

ST-A30L

339

AEP Model
UK Model

FM STEREO/FM-AM TUNER

SPECIFICATIONS

GENERAL

System:	FM stereo, FM/AM superheterodyne tuner Acute Servo Lock system
Power Requirements:	220V ac \sim , 50/60 Hz (AEP model) 240V ac \sim , 50/60 Hz (UK model)
Power Consumption:	7W
Dimensions:	Approx. 430 (w) \times 80 (h) \times 275 (d) mm 17 1/4 \times 3 1/4 (h) \times 10 7/8 (d) inches including projecting parts and controls
Weight:	Approx. 3.6 kg, 7 lb 15 oz (net) Approx. 4.4 kg, 9 lb 12 oz (in shipping carton)

FM TUNER SECTION

Tuning Range:	87.5-106 MHz
Antenna Terminal:	300 Ω balanced 75 Ω unbalanced
Intermediate Frequency:	10.7 MHz

Sensitivity at 45 dB Quiet: (40 kHz deviation)	3.5 μ V, 16.1 dBf (mono) 40 μ V, 37.3 dBf (stereo)
Usable Sensitivity:	1.3 μ V, S/N = 26 dB (40 kHz deviation) 1.8 μ V, 10.3 dBf; IHF
Limiting Threshold:	1 μ V (-3 dB)
S/N Ratio: (40 kHz deviation)	65 dB (mono) 60 dB (stereo)
Harmonic Distortion:	at 100 Hz 0.15% (mono) 0.4% (stereo) at 1 kHz 0.15% (mono) 0.4% (stereo) at 10 kHz 0.3% (mono) 0.6% (stereo)
IM Distortion: (40 kHz deviation)	0.15% (mono) 0.4% (stereo)
Separation:	35 dB at 100 Hz 45 dB at 1 kHz 32 dB at 10 kHz

SAFETY-RELATED COMPONENT WARNING!

COMPONENTS IDENTIFIED BY SHADING AND MARK Δ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

- Continued on page 2 -

SONY

SERVICE MANUAL

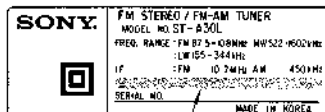
Frequency Response:	40 Hz–12.5 kHz \pm 1 dB
Selectivity:	50 dB (300 kHz) 75 dB (400 kHz)
Capture Ratio:	1.0 dB
AM Suppression Ratio:	55 dB
Image Response Ratio:	50 dB
IF Response Ratio:	95 dB
Spurious Response Ratio:	75 dB
RF Intermodulation:	60 dB
Sub-carrier Product Ratio:	50 dB
Mixing Threshold:	Approx. 5 μ V
Output Level/Impedance:	750 mV, 4.7 k Ω (at 75 kHz deviation)

AM (MW and LW) TUNER SECTION

		MW	LW
Tuning Range		522–1,602 kHz	155–344 kHz
Antenna	Built-in	provided	provided
	External	provided	provided
Intermediate Frequency		450 kHz	
Usable Sensitivity	Built-in antenna	250 μ V/m (1,000 kHz)	500 μ V/m (250 kHz)
	External antenna	100 μ V (1,000 kHz)	100 μ V (250 kHz)
S/N Ratio		50 dB (50 mV/m)	50 dB (50 mV/m)
Harmonic Distortion		0.5% (50 mV/m, 400 Hz)	0.5% (50 mV/m, 400 Hz)
Selectivity		45 dB (9 kHz)	45 dB (9 kHz)
Image Response Ratio		45 dB (1,000 kHz)	75 dB (250 kHz)
IF Response Ratio		40 dB (1,000 kHz)	—

MODEL IDENTIFICATION

— Specification Label —



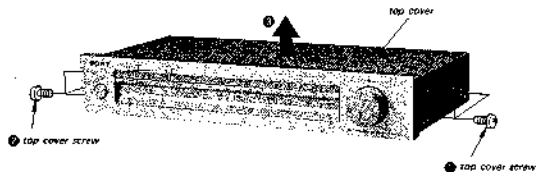
AEP model: 220 V \sim 50/60 Hz 7W
 UK model: 240 V \sim 50/60 Hz 7W

SECTION 2
DISASSEMBLY

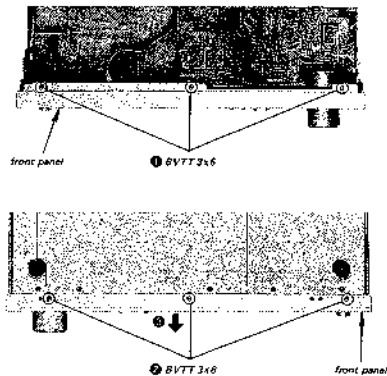
2-1. REMOVAL

Note: Follow the disassembly procedure in the numerical order given.

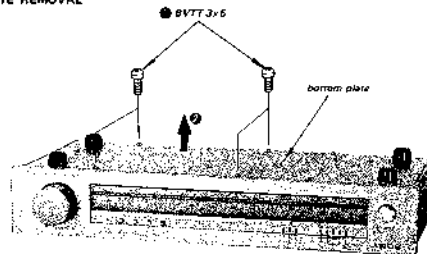
TOP COVER REMOVAL



FRONT PANEL REMOVAL



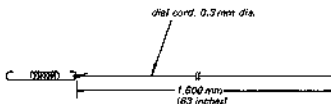
BOTTOM PLATE REMOVAL



2-2. DIAL CORD STRINGING

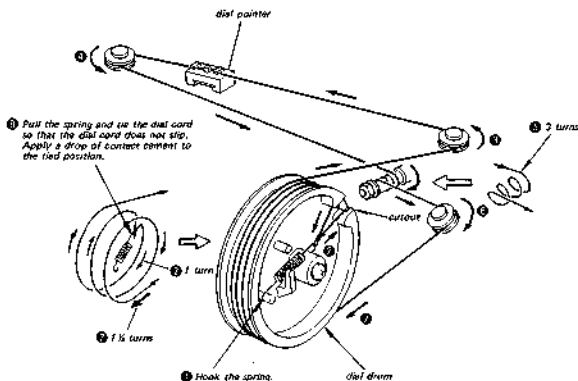
Perform after removing the guide-cord.
Perform the guide-cord stringing after stringing the dial cord. (See page 8.)

1. Preparation



2. Stringing

Turn the tuning capacitor shaft fully clockwise and set the dial drum so that the cutout is positioned as shown below.



3. Dial Pointer Installation

1. Receive a broadcasting station signal and set the dial pointer on the dial scale.
2. Apply a drop of contact cement to the dial pointer



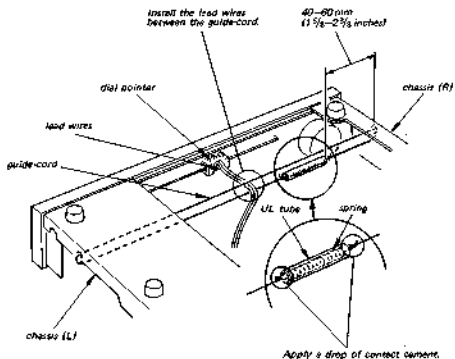
2.3. GUIDE-CORD STRINGING

Perform the guide-cord stringing after stringing the dial cord.

1. Preparation



2. Stringing



SECTION 3 ADJUSTMENTS

MW/LW SECTION

Setting:

BAND selector: MW or LW

AM ANTENNA switch: BUILT IN

Setup:

AM of signal generator

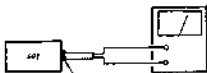


Put the lead-wire antenna close to the sp.

Carrier frequency: MW: 1,000 kHz
LW: 250 kHz

30% amplitude modulation by 400 Hz signal

VOM (V)
(range: 0.5-5 V ac)



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

LW TRACKING ADJUSTMENT
Adjust for a maximum reading on VOM (V).

L901	145 kHz
CT402	365 kHz

LW FREQUENCY COVERAGE ADJUSTMENT
Adjust for a maximum reading on VOM (V).

T401	145 kHz
CT401	365 kHz

MW FREQUENCY COVERAGE ADJUSTMENT
Adjust for a maximum reading on VOM (V).

CT403	1,660 kHz
T402	515 kHz

MW TRACKING ADJUSTMENT
Adjust for a maximum reading on VOM (V).

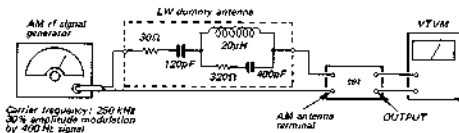
CT404	1,400 kHz
L901	600 kHz

LW EXT Antenna Coil Adjustment

Setting:

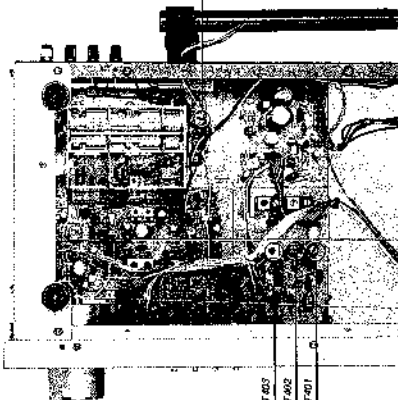
BAND selector: LW
 AM ANTENNA switch: EXT

Procedure:



Tune the set to 250 kHz and adjust L403 for a maximum reading on VTVM.

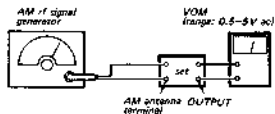
L403



IFT401
 IFT402
 IFT403

AM IF Alignment

Procedure:



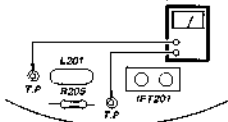
Carrier frequency: 1,000 kHz
 30% amplitude modulation
 by 400 Hz signal
 Output level: as low as possible

1. Tune the set to 1,000 kHz and adjust IFT401-403 for a maximum reading on VOM.
2. Repeat the procedure in adjustment several times.

FM SECTION

FM Discriminator Alignment 1

VOM range: 2.6 V ac1



Setting:

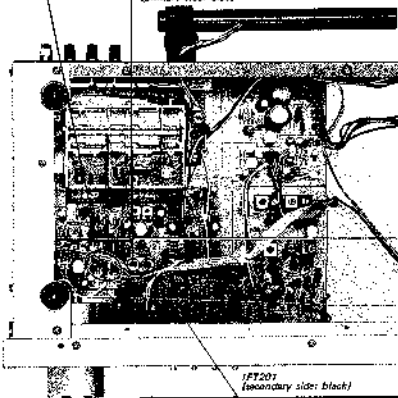
MODE switch: MONO

Procedure:

1. Detune the set.
2. Adjust the blue core (primary-side) of IFT201 for 0 V reading on VOM.

Note: When replacing the ceramic filter (CF101-103), perform this alignment.

IFT201 (primary side: blue)

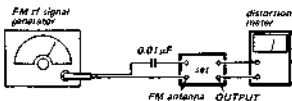


IFT201 (secondary side: black)

FM Discriminator Alignment 2

Setting:

MODE switch: MONO



Carrier frequency: 98 MHz
Output level: 1 mV (160 dB)
Modulation: 400 Hz, 75 kHz deviation (100%)

Procedure:

Adjust the black core (secondary side) of IFT201 for minimum distortion.

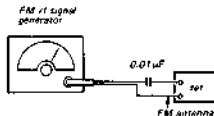
VCO Adjustment

A) Regular Method

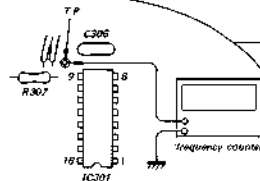
Setting:

MODE switch: MONO

Procedure:



Carrier frequency: 98 MHz
Modulation: 400 Hz, 75 kHz deviation (100%)
Output level: 1 mV (160 dB)

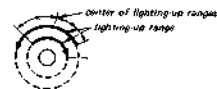


1. Tune the set to 98 MHz.
2. Adjust RT301 for 76 kHz \pm 100 Hz on the counter.

B) Simple Method

Procedure:

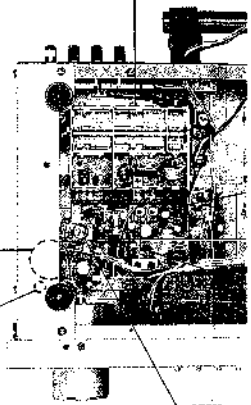
1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT301 clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure RT301 at the center of the lighting-up range of both turns as shown below.



FM FREQUENCY COVERAGE ADJUSTMENT (FM TRACKING ADJUSTMENT) and FM IF ALIGNMENT

The front-end section has been carefully adjusted at the factory, so the adjustment is unnecessary in the field.

FRONT-END SECTION



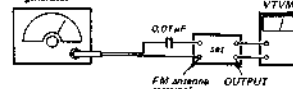
FM Stereo Separation Adjustment

Setting:

MODE switch: STEREO (moving ON)

Procedure:

FM rf stereo signal generator



Carrier frequency: 98 MHz
Output level: 1 mV (160 dB)
Modulation: Audio (400 Hz), 33.75 kHz deviation (45%)
Pilot (19 kHz): 7.5 kHz deviation (10%)

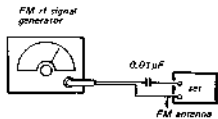
VCO Adjustment

A) Regular Method

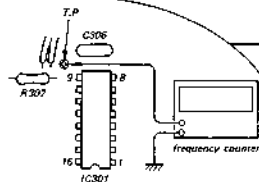
Setting:

MODE switch: MONO

Procedure:



Carrier frequency: 98 MHz
 Modulation: 400 Hz, 75 kHz deviation (100%)
 Output level: 1 mV (80 dB)

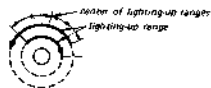


1. Tune the set to 98 MHz.
2. Adjust RT301 for 76 kHz \pm 100 Hz on the counter.

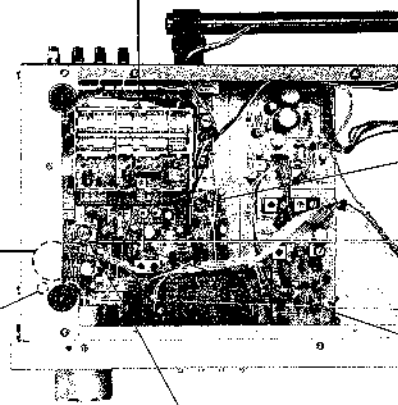
B) Simple Method

Procedure:

1. Tune the set to the FM stereo broadcasting signal.
2. Turn RT301 clockwise or counterclockwise and memorize the lighting-up range of the stereo lamp.
3. Secure RT301 at the center of the lighting-up range of both turns as shown below.



FM FREQUENCY COVERAGE ADJUSTMENT
 FM TRACKING ADJUSTMENT and
 FM IF ALIGNMENT
 The frontend section has been carefully adjusted at the factory, so the adjustment is unnecessary in the field.
 FRONT-END SECTION



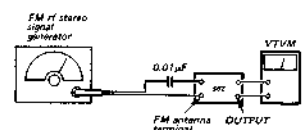
RT301

RT302

FM Stereo Separation Adjustment

Setting: MODE switch: STEREO (mating ON)

Procedure:



Carrier frequency: 98 MHz
 Output level: 1 mV (80 dB)
 Modulation: Audio (400 Hz): 32.75 kHz deviation (66%)
 Pilot (19 kHz): 7.5 kHz deviation (15%)

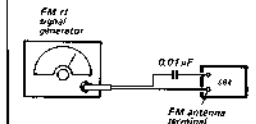
FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	(A)
R-CH	L-CH	Adjust RT302 for minimum reading.
R-CH	R-CH	
L-CH	R-CH	Adjust RT302 for minimum reading.
L-CH	L-CH	

L-CH Stereo separation: (A) - (B)
 R-CH Stereo separation: (C) - (D)
 The separations of both channels should be equal.

Signal Indicator Level Adjustment

Setup:

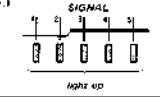
MODE switch: MONO



Carrier frequency: 98 MHz
 Modulation: 400 Hz, 75 kHz deviation (100%)
 Output level: 1 mV (80 dB)

Procedure:

Tune the set to 98 MHz and adjust RT201 so that all signal elements light up. (See figure below.)

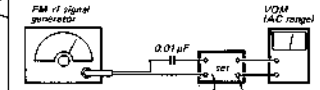


FM Muting Level Adjustment

Setting:

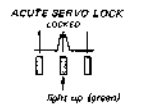
MODE switch: STEREO (mating ON)

Procedure:



Carrier frequency: 98 MHz
 Modulation: 400 Hz, 75 kHz deviation (100%)
 Output level: 7.5 µV (18 dB)

1. Tune the set to 98 MHz.
2. Turn RT203 and stop it just when the VOM indication suddenly decreases.
3. Receive a signal stronger than the muting level. Confirm that the ACUTE SERVO LOCK lamp (green) lights up. (See figure below.)

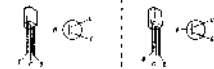


SECTION 4
DIAGRAMS

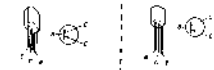
Replacement Semiconductors

For replacement, use semiconductors except as listed.

Q101, 102 : 2SC710-16 (2SC7100)

Q201-208 : 2SC1384 (2SC7116)
Q301-303 : 2SC1384 (2SC7116)
Q401-403 :

D207-210 : 2SA1027A (2SA628G)



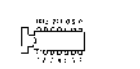
Q801 : 2SC1061 (2SD359E)

IC201 : LA1231 (LA1231N)
IC301 : μPC1161C
IC401 : LA1240

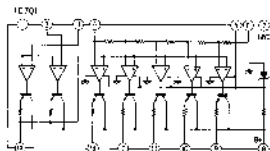
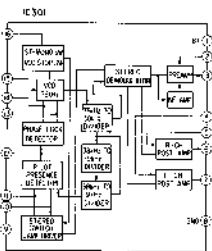
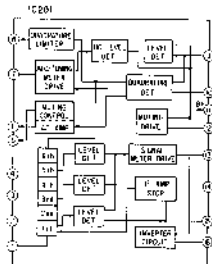
IC601 : μPC659BC



IC701 : LB1416

D201-204 : 1S155 (1S2473)
D301-304 : 1T22AM (1S18BAM)
D501-503 : 1DE2 (1N4603)
D601 : RD13E (RD13E-B)

D301 : AR3111D

D901-906 : SLP241D
D907, 908 : SLP141D

Note:

- [Symbol] : indicates side identified with part number.
- [Symbol] : signal path
- [Symbol] : 1-GH
- [Symbol] : 0.5-GH
- [Symbol] : 0.1-poise
- Readings are taken under d-biased conditions with a VOM (20 kΩ/V)
- no mark: FM
- () : AM
- () : FM STEREO (with signal input)

A

B

C

D

4-1. MOUNTING DIAGRAM

- Conductor Side -

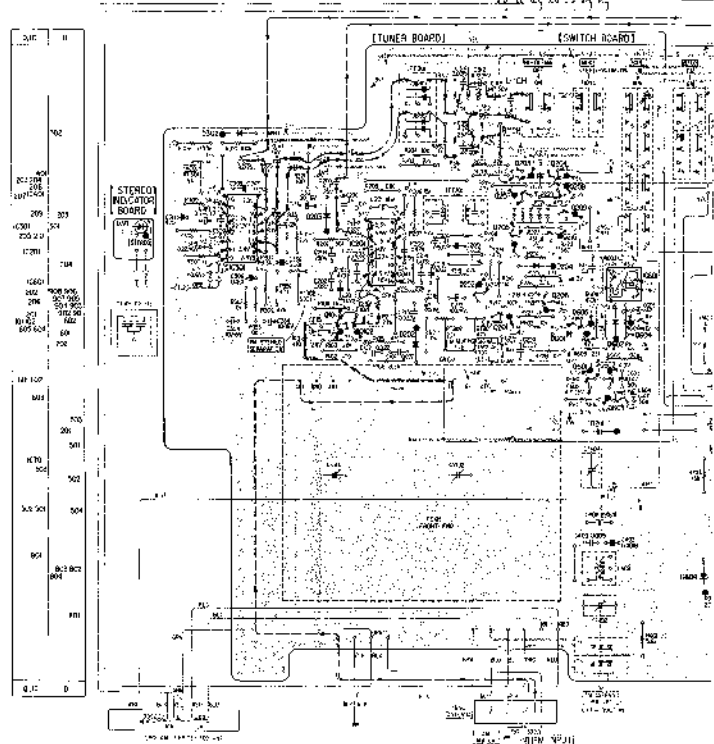
1

2

3

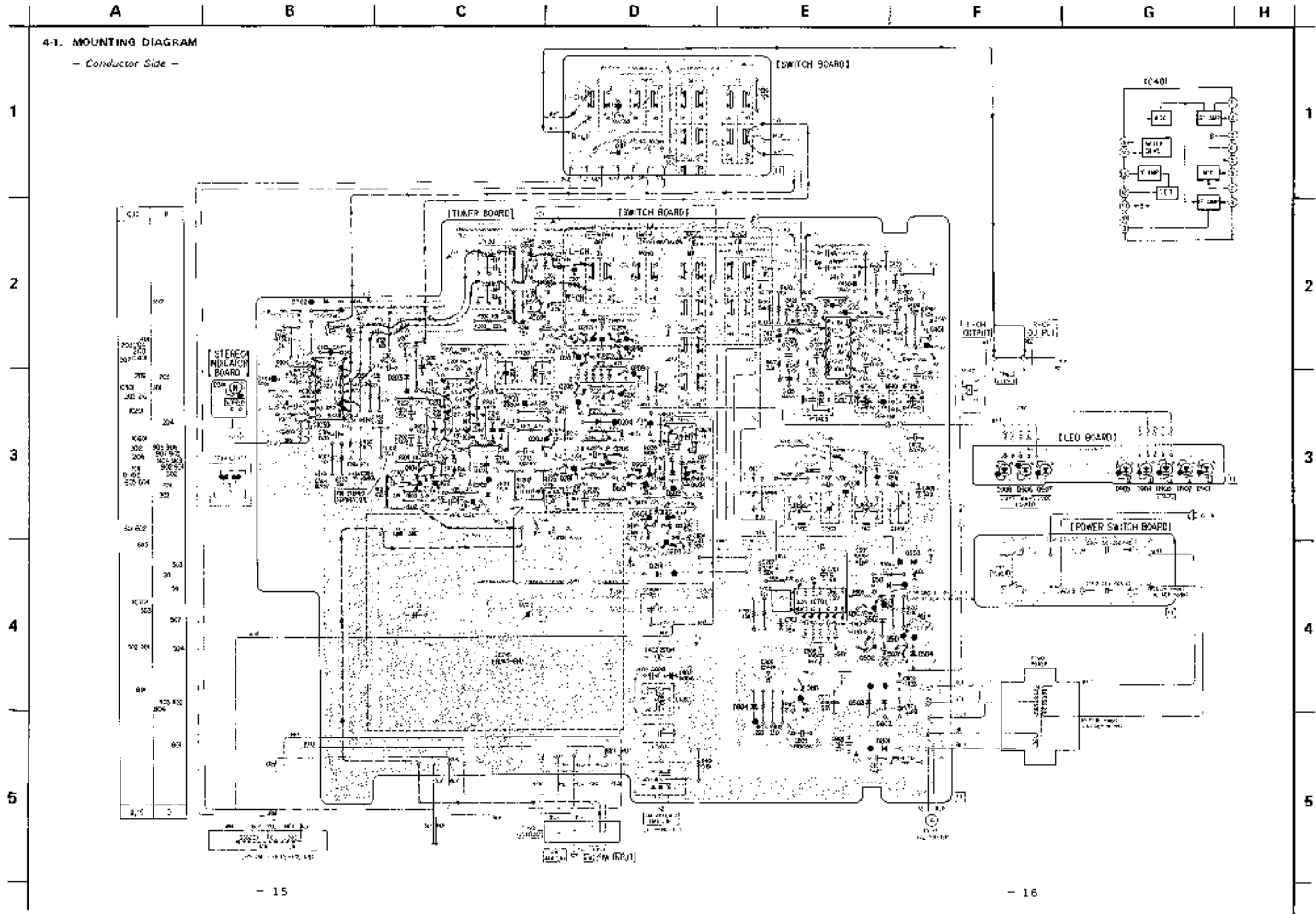
4

5

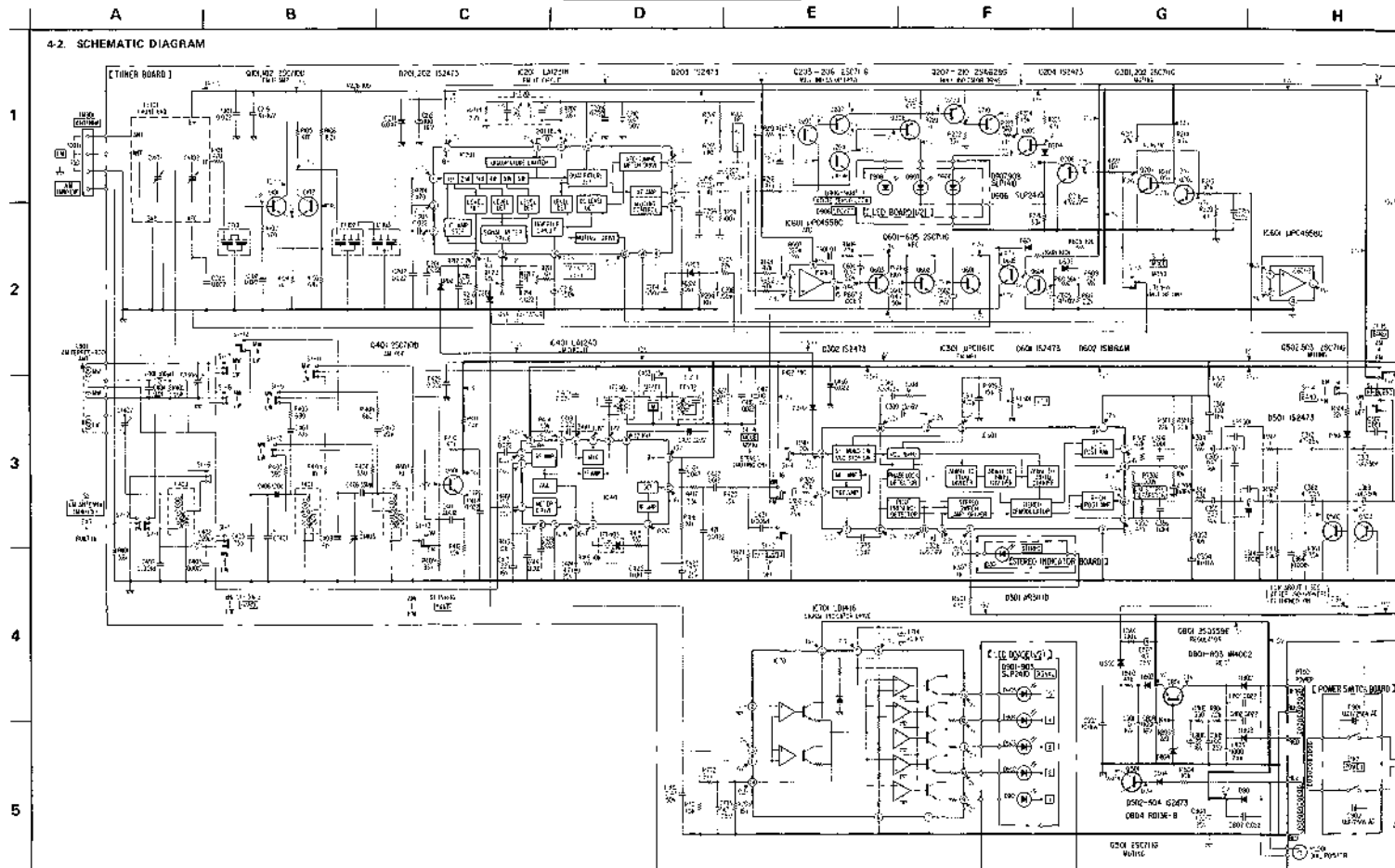


4-1. MOUNTING DIAGRAM

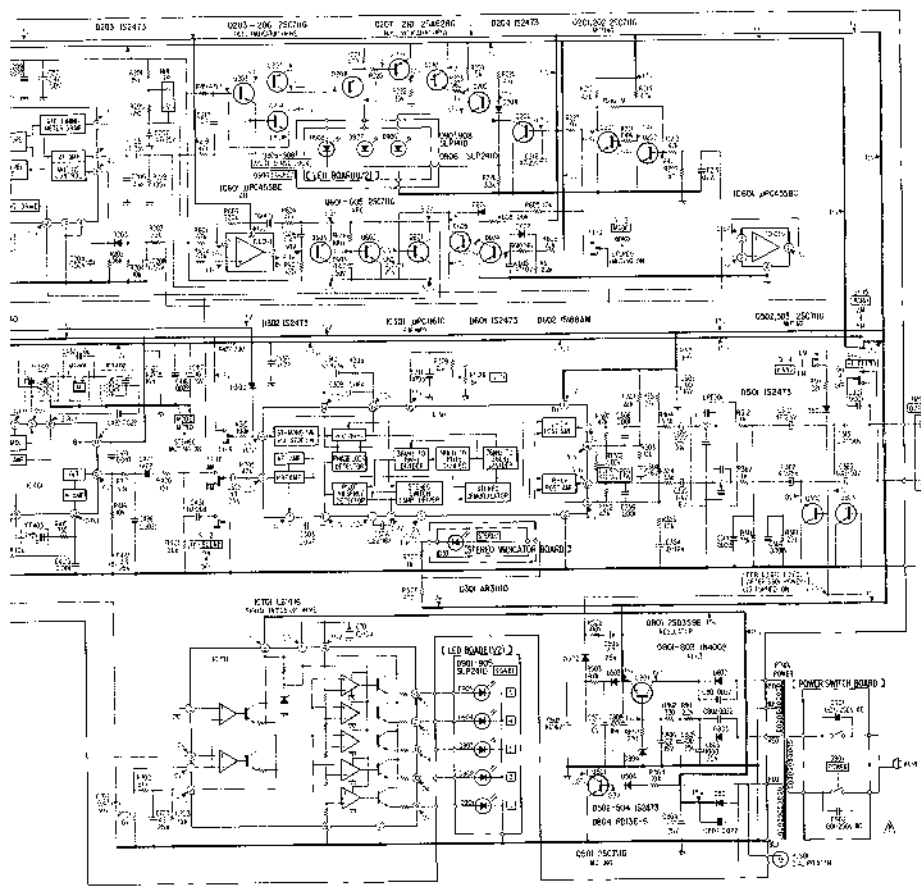
— Conductor Side —



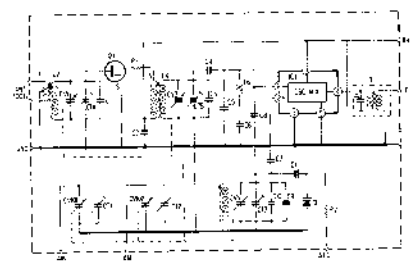
4-2. SCHEMATIC DIAGRAM



D E F G H I J K L



FE101 FRONT-END



- Note:
- Front-end reference numbers are not included in the Electrical Parts List.
 - All capacitors are in μF unless otherwise noted. μF and μMFD or less are not indicated except for electrolytics.
 - All resistors are in ohms, Ω unless otherwise noted, e.g. 1000 Ω , M Ω 1000 Ω .
 - All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
 - Δ - internal component
 - \square - B4 flux
 - \square - panel designation
 - \square - adjustment for repair
 - Voltages are dc with respect to ground unless otherwise noted.
 - Readings are taken under defined conditions with a VOM (DIAL IN):
 () - FM
 () - FM STEREO (With signal input)
 - Voltage variations may be noted due to minimal production tolerances.
 - Switch

Ref. No.	Switch	Position
S1-1, 2	HI-BLEND	OFF
S1-3, 4	MODE	STEREO (MUTING ON)
S1-5 to 1-12	BAND	LW
S1-13 to 1-16	BAND	FM
S2 1, 2	AM ANTENNA	BUILT IN
S301	POWER	OFF

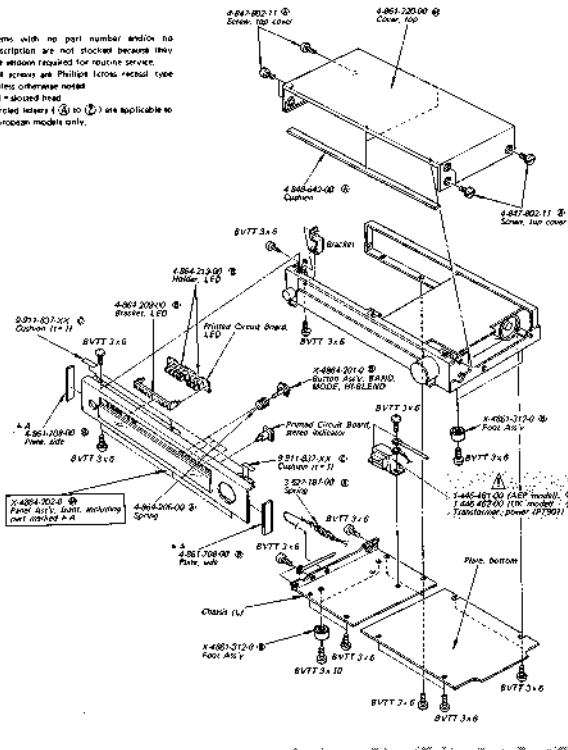
Note: The components identified by shading and mark Δ are critical for safety. Replace only with part number specified.

SECTION 5
EXPLODED VIEWS

(1)

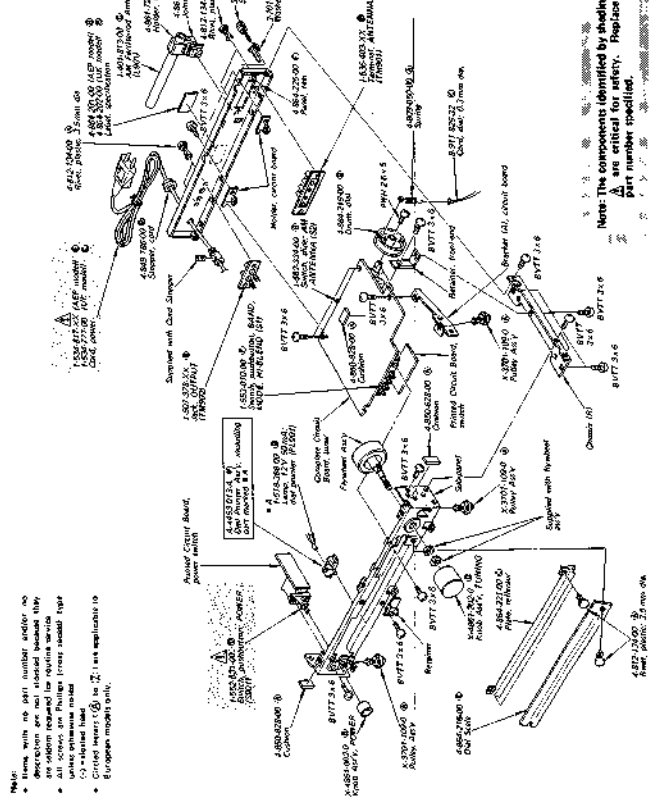
Note:

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips cross recess type unless otherwise noted.
- (1) = accented head.
- Crated items (1) to (2) are applicable to European models only.



Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

(2)

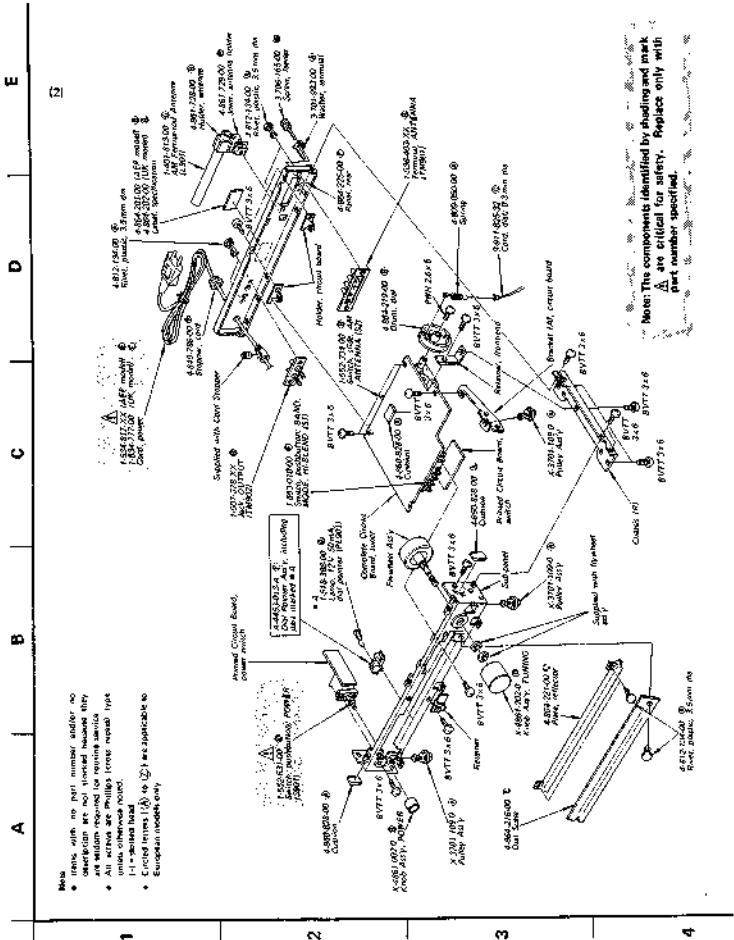


Note: The components identified by shading and mark are critical for safety. Replace only with part number specified.

Ref. No.	Part Number	Description
Q101	4-881-317-X-X	Cushion (1-3)
Q201	4-881-318-00	Spring
Q301	4-881-319-0	Foot, side
Q401	4-881-312-0	Foot, side
Q501	4-881-315-0	Foot, side
Q601	4-881-316-0	Foot, side
Q701	4-881-318-0	Spring
Q801	4-881-319-0	Foot, side
Q901	4-881-320-0	Foot, side
K201	4-881-321-0	Foot, side
K301	4-881-322-0	Foot, side
K401	4-881-323-0	Foot, side
K501	4-881-324-0	Foot, side
K601	4-881-325-0	Foot, side
D602	4-881-326-0	Foot, side
D601	4-881-327-0	Foot, side
D704	4-881-328-0	Foot, side
D901	4-881-329-0	Foot, side
D902	4-881-330-0	Foot, side
IF74	4-881-331-0	Foot, side
L301	4-881-332-0	Foot, side
L401	4-881-333-0	Foot, side
L402	4-881-334-0	Foot, side
L403	4-881-335-0	Foot, side

ELECTRICAL PARTS LIST

Note: Circled letters (A) to (Z) are applicable to European models only.



Ref. No.	Part No.	Description
SEMICONDUCTORS		
Transistors		
= Q101-102	8-729-671-15	2SC710-15
= Q201-206	8-729-663-67	2SC1364
= Q307-210	8-729-612-77	2SA1027R
= Q401	8-729-671-15	2SC710-15
= Q501-503	8-729-663-67	2SC1364
= Q601-605	8-729-316-12	2SC1961
= Q901	8-729-316-12	2SC1961
ICs		
= IC201	8-759-812-31	LA1231
IC301	1-800-750-11	µPC1161C
IC401	8-759-812-40	LA1240
IC601	8-759-145-58	µPC4558C
IC701	8-759-814-16	LB1416
Diodes		
= D201-204	8-719-815-55	1S1555
D301	1-800-939-11	AR3111D
= D302		
= D501-504	8-719-815-55	1S1555
= D601		
= D602	8-719-422-21	1723AM
= D801-803	8-719-200-92	1UE7
= D804	8-719-113-07	KD13E
D901-906	8-719-903-41	SLP241D
D907,908	8-719-901-41	SLP141D
COILS		
IFT401	1-409-323-00	Mechanical Filter (primary)
IPT402	1-409-324-00	Mechanical Filter (secondary)
IFT403	1-404-220-00	AM Detector
L201	1-407-741-00	18µH, microinductor
L401	1-407-750-00	100µH, microinductor
L402	1-407-754-00	220µH, microinductor
L403	1-401-709-00	LW Antenna

Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Ref. No.	Part No.	Description
L901	1-401-813-00	AM Ferrite rod Antenna
T401	1-405-776-00	LW OSC
T402	1-405-732-00	MW OSC
TRANSFORMERS		
IFT201	1-404-011-00	FM Discriminator
P7901	1-446-461-00	Power (AEE model)
P7901	1-446-462-00	Power (UK model)

CAPACITORS

All capacitors are in µF and centavo unless otherwise noted.
50WV or less are not indicated except for electrolytic and tantalum.
p = pF, elem = electrolytic

C101,102	1-101-405-00	0.022
C201-203		
C204	1-121-391-00	1 50V elect
C205	1-121-395-00	4.7 25V elect
C206	1-102-963-00	33p
C207	1-121-395-00	4.7 25V elect
C208	1-121-391-00	1 50V elect
C209	1-101-405-00	0.022
C210	1-121-726-00	0.47 50V elect
C211	1-101-406-00	0.047
C212	1-121-415-00	100 16V elect
C213-215	1-401-805-00	0.022
C216	1-121-391-00	1 50V elect
C217	1-108-603-00	0.1 50V electrolytic
C218	1-121-395-00	4.7 25V elect
C219	1-121-409-00	47 16V elect
C220	1-101-405-00	0.022
C301	1-121-415-00	100 16V elect
C302	1-121-395-00	4.7 25V elect
C303	1-108-546-00	0.047 mylar
C304	1-121-461-00	10 16V elect

Note: The components identified by shading and mark A are critical for safety. Replace only with the same part number and type.

Note: Circled letters (A) to (Z) are applicable to European models only.

Ref. No.	Part No.	Description
C305	1-131-455-00 (A) 0.47	16V tantalum
C306,307	1-108-227-00 (A) 0.001	mylar
C308	1-131-453-00 (A) 0.22	16V tantalum
C309	1-131-416-00 (B) 1.5	16V tantalum
C310	1-131-422-00 (B) 3.3	6.3V tantalum
C311	1-104-069-00 (A) 470p	polystyrol
C312	1-121-395-00 (A) 4.7	25V elect
C313	1-121-726-00 (A) 0.47	50V elect
C314	1-108-228-00 (A) 0.0015	mylar
C354	1-121-651-00 (A) 10	16V elect
C355	1-131-455-00 (A) 0.47	16V tantalum
C356	1-108-227-00 (A) 0.001	mylar
C362	1-121-395-00 (A) 4.7	25V elect
C363	1-121-726-00 (A) 0.47	50V elect
C364	1-108-228-00 (A) 0.0015	mylar
C402	1-103-731-00 (A) 0.0018	polystyrol
C403	1-104-081-00 (A) 0.0015	polystyrol
C404	1-108-239-00 (A) 0.01	nylon
C405	1-102-963-00 (A) 33p	
C406	1-104-055-00 (A) 120p	polystyrol
C407	1-101-974-00 (A) 20p	
C408	1-102-941-00 (A) 4p	
C409	1-104-065-00 (A) 330p	polystyrol
C410	1-101-974-00 (A) 20p	
C411	1-108-351-00 (A) 0.0012	mylar
C412	1-101-003-00 (A) 0.022	
C413	1-121-479-00 (A) 22	16V elect
C414	1-102-074-00 (A) 0.001	
C415,416	1-101-005-00 (A) 0.022	
C417	1-121-651-00 (A) 10	16V elect
C418,419	1-101-005-00 (A) 0.022	
C420	1-108-243-00 (A) 0.022	nylon
C421	1-101-006-00 (A) 0.047	
C422	1-121-415-00 (A) 100	16V elect
C423	1-121-392-00 (A) 3.3	25V elect
C424	1-121-395-00 (A) 4.7	25V elect
C425	1-102-074-00 (A) 0.001	
C426	1-108-230-00 (A) 0.0022	nylon
C427	1-108-357-00 (A) 0.012	mylar
C428-430	1-101-005-00 (A) 0.022	

Ref. No.	Part No.	Description
C431	1-108-237-00 (A) 0.0068	nylon
C432	1-102-511-00 (A) 13p	
C501,503	1-121-651-00 (A) 10	16V elect
C503	1-121-395-00 (A) 4.7	25V elect
C601	1-105-603-00 (B) 0.1	nylon
C602	1-121-395-00 (A) 4.7	25V elect
C603,604	1-121-726-00 (A) 0.47	50V elect
C605	1-121-352-00 (A) 47	10V elect
C701	1-121-651-00 (A) 10	16V elect
C702	1-121-726-00 (A) 0.47	50V elect
C703	1-121-395-00 (A) 4.7	25V elect
C801,802	1-101-005-00 (A) 0.022	
C803	1-121-657-00 (B) 1000	25V elect
C804,805	1-121-416-00 (B) 100	25V elect
C806	1-121-479-00 (A) 22	16V elect
C807	1-101-005-00 (A) 0.022	
C808	1-121-415-00 (A) 100	16V elect
C901,902	1-130-196-00 (B) 0.01	250V ac film

CT401,402	1-141-147-XX (B) Trimmer
CT403,404	1-141-138-XX (A) Trimmer

RESISTORS

All resistors are 1% ohms. Common 1/4W carbon resistors are omitted.

Refer to the list on page 25 for their part numbers.

RT201	1-226-278-00 (A) 50 k- Ω , adjustable; signal indicator level
RT202	1-226-237-00 (A) 20 k- Ω , adjustable; FM muting level
RT301	1-226-652-00 (B) 5 k- Ω , adjustable; VCO
RT302	1-226-653-00 (B) 500 k- Ω , adjustable; FM stereo separation


SWITCHES

S1	1-553-010-00 (B) Pushbutton, BAND, MODE, HI-BLEND
S2	1-552-334-00 (B) Slide, AM ANTENNA
S901	1-552-531-00 (B) Pushbutton, POWER

Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Note: The components identified by shading and mark A are critical for safety. Replace only with part number specified.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
MISCELLANEOUS		
CF101-103	1-527-496-00	Ⓒ Filter, ceramic
FE101	1-463-280-00	Ⓒ Front-end
LPF301	1-231-589-00	Ⓒ Filter, low-pass
MF401	1-527-538-00	Ⓒ Filter, mechanical
PL901	1-518-388-00	Ⓒ Lamp, 12V 50 mA; dot pointer
TM901	1-536-403-XX	Ⓒ Terminal, ANTENNA
TM902	1-507-378-XX	Ⓒ Jack, OUTPUT
	1-534-777-00	Ⓒ Cord, power (UK model)
	1-534-817-XX	Ⓒ Cord, power (AEP model)

Note: The components identified by shading and mark  are critical for safety. Replace only with part number specified.

Note: Circled letters (Ⓐ) to (Ⓒ) are applicable to European models only.

ACCESSORIES & PACKING MATERIALS

<u>Part No.</u>	<u>Description</u>
1-501-161-00	Ⓒ FM Ribbon Antenna
1-551-918-00	Ⓒ Cord, connection
3-701-630-00	Ⓐ Bag, plastic; for accessories
3-770-909-11	Ⓒ Manual, instruction
4-861-226-00	Ⓐ Bag, plastic; for set
4-864-236-00	Ⓒ Cushion
4-864-239-00	Ⓒ Carton

1/4 WATT CARBON RESISTORS

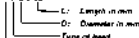
Note: Circled letter (A) is applicable to European models only.

S	Part No	R	Part No	D	Part No	G	Part No	H	Part No	I	Part No	J	Part No
1.6	1-246-402-00	20	1-246-425-00	108	1-246-449-00	5.0A	1-246-473-00	18A	1-246-497-00	108A	1-246-521-00	1.09A	1-246-545-00
1.8	1-246-403-00	21	1-246-426-00	110	1-246-450-00	5.1A	1-246-474-00	18B	1-246-498-00	110A	1-246-522-00	1.10A	1-246-546-00
1.2	1-246-405-00	22	1-246-427-00	112	1-246-451-00	5.2A	1-246-475-00	12A	1-246-499-00	130A	1-246-523-00	1.20A	1-246-548-00
1.3	1-246-406-00	23	1-246-428-00	115	1-246-452-00	5.3A	1-246-476-00	13B	1-246-500-00	130B	1-246-524-00	1.30A	1-246-549-00
1.1	1-246-405-00	25	1-246-429-00	150	1-246-453-00	5.5A	1-246-477-00	15A	1-246-501-00	150A	1-246-525-00	1.50A	1-246-547-00
1.4	1-246-406-00	26	1-246-430-00	160	1-246-454-00	5.6A	1-246-478-00	16A	1-246-502-00	160A	1-246-526-00	1.60A	1-246-548-00
1.5	1-246-405-00	26	1-246-431-00	160	1-246-455-00	5.6A	1-246-479-00	18C	1-246-503-00	180A	1-246-527-00	1.80A	1-246-549-00
2.4	1-246-406-00	30	1-246-432-00	205	1-246-456-00	2.0A	1-246-500-00	20A	1-246-504-00	200A	1-246-528-00	2.00A	1-246-529-00
2.2	1-246-405-00	32	1-246-433-00	230	1-246-457-00	2.2A	1-246-501-00	23A	1-246-505-00	230A	1-246-529-00	2.30A	1-246-623-00
2.4	1-246-430-00	34	1-246-434-00	240	1-246-458-00	2.4A	1-246-502-00	24A	1-246-506-00	240A	1-246-530-00	2.40A	1-246-754-00
2.3	1-246-421-00	37	1-246-435-00	270	1-246-459-00	2.5A	1-246-503-00	27A	1-246-507-00	270A	1-246-531-00	2.70A	1-246-755-00
2.0	1-246-432-00	38	1-246-436-00	300	1-246-460-00	2.6A	1-246-504-00	30A	1-246-508-00	300A	1-246-532-00	3.00A	1-246-756-00
3.5	1-246-433-00	38	1-246-437-00	330	1-246-461-00	3.3A	1-246-505-00	33A	1-246-509-00	330A	1-246-533-00	3.30A	1-246-757-00
3.6	1-246-434-00	36	1-246-438-00	300	1-246-462-00	2.6A	1-246-506-00	36A	1-246-510-00	360A	1-246-534-00	3.60A	1-246-754-00
3.2	1-246-430-00	39	1-246-439-00	360	1-246-463-00	3.9A	1-246-507-00	39A	1-246-511-00	390A	1-246-535-00	3.90A	1-246-753-00
4.0	1-246-436-00	42	1-246-440-00	430	1-246-464-00	4.2A	1-246-493-00	42A	1-246-512-00	420A	1-246-536-00	4.20A	1-246-760-00
4.7	1-246-437-00	42	1-246-441-00	470	1-246-465-00	4.7A	1-246-498-00	47A	1-246-498-00	470A	1-246-537-00	4.70A	1-246-761-00
5.1	1-246-438-00	51	1-246-442-00	510	1-246-466-00	5.1A	1-246-490-00	51A	1-246-514-00	510A	1-246-538-00	5.10A	1-246-762-00
5.6	1-246-439-00	56	1-246-443-00	560	1-246-467-00	5.6A	1-246-492-00	56A	1-246-515-00	560A	1-246-539-00		
6.2	1-246-430-00	62	1-246-444-00	620	1-246-468-00	6.2A	1-246-495-00	62A	1-246-516-00	620A	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8A	1-246-490-00	68A	1-246-517-00	680A	1-246-541-00		
7.5	1-246-432-00	75	1-246-446-00	750	1-246-470-00	7.5A	1-246-494-00	75A	1-246-518-00	750A	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2A	1-246-495-00	82A	1-246-519-00	820A	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1A	1-246-496-00	91A	1-246-520-00	910A	1-246-544-00		

HARDWARE NOMENCLATURE

Screw

P, D, H

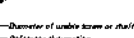


Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring

N



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding head (B) screw for replacement
PWH		pan-head screw with washer face	binding head (B) screws and flat washers for replacement
PS		pan-head screw with spring washer	binding head (B) screws and spring washers for replacement
PSP		pan-head screw with spring and flat washers	binding head (B) screw and spring and flat washers for replacement
R		round head screw	binding head (B) screw for replacement
K		hexagon head screw	
HK		hexagon head screw	
B		binding head screw	
T		tension head screw	binding head (B) screw for replacement
F		flat Phillips head screw	
RF		riffler head screw	
BV		bolt-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
EA		self-tapping screw	ea: TA, P, D + 10
PTP		pan-head self-tapping screw	binding head self-tapping (TA, B) screws for replacement
PTPH		pan-head self-tapping screw with washer face	binding head self-tapping (TA, B) screws and flat washers for replacement
PTTWH		pan-head self-tapping screw with washer face	binding head (B) screws and flat washers for replacement
SET SCREWS			
SC		set screw	
SC		hexagon socket set screw	ea: SC 2 + 6, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal lock washer	ea: LW2, internal
EW		external lock washer	ea: LW2, external
RETAINING RINGS			
E		retaining ring	
G		split-type retaining ring	