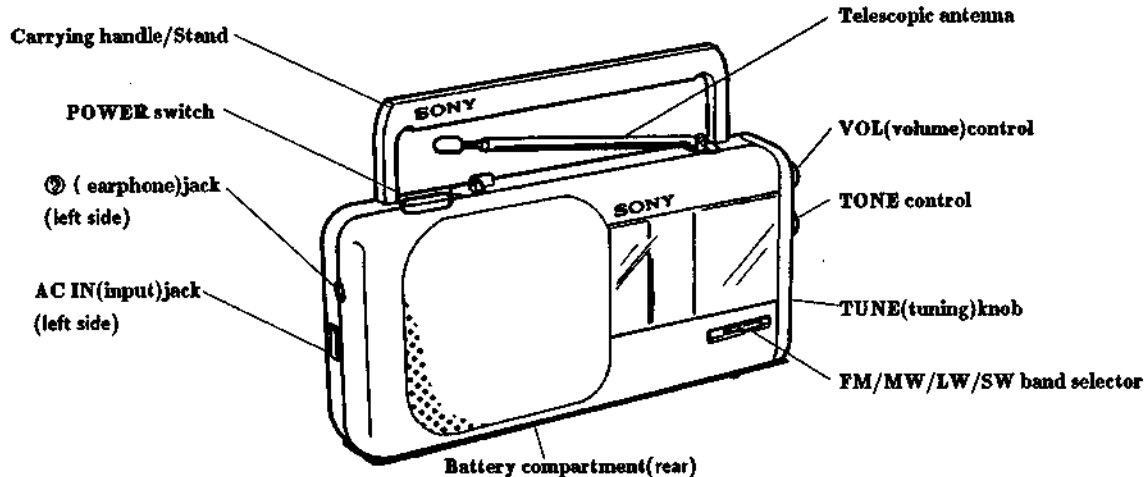


ICF-860L

SERVICE MANUAL

West Germany Model



- ICF-860L is almost the same as ICF-850L (G-AEP Model).

(G-AEP shows West Germany.)

Refer to ICF-850L Service Manual previously issued for the information of this set.

- Only following parts differ from those in ICF-850L.

| No. | Part No. | Description |
|-----|---------------|-------------|
| 3 | 3-898-918-31 | KNOB, BAND |
| 15 | 3-898-915-11 | KNOB, POWER |
| 25 | 3-898-930-51 | CASE, REAR |
| 30 | 3-898-928-21 | CASE, SIDE |
| 31 | *3-898-904-21 | PLATE, BACK |
| 33 | 3-898-922-41 | POINTER |

ELECTRICAL PARTS

| Ref.No. | Part No. | Description |
|---------|---------------|---------------------|
| 902 | *A-3615-303-A | PC BOARD ASSY, MAIN |
| SP 1 | 1-503-847-21 | SPEAKER |

ACCESSORY & PACKING MATERIAL

| | |
|--------------|---------------------|
| 3-750-613-41 | MANUAL, INSTRUCTION |
| 3-902-105-01 | INDIVIDUAL CARTON |

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

FM/MW/LW/SW 4 BAND RECEIVER

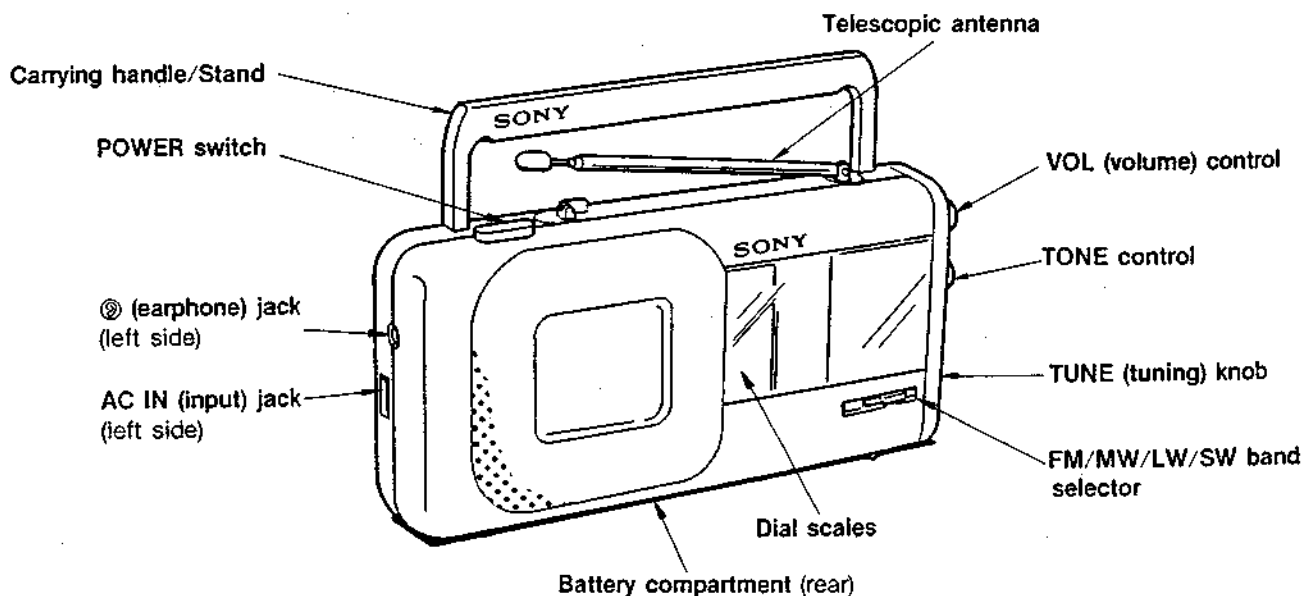
SONY®

ICF-850L

AR 22

SERVICE MANUAL

AEP Model
UK Model




SPECIFICATIONS

| | |
|--------------------|---|
| Frequency range | FM: 87.6-107 MHz (model for West Germany) 87.6-108 MHz (model for other countries) MW: 530-1,605 kHz LW: 150-255 kHz SW: 5.95-18 MHz |
| Antennas | FM/SW: Telescopic antenna MW/LW: Built-in ferrite rod antenna |
| Speaker | Approx. 9.2 cm (3 ⁵ / ₈ inches) dia., 8 Ω |
| Power output | 500 mW (at 10% harmonic distortion) |
| Output | Earphone jack (mini-jack) |
| Power requirements | 240 V (UK model) or 220 V (model for other countries) AC, 50 Hz with the supplied AC power cord 6 V DC with four R6 (size AA) batteries |
| Battery life | Approx. 37 hours of listening (for four hours a day at a normal volume) using Sony battery SUM-3(NS) |
| Dimensions | Approx. 263 × 128 × 56.5 mm (w/h/d) (10 ³ / ₈ × 5 ¹ / ₈ × 2 ¹ / ₄ inches) incl. projecting parts and controls with the carrying handle pushed in. |
| Weight | Approx. 836 g (1 lb 13 ¹ / ₂ oz) incl. batteries |
| Supplied accessory | AC power cord (1) |

FEATURES

- Two different power sources: batteries and house current.
- TONE control facilitates fine tone adjustment.
- Fast tuning to key stations marked on the MW and LW dial scales.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS 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.

FM/MW/LW/SW 4 BAND RECEIVER
SONY®

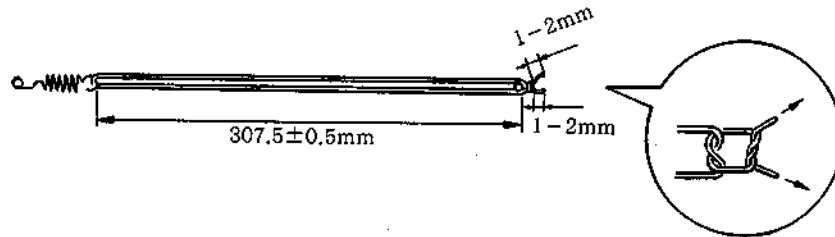


TR

**SECTION 1
DISASSEMBLY**

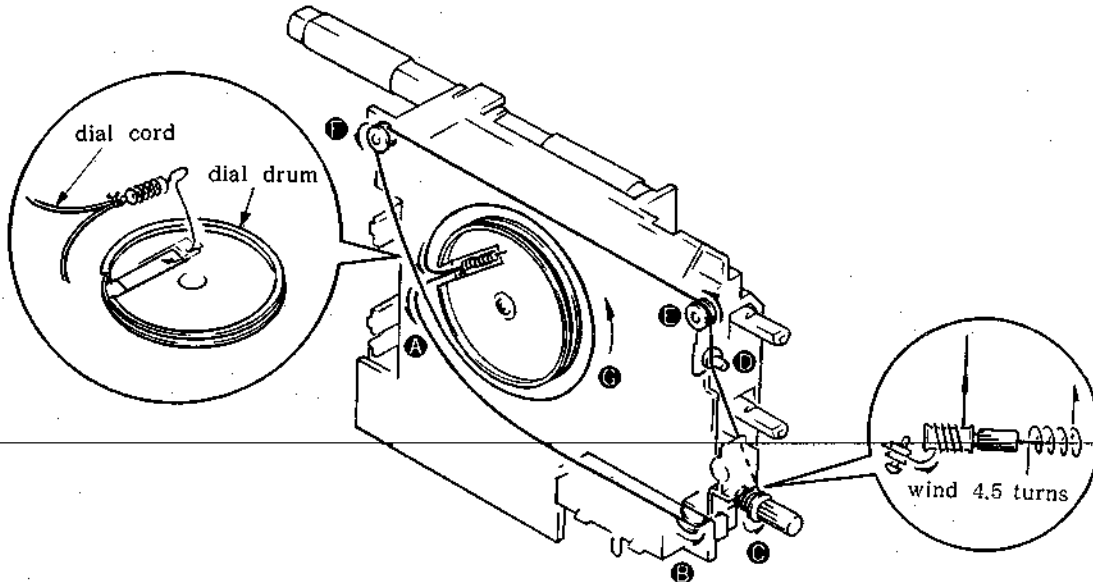
DIAL CORD STRINGING

1. Preparation



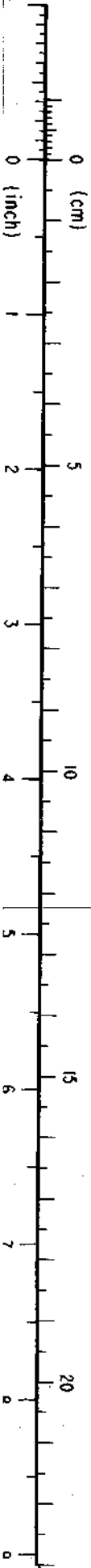
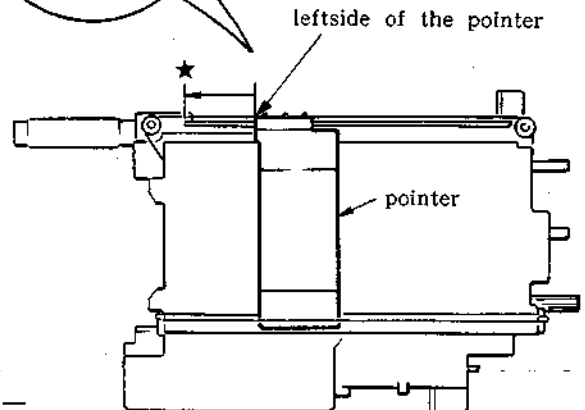
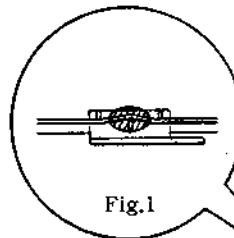
2. Stringing

- 1) Turn the dial drum fully counterclockwise.
- 2) Hook the spring to the dial drum. String the dial cord in the numerical order given.



3. Dial Pointer Installation

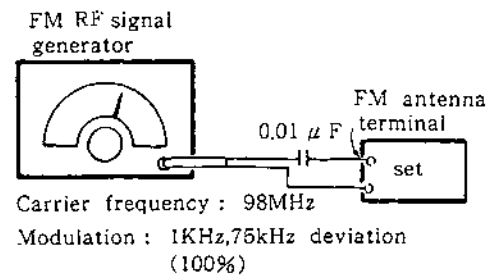
- 1) Turn the tuning knob fully counterclockwise.
- 2) Set the pointer.
- 3) Set the leftside of the pointer to ★ mark.
- 4) Secure the portion ⊗ of the pointer with locking compound after setting the pointer (see Fig.1).



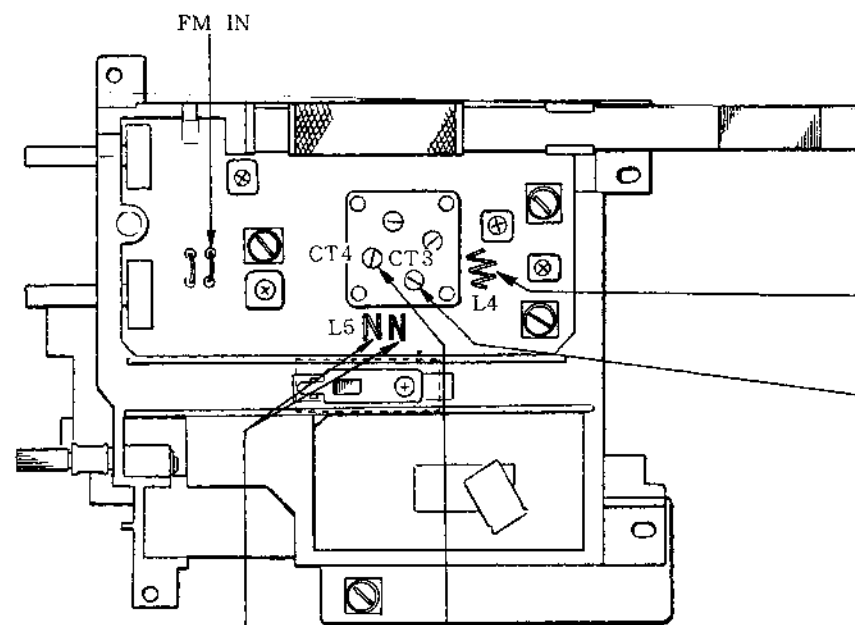
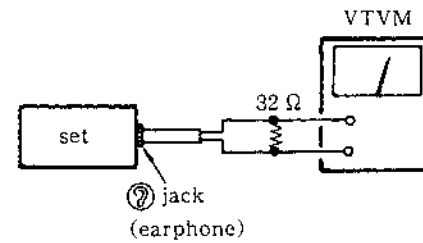
SECTION 2
ELECTRICAL ADJUSTMENTS

FM

BAND switch : FM



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



| FM FREQUENCY COVERAGE ADJUSTMENT | |
|---------------------------------------|-----------|
| Adjust for a maximum reading on VTVM. | |
| L4 | 86.5MHz |
| | *87.35MHz |
| CT3 | 109.5MHz |
| | *107.8MHz |

*G-AEP model

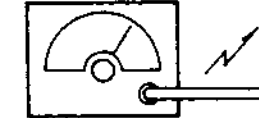
| L5 | CT4 |
|---------------------------------------|-----------|
| 86.5MHz | 109.5MHz |
| *87.35MHz | *107.8MHz |
| Adjust for a maximum reading on VTVM. | |
| FM TRACKING ADJUSTMENT | |

*G-AEP model

MW/LW/SW

BAND switch : MW (when MW adjustments)
LW (when LW adjustments)
SW (when SW adjustments)

AM RF signal generator (MW, LW)



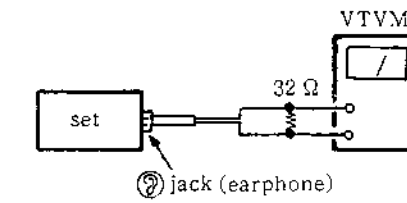
Put the lead wire antenna close to the set.

30% amplitude modulation by 400Hz signal

AM RF signal generator (SW)

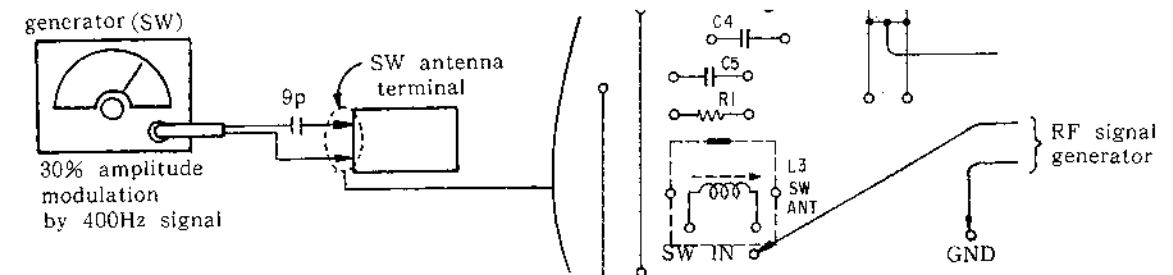


30% amplitude modulation by 400Hz signal



Note : LW adjustment should be made after making MW adjustments. (*1)

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

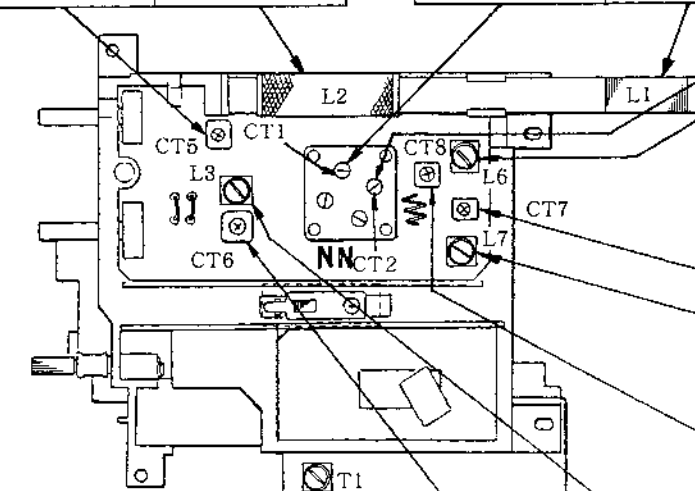


*1

| LW TRACKING ADJUSTMENT | |
|---------------------------------------|--------|
| Adjust for a maximum reading on VTVM. | |
| 240kHz | 160kHz |
| CT5 | L2 |

| MW TRACKING ADJUSTMENT | |
|---------------------------------------|--------|
| Adjust for a maximum reading on VTVM. | |
| 1400kHz | 620kHz |
| CT1 | L1 |

| MW FREQUENCY COVERAGE ADJUSTMENT | |
|---------------------------------------|---------|
| Adjust for a maximum reading on VTVM. | |
| CT2 | 1650kHz |
| L6 | 520kHz |



| SW FREQUENCY COVERAGE ADJUSTMENT | |
|---------------------------------------|---------|
| Adjust for a maximum reading on VTVM. | |
| CT7 | 18.5MHz |
| L7 | 5.8MHz |

| 455kHz | T1 |
|---------------------------------------|----|
| Adjust for a maximum reading on VTVM. | |
| AM TRACKING ADJUSTMENT | |

| CT6 | L3 |
|---------------------------------------|--------|
| 18.5MHz | 5.8MHz |
| Adjust for a maximum reading on VTVM. | |
| SW TRACKING ADJUSTMENT | |

*1

| LW FREQUENCY COVERAGE ADJUSTMENT | |
|---------------------------------------|--------|
| Adjust for a maximum reading on VTVM. | |
| CT8 | 260kHz |


SECTION 4
EXPLODED VIEWS

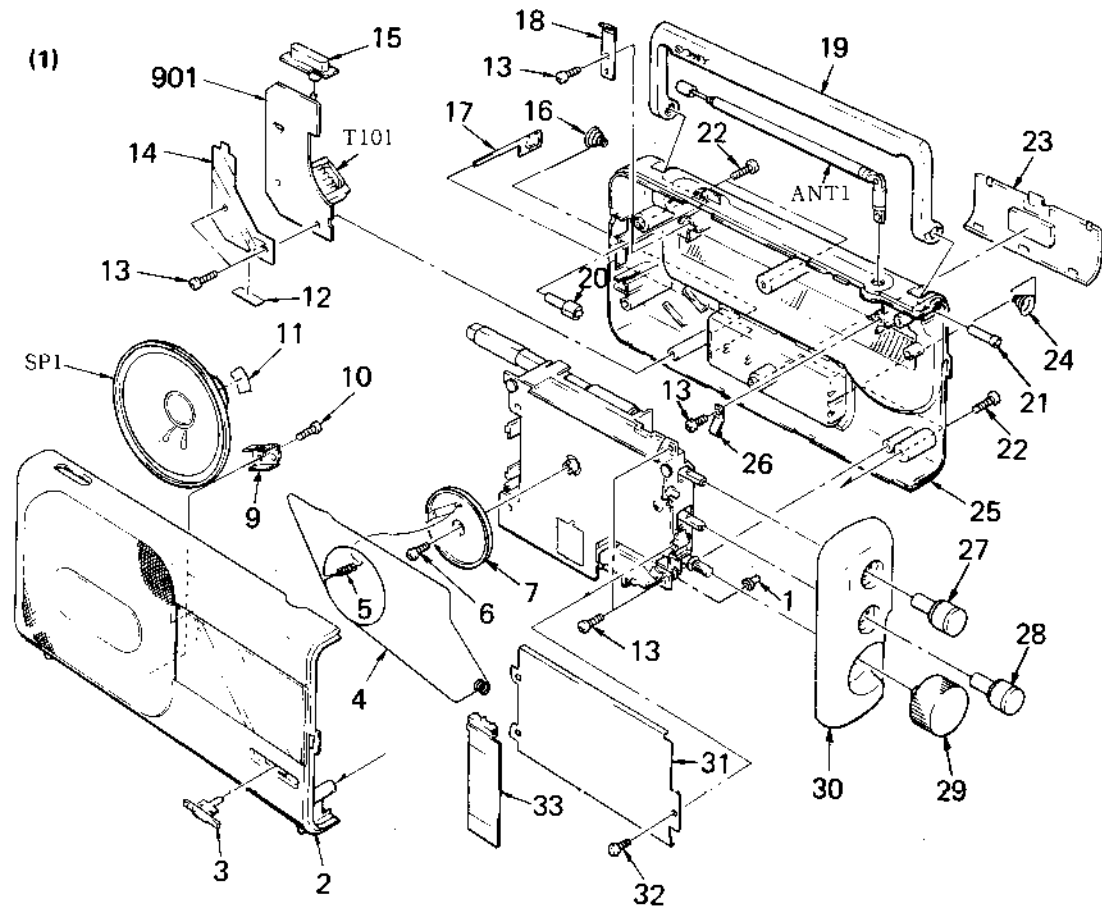
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

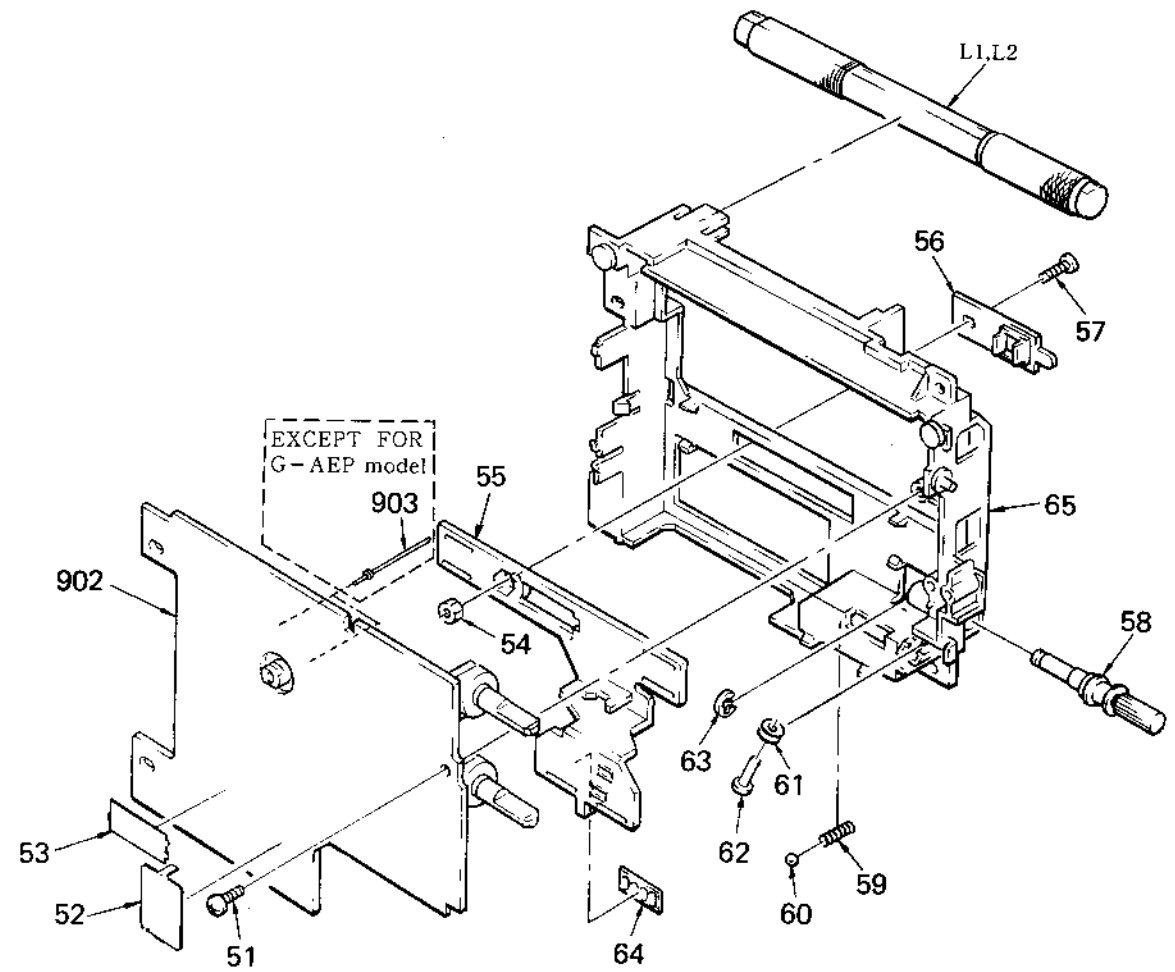
- The construction parts of an assembled part are indicated with a collation number in the remark column.

Color Indication of Appearance Parts
Example: (RED) KNOB, BALANCE (WHITE)
Cabinet's Color Parts' Color

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



(2)



| No. | Part No. | Description | Remarks |
|-----|---|------------------------------|---------|
| 1 | 7-623-605-01 | EYELET, 1.3X2.5 | |
| 2 | X-3898-905-1 (UK:WHITE).....CASE (FRONT) ASSY | | |
| | X-3898-905-2 (UK:GRAY).....CASE (FRONT) ASSY | | |
| | X-3898-905-3 (UK:BLACK).....CASE (FRONT) ASSY | | |
| | X-3898-908-1 (AEP,FRENCH:WHITE)...CASE (FRONT) ASSY | | |
| | X-3898-908-2 (AEP,FRENCH:GRAY)...CASE (FRONT) ASSY | | |
| | X-3898-908-3 (AEP,FRENCH:BLACK)...CASE (FRONT) ASSY | | |
| | X-3898-909-1 (G-AEP:WHITE)...CASE (FRONT) ASSY | | |
| | X-3898-909-2 (G-AEP:GRAY)...CASE (FRONT) ASSY | | |
| | X-3898-909-3 (G-AEP:BLACK)...CASE (FRONT) ASSY | | |
| 3 | 3-898-918-01 (WHITE)...KNOB, BAND (WHITE) | | |
| | 3-898-918-11 (BLACK,GRAY)...KNOB, BAND (GRAY) | | |
| 4 | 9-911-825-32 | STRING, TETRON DIAL (0.3) | |
| 5 | 3-891-903-00 | SPRING, TENSION | |
| 6 | 7-621-775-10 | SCREW +B 2.6X4 | |
| 7 | *3-898-924-01 | DRUM, VC | |
| 9 | 3-898-949-01 | SPEAKER CLAMP | |
| 10 | 7-685-647-79 | SCREW +P 3X10 TYPE2 NON-SLIT | |
| 11 | 3-898-518-01 | CUSHION | |
| 12 | 3-831-441-XX (UK)....SPACER | | |
| 13 | 7-685-648-79 | SCREW +P 3X12 TYPE2 NON-SLIT | |
| 14 | *3-898-950-01 | SHEET, INSULATING | |
| 15 | 3-898-915-01 | KNOB, POWER | |
| 16 | 3-898-908-01 | SPRING | |
| 17 | 3-898-907-01 | TERMINAL, PLUS | |

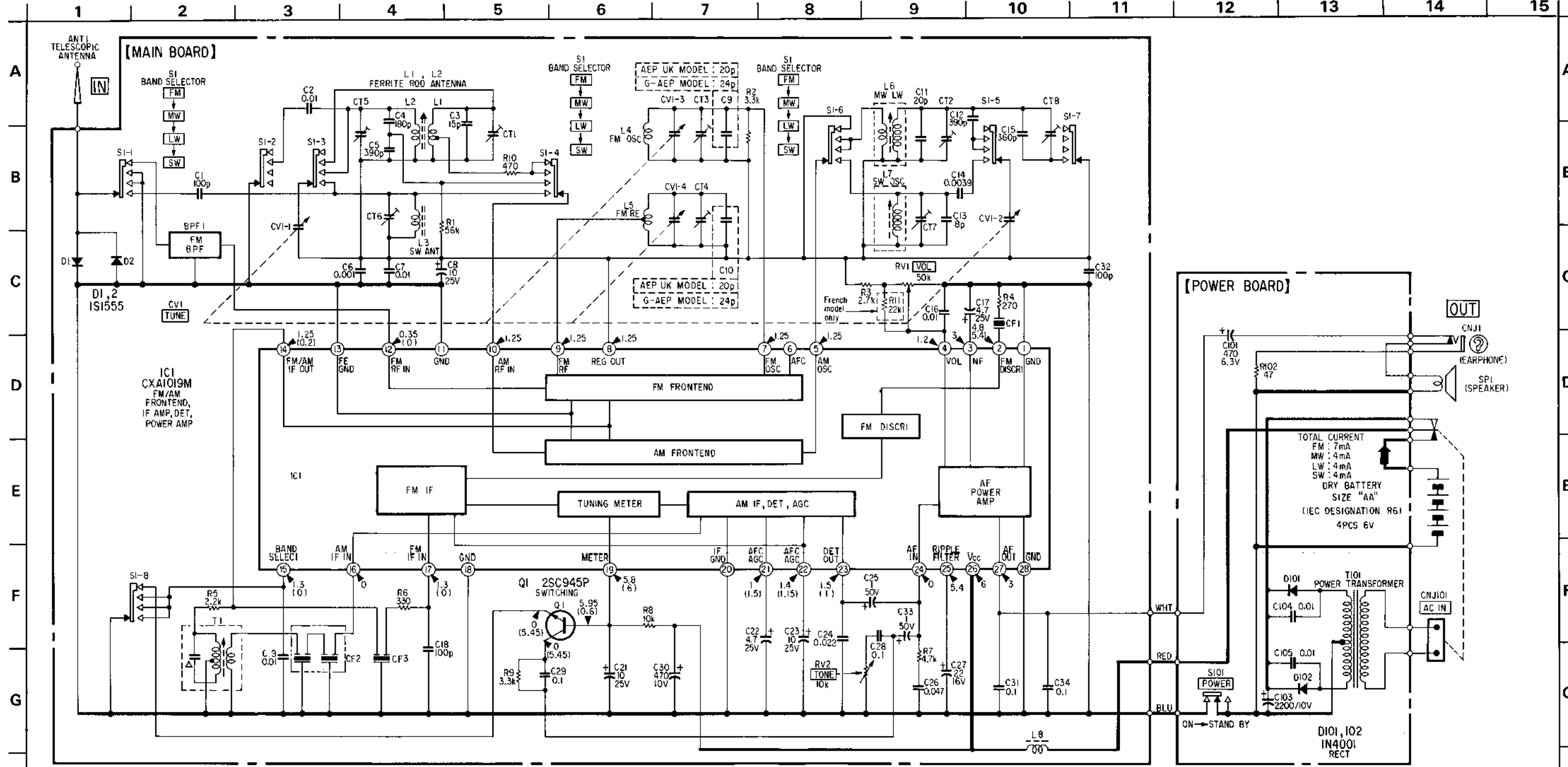
| No. | Part No. | Description | Remarks |
|------|--|------------------------------|---------|
| 18 | *3-898-909-01 | SPRING | |
| 19 | 3-898-923-01 | HANDLE | |
| 20 | 3-898-906-01 | SHAFT (L), HANDLE | |
| 21 | 3-898-921-01 | SHAFT (R), HANDLE | |
| 22 | 7-685-650-79 | SCREW +P 3X16 TYPE2 NON-SLIT | |
| 23 | X-3898-903-1 | LID ASSY, BATTERY CASE | |
| 24 | 3-896-450-01 | SPRING | |
| 25 | 3-898-930-01 (UK).....CASE (REAR) | | |
| | 3-898-930-11 (AEP,G-AEP,FRENCH)...CASE (REAR) | | |
| 26 | 3-898-901-01 | PLATE, CLICK | |
| 27 | X-3898-901-1 | KNOB ASSY (VOL), CONTROL | |
| 28 | X-3898-902-1 | KNOB ASSY (TONE), CONTROL | |
| 29 | 3-898-919-01 | KNOB, TUNING | |
| 30 | 3-898-928-01 | CASE, SIDE | |
| 31 | 3-898-904-01 | PLATE, BACK | |
| 32 | 7-685-133-19 | SCREW +P 2.6X6 TYPE2 SLIT | |
| 33 | 3-898-922-11 (AEP,G-AEP,FRENCH)...POINTER | | |
| | 3-898-922-01 (UK).....POINTER | | |
| 901 | *1-623-031-11 | PC BOARD, POWER | |
| ANT1 | 1-501-222-51 | ANTENNA, TELESCOPIC | |
| SP1 | 1-503-847-11 | SPEAKER | |
| T101 | A-1-448-974-11 (AEP,G-AEP,FRENCH)...TRANSFORMER, POWER | | |
| T101 | A-1-448-975-11 (UK).....TRANSFORMER, POWER | | |

| No. | Part No. | Description | Remarks |
|-----|---------------|------------------------------|---------|
| 51 | 7-685-647-79 | SCREW +P 3X10 TYPE2 NON-SLIT | |
| 52 | *3-898-902-01 | PLATE, SHIELD | |
| 53 | 3-892-935-11 | PLATE, GROUND | |
| 54 | 7-622-207-05 | N 2.6, TYPE 2 | |
| 55 | *3-898-927-01 | SLIDER | |
| 56 | *3-898-914-01 | ADJUSTOR | |
| 57 | 7-621-773-95 | SCREW +B 2.6X6 | |
| 58 | *3-898-912-01 | SHAFT, TUNING | |
| 59 | 3-898-910-01 | SPRING, COMPRESSION | |
| 60 | 7-671-112-11 | BALL, STEEL | |

| No. | Part No. | Description | Remarks |
|------|--|------------------------------|---------|
| 61 | 3-881-911-00 | PULLEY | |
| 62 | 7-625-712-40 | RIVET 2X5 | |
| 63 | 7-624-106-04 | STOP RING 3.0, TYPE -E | |
| 64 | *3-898-911-01 | PLATE, CLICK | |
| 65 | X-3898-904-1 | CHASSIS ASSY | |
| 902 | *A-3615-167-A (AEP,UK)...PC BOARD ASSY, MAIN | | |
| | *A-3615-188-A (G-AEP)...PC BOARD ASSY, MAIN | | |
| | *A-3615-196-A (FRENCH)...PC BOARD ASSY, MAIN | | |
| 903 | *1-535-650-11 (EXCEPT FOR G-AEP)...TERMINAL | | |
| L1.2 | 1-402-299-11 | ANTENNA, FERRITE-ROD (LW/MW) | |

ICF-850L ICF-850L

3-2. SCHEMATIC DIAGRAM



Note for Schematic Diagram

- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- \square : signal path.
- \triangle : internal component.
- Switch

- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal (detuned) conditions with a VOM (50k Ω /V).
- Voltage variations may be noted due to normal production tolerances.
- no-mark: FM
- () : MW, LW, SW

| Ref. No. | Switch | Position |
|----------|-------------|----------|
| S1 | POWER | ON |
| S101 | BAND SELECT | FM |

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

SECTION 5
ELECTRICAL PARTS LIST

NOTE:


- Items marked * are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
All resistors are in ohms.
F: nonflammable

COILS
MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC,
UPD...: μPD...

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

ELECTRICAL PARTS

| Ref.No. | Part No. | Description | | | |
|---------|---------------|-------------------------------------|----------|-------|------|
| 901 | *1-623-031-11 | PC BOARD, POWER | | | |
| 902 | *A-3615-167-A | {AEP,UK}...PC BOARD ASSY, MAIN | | | |
| | *A-3615-188-A | {G-AEP}...PC BOARD ASSY, MAIN | | | |
| | *A-3615-196-A | {FRENCH}...PC BOARD ASSY, MAIN | | | |
| 903 | *1-535-650-11 | {EXCEPT FOR G-AEP}...TERMINAL | | | |
| ANT1 | 1-501-222-51 | ANTENNA, TELESCOPIC | | | |
| BPF1 | 1-235-171-00 | {AEP,UK,FRENCH}...FILTER, BAND PASS | | | |
| BPF1 | 1-235-911-21 | {G-AEP}...FILTER, BAND PASS | | | |
| C1 | 1-102-973-00 | CERAMIC | 100PF | 10% | 50V |
| C2 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C3 | 1-102-951-00 | CERAMIC | 15PF | 10% | 50V |
| C4 | 1-102-976-00 | CERAMIC | 180PF | 10% | 50V |
| C5 | 1-102-821-21 | CERAMIC | 390PF | 10% | 50V |
| C6 | 1-161-039-00 | CERAMIC | 0.001MF | 10% | 25V |
| C7 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C8 | 1-123-356-00 | ELECT | 10MF | 20% | 25V |
| C9 | 1-102-958-00 | {AEP,UK,FRENCH}... CERAMIC | 20PF | 5% | 50V |
| C9 | 1-102-960-00 | {G-AEP}... CERAMIC | 24PF | 5% | 50V |
| C10 | 1-102-958-00 | {AEP,UK,FRENCH}... CERAMIC | 20PF | 5% | 50V |
| C10 | 1-102-960-00 | {G-AEP}... CERAMIC | 24PF | 5% | 50V |
| C11 | 1-102-801-00 | CERAMIC | 20PF | 5% | 50V |
| C12 | 1-104-067-00 | POLYSTYRENE | 390PF | 5% | 50V |
| C13 | 1-102-241-00 | CERAMIC | 8PF | 0.5PF | 50V |
| C14 | 1-104-091-00 | POLYSTYRENE | 0.0039MF | 5% | 50V |
| C15 | 1-104-065-00 | POLYSTYRENE | 330PF | 5% | 50V |
| C16 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C17 | 1-123-369-00 | ELECT | 4.7MF | 20% | 25V |
| C18 | 1-102-973-00 | CERAMIC | 100PF | 10% | 50V |
| C19 | 1-161-013-00 | CERAMIC | 0.01MF | 10% | 25V |
| C21 | 1-123-356-00 | ELECT | 10MF | 20% | 25V |
| C22 | 1-123-369-00 | ELECT | 4.7MF | 20% | 25V |
| C23 | 1-123-356-00 | ELECT | 10MF | 20% | 25V |
| C24 | 1-161-055-00 | CERAMIC | 0.022MF | 10% | 25V |
| C25 | 1-124-499-11 | ELECT | 1MF | 20% | 50V |
| C26 | 1-161-021-11 | CERAMIC | 0.047MF | 10% | 25V |
| C27 | 1-123-330-00 | ELECT | 22MF | 20% | 16V |
| C28 | 1-162-851-11 | CERAMIC | 0.1MF | 20% | 16V |
| C29 | 1-162-851-11 | CERAMIC | 0.1MF | 20% | 16V |
| C30 | 1-124-472-11 | ELECT | 470MF | 20% | 10V |
| C31 | 1-162-851-11 | CERAMIC | 0.1MF | 20% | 16V |
| C32 | 1-102-973-00 | CERAMIC | 100PF | 10% | 50V |
| C33 | 1-124-499-11 | ELECT | 1MF | 20% | 50V |
| C34 | 1-162-851-11 | CERAMIC | 0.1MF | 20% | 16V |
| C35 | 1-102-973-00 | CERAMIC | 100PF | 10% | 50V |
| C36 | 1-101-001-00 | CERAMIC | 0.001MF | | 50V |
| C101 | 1-124-472-11 | ELECT | 470MF | 20% | 6.3V |
| C103 | 1-124-893-11 | ELECT | 2200MF | 20% | 10V |
| C104 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |
| C105 | 1-101-004-00 | CERAMIC | 0.01MF | | 50V |

ELECTRICAL PARTS

| Ref.No. | Part No. | Description | | | | |
|---------|---------------|----------------------------------|------|----|------|--|
| CF1 | 1-567-166-00 | FILTER, CERAMIC | | | | |
| CF2 | 1-567-670-11 | FILTER, CERAMIC | | | | |
| CF3 | 1-567-166-00 | FILTER, CERAMIC | | | | |
| CNJ1 | 1-563-836-21 | JACK (EARPHONE) | | | | |
| CNJ101 | 1-526-838-11 | INLET, AC 2P | | | | |
| CT5 | 1-141-245-00 | CAP, VAR, TRIMMER | | | | |
| CT6 | 1-141-364-11 | CAP, VAR, TRIMMER | | | | |
| CT7 | 1-141-364-11 | CAP, VAR, TRIMMER | | | | |
| CT8 | 1-141-245-00 | CAP, VAR, TRIMMER | | | | |
| CV1 | 1-151-572-11 | CAP, VAR, POLYETHYLENE | | | | |
| D1 | 8-719-107-94 | DIODE 1SS202-1 | | | | |
| D2 | 8-719-107-94 | DIODE 1SS202-1 | | | | |
| D101 | 8-719-200-02 | DIODE 10E2 | | | | |
| D102 | 8-719-200-02 | DIODE 10E2 | | | | |
| IC1 | 8-752-030-15 | IC CXA1019M | | | | |
| L1,2 | 1-402-299-11 | ANTENNA, FERRITE-ROD (LW/MW) | | | | |
| L3 | 1-402-073-11 | COIL, ANT (SW) | | | | |
| L4 | *1-422-294-11 | {AEP,UK,FRENCH}...COIL, AIR-CORE | | | | |
| L4 | *1-459-789-11 | {G-AEP}...COIL, WITH CORE | | | | |
| L5 | 1-422-349-11 | COIL, AIR-CORE | | | | |
| L6 | 1-406-092-11 | COIL, OSC (MW) | | | | |
| L7 | 1-406-093-11 | COIL, OSC (SW) | | | | |
| L8 | 1-421-659-11 | COIL, CHOKE 20UH | | | | |
| Q1 | 8-729-600-27 | TRANSISTOR 2SC634SP | | | | |
| R1 | 1-249-438-11 | CARBON | 56K | 5% | 1/4W | |
| R2 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R3 | 1-249-422-11 | CARBON | 2.7K | 5% | 1/4W | |
| R4 | 1-249-410-11 | CARBON | 270 | 5% | 1/4W | |
| R5 | 1-249-421-11 | CARBON | 2.2K | 5% | 1/4W | |
| R6 | 1-249-411-11 | CARBON | 330 | 5% | 1/4W | |
| R7 | 1-249-425-11 | CARBON | 4.7K | 5% | 1/4W | |
| R8 | 1-249-429-11 | CARBON | 10K | 5% | 1/4W | |
| R9 | 1-249-423-11 | CARBON | 3.3K | 5% | 1/4W | |
| R10 | 1-249-413-11 | CARBON | 470 | 5% | 1/4W | |
| R11 | 1-249-433-11 | {FRENCH}...CARBON | 22K | 5% | 1/4W | |
| R102 | 1-249-401-11 | CARBON | 47 | 5% | 1/4W | |
| RV1 | 1-237-793-11 | RES, VAR, CARBON 50K (VOL) | | | | |
| RV2 | 1-237-794-11 | RES, VAR, CARBON 10K (TONE) | | | | |
| S1 | 1-571-172-11 | SWITCH, SLIDE (BAND SELECT) | | | | |
| S101 | 1-572-042-11 | SWITCH PUSH (POWER) | | | | |
| SP1 | 1-503-847-11 | SPEAKER | | | | |
| T1 | 1-404-341-00 | TRANSFORMER, IF | | | | |