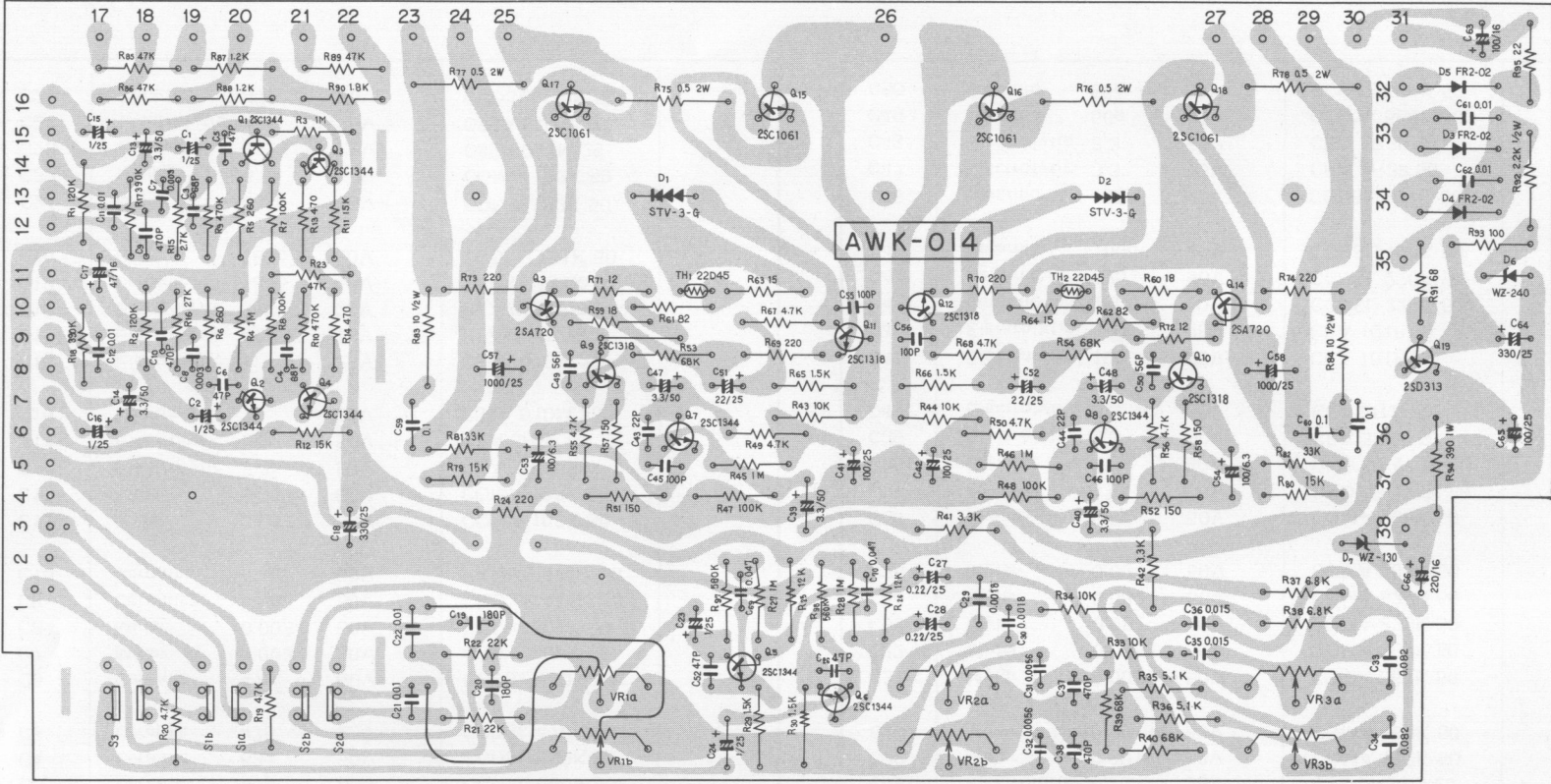
9.3 AF UNIT (AWK-014) (AWK-018)

NOTE:

All items including CIRCUIT DIAGRAM, PCB PATTERNS, and PARTS LIST of the AF unit in this manual for NBW model can also be commonly used for other models, except when new parts for replacement are attached to the PCB of NBW model.

To protect NBW model from over-heating, it is factory-adjusted to take a slight clearance between the PCB and parts, meeting the requirements of the Scandinavian Safety Standards.
When replacing parts, do not fail to take such a slight clearance.





AWK-014

SX-424

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 |
| C18 | Electrolytic 330 25V | CEA 331P 25 |
| 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 |

| Symbol | Description | Part No. |
|--------|-----------------------|---------------|
| C26 | Ceramic 47p 50V | CCDSL 470K 50 |
| 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 |

| Symbol | Description | | | Part No. |
|--------|--------------|-------|----------|---------------|
| C51 | Electrolytic | 22 | 25V | CEA 220P 25 |
| 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 | | RD½PS 124J |
| R2 | Carbon film | 120k | | RD½PS 124J |
| R3 | Carbon film | 1M | | RD½PS 105J |
| R4 | Carbon film | 1M | | RD½PS 105J |
| R5 | Carbon film | 560 | | RD½PS 561J |
| R6 | Carbon film | 560 | | RD½PS 561J |
| R7 | Carbon film | 100k | | RD½PS 104J |
| R8 | Carbon film | 100k | | RD½PS 104J |
| R9 | Carbon film | 470k | | RD½PS 474J |
| R10 | Carbon film | 470k | | RD½PS 474J |

| Symbol | Description | | Part No. |
|--------|-------------|------|------------|
| R11 | Carbon film | 15k | RD½PS 153J |
| R12 | Carbon film | 15k | RD½PS 153J |
| R13 | Carbon film | 470 | RD½PS 471J |
| R14 | Carbon film | 470 | RD½PS 471J |
| R15 | Carbon film | 27k | RD½PS 273J |
| R16 | Carbon film | 27k | RD½PS 273J |
| R17 | Carbon film | 390k | RD½PS 394J |
| R18 | Carbon film | 390k | RD½PS 394J |
| R19 | Carbon film | 4.7k | RD½PS 472J |
| R20 | Carbon film | 4.7k | RD½PS 472J |
| R21 | Carbon film | 22k | RD½PS 223J |
| R22 | Carbon film | 22k | RD½PS 223J |
| R23 | Carbon film | 47k | RD½PS 473J |
| R24 | Carbon film | 220 | RD½PS 221J |
| R25 | Carbon film | 12k | RD½PS 123J |
| R26 | Carbon film | 12k | RD½PS 123J |
| R27 | Carbon film | 1M | RD½PS 105J |
| R28 | Carbon film | 1M | RD½PS 105J |
| R29 | Carbon film | 1.5k | RD½PS 152J |
| R30 | Carbon film | 1.5k | RD½PS 152J |
| R33 | Carbon film | 10k | RD½PS 103J |
| R34 | Carbon film | 10k | RD½PS 103J |
| R35 | Carbon film | 5.1k | RD½PS 512J |
| R36 | Carbon film | 5.1k | RD½PS 512J |
| R37 | Carbon film | 6.8k | RD½PS 682J |
| R38 | Carbon film | 6.8k | RD½PS 682J |
| R39 | Carbon film | 68k | RD½PS 683J |
| R40 | Carbon film | 68k | RD½PS 683J |
| R41 | Carbon film | 3.3k | RD½PS 332J |
| R42 | Carbon film | 3.3k | RD½PS 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 56 | RD¼PS 560J |
| R62 | Carbon film 56 | RD¼PS 560J |
| 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 ¼W | RD¼PS 100J |
| R84 | Carbon film 10 ¼W | RD¼PS 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 1.8k | RD¼PS 182J |
| R91 | Carbon film 27 | RD¼PS 270J |
| R92 | Carbon film 2.2k ¼W | RD¼PS 222J |
| R93 | Carbon film 100 | RD¼PS 101J |
| R94 | Metal oxide 270 1W | RS1P 271J |
| R95 | Carbon film 22 | RD¼PS 220J |
| R97 | Carbon film 560k | RD¼PS 564J |
| R98 | Carbon film 560k | RD¼PS 564J |
| 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-G Varistor | |
| D2 | STV-3-G Varistor | |
| D3 | FR2-02 Diode | |
| D4 | FR2-02 Diode | |
| D5 | FR2-02 Diode | |
| D6 | WZ-240 Zener diode | |
| D7 | WZ-130 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. |
|--------|--------------------|-----------|
| | Insulating bushing | AEC-042-0 |
| | Insulating spacer | AEC-043-0 |