



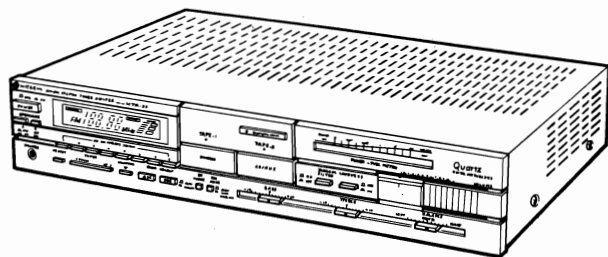
# HITACHI

## SERVICE MANUAL

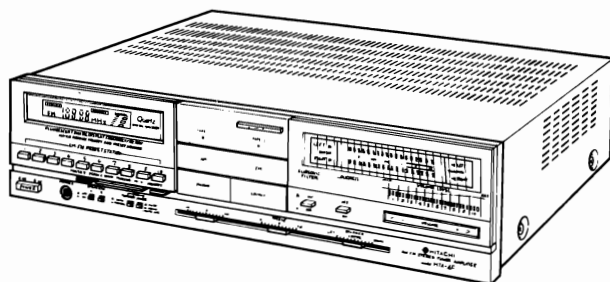
TY

No. 378 EF

**HTA-3F**  
**HTA-4F**



HTA-3F



HTA-4F

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**CAUTION FOR U.S.A.**

Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

**SAFETY PRECAUTIONS**

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety related characteristics, always use genuine Hitachi's replacement parts. Especially critical parts in the power circuit block should not be replaced with other makers. Critical parts are marked with  $\Delta$  in the circuit diagram and printed wiring board.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

**PRÉCAUTIONS DE SÉCURITÉ**

Les précautions suivantes doivent être observées chaque fois qu'une réparation doit être faite.

1. Etant donné que de nombreux composants de l'appareil possèdent des caractéristiques relatives à la sécurité, utiliser uniquement des pièces de rechange d'origine Hitachi pour effectuer un remplacement. Ceci se rapporte notamment aux pièces critiques du bloc d'alimentation qui ne doivent en aucun cas être remplacées par celles d'autres fabricants. Les pièces critiques sont accompagnés du symbole  $\Delta$  dans le schéma de montage et sur le schéma de plaque de câblage.
2. Avant de retourner l'appareil réparé au client, le technicien doit procéder à un essai complet pour s'assurer qu'il ne présente aucun danger de chocs électriques.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

# STEREO TUNER AMPLIFIER

July 1983

TOYOKAWA WORKS

**SPECIFICATIONS**

**FM SECTION**

|  |                                       |                                  |
|--|---------------------------------------|----------------------------------|
| Frequency range                                | 87.9 – 107.9 MHz (100 kHz spacing)    |                                  |
| Usable sensitivity (IHF)                       | Mono : 13.2 dBf                       |                                  |
| 50 dB quieting sensitivity                     | Mono : 20.2 dBf (5.6 $\mu$ V)         | Stereo : 38.2 dBf (44.7 $\mu$ V) |
| Signal-to-noise ratio (at 65 dBf)              | Mono : 76 dB (IHF)                    | Stereo : 70 dB (IHF)             |
| Total harmonic distortion (at 65 dBf)<br>1 kHz | Mono : 0.15 %                         | Stereo : 0.25 %                  |
| Frequency response                             | 30 Hz – 12 kHz $\pm$ 2 dB             |                                  |
| Selectivity                                    | 53 dB ( $\pm$ 400 kHz IHF)            |                                  |
| Stereo separation                              | 40 dB (1 kHz)                         |                                  |
| Antenna input                                  | 300 ohms balanced, 75 ohms unbalanced |                                  |

**AM SECTION**

|                                  |                                    |
|----------------------------------|------------------------------------|
| Frequency range                  | 530 – 1,620 kHz (10 kHz spacing)   |
| Sensitivity                      | 15 $\mu$ V (IHF, ext. Antenna)     |
| Selectivity                      | 38 dB                              |
| Signal-to-noise ratio (at 50 mV) | 45 dB                              |
| Antenna                          | Loop antenna and external terminal |

**AUDIO SECTION**

|   |  |
|---|--|
| <b>RMS Power</b><br>(Both channels driven)                    | 30 Watts [HTA-3F] 40 Watts [HTA-4F] per channel, min RMS, at 8 ohms from 20 Hz to 20 kHz, with less than 0.05% [HTA-3F], 0.01% [HTA-4F] total harmonic distortion.<br>30 W + 30 W (8 ohms, 1 kHz, T.H.D. 0.05 % IHF) [HTA-3F]<br>45 W + 45 W (8 ohms, 1 kHz, T.H.D. 0.01 % IHF) [HTA-4F] |
| <b>Power bandwidth</b>  | 10 Hz – 30 kHz (1/2 RMS power, T.H.D. 0.05 % at 8 ohms) [HTA-3F]<br>20 Hz – 30 kHz (1/2 RMS power, T.H.D. 0.01 % at 8 ohms) [HTA-4F]   |
| <b>Frequency characteristics</b>                              | 10 Hz – 40 kHz ( $\pm$ 2 dB) [HTA-3F]<br>10 Hz – 60 kHz ( $\pm$ 2 dB) [HTA-4F]   |
| <b>Total harmonic distortion (at rated output)</b>            | Less than 0.05 % [HTA-3F]<br>Less than 0.01 % [HTA-4F]   |
| <b>Intermodulation distortion</b><br>(at 1/2 rated output)    | Less than 0.05 % [HTA-3F]<br>Less than 0.01 % [HTA-4F]   |
| <b>Input sensitivity/impedance</b><br>(at 30 W output, 1 kHz) |  |
| <b>PHONO</b>  | 2.5 mV/47 k-ohms [HTA-3F]<br>2.5 mV/50 k-ohms [HTA-4F]   |
| <b>TAPE 1,2 : CD/VIDEO/AUX</b>                                | 150 mV/35 k-ohms [HTA-3F]<br>150 mV/50 k-ohms [HTA-4F]   |
| <b>Max. input level (PHONO)</b>                               | 140 mV (T.H.D. 0.05 % at 1 kHz) [HTA-3F]<br>150 mV (T.H.D. 0.02 % at 1 kHz) [HTA-4F]   |
| <b>Output level at TAPE OUT</b>                               | 150 mV (PHONO at rated input)<br>150 mV (FM 400 Hz, 30 % mod. input 1 mV)<br>150 mV (AM 400 Hz, 30 % mod. input 5 mV/m)  |
| <b>Signal-to-noise ratio</b><br>(IHF, A network, rated power) |  |
| <b>PHONO</b>  | 70 dB [HTA-3F]<br>71 dB [HTA-4F]   |
| <b>TAPE 1,2 : CD/VIDEO/AUX</b>                                | 95 dB  |
| <b>Damping factor</b>   | 30 (1 kHz, 8 ohms) [HTA-3F]<br>50 (1 kHz, 8 ohms) [HTA-4F]   |
| <b>Equalizer</b>  | RIAA $\pm$ 0.5 dB  |
| <b>Bass control (100 Hz)</b>                                  | $\pm$ 9 dB [HTA-3F]<br>$\pm$ 8 dB [HTA-4F]   |
| <b>Treble control (10 kHz)</b>                                | $\pm$ 8 dB   |
| <b>Loudness control (100 Hz/10 kHz)</b>                       | +6 dB/+5 dB/(100 Hz/10 kHz) [HTA-3F]<br>+7 dB/+5 dB/(100 Hz/10 kHz) [HTA-4F]   |
| <b>Subsonic filter</b>  | -12 dB/oct. (20 Hz)  |
| <b>FM muting</b>  | Provided   |
| <b>Tape monitor</b>   | Provided (2 tape deck facilities)  |
| <b>Tape copy</b>  | Provided (1 - 2)   |
| <b>Speaker switch</b>   | A, B, A + B, OFF   |
| <b>AC outlet</b>  | 1 (100 W unswitched)   |
| <b>Power requirements</b>                                     | AC 120 V 60 Hz   |
| <b>Power consumption</b>                                      | 150 W (at 1/3 rated output) [HTA-3F]<br>190 W (at 1/3 rated output) [HTA-4F]   |
| <b>Dimensions</b>   | 435(W) $\times$ 83(H) $\times$ 292(D) mm [HTA-3F]<br>435(W) $\times$ 110(H) $\times$ 347(D) mm [HTA-4F]  |
| <b>Weight</b>   | 5.5 kg [HTA-3F]<br>7.2 kg [HTA-4F]   |

# CARACTERISTIQUES TECHNIQUES

## SECTION FM

|  |   |                                  |
|--|---|----------------------------------|
| <b>Gamme de fréquences</b>                               | 87,9 – 107,9 MHz (intervalle 100 kHz)       |                                  |
| <b>Sensibilité utile (IHF)</b>                           | Mono : 13,2 dBf                             |                                  |
| <b>Seuil de sensibilité 50 dB</b>                        | Mono : 20,2 dBf (5,6 $\mu$ V)               | Stéréo : 38,2 dBf (44,7 $\mu$ V) |
| <b>Rapport signal/bruit (à 65 dBf)</b>                   | Mono : 76 dB (IHF)                          | Stéréo : 70 dB (IHF)             |
| <b>Distorsion harmonique totale (à 65 dBf)<br/>1 kHz</b> | Mono : 0,15 %                               | Stéréo : 0,25 %                  |
| <b>Courbe de réponse</b>                                 | 30 Hz – 12 kHz $\pm$ 2 dB                   |                                  |
| <b>Sélectivité</b>                                       | 53 dB ( $\pm$ 400 kHz IHF)                  |                                  |
| <b>Séparation stéréo</b>                                 | 40 dB (1 kHz)                               |                                  |
| <b>Entrée d'antenne</b>                                  | 300 ohms équilibrée, 75 ohms non équilibrée |                                  |

## SECTION AM

|                                       |                                     |
|---------------------------------------|-------------------------------------|
| <b>Gamme de fréquences</b>            | 530 – 1,620 kHz (intervalle 10 kHz) |
| <b>Sensibilité</b>                    | 15 $\mu$ V (IHF, antenne ext.)      |
| <b>Sélectivité</b>                    | 38 dB                               |
| <b>Rapport signal/bruit (à 50 mV)</b> | 45 dB                               |
| <b>Antenne</b>                        | Antenne boucle et borne extérieure  |

## SECTION AUDIO

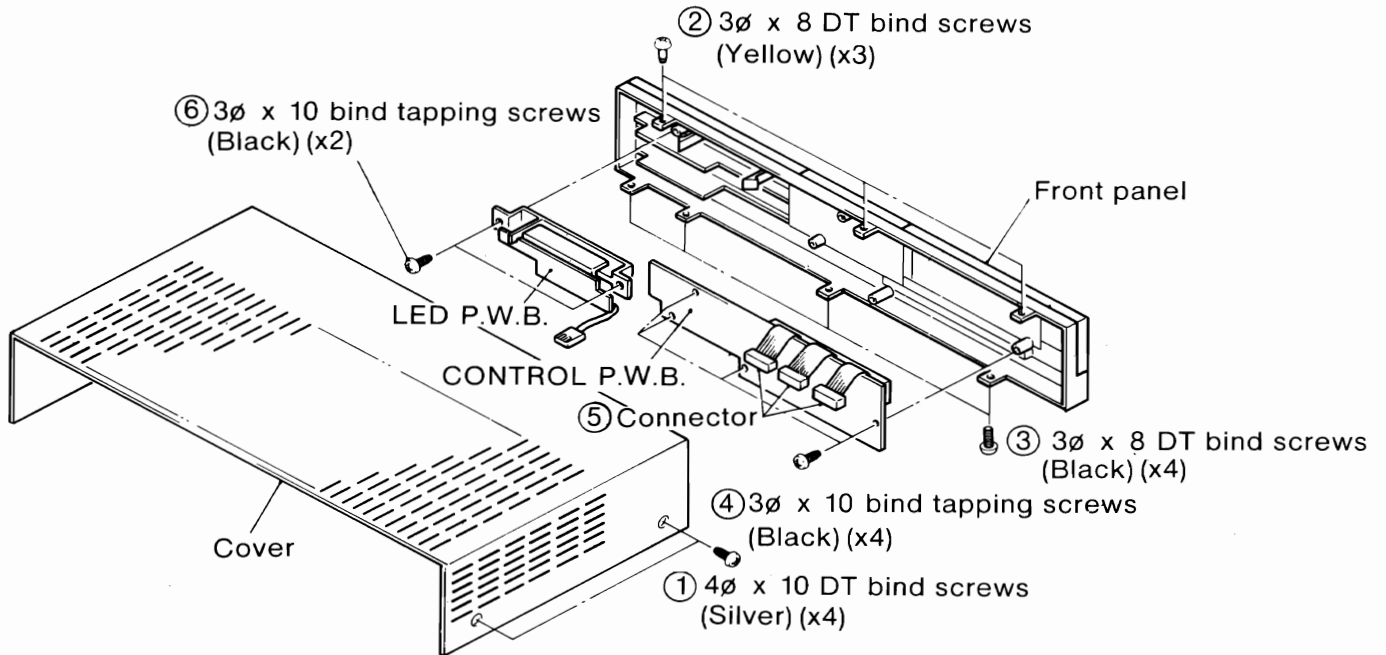
|   |   |  |
|---|---|--|
| <b>Puissance efficace</b>   | 30 Watts [HTA-3F] 40 Watts [HTA-4F] par canal, min. efficace, à 8 ohms de 20 Hz à 20 kHz, avec une distorsion harmonique total inférieure à 0,05 % [HTA-3F] 0,01 % [HTA-4F] |  |
|   | 30 W + 30 W (8 ohms, 1 kHz, DHT 0,05 % IHF) [HTA-3F]  |  |
|   | 45 W + 45 W (8 ohms, 1 kHz, DHT 0,01 % IHF) [HTA-4F]  |  |
| <b>Largeur de bande</b>   | 10 Hz – 30 kHz (Puissance efficace 1/2, DHT 0,05 % à 8 ohms) [HTA-3F]   |  |
|   | 20 Hz – 30 kHz (Puissance efficace 1/2, DHT 0,01 % à 8 ohms) [HTA-4F]   |  |
| <b>Caractéristiques de fréquence</b>                                      | 10 Hz – 40 kHz ( $\pm$ 2 dB) [HTA-3F]   |  |
|   | 10 Hz – 60 kHz ( $\pm$ 2 dB) [HTA-4F]   |  |
| <b>Distorsion harmonique totale (à la sortie nominale)</b>                | Inférieure à 0,05 % [HTA-3F]  |  |
|   | Inférieure à 0,01 % [HTA-4F]  |  |
| <b>Distorsion d'intermodulation (à 1/2 de la sortie nominale)</b>         | Inférieure à 0,05 % [HTA-3F]  |  |
|   | Inférieure à 0,02 % [HTA-4F]  |  |
| <b>Impédance/sensibilité d'emtrée (avec sortie 30 W, 1 kHz)<br/>PHONO</b> | 2,5 mV/47-ohms [HTA-3F]   |  |
|   | 2,5 mV/50 k-ohms [HTA-4F]   |  |
| <b>TAPE 1-2 : CD/VIDEO/AUX</b>  | 150 mV/35 k-ohms [HTA-3F]   |  |
|   | 150 mV/50 k-ohms [HTA-4F]   |  |
| <b>Niveau d'entrée max.</b>   | 140 mV (DHT 0,05 % à 1 kHz) [HTA-3F]  |  |
|   | 150 mV (DHT 0,01 % à 1 kHz) [HTA-4F]  |  |
| <b>Niveau de sortie à TAPE OUT</b>  | 150 mV (PHONO à l'entrée nominale)  |  |
|   | 150 mV (FM 400 Hz, 30 % mod. entrée 1 mV)   |  |
|   | 150 mV (AM 400 Hz, 30 % mod. entrée 5 mV/m)   |  |
| <b>Rapport signal/bruit (IHF, réseau A, puissance nominale)<br/>PHONO</b> | 70 dB [HTA-3F]  |  |
|   | 71 dB [HTA-4F]  |  |
| <b>TAPE 1-2 : CD/VIDEO/AUX</b>  | 95 dB   |  |
| <b>Facteur d'amortissement</b>  | 30 (1 kHz, 8 ohms) [HTA-3F]   |  |
|   | 50 (1 kHz, 8 ohms) [HTA-4F]   |  |
| <b>Egalisateur</b>  | RIAA $\pm$ 0,5 dB   |  |
| <b>Commande des graves (100 Hz)</b>                                       | $\pm$ 9 dB [HTA-3F]   |  |
|   | $\pm$ 8 dB [HTA-4F]   |  |
| <b>Commande des aigus (10 kHz)</b>  | $\pm$ 8 dB  |  |
| <b>Commande de correction physiologique (100 Hz/10 kHz)</b>               | +6 dB/5 dB/(100 Hz/10 kHz) [HTA-3F]   |  |
|   | +7 dB/5 dB/(100 Hz/10 kHz) [HTA-4F]   |  |
| <b>Filtre infra-acoustique</b>  | -12 dB/oct. (20 Hz)   |  |
| <b>Sourdine FM</b>  | Fournie   |  |
| <b>Contrôleur de bande</b>  | Fourni (pour une installation de 2 magnéto-phones)  |  |
| <b>Copie de bande</b>   | Fournie (1 – 2)   |  |
| <b>Interrupteur d'enceintes</b>   | A, B, A+B, OFF  |  |
| <b>Prise secteur</b>  | 1 (100 W non commutable)  |  |
| <b>Alimentation</b>   | CA 120 V 60 Hz  |  |
| <b>Consommation</b>   | 150 W (au 1/3 de la sortie nominale) [HTA-3F]   |  |
|   | 190 W (au 1/3 de la sortie nominale) [HTA-4F]   |  |
| <b>Dimensions</b>   | 435(L) $\times$ 83(H) $\times$ 292(P) mm [HTA-3F]   |  |
|   | 435(L) $\times$ 110(H) $\times$ 347(P) mm [HTA-4F]  |  |
| <b>Poides</b>   | 5,5 kg [HTA-3F]   |  |
|   | 7,2 kg [HTA-4F]   |  |

Les caractéristiques techniques et la présentation peuvent être modifiées sans préavis pour des raisons d'améliorations.

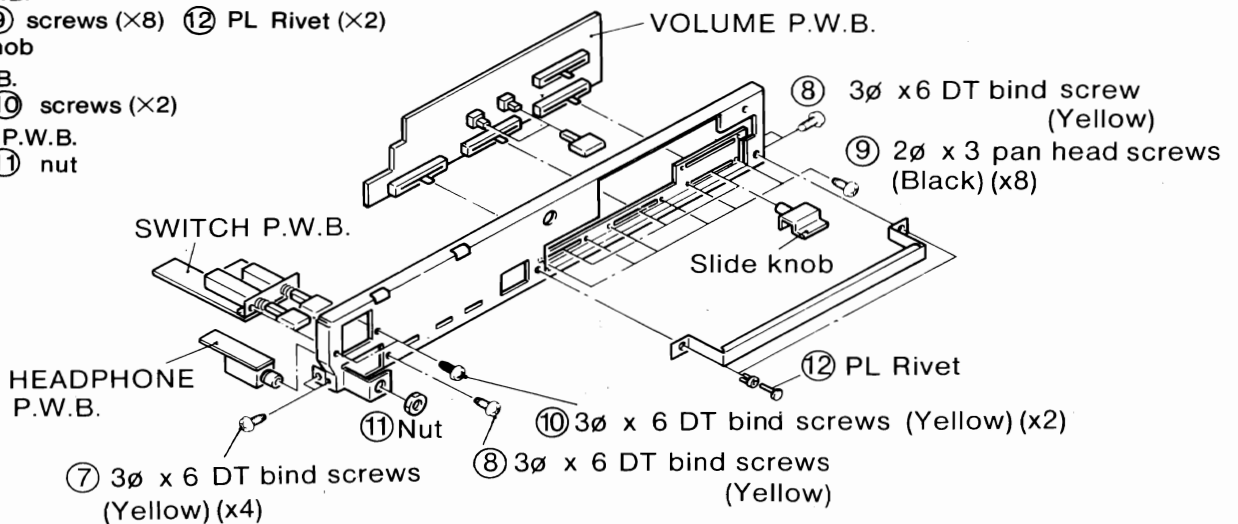
DISASSEMBLY AND REPLACEMENT · DEMONTAGE ET REMONTAGE

HTA-3F

1. Cover
  - Remove ① screws (×4)
2. Front panel
  - Remove ② screws (×3) and ③ screws (×4)
3. Control P.W.B.
  - Remove ④ screws (×4) and ⑤ connector (×3)
4. LED P.W.B.
  - Remove ⑥ screws (×2)



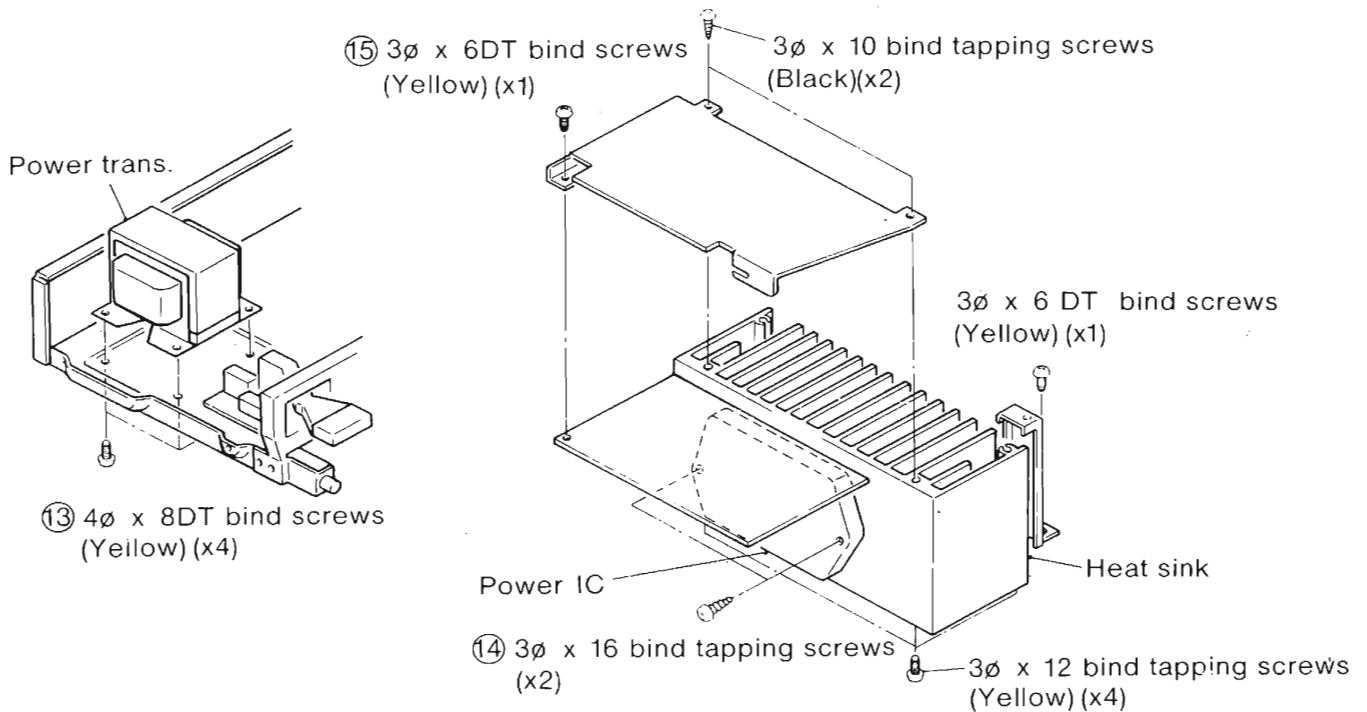
5. Mecha plate
  - Remove ⑦ screws (×4) and ⑧ 3ø × 6 DT bind screws
6. Volume P.W.B.
  - Remove ⑨ screws (×8) ⑫ PL Rivet (×2) and Slide knob
7. Switch P.W.B.
  - Remove ⑩ screws (×2)
8. Headphone P.W.B.
  - Remove ⑪ nut



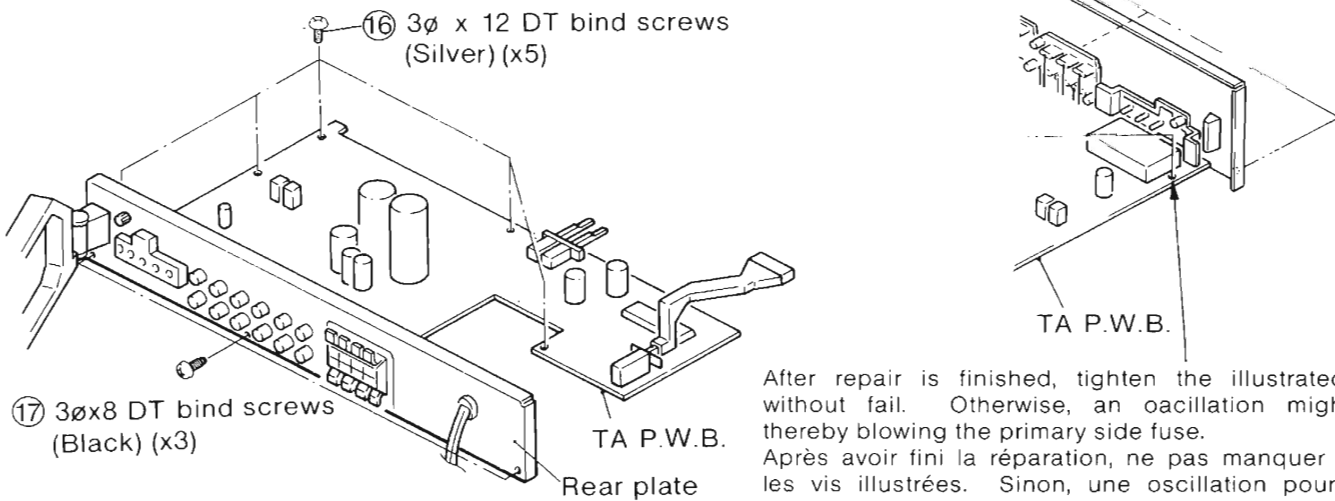
Note : After repair is finished, tighten the illustrated screws without fail. Otherwise, an oscillation might occur, thereby blowing the primary side fuse.

Note : Après avoir fini la réparation, ne pas manquer de serrer les vis illustrées. Sinon, une oscillation pourrait avoir lieu, ce qui ferait sauter le fusible côté primaire.

- 9. Power transformer
  - Remove ⑬ screws (x4)
- 10. Power IC
  - Remove ⑭ screws (x2) and ⑮ screws (x1)



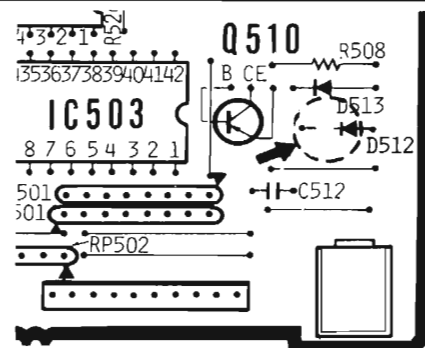
- 11. TA P.W.B.
  - Remove ⑯ screws (x5) and ⑰ screws (x3)



After repair is finished, tighten the illustrated screws without fail. Otherwise, an oscillation might occur, thereby blowing the primary side fuse.  
 Après avoir fini la réparation, ne pas manquer de serrer les vis illustrées. Sinon, une oscillation pourrait avoir lieu, ce qui ferait sauter le fusible côté primaire.

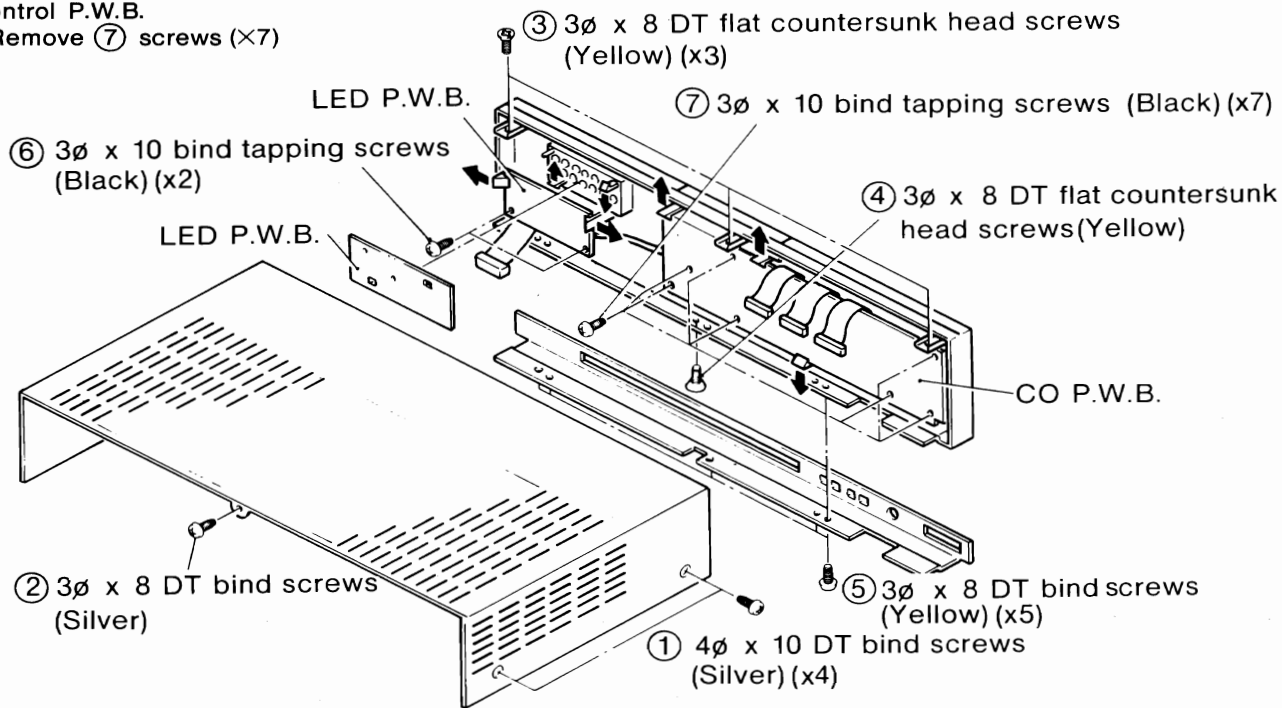
**Notice for export models to the U.S.A. & Canada.**  
 In order to switch the AM broadcast frequencies channel spacing from 10 kHz to 9 kHz, connect D512 as illustrated in the following figure.

**Remarque concernant les modèles d'exportation pour les Etats-Unis et le Canada**  
 Pour modifier l'espace entre deux fréquences radio de la bande AM de 10 kHz à 9 kHz, relier D512 comme indiqué sur la figure.

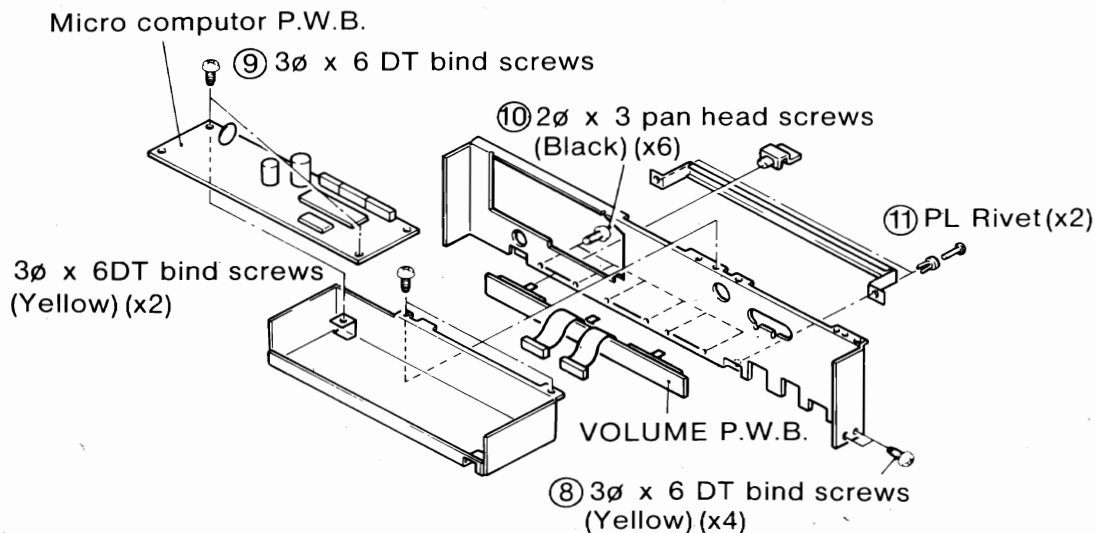


HTA-4F

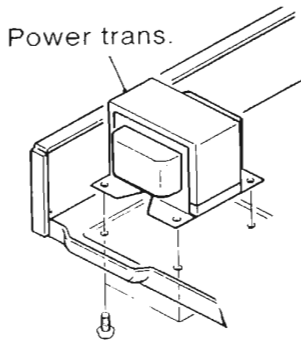
1. Cover
  - Remove ① screws (×4) and ② screws
2. Front panel
  - Remove ③ screws (×3), ④ screw and ⑤ screws (×5)
3. LED P.W.B.
  - Remove ⑥ screw (×2)
4. Control P.W.B.
  - Remove ⑦ screws (×7)



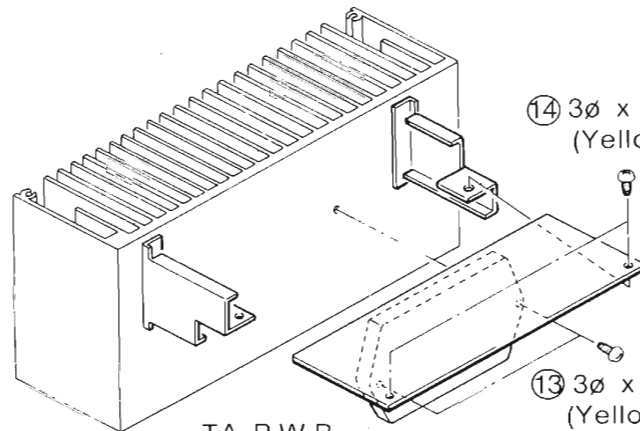
5. Mech plate
  - Remove ⑧ screws (×4)
6. MICRO COMPUTER P.W.B.
  - Remove ⑨ screws (×2)
7. VOLUME P.W.B.
  - Remove ⑩ screws (×6), ⑪ PL Rivet and Side knob



- 8. Power transformer
  - Remove ⑫ screws (x4)
- 9. Power IC
  - Remove ⑬ screws (x2) and ⑭ screws (x2)
- 10. TA P.W.B.
  - Remove ⑮ screws (x5) and ⑯ screws (x4)



⑫ 4ø x 8DT bind screws (Yellow) (x4)

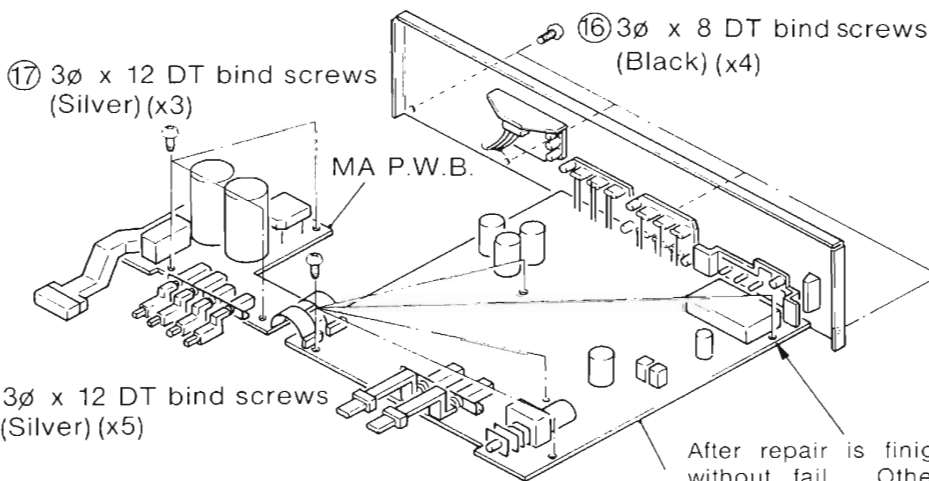


⑭ 3ø x 6 DT bind screws (Yellow) (x2)

⑬ 3ø x 16 bind tapping screws (Yellow) (x2)

TA P.W.B. Power IC

- 11. MA P.W.B.
  - Remove ⑰ screws (x3)



⑰ 3ø x 12 DT bind screws (Silver) (x3)

⑯ 3ø x 8 DT bind screws (Black) (x4)

⑮ 3ø x 12 DT bind screws (Silver) (x5)

TA P.W.B.

After repair is finished, tighten the illustrated screws without fail. Otherwise, an oscillation might occur, thereby blowing the primary side fuse.

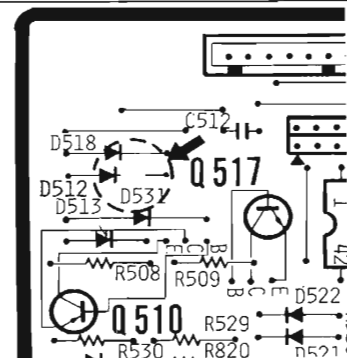
Après avoir fini la réparation, ne pas manquer de serrer les vis illustrées. Sinon, une oscillation pourrait avoir lieu, ce qui ferait sauter le fusible côté primaire.

**Notice for export models to the U.S.A. & Canada.**

In order to switch the AM broadcast frequencies channel spacing from 10 kHz to 9 kHz, connect D512 as illustrated in the following figure.

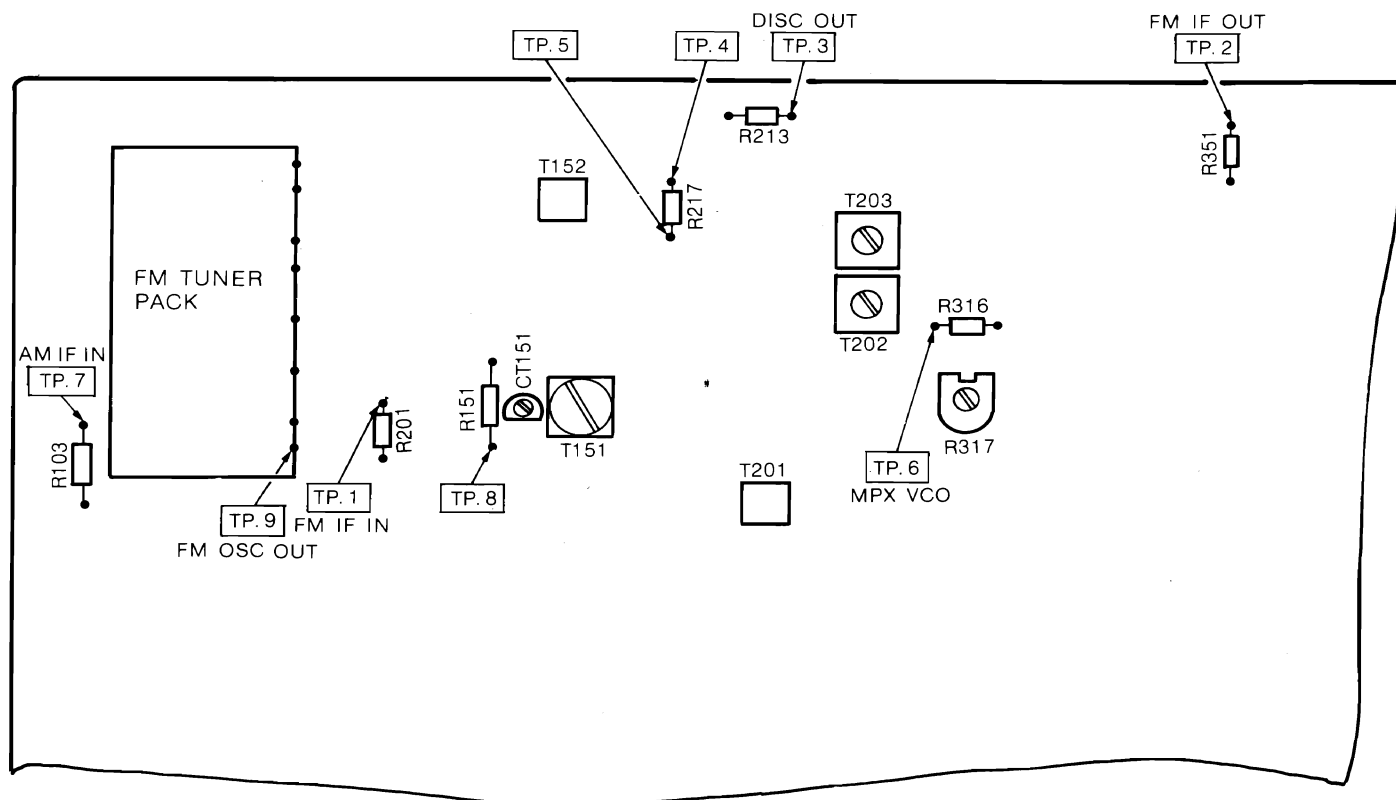
**Remarque concernant les modèles d'exportation pour les Etats-Unis et le Canada**

Pour modifier l'espacement entre deux fréquences radio de la bande AM de 10 kHz à 9 kHz, relier D512 comme indiqué sur la figure.

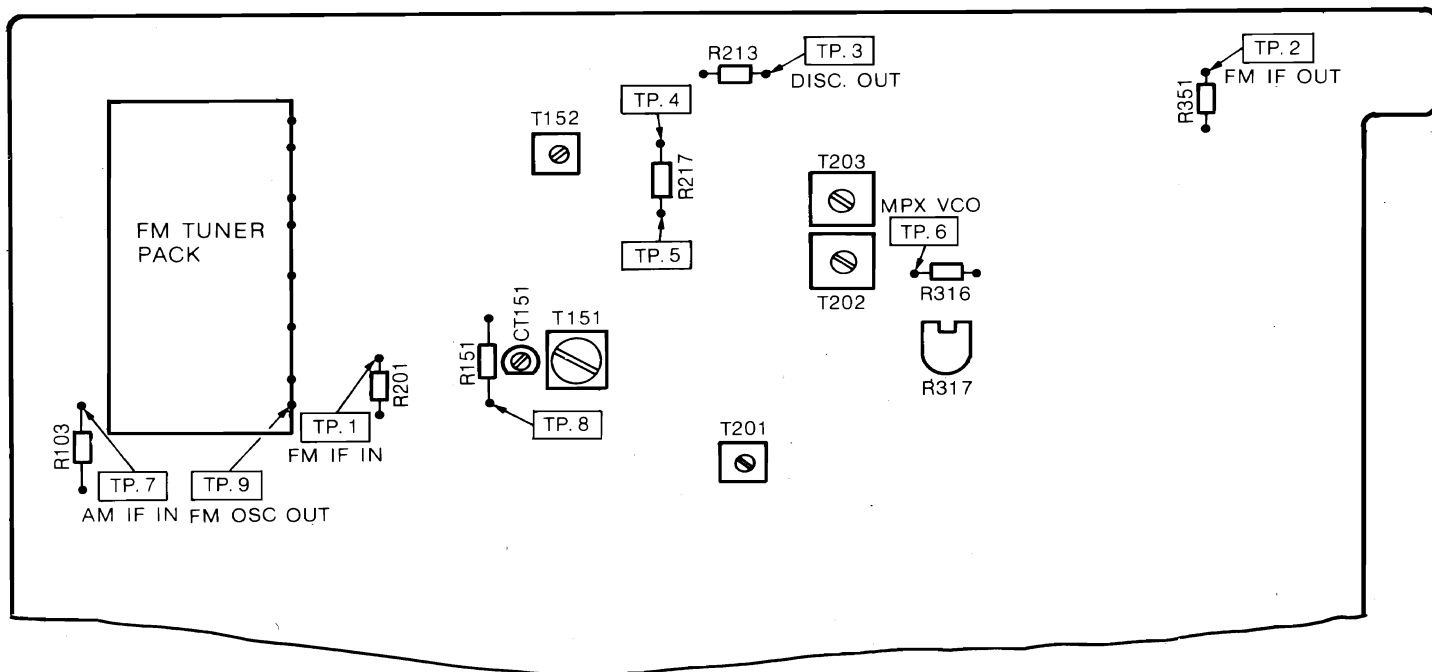


GENERAL ALIGNMENT INSTRUCTION · INSTRUCTIONS GENERALES

HTA-3F



HTA-4F





# FM TUNER ALIGNMENT · REGLAGE DE TUNER FM

FUNCTION : FM  
FONCTION : FM

VOLUME : MIN  
VOLUME : min.

FM MODE : MONO

Sweep Generator  
Générateur de balayage

Signal Generator  
Générateur de signaux

Oscilloscope

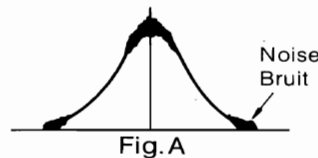
+ DC Null Meter  
- Indicateur d'équilibrage à C.C.

VTVM  
Voltmètre électronique

Frequency Counter  
Fréquencemètre

Dist.  
Distortion Meter  
Distorsionmètre

| Sequence<br>Ordre | Connection<br>Connexion                                   |  | Setting<br>Montage               |          | Adjust for<br>Réglage pour |   |                             |
|-------------------|---|--|----------------------------------|----------|----------------------------|---|-----------------------------|
|                   | Input<br>Entrée   | Output<br>Sortie   | Tuning<br>Indicateur<br>d'accord | Signal   | Adjust<br>Réglage          | Indication  |                             |
| 1                 | IF Amp.<br>Amplificateur<br>de fréquence<br>intermédiaire | TP. 1<br>Out<br>Sortie<br>   | TP. 2<br>IN<br>Entrée<br>        | —        | 10.7 MHz                   | T101<br>(Tuner pack)<br>(Ensemble Tuner)  | (Note 2)                    |
| 2                 | "S" curve<br>Courbe                                       | TP. 1<br>Out<br>Sortie<br>   | TP. 3<br>IN<br>Entrée<br>        | —        | 10.7 MHz                   | T202, T203<br>T202 : "S" curve<br>Courbe en<br>forme de "S"<br>T203 : Straight Line<br>Ligne droite | <br>(Note 3)                |
| 3                 | Discriminator<br>Discriminateur                           | ANT. Terminal (300 ohms)<br>Borne d'antenne (300 ohms)<br>   | TP. 4<br>TP. 5<br>               | 98.1 MHz | 98.1 MHz                   | T202  | (Note 4)                    |
| 4                 | Distortion<br>Distorsion                                  | 1 kHz 60 dBµ 75 kHz (dev.)<br>   | REC OUT<br>Dist.<br>             | 98.1 MHz | 98.1 MHz                   | T202, T203  | Distortion min.<br>(Note 5) |
| 5                 | Covering<br>Portée  |  |                                  |          |                            |   | (Note 6)                    |
| 6                 | Tracking<br>Alignement                                    |  |                                  |          |                            |   | (Note 6)                    |
| 7                 | 76 kHz<br>(FM MODE :<br>AUTO)                             | ANT. Terminal (300 ohms)<br>Borne d'antenne (300 ohms)<br>60 dBµ<br>Non modulated<br>Sans modulation | TP. 6<br>                        | 98.1 MHz | 98.1 MHz                   | R317  | 76 kHz ±100 Hz              |



**Note 1 :** Perform adjustment at least 3 minutes after the power has been switched on.

**Note 2 :** Using a sweep generator, apply low-input signals (with a small amount of noise superimposed as in Fig. A), and adjust the T101 so that the waveforms are brought to their maximum in center marker frequency (10.7 MHz).

**Note 3 :** Adjust the T202 coil and obtain an S-curve. Now adjust the T203 coil and improve the linearity of the S-curve.

**Note 4 :** Connect a DC null meter across R217 on the TA P.W.B., and adjust T202 core for a reading of 0 V ±60 mV.

**Note 5 :** When the distortion adjustment is performed, there will be a slight deviation in the discriminator adjustment performed under 3. Therefore, repeat adjustments 3 and 4 several times and adjust for a reading of 0V on the DC null meter with the distortion at its minimum.

**Note 6 :** FM Tuner pack is aligned before shipping, so it is not necessary to adjust covering and tracking.

- Note 1 :** Effectuer ce réglage au moins 3 minutes après la mise sous tension.
- Note 2 :** Utiliser un générateur de balayage et appliquer des signaux d'entrée à faible niveau (avec un faible chevauchement de bruit comme représenté sur la Fig. A), et ajuster T101 pour amener les formes d'ondes à leur maximum de la fréquence nominale de repérage (10,7 MHz).
- Note 3 :** Ajuster la bobine T202 pour obtenir une courbe en forme de "S". Ajuster ensuite la bobine T203 et améliorer la linéarité de la courbe en forme de "S".
- Note 4 :** Raccorder un indicateur de zéro à courant continu entre R217 de la plaquette à circuits imprimés du TA et ajuster le noyau T202 pour obtenir une lecture de 0 V ±60 mV.
- Note 5 :** Quand le réglage de distorsion est réalisé, il existera un léger écart de réglage du discriminateur, opération qui est réalisée en en 3. Par conséquent, les réglages 3 et 4 doivent être faits à plusieurs reprises de façon à obtenir une indication de 0 V à l'indicateur de zéro à continu quand la distorsion est minimale.
- Note 6 :** L'étage tuner FM est réglé avant son envoi, il est donc inutile d'effectuer le réglage de portée et d'alignement.

**AM TUENR ALIGNMENT · REGLAGE DE TUNER AM**

FUNCTION : AM  
MODULATION : 400 Hz 30 %

FONCTION : AM  
MODULATION : 400 Hz 30 %

| Sequence<br>Ordre | Connection<br>Connexion                                   |                                   | Setting<br>Montage               |          | Adjust for<br>Réglage pour |            |   |
|-------------------|---|-----------------------------------|----------------------------------|----------|----------------------------|------------|---|
|                   | Input<br>Entrée   | Output<br>Sortie                  | Tuning<br>Indicateur<br>d'accord | Signal   | Adjust<br>Réglage          | Indication |   |
| 1                 | IF Amp.<br>Amplificateur<br>de fréquence<br>intermédiaire |                                   |                                  | —        | 450 kHz                    | T201       | <br>Caution 1<br>Attention 1                  |
| 2                 | Covering<br>Guipage                                       | Loop antenna<br>Antenne en carton |                                  | 530 kHz  | —                          | T152       | 530 kHz : 2.0V DC<br>Caution 2<br>Attention 2 |
| 3                 | Tracking<br>Alignement                                    |                                   |                                  | 600 kHz  | 600 kHz                    | T151       | Output max.<br>Caution 3<br>Attention 3       |
|                   |   |                                   |                                  | 1400 kHz | 1400 kHz                   | CT151      |   |

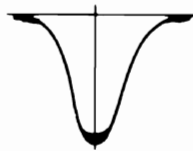


Fig. B

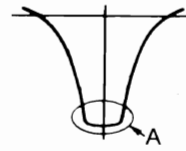


Fig. C

**CAUTION**

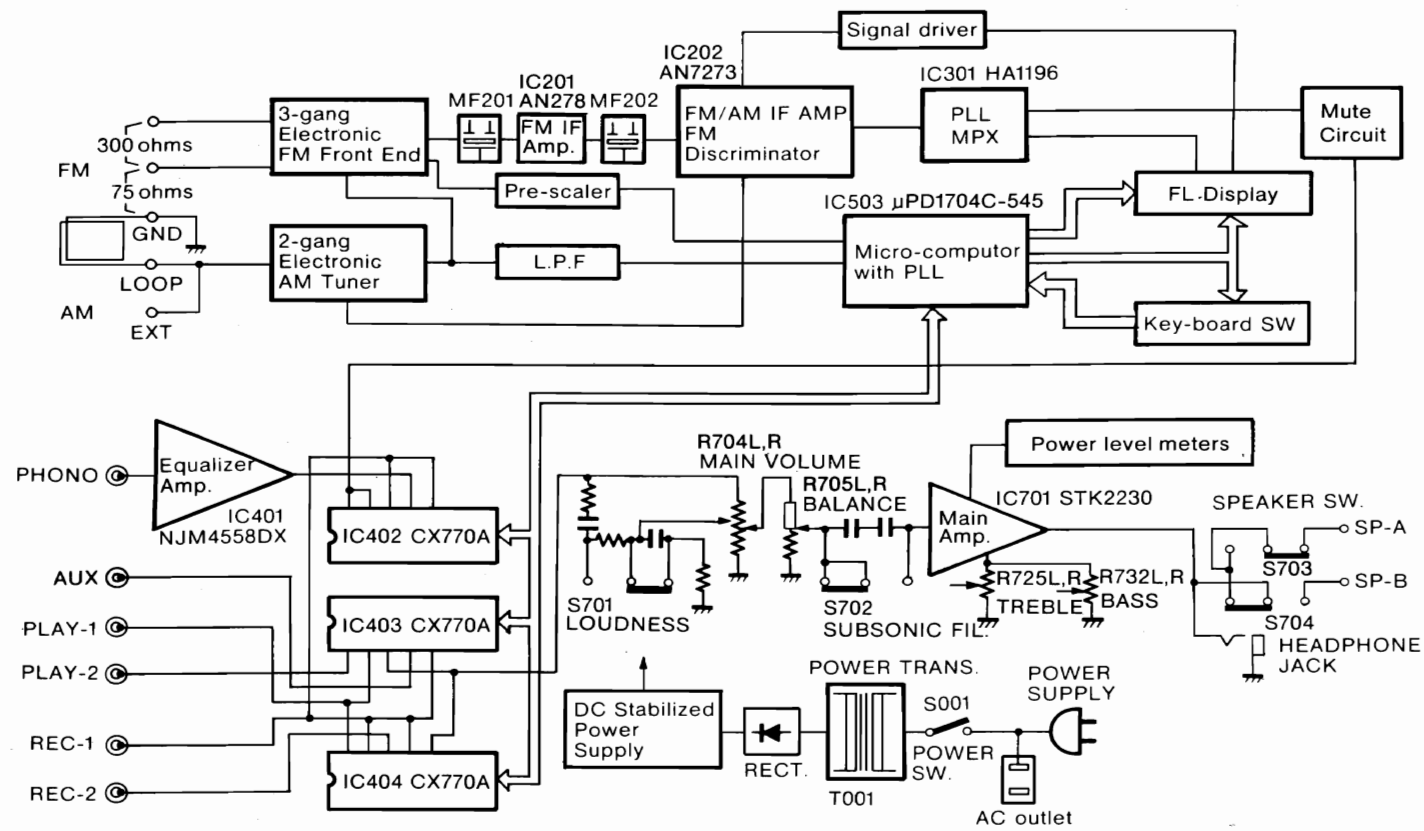
1. Adjust cores of T201 so that the waveform is as shown in Fig. B. After adjusting as above, increase the output level of the sweep generator and adjust T201 again so that the top of the waveform A (indicated in Fig. C) will be flat and wide.
2. Carry out this adjustment for final adjustment of the coil only when you have moved the core by mistake.
3. Set the input level to 74 dB/m in coarse adjustment. Reduce the input level to minimum (60 dB/m) as adjustment proceeds.

**ATTENTION**

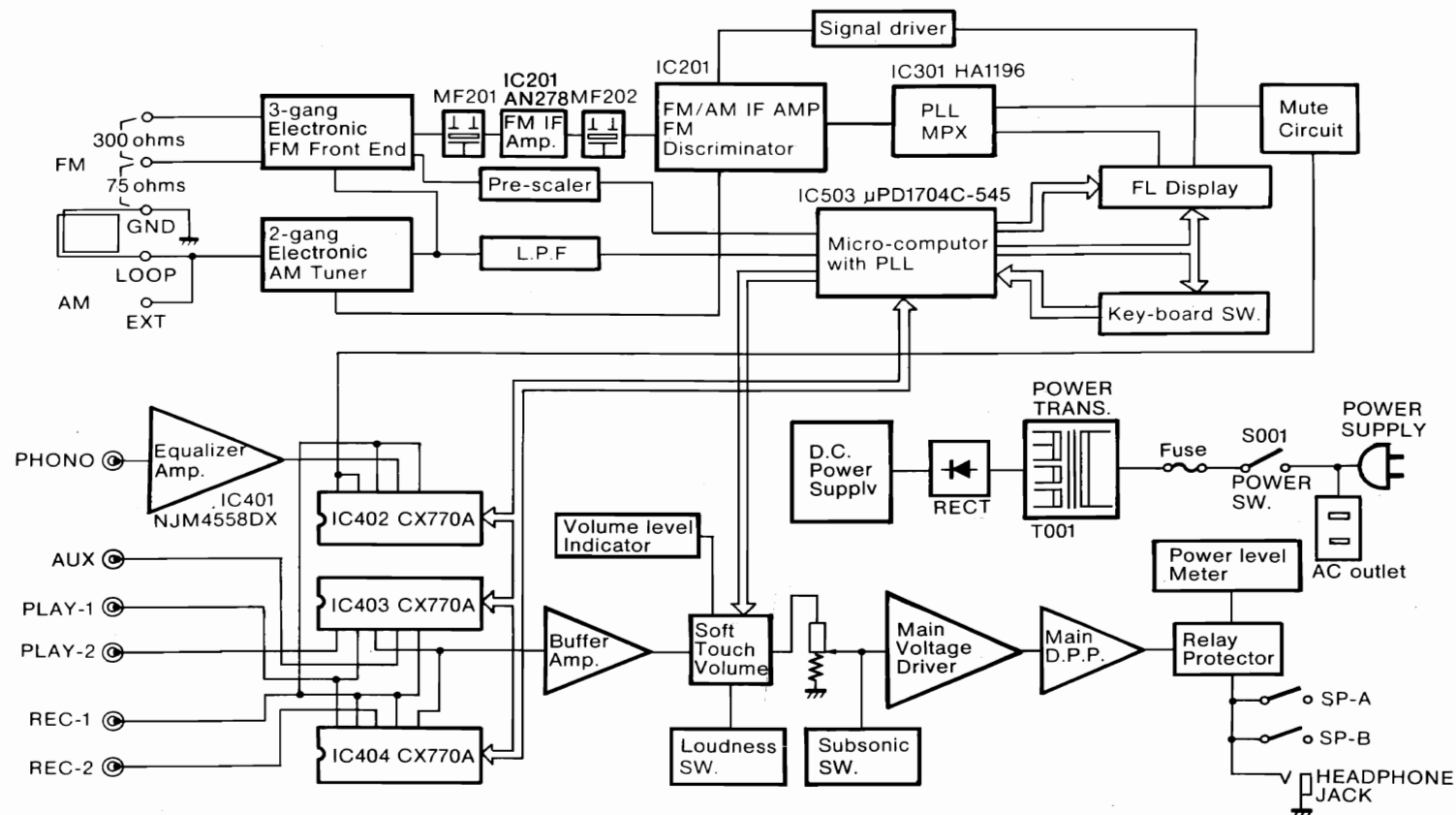
1. Régler les âmes noires de T201 de façon à obtenir une forme d'onde comme indiquée sur la Fig. B. Après avoir réglé comme indiqué ci-dessus, augmenter le niveau d'entrée du générateur de balayage et régler T201 à nouveau de façon que le sommet de la forme d'onde A (voir Fig. C) soit aplati et large.
2. N'effectuer le dernier réglage de la bobine par ce réglage que si vous avez bougé l'âme par erreur.
3. Faire un réglage approximatif du niveau d'entrée à 74 dB/m. Réduire le niveau d'entrée jusqu'à un minimum de 60 dB/m à mesure que l'on effectue le réglage.

**BLOCK DIAGRAM · SCHEMA**

**HTA-3F**

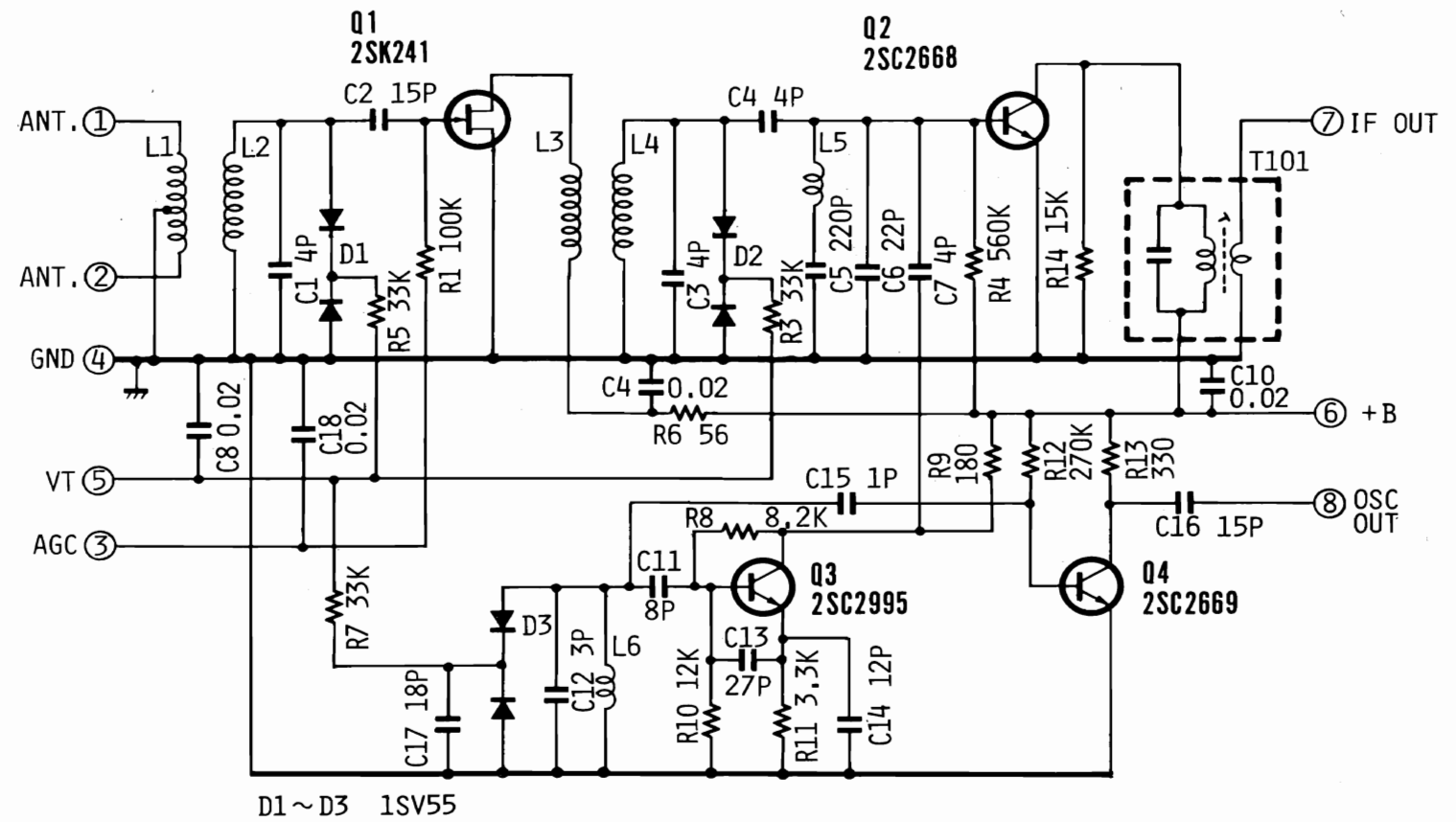


**HTA-4F**



**CIRCUIT DIAGRAM · PLAN DE CIRCUIT**

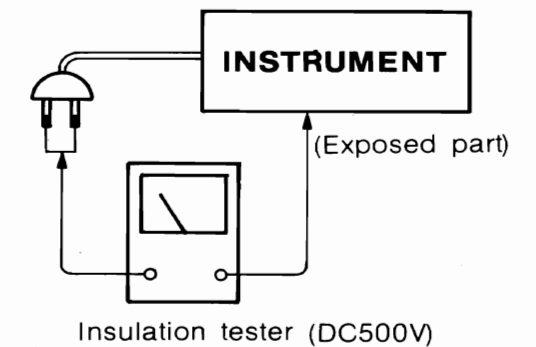
**Tuner pack**



Check that exposed parts are acceptably insulated from the supply circuit before returning the instrument repaired to the customer.

**● Checking method**

Power switch is set to ON.  
Next, measure the resistance value between the both poles of attachment cup (Power supply plug) and the exposed parts (Parts such as Ground terminal, Knob, Cover, etc. where the customer is easy to touch.) and check that the resistance value is 500 kohms or more.

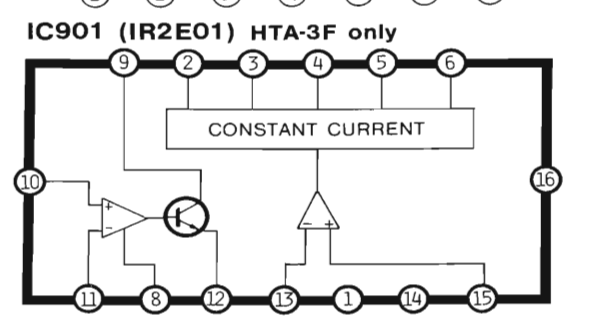
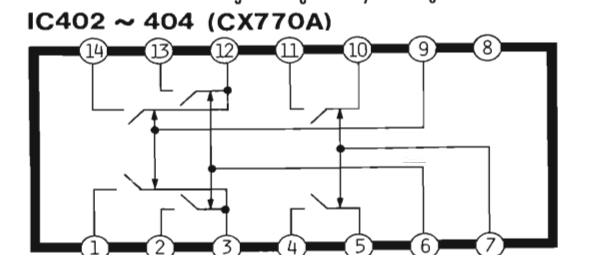
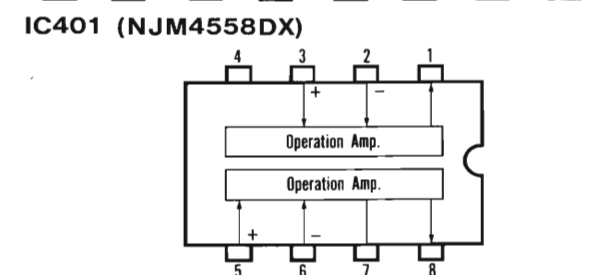
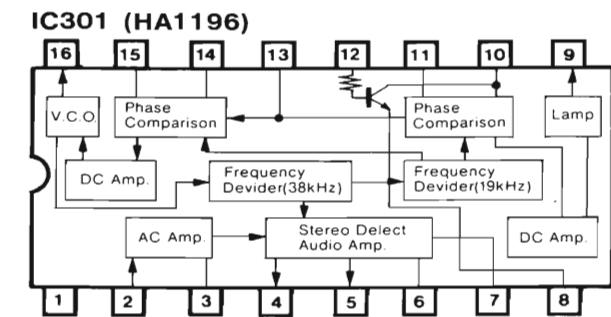
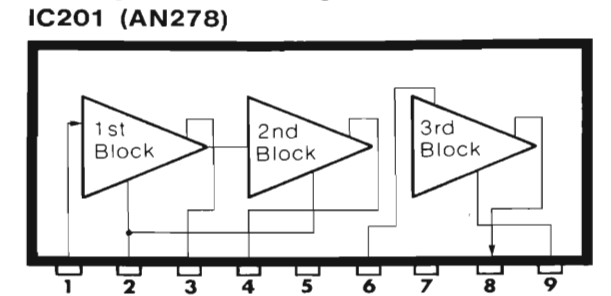
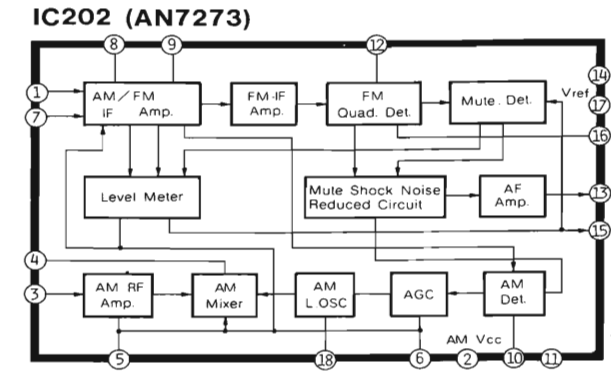
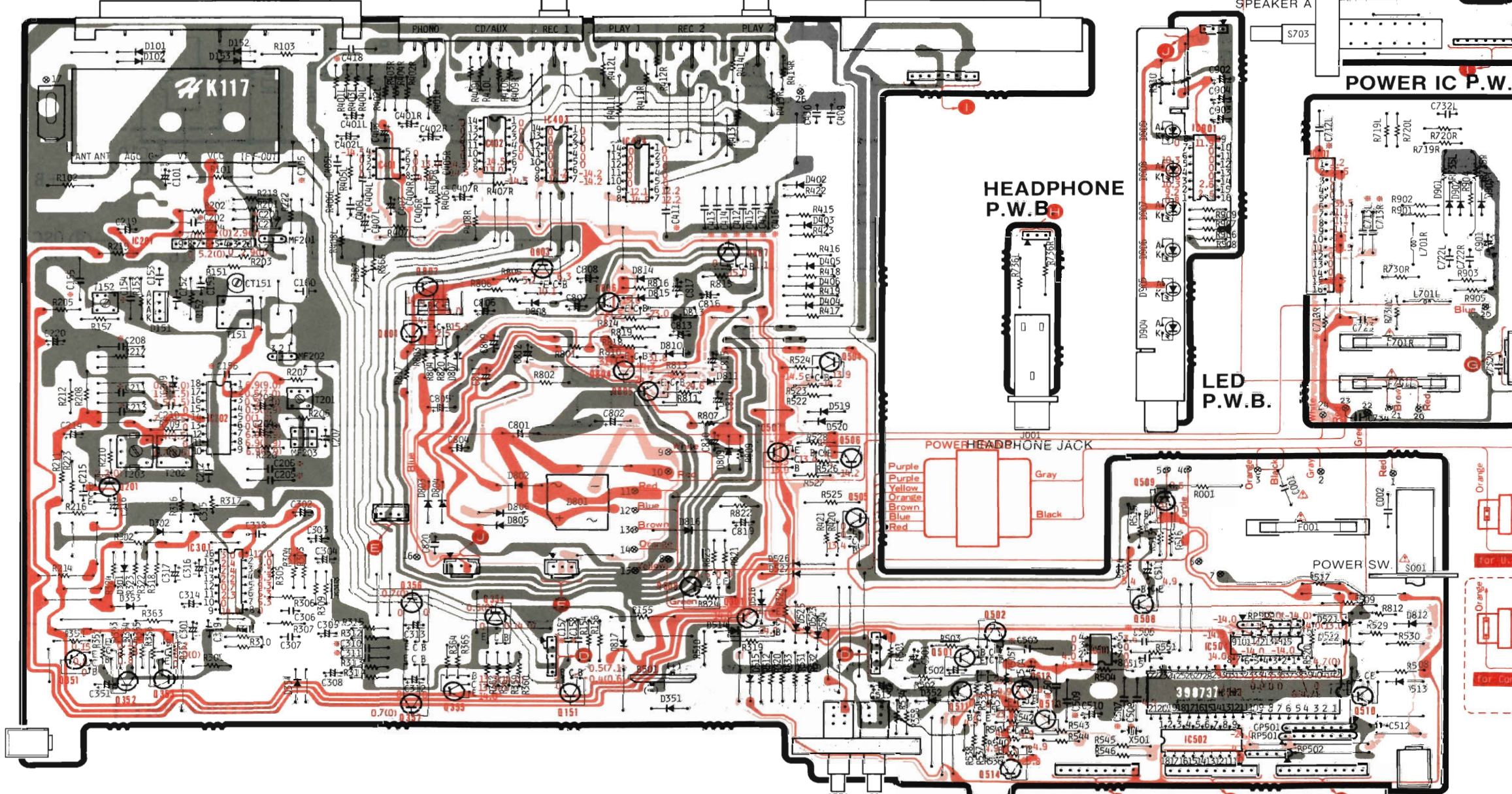


PRINTED WIRING BOARD · PLAN DE BASE  
HTA-3F

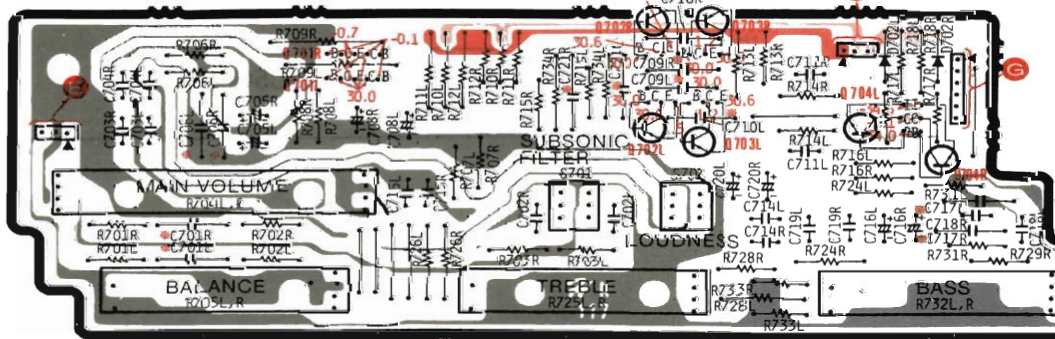
[ : +B, : -B, : Earth, : Other ]

\* : Axial lead cylindrical ceramic capacitor  
\* : Condensateur céramique cylindrique à conducteur axial

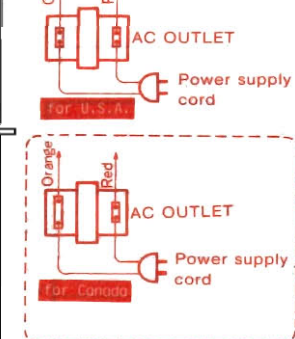
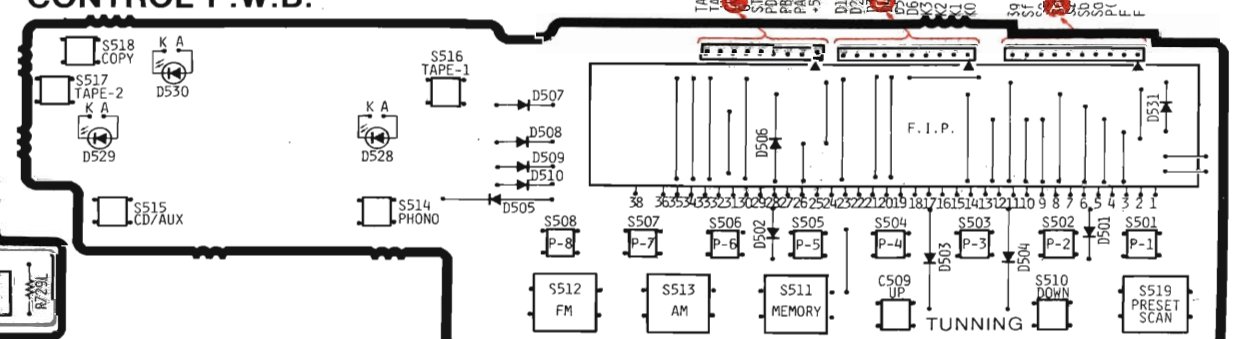
TA P.W.B. ( ) : AM POSITION



VOLUME P.W.B.

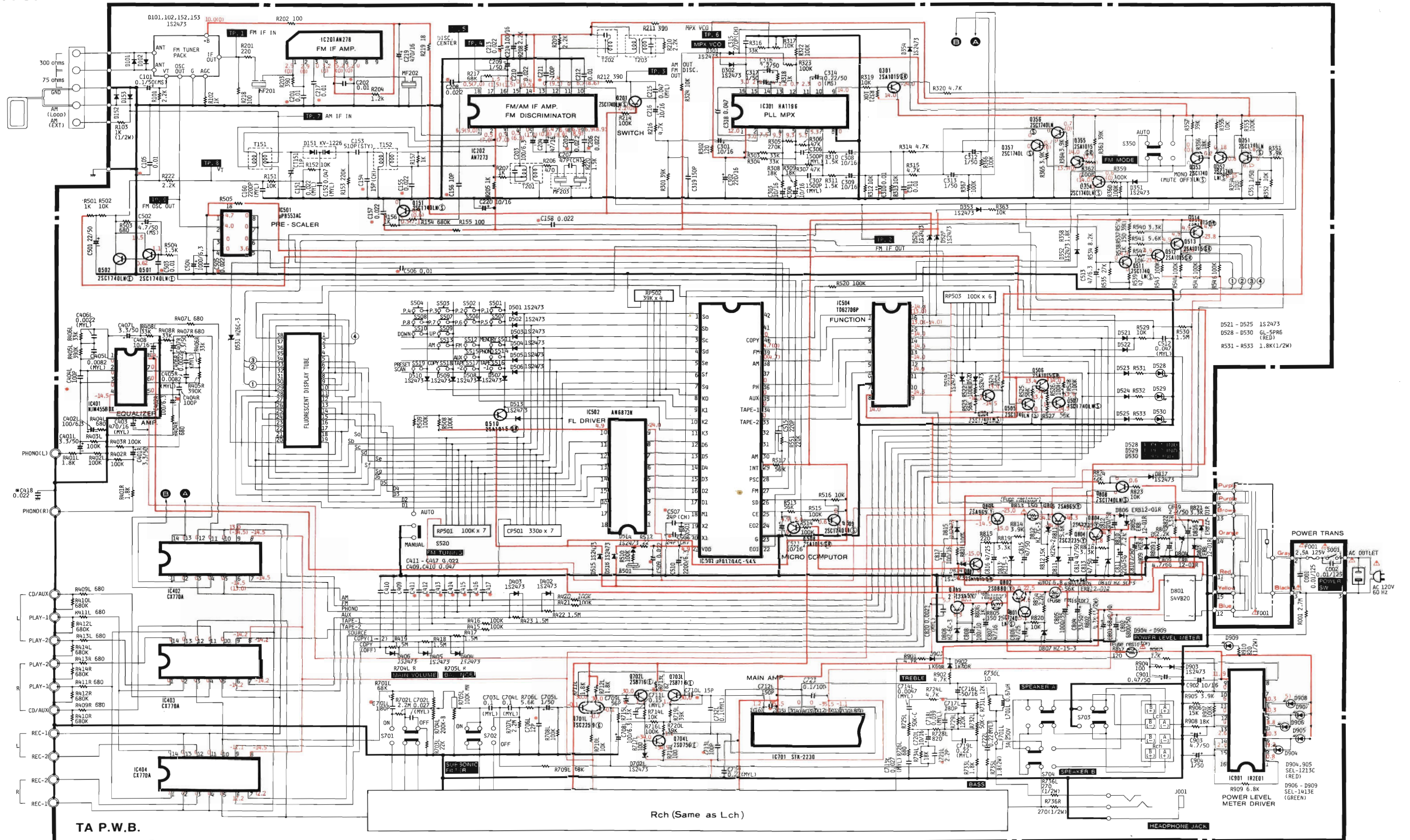


CONTROL P.W.B.



CIRCUIT DIAGRAM · PLAN DE CIRCUIT  
HTA-3F

\* : Axial lead cylindrical ceramic capacitor  
\* : Condensateur céramique cylindrique à conducteur axial



TA P.W.B.

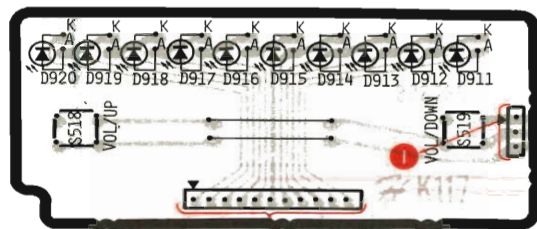
Rch (Same as Lch)

PRINTED WIRING BOARD · PLAN DE BASE  
HTA-4F

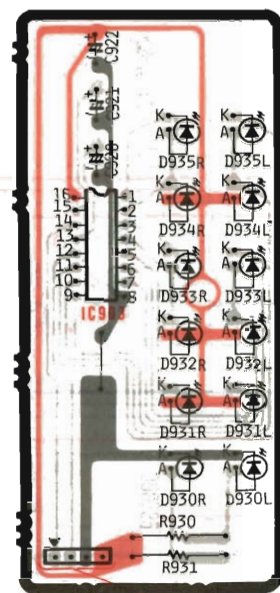
[ ■ : +B, ■ : -B, ■ : Earth, ■ : Other ]

\* : Axial lead cylindrical ceramic capacitor  
\* : Condensateur céramique cylindrique à conducteur axial

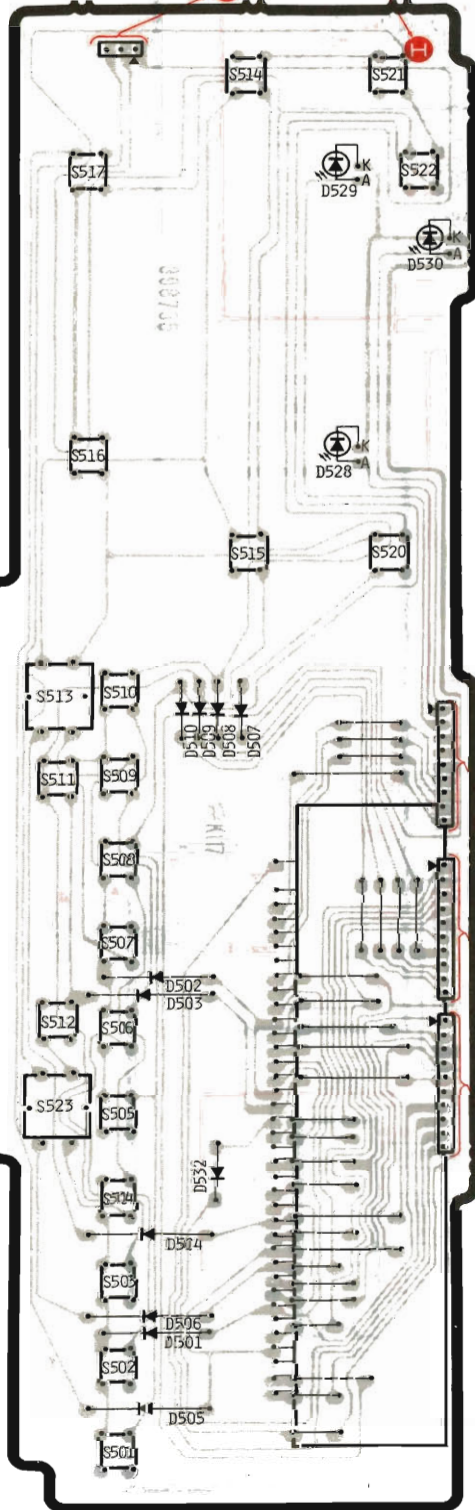
LED P.W.B.



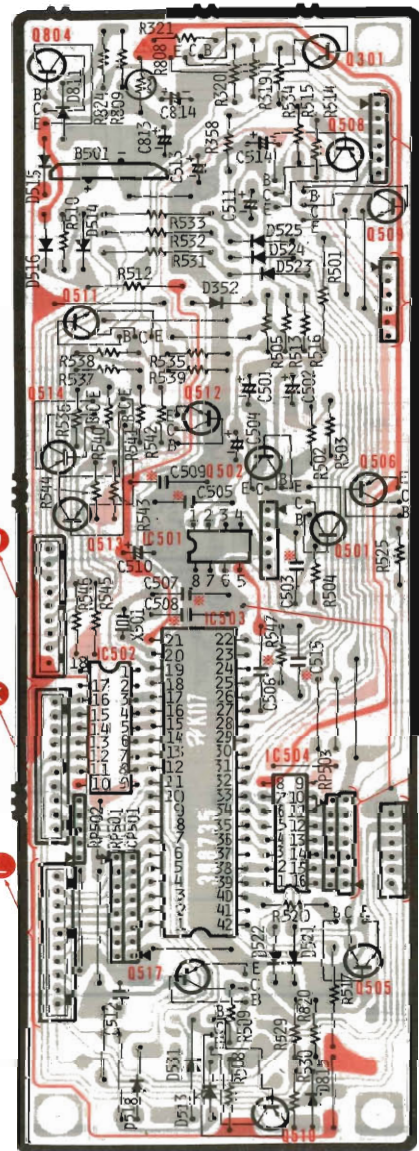
LED P.W.B.



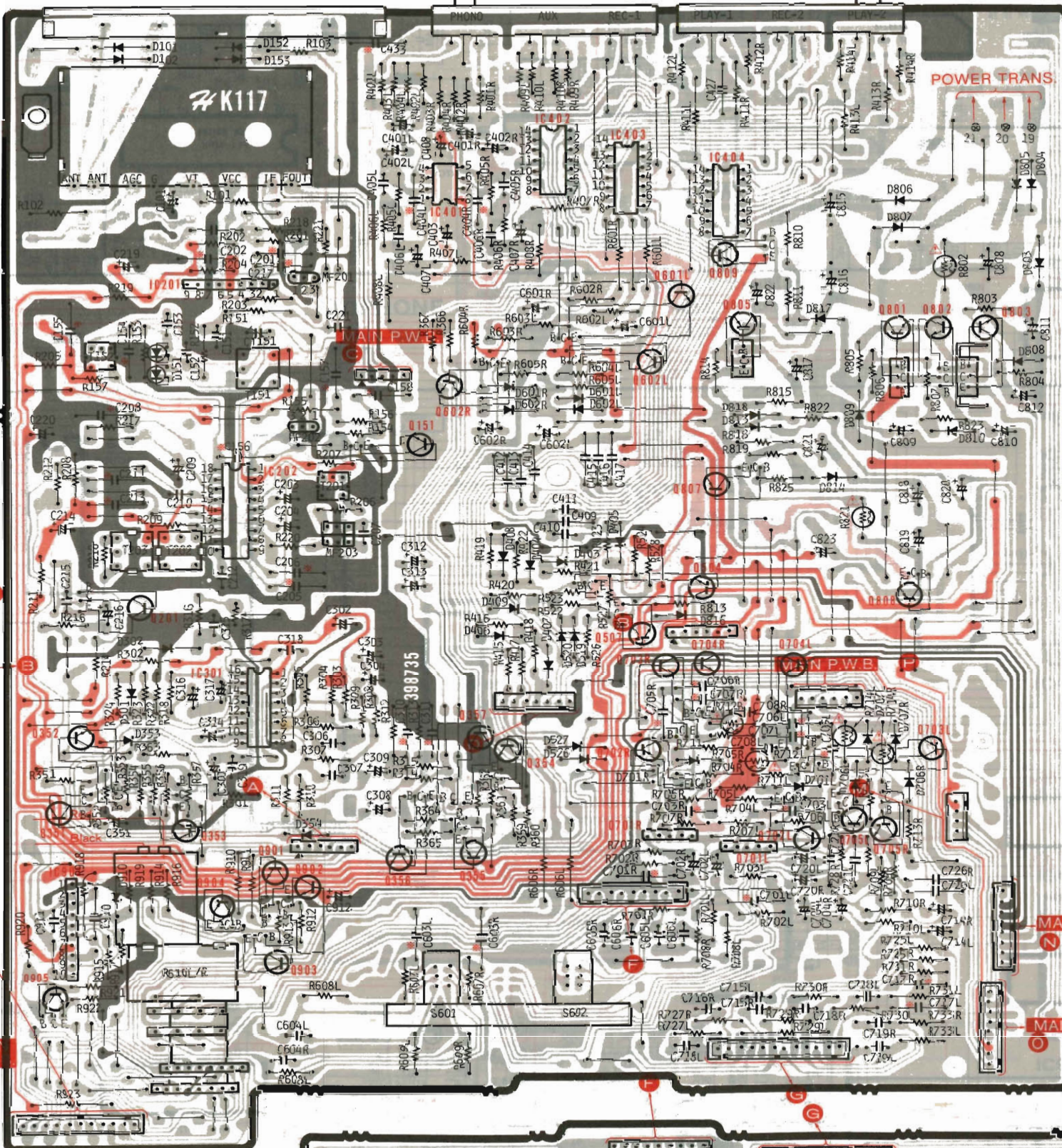
CONTROL P.W.B.



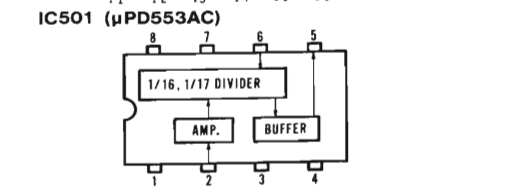
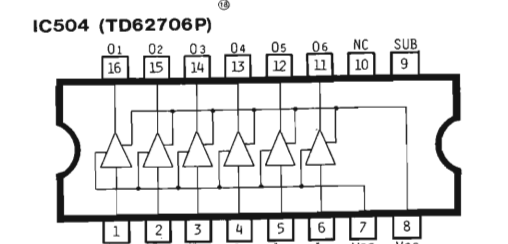
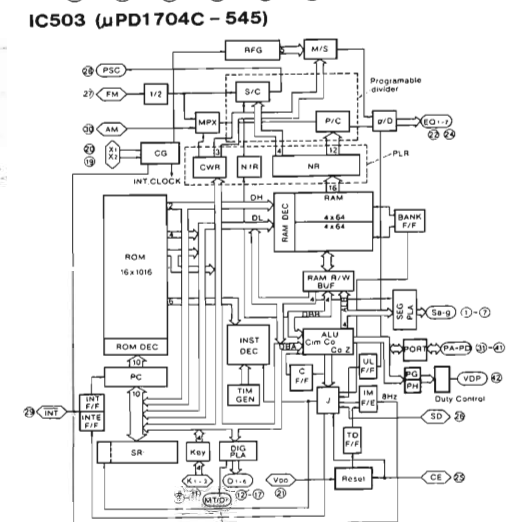
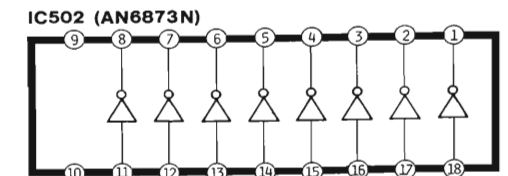
MICRO COMPUTER P.W.B.



TA P.W.B.

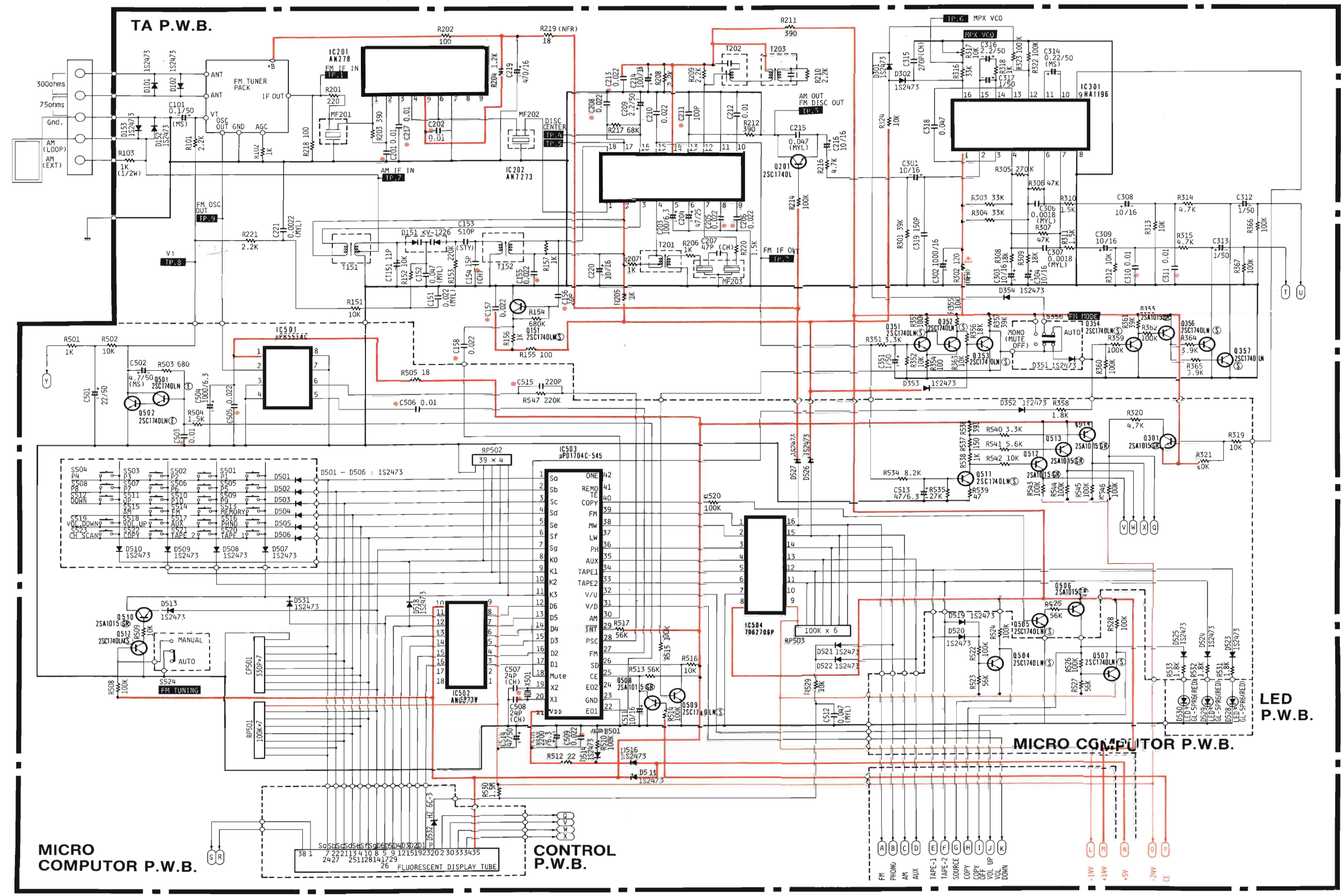


VOLUME P.W.B.



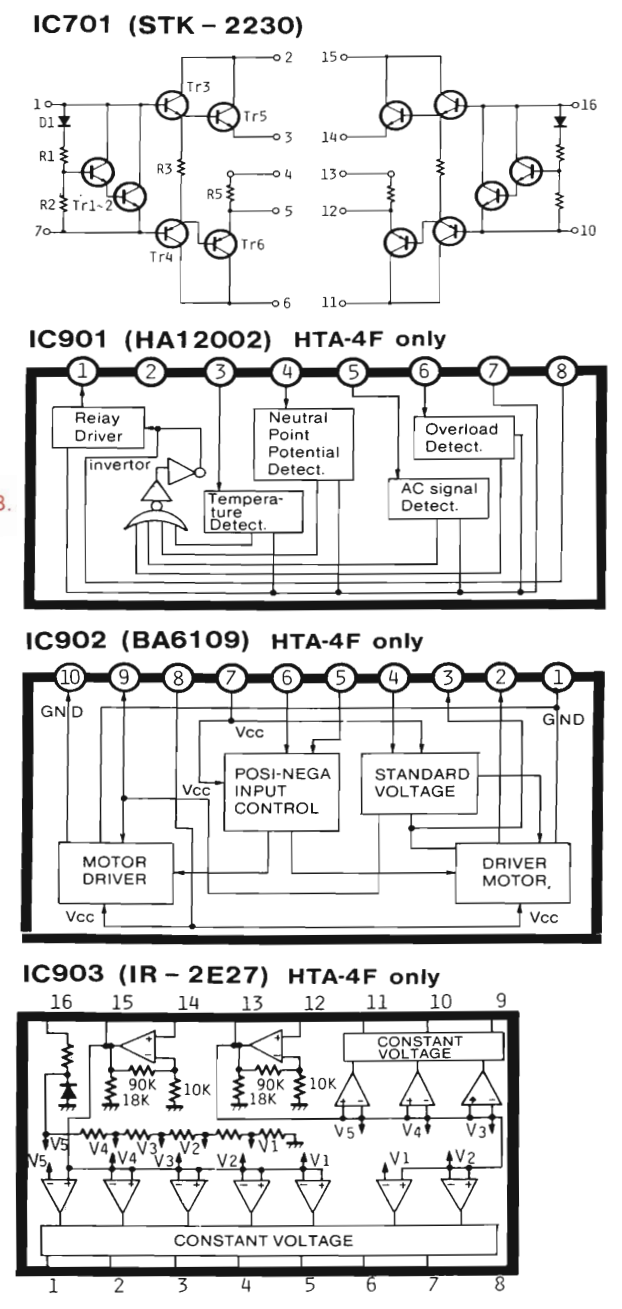
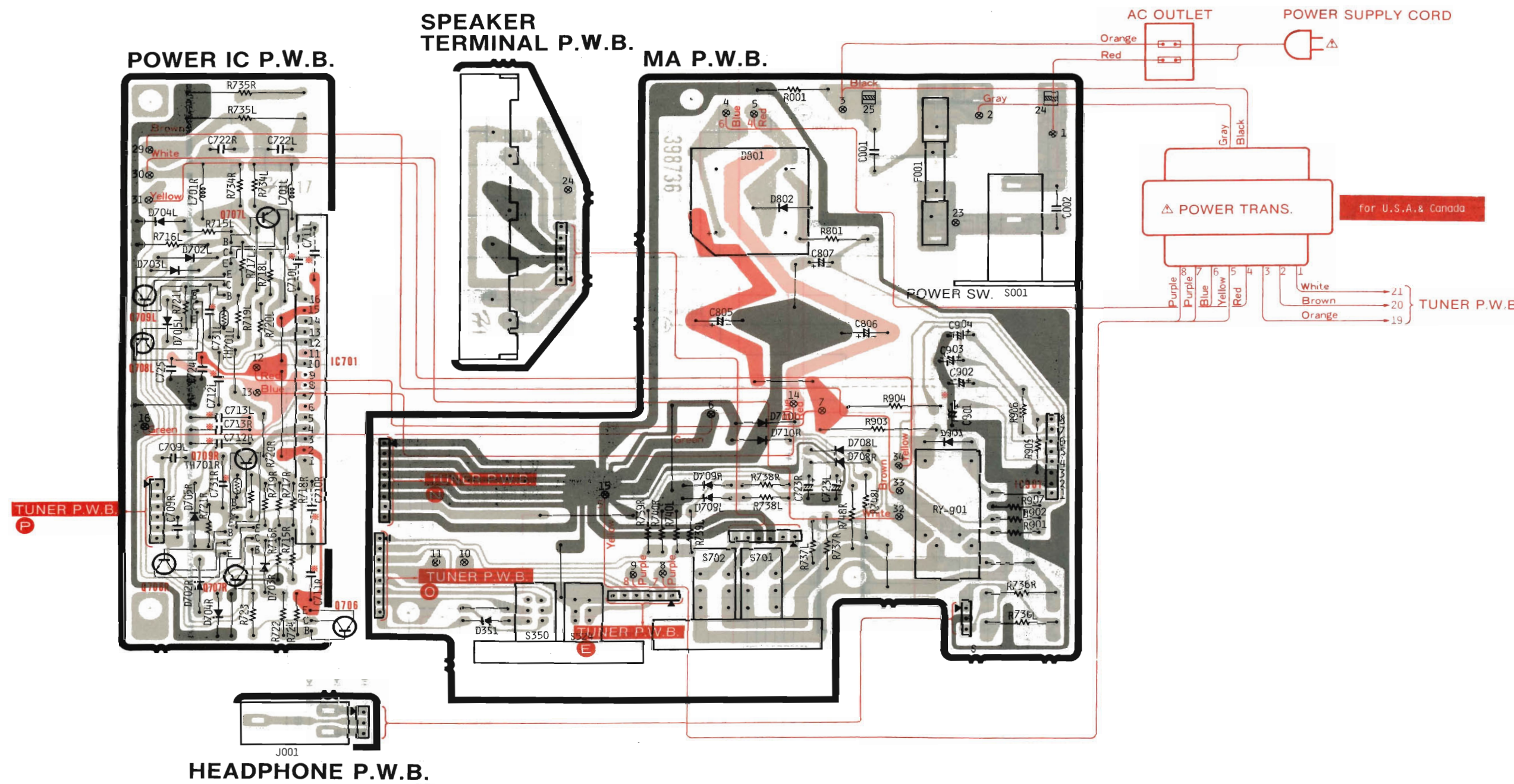
CIRCUIT DIAGRAM · PLAN DE CIRCUIT  
HTA-4F

\* : Axial lead cylindrical ceramic capacitor  
\* : Condensateur céramique cylindrique à conducteur axial



[ : +B, : -B, : Earth, : Other ]

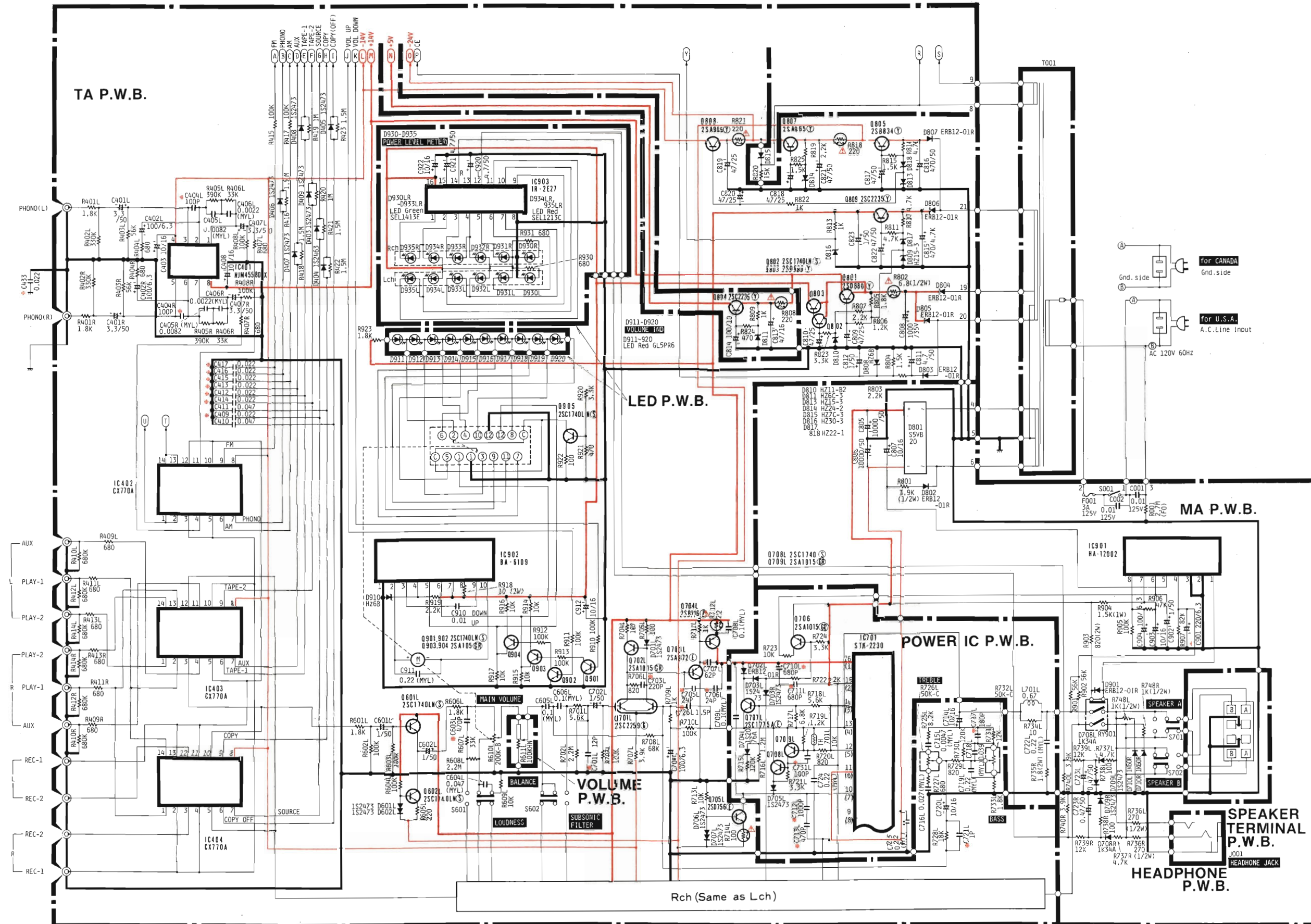
⊛ : Axial lead cylindrical ceramic capacitor  
⊛ : Condensateur céramique cylindrique à conducteur axial



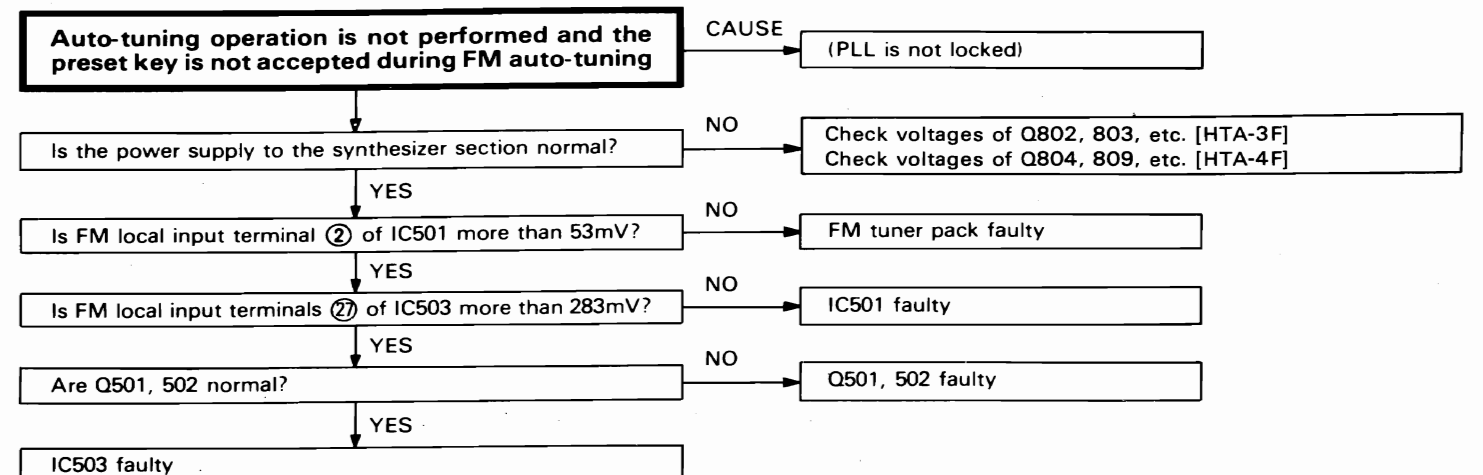
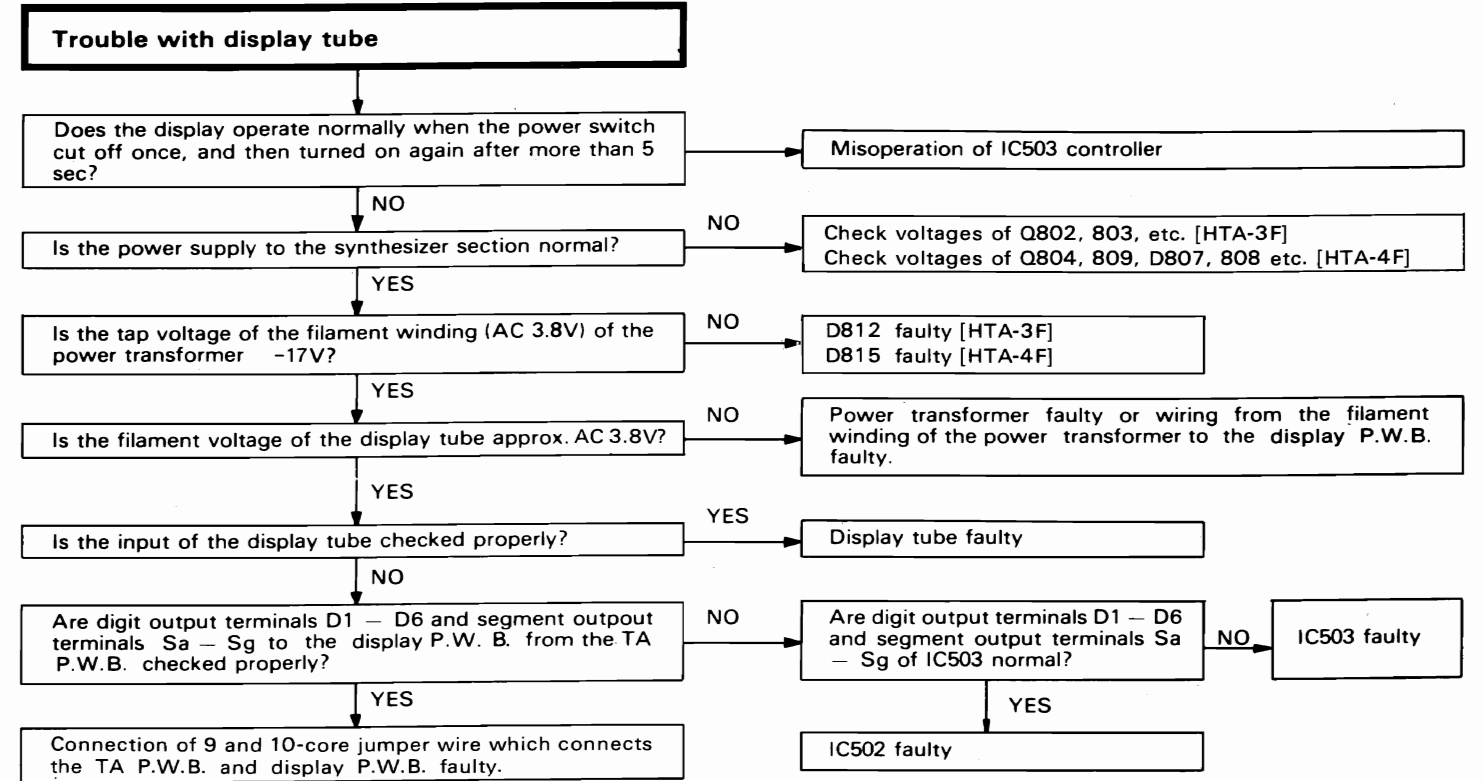
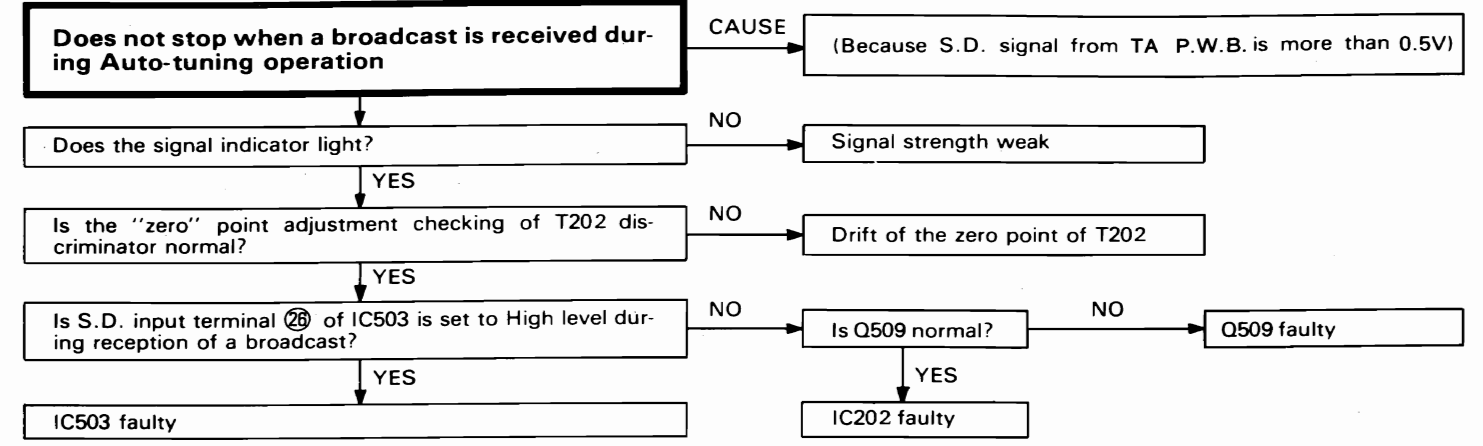
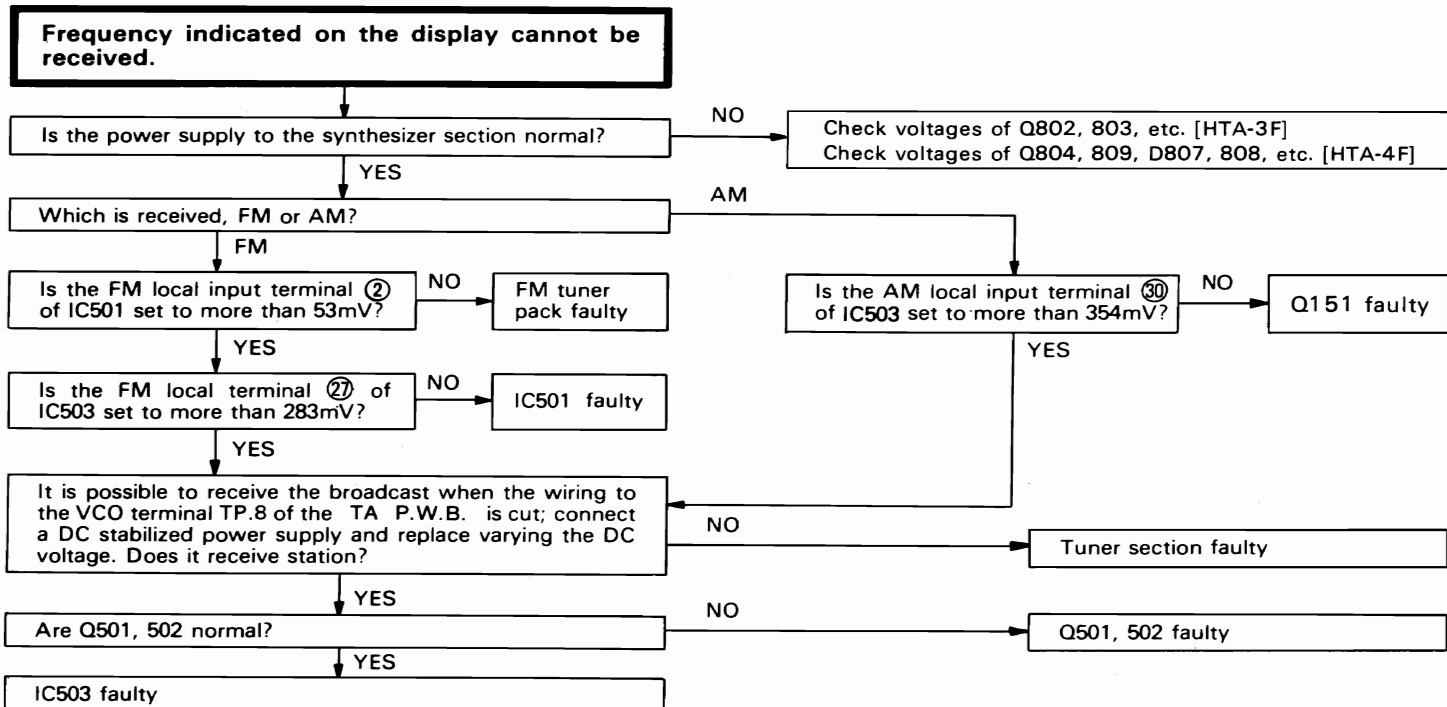
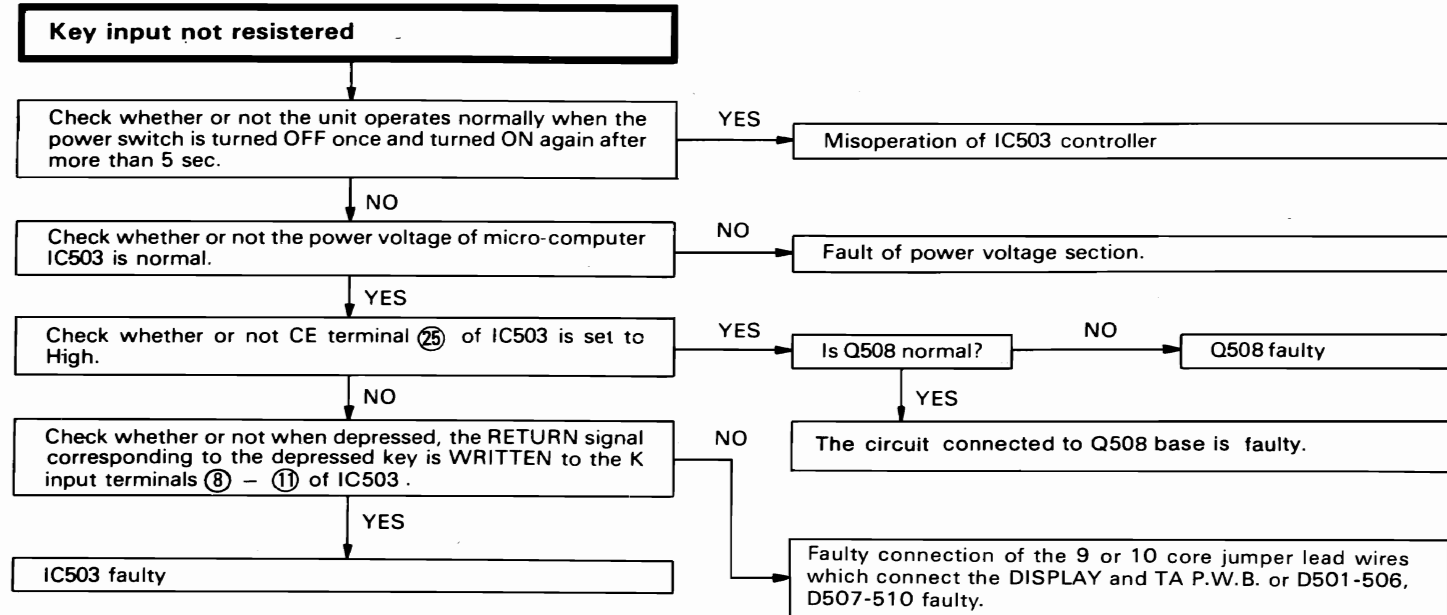


CIRCUIT DIAGRAM · PLAN DE CIRCUIT  
HTA-4F

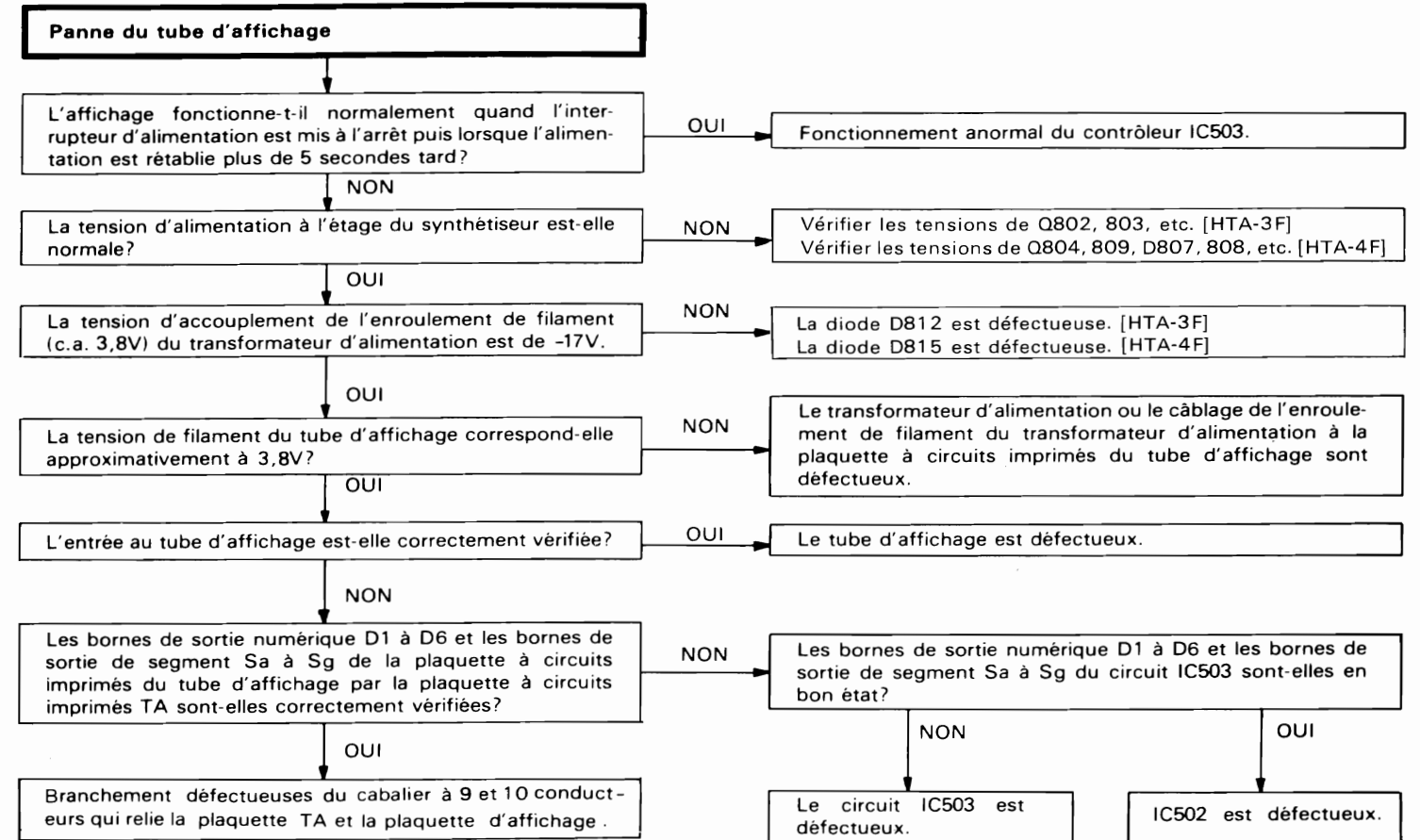
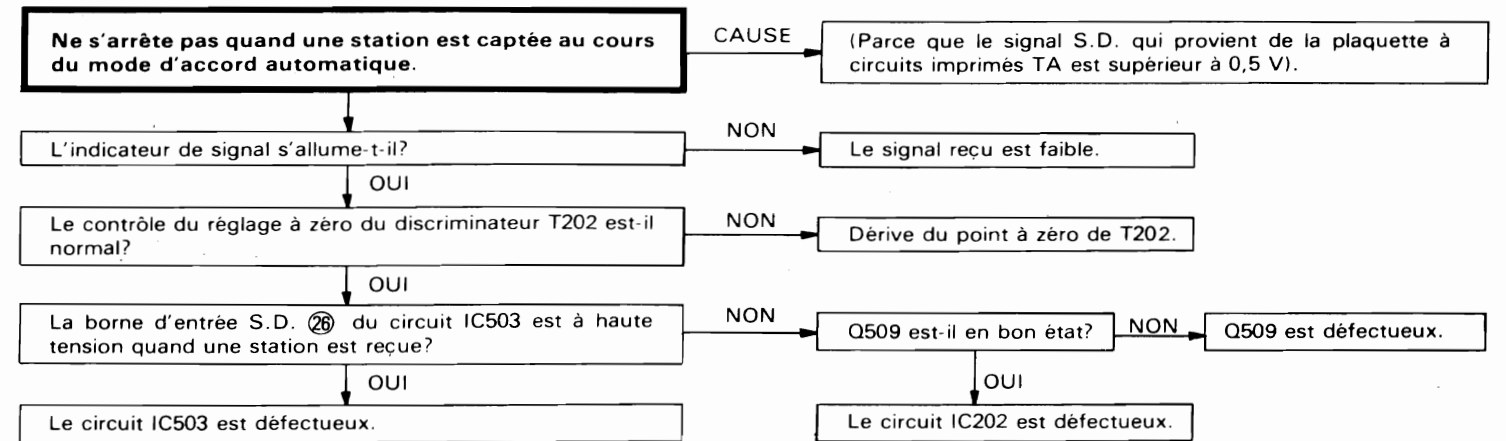
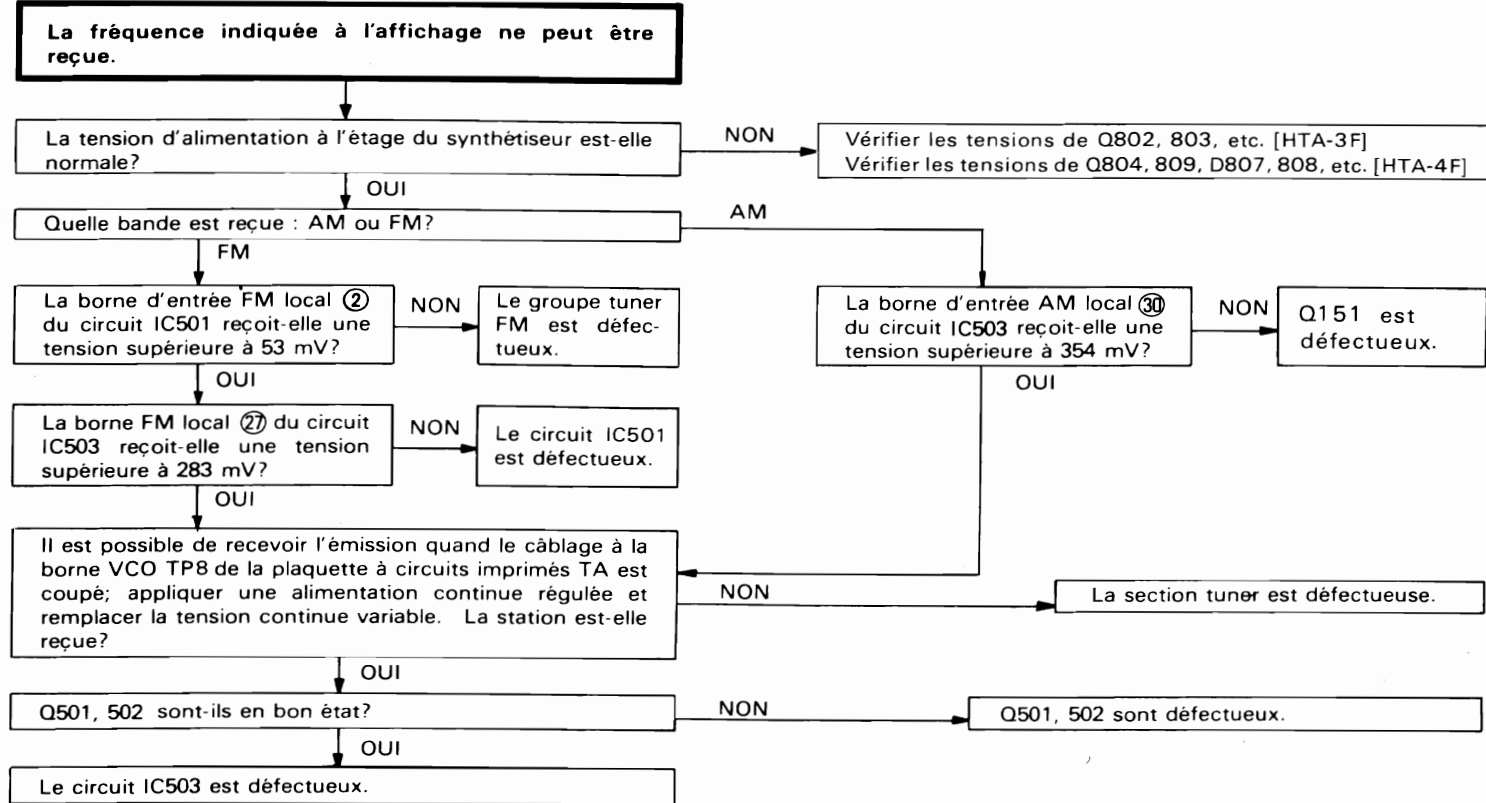
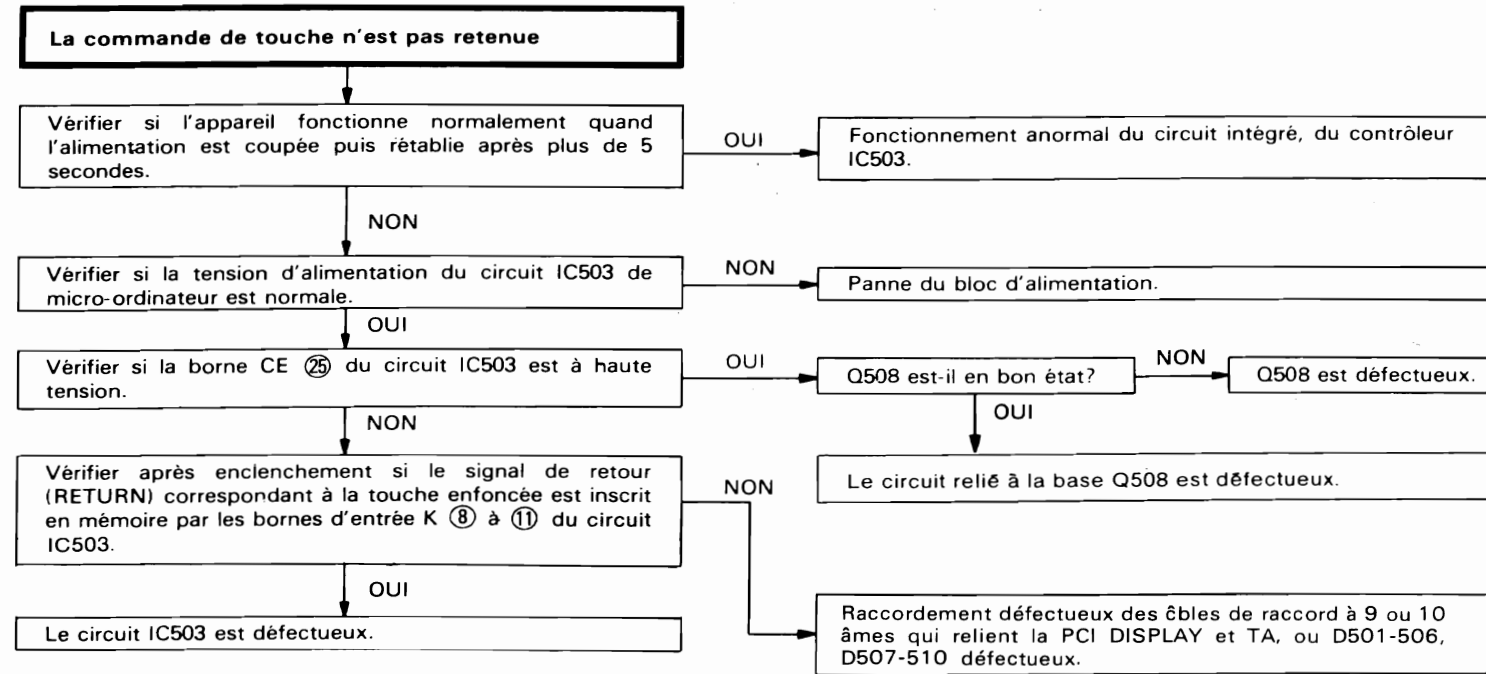
\* : Axial lead cylindrical ceramic capacitor  
\* : Condensateur céramique cylindrique à conducteur axial



**TROUBLE SHOOTING**

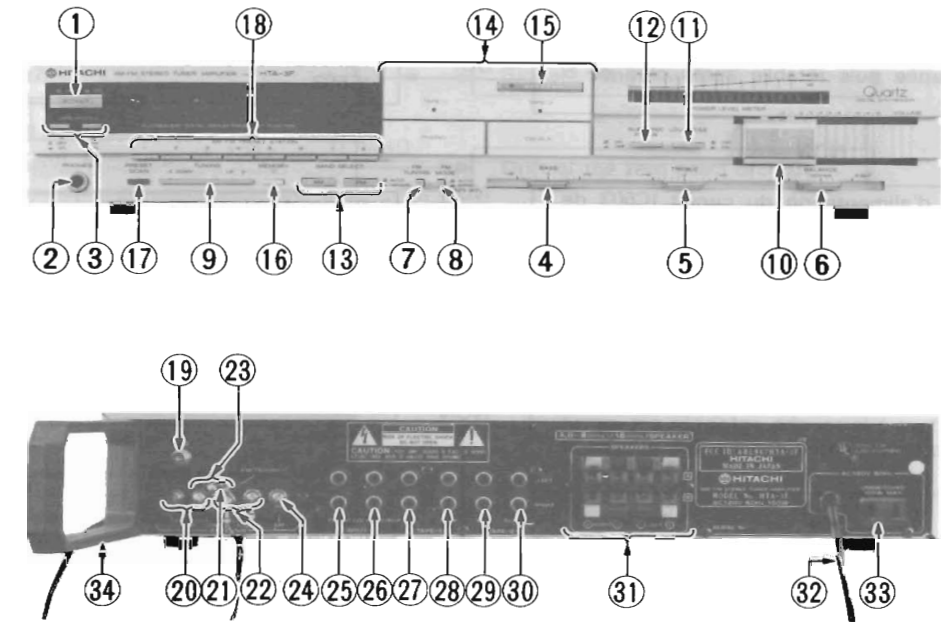
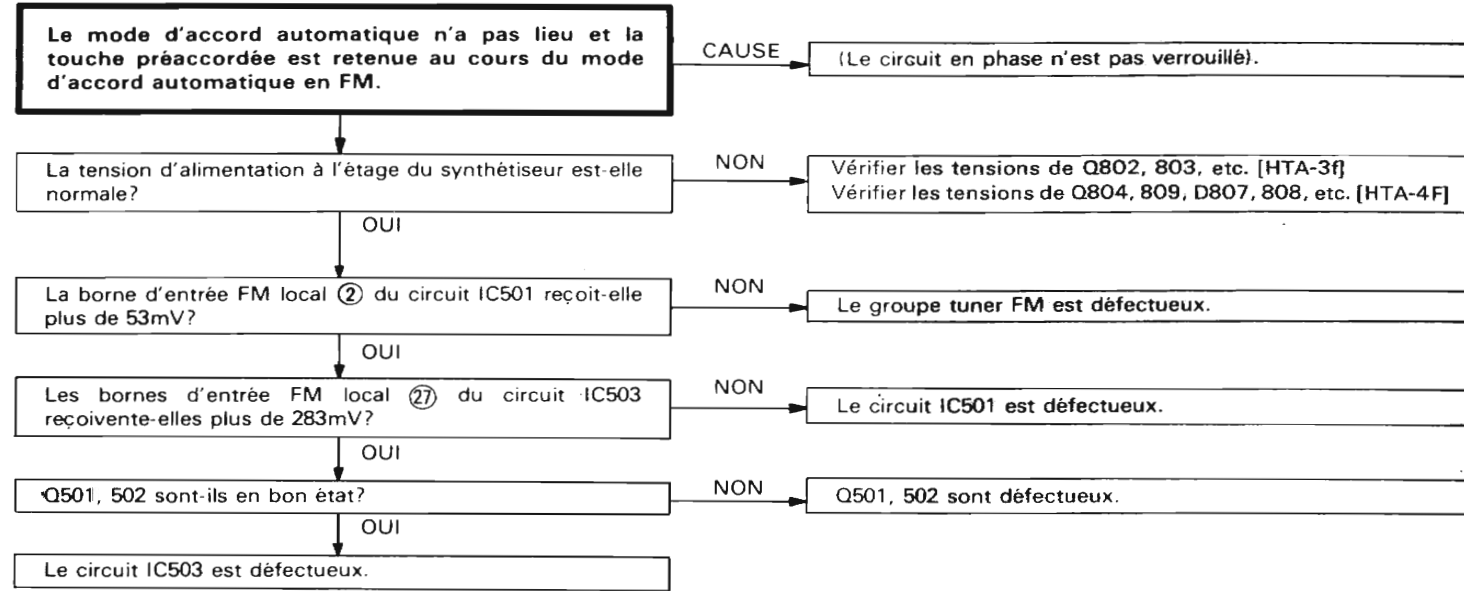


**ANALYSE DE PANNES**



FRONT AND REAR PANEL · PANNEAUX AVANT ET ARRIERE

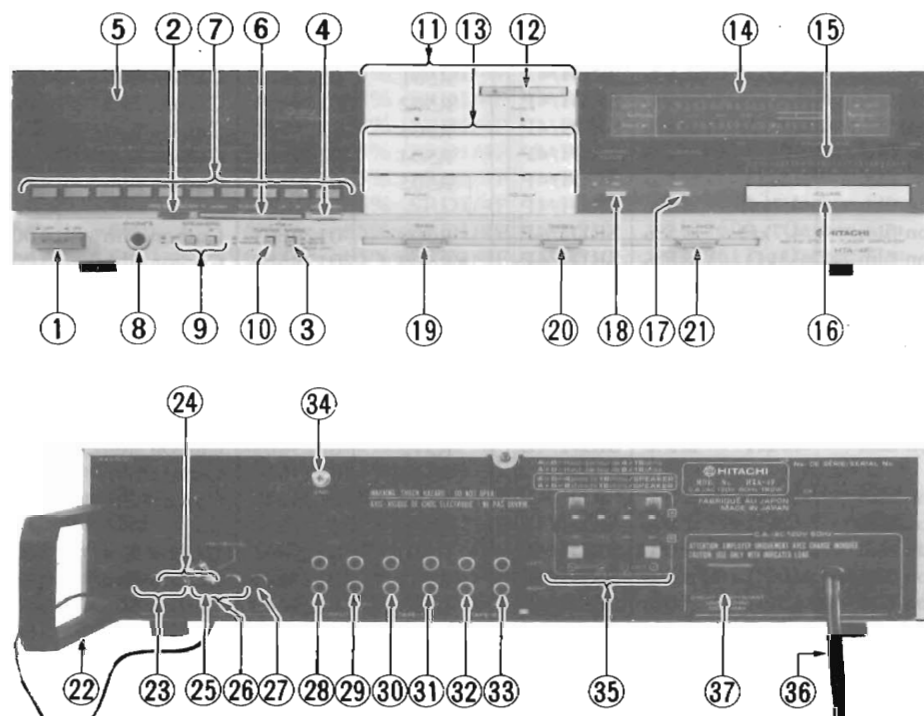
HTA-3F



- ① POWER switch (POWER)
- ② HEADPHONES jack (PHONES)
- ③ SPEAKERS switches (SPEAKERS)
- ④ BASS control (BASS)
- ⑤ TREBLE control (TREBLE)
- ⑥ BALANCE control (BALANCE)
- ⑦ FM TUNING switch (FM TUNING)
- ⑧ FM MODE switch (FM MODE)
- ⑨ TUNING key (UP/DOWN) (TUNING)
- ⑩ VOLUME control (VOLUME)
- ⑪ LOUDNESS switch (LOUDNESS)
- ⑫ SUBSONIC FILTER switch (SUBSONIC FILTER)
- ⑬ BAND SELECTOR switch (BAND SELECT)
- ⑭ FUNCTION keys
- ⑮ TAPE COPY key (Copy 1 ▷ 2) (TAPE COPY)
- ⑯ MEMORY write key (MEMORY)
- ⑰ PRESET SCAN key (PRESET SCAN)
- ⑱ PRESET keys (AM-FM PRESET STATION)
- ⑲ GROUND terminal (GND)
- ⑳ FM ANTENNA terminals (300 ohms)(FM ANTENNA)
- ㉑ GROUND terminal (GND)
- ㉒ AM LOOP Antenna terminals (AM LOOP ANTENNA)
- ㉓ FM ANTENNA terminal (75 ohms)
- ㉔ AM ANTENNA terminal (AM ANTENNA)
- ㉕ PHONO INPUT jacks (PHONO INPUT)
- ㉖ CD/VIDEO/AUX INPUT jacks (CD/VIDEO AUX INPUT)
- ㉗ TAPE-1 REC jacks (TAPE-1 REC)
- ㉘ TAPE-1 PLAY jacks (TAPE-1 PLAY)
- ㉙ TAPE-2 REC jacks (TAPE-2 REC)
- ㉚ TAPE-2 PLAY jacks (TAPE-2 PLAY)
- ㉛ SPEAKER terminals (SPEAKERS)
- ㉜ Power supply cord
- ㉝ AC outlet
- ㉞ AM LOOP ANTENNA

- ① Interrupteur d'alimentation (POWER)
- ② Prise du casque d'écoute (PHONES)
- ③ Interrupteurs d'enceintes (SPEAKERS)
- ④ Commande des graves (BASS)
- ⑤ Commande des aigus (TREBLE)
- ⑥ Commande de balance (BALANCE)
- ⑦ Bouton d'accord FM (FM TUNING)
- ⑧ Commutateur de mode FM (FM MODE)
- ⑨ Touche d'accord (UP/DOWN) (TUNING)
- ⑩ Commande de volume (VOLUME)
- ⑪ Commande de correction physiologique (LOUDNESS)
- ⑫ Interrupteur du filtre infra-acoustique (SUBSONIC FILTER)
- ⑬ Selecteur de bande (BAND SELECT)
- ⑭ Touches de fonction
- ⑮ Touche de copie de bande (copie 1 ▷ 2) (TAPE COPY)
- ⑯ Touche d'enregistrement de mémoire (MEMORY)
- ⑰ Touche de pré-réglage de balayage (PRESET SCAN)
- ⑱ Touches de pré-réglage (AM-FM PRESET STATIONS)
- ⑲ Borne de mise à la terre (GND)
- ⑳ Bornes d'antenne FM (300 ohms) (FM ANTENNA)
- ㉑ Borne de mise à la terre (GND)
- ㉒ Bornes d'antenne boucle AM (AM LOOP ANTENNA)
- ㉓ Bornes d'antenne FM (75 ohms)
- ㉔ Borne d'antenne AM (Antenne AM)
- ㉕ Prises d'entrée phono (PHONO INPUT)
- ㉖ Prises d'entrée CD/VIDEO/AUX (CD/VIDEO/AUX INPUT)
- ㉗ Prises d'enregistrement de bande 1 (TAPE-1 REC)
- ㉘ Prises de lecture de bande 1 (TAPE-1 PLAY)
- ㉙ Prises d'enregistrement de bande 2 (TAPE-2 REC)
- ㉚ Prises de lecture de bande 2 (TAPE-2 PLAY)
- ㉛ Bornes d'enceintes (SPEAKERS)
- ㉜ Cordon d'alimentation
- ㉝ Prise secteur
- ㉞ Antenne boucle AM

HTA-4F



- ① POWER switch (POWER)
- ② PRESET SCAN key (PRESET SCAN)
- ③ FM MODE switch (FM MODE)
- ④ MEMORY WRITE key (MEMORY)
- ⑤ CHANNEL/FREQUENCY display
- ⑥ TUNING key (UP/DOWN) (TUNING)
- ⑦ PRESET keys (AM-FM PRESET STATION)
- ⑧ HEADPHONES jack (PHONES)
- ⑨ SPEAKER switches (SPEAKERS)
- ⑩ FM TUNING switch (FM TUNING)
- ⑪ TAPE MONITOR key (TAPE-1, TAPE-2)
- ⑫ TAPE COPY key (Copy 1 ▷ 2) (TAPE COPY)
- ⑬ FUNCTION keys
- ⑭ LED POWER LEVEL meter
- ⑮ VOLUME LEVEL indicator (VOLUME LEVEL)
- ⑯ VOLUME control (VOLUME)
- ⑰ LOUDNESS switch (LOUDNESS)
- ⑱ SUBSONIC FILTER switch (SUBSONIC FILTER)
- ⑲ BASS control (BASS)
- ⑳ TREBLE control (TREBLE)
- ㉑ BALANCE control (BALANCE)
- ㉒ AM LOOP antenna
- ㉓ FM ANTENNA terminals (300 ohms) (FM ANTENNA)
- ㉔ FM ANTENNA terminals (75 ohms) (FM ANTENNA)
- ㉕ GROUND terminal (GND)
- ㉖ AM LOOP Antenna terminals (AM LOOP ANTENNA)
- ㉗ AM ANTENNA terminal (AM ANTENNA)
- ㉘ PHONO INPUT jacks (PHONO INPUT)
- ㉙ CD/VIDEO/AUX input jacks (CD/VIDEO AUX INPUT)
- ㉚ TAPE-1 REC jacks (TAPE-1 REC)
- ㉛ TAPE-1 PLAY jacks (TAPE-1 PLAY)
- ㉜ TAPE-2 REC jacks (TAPE-2 REC)
- ㉝ TAPE-2 PLAY jacks (TAPE-2 PLAY)
- ㉞ GROUND terminal (GND)
- ㉟ SPEAKER terminals (SPEAKERS)
- ㊱ POWER SUPPLY cord
- ㊲ AC outlet

- ① Interrupteur d'alimentation (POWER)
- ② Touche de balayage pré-réglé/pré-réglé (PRESET SCAN)
- ③ Commutateur de mode FM (FM MODE)
- ④ Touche d'enregistrement de mémoire (MEMORY)
- ⑤ Affichage de fréquence/canal
- ⑥ Touche d'accord (UP/DOWN) (TUNING)
- ⑦ Touches de pré-réglage (AM-FM PRESET STATION)
- ⑧ Prise du casque d'écoute (PHONOS)
- ⑨ Interrupteurs d'enceintes (SPEAKERS)
- ⑩ Touche d'accord FM (FM TUNING)
- ⑪ Touche de contrôle de bande (TAPE-1, TAPE-2)
- ⑫ Touche de copie de bande (copie 1 ▷ 2) (TAPE COPY)
- ⑬ Touches de fonction
- ⑭ Indicateur de niveau de puissance à DEL
- ⑮ Indicateur de niveau de volume (VOLUME LEVEL)
- ⑯ Commande de volume (VOLUME)
- ⑰ Interrupteur de correction physiologique (LOUDNESS)
- ⑱ Interrupteur du filtre infra-acoustique (SUBSONIC FILTER)
- ⑲ Commande des graves (BASS)
- ⑳ Commande des aigus (TREBLE)
- ㉑ Commande de balance (BALANCE)
- ㉒ Antenne boucle AM
- ㉓ Bornes d'antenne FM (300 ohms) (FM ANTENNA)
- ㉔ Borne d'antenne FM (75 ohms) (FM ANTENNA)
- ㉕ Borne de mise à la terre (GND)
- ㉖ Bornes d'antenne boucle AM (AM LOOP ANTENNA)
- ㉗ Borne d'antenne AM (Antenne AM)
- ㉘ Prises d'entrée phono (PHONO INPUT)
- ㉙ Prises d'entrée CD/VIDEO/AUX (CD/VIDEO/AUX INPUT)
- ㉚ Prises d'enregistrement de bande 1 (TAPE-1 REC)
- ㉛ Prises de lecture de bande 1 (TAPE-1 PLAY)
- ㉜ Prises d'enregistrement de bande 2 (TAPE-2 REC)
- ㉝ Prises de lecture de bande 2 (TAPE-2 PLAY)
- ㉞ Borne de mise à la terre (GND)
- ㉟ Bornes d'enceintes (SPEAKERS)
- ㊱ Cordon d'alimentation
- ㊲ Prise secteur

REPLACEMENT PARTS LIST · TABLEAU DE PIÈCE

\* marked parts used for only HTA-3F, o marked parts used for only HTA-4F

| SYMBOL No.        | PART No. | DESCRIPTION         | SYMBOL No. | PART No. | DESCRIPTION         |
|-------------------|----------|---------------------|------------|----------|---------------------|
| <b>CAPACITORS</b> |          |                     |            |          |                     |
| C001,002          | 0243899  | Ceramic, discal     | C401LR     | 0252813  | Electrolytic        |
| C101              | 0252871  | Electrolytic        | C402LR     | 0252231  | Electrolytic        |
| *C105             | 0240106  | Cylindrical ceramic | *C403      | 0252535  | Electrolytic        |
| C151              | 0275013  | Mylar, film         | oC403      | 0252521  | Electrolytic        |
| C152              | 0275015  | Mylar, film         | C404LR     | 0230036  | Cylindrical ceramic |
| C153              | 0228478  | Styrol              | *C405LR    | 0274036  | Mylar, film         |
| C154              | 0230066  | Cylindrical ceramic | oC405LR    | 0274236  | Mylar, film         |
| C155              | 0240108  | Cylindrical ceramic | C406LR     | 0274013  | Mylar, film         |
| C156              | 0230012  | Cylindrical ceramic | C407LR     | 0252813  | Electrolytic        |
| C157              | 0240108  | Cylindrical ceramic | C408       | 0252521  | Electrolytic        |
| C158              | 0240108  | Cylindrical ceramic | *C409      | 0275015  | Mylar, film         |
| *C160             | 0274213  | Mylar, film         | oC409      | 0240108  | Cylindrical ceramic |
| C201              | 0240106  | Cylindrical ceramic | C410       | 0275015  | Mylar, film         |
| C202              | 0240106  | Cylindrical ceramic | *C411      | 0240108  | Cylindrical ceramic |
| C203              | 0252231  | Electrolytic        | oC411      | 0275015  | Mylar, film         |
| *C204             | 0252525  | Electrolytic        | C412       | 0240108  | Cylindrical ceramic |
| oC204             | 0252625  | Electrolytic        | ?          | ?        | ?                   |
| C205              | 0240108  | Cylindrical ceramic | C417       | 0240108  | Cylindrical ceramic |
| C206              | 0240108  | Cylindrical ceramic | *C418      | 0240108  | Cylindrical ceramic |
| C207              | 0246456  | Ceramic, discal     | oC433      | 0240108  | Cylindrical ceramic |
| C208              | 0240108  | Cylindrical ceramic | C501       | 0252822  | Electrolytic        |
| C209              | 0252812  | Electrolytic        | C502       | 0252880  | Electrolytic        |
| C210              | 0245018  | Ceramic, discal     | C503       | 0240106  | Cylindrical ceramic |
| C211              | 0230036  | Cylindrical ceramic | C504       | 0252241  | Electrolytic        |
| C212              | 0244171  | Ceramic, discal     | C505       | 0240108  | Cylindrical ceramic |
| C213              | 0240108  | Cylindrical ceramic | C506       | 0240106  | Cylindrical ceramic |
| C214              | 0252531  | Electrolytic        | C507       | 0230071  | Cylindrical ceramic |
| C215              | 0275015  | Mylar, film         | C508       | 0230071  | Cylindrical ceramic |
| C216              | 0252521  | Electrolytic        | C509       | 0240108  | Cylindrical ceramic |
| C217              | 0240106  | Cylindrical ceramic | C510       | 0252242  | Electrolytic        |
| C219              | 0252535  | Electrolytic        | C511       | 0252521  | Electrolytic        |
| C220              | 0252521  | Electrolytic        | C512       | 0275015  | Mylar, film         |
| oC221             | 0274013  | Mylar, film         | C513       | 0252225  | Electrolytic        |
| C301              | 0252521  | Electrolytic        | oC514      | 0252825  | Electrolytic        |
| *C302             | 0252532  | Electrolytic        | oC515      | 0240004  | Cylindrical ceramic |
| oC302             | 0252541  | Electrolytic        | *C515      | 0248692  | Ceramic, discal     |
| C303              | 0252521  | Electrolytic        | oC601LR    | 0252811  | Electrolytic        |
| C304              | 0252521  | Electrolytic        | oC602LR    | 0252811  | Electrolytic        |
| *C306             | 0274012  | Mylar, film         | oC603LR    | 0240008  | Cylindrical ceramic |
| oC306             | 0274032  | Mylar, film         | oC604LR    | 0275015  | Mylar, film         |
| *C307             | 0274012  | Mylar, film         | oC605LR    | 0276011  | Mylar, film         |
| oC307             | 0274032  | Mylar, film         | oC606LR    | 0276011  | Mylar, film         |
| C308              | 0252521  | Electrolytic        | *C701LR    | 0240003  | Cylindrical ceramic |
| C309              | 0252521  | Electrolytic        | oC701LR    | 0230014  | Cylindrical ceramic |
| C310              | 0240106  | Cylindrical ceramic | *C702LR    | 0275033  | Mylar, film         |
| C311              | 0240106  | Cylindrical ceramic | oC702LR    | 0252811  | Electrolytic        |
| C312              | 0252811  | Electrolytic        | *C703LR    | 0276011  | Mylar, film         |
| C313              | 0252811  | Electrolytic        | oC703LR    | 0240004  | Cylindrical ceramic |
| C314              | 0252873  | Electrolytic        | *C704LR    | 0276011  | Mylar, film         |
| C315              | 0246470  | Ceramic, discal     | oC704LR    | 0252231  | Electrolytic        |
| C316              | 0252812  | Electrolytic        | *C705LR    | 0252811  | Electrolytic        |
| C317              | 0252811  | Electrolytic        | oC705LR    | 0230021  | Cylindrical ceramic |
| C318              | 0244185  | Ceramic, discal     | *C706LR    | 0230014  | Cylindrical ceramic |
| C319              | 0248688  | Ceramic, discal     | oC706LR    | 0230021  | Cylindrical ceramic |
| C351              | 0252811  | Electrolytic        | oC707LR    | 0230031  | Cylindrical ceramic |
|                   |          |                     | *C708LR    | 0252231  | Electrolytic        |
|                   |          |                     | oC708LR    | 0276011  | Mylar, film         |
|                   |          |                     | *C709LR    | 0230030  | Cylindrical ceramic |
|                   |          |                     | oC709LR    | 0276011  | Mylar, film         |
|                   |          |                     | *C710LR    | 0230016  | Cylindrical ceramic |
|                   |          |                     | oC710LR    | 0240010  | Cylindrical ceramic |

\* marked parts used for only HTA-3F, o marked parts used for only HTA-4F

| SYMBOL No. | PART No. | DESCRIPTION         | SYMBOL No. | PART No. | DESCRIPTION         |
|------------|----------|---------------------|------------|----------|---------------------|
| *C711LR    | 0276012  | Mylar, film         | *C901      | 0252805  | Electrolytic        |
| oC711LR    | 0240010  | Cylindrical ceramic | oC901      | 0252232  | Electrolytic        |
| *C712LR    | 0240002  | Cylindrical ceramic | *C902      | 0252521  | Electrolytic        |
| oC712LR    | 0240020  | Cylindrical ceramic | oC902      | 0252811  | Electrolytic        |
| *C713LR    | 0230036  | Cylindrical ceramic | *C903      | 0252815  | Electrolytic        |
| oC713LR    | 0240008  | Cylindrical ceramic | oC903      | 0252521  | Electrolytic        |
| *C714LR    | 0274015  | Mylar, film         | *C904      | 0252811  | Electrolytic        |
| oC714LR    | 0252521  | Electrolytic        | oC904      | 0252231  | Electrolytic        |
| *C715LR    | 0275033  | Mylar, film         | oC910      | 0240106  | Cylindrical ceramic |
| oC715LR    | 0274015  | Mylar, film         | oC911      | 0276013  | Mylar, film         |
| *C716LR    | 0252521  | Electrolytic        | oC912      | 0252521  | Electrolytic        |
| oC716LR    | 0275033  | Mylar, film         | oC920      | 0252815  | Electrolytic        |
| C717LR     | 0240003  | Cylindrical ceramic | oC921      | 0252815  | Electrolytic        |
| C718LR     | 0275034  | Mylar, film         | oC922      | 0252521  | Electrolytic        |
| C719LR     | 0276013  | Mylar, film         |            |          |                     |
| C720LR     | 0252521  | Electrolytic        |            |          |                     |
| *C721LR    | 0230004  | Cylindrical ceramic |            |          |                     |
| oC721LR    | 0230000  | Cylindrical ceramic |            |          |                     |
| C722LR     | 0276013  | Mylar, film         |            |          |                     |
| *C723      | 0276511  | Mylar, film         |            |          |                     |
| oC723LR    | 0252805  | Electrolytic        |            |          |                     |
| oC724      | 0276013  | Mylar, film         |            |          |                     |
| oC725      | 0276013  | Mylar, film         |            |          |                     |
| oC726LR    | 0230002  | Cylindrical ceramic |            |          |                     |
| oC731LR    | 0230036  | Cylindrical ceramic |            |          |                     |
| *C732LR    | 0276011  | Mylar, film         |            |          |                     |
| *C734      | 0276013  | Mylar, film         |            |          |                     |
| *C801      | 0259931  | Electrolytic        |            |          |                     |
| *C802      | 0259931  | Electrolytic        |            |          |                     |
| *C804      | 0252823  | Electrolytic        |            |          |                     |
| *C805      | 0252741  | Electrolytic        |            |          |                     |
| oC805      | 0259927  | Electrolytic        |            |          |                     |
| *C806      | 0252625  | Electrolytic        |            |          |                     |
| oC806      | 0259927  | Electrolytic        |            |          |                     |
| *C807      | 0252525  | Electrolytic        |            |          |                     |
| oC807      | 0252521  | Electrolytic        |            |          |                     |
| *C808      | 0252331  | Electrolytic        |            |          |                     |
| oC808      | 0252741  | Electrolytic        |            |          |                     |
| *C809      | 0252815  | Electrolytic        |            |          |                     |
| oC809      | 0252625  | Electrolytic        |            |          |                     |
| *C810      | 0252811  | Electrolytic        |            |          |                     |
| oC810      | 0252625  | Electrolytic        |            |          |                     |
| *C811      | 0252832  | Electrolytic        |            |          |                     |
| oC811      | 0252815  | Electrolytic        |            |          |                     |
| *C812      | 0252832  | Electrolytic        |            |          |                     |
| oC812      | 0252811  | Electrolytic        |            |          |                     |
| *C813      | 0252825  | Electrolytic        |            |          |                     |
| oC813      | 0252525  | Electrolytic        |            |          |                     |
| *C814      | 0252825  | Electrolytic        |            |          |                     |
| oC814      | 0252331  | Electrolytic        |            |          |                     |
| *C815      | 0252825  | Electrolytic        |            |          |                     |
| oC815      | 0252835  | Electrolytic        |            |          |                     |
| *C816      | 0252625  | Electrolytic        |            |          |                     |
| oC816      | 0252835  | Electrolytic        |            |          |                     |
| *C817      | 0252531  | Electrolytic        |            |          |                     |
| oC817      | 0252825  | Electrolytic        |            |          |                     |
| *C818      | 0252625  | Electrolytic        |            |          |                     |
| oC818      | 0252812  | Electrolytic        |            |          |                     |
| *C819      | 0252625  | Electrolytic        |            |          |                     |
| oC819      | 0252625  | Electrolytic        |            |          |                     |
| *C820      | 0274013  | Mylar, film         |            |          |                     |
| oC820      | 0252625  | Electrolytic        |            |          |                     |
| oC821      | 0252825  | Electrolytic        |            |          |                     |
| oC822      | 0252825  | Electrolytic        |            |          |                     |
| oC823      | 0252811  | Electrolytic        |            |          |                     |

\* marked parts used for only HTA-3F, o marked parts used for only HTA-4F

| SYMBOL No. | PART No. | DESCRIPTION | SYMBOL No. | PART No. | DESCRIPTION |
|------------|----------|-------------|------------|----------|-------------|
| R309       | 0129637  | Carbon film | R501       | 0129601  | Carbon film |
| R310       | 0129605  | Carbon film | R502       | 0129631  | Carbon film |
| R311       | 0129605  | Carbon film | R503       | 0129581  | Carbon film |
| R312       | 0129631  | Carbon film | R504       | 0129605  | Carbon film |
| R313       | 0129631  | Carbon film | R505       | 0129537  | Carbon film |
| R314       | 0129617  | Carbon film | R508       | 0129661  | Carbon film |
| R315       | 0129617  | Carbon film | *R509      | 0129661  | Carbon film |
| R316       | 0129643  | Carbon film | oR509      | 0129631  | Carbon film |
| R318       | 0129601  | Carbon film | R510       | 0129661  | Carbon film |
| R319       | 0129631  | Carbon film | R512       | 0129539  | Carbon film |
| R320       | 0129617  | Carbon film | R513       | 0129649  | Carbon film |
| R321       | 0129631  | Carbon film | R514       | 0129661  | Carbon film |
| R322       | 0129661  | Carbon film | R515       | 0129661  | Carbon film |
| R323       | 0129661  | Carbon film | R516       | 0129631  | Carbon film |
| R324       | 0129631  | Carbon film | R517       | 0129649  | Carbon film |
| R351       | 0129613  | Carbon film | R520       | 0129661  | Carbon film |
| R352       | 0129631  | Carbon film | R522       | 0129661  | Carbon film |
| R353       | 0129661  | Carbon film | R523       | 0129649  | Carbon film |
| R354       | 0129561  | Carbon film | R524       | 0129661  | Carbon film |
| R355       | 0129631  | Carbon film | R525       | 0129649  | Carbon film |
| R356       | 0129637  | Carbon film | R526       | 0129661  | Carbon film |
| R357       | 0129645  | Carbon film | R527       | 0129649  | Carbon film |
| R358       | 0129607  | Carbon film | R528       | 0129661  | Carbon film |
| R359       | 0129661  | Carbon film | R529       | 0129631  | Carbon film |
| R360       | 0129661  | Carbon film | R530       | 0129705  | Carbon film |
| R361       | 0129645  | Carbon film | *R531      | 0134376  | Composition |
| R362       | 0129661  | Carbon film | oR531      | 0129607  | Carbon film |
| R363       | 0129631  | Carbon film | *R532      | 0134376  | Composition |
| R364       | 0129615  | Carbon film | oR532      | 0129607  | Carbon film |
| R365       | 0129615  | Carbon film | *R533      | 0134376  | Composition |
| R366       | 0129661  | Carbon film | oR533      | 0129607  | Carbon film |
| R367       | 0129661  | Carbon film | R534       | 0129623  | Carbon film |
| R401LR     | 0129607  | Carbon film | R535       | 0129641  | Carbon film |
| *R402LR    | 0129661  | Carbon film | R536       | 0129575  | Carbon film |
| oR402LR    | 0129673  | Carbon film | R537       | 0129565  | Carbon film |
| *R403LR    | 0129661  | Carbon film | R538       | 0129601  | Carbon film |
| oR403LR    | 0129649  | Carbon film | R539       | 0129547  | Carbon film |
| R404LR     | 0129581  | Carbon film | R540       | 0129613  | Carbon film |
| R405LR     | 0129675  | Carbon film | R541       | 0129619  | Carbon film |
| R406LR     | 0129643  | Carbon film | R542       | 0129631  | Carbon film |
| R407LR     | 0129581  | Carbon film | R543       | 0129661  | Carbon film |
| *R408LR    | 0129643  | Carbon film | ?          | ?        | ?           |
| oR408LR    | 0129661  | Carbon film | R546       | 0129661  | Carbon film |
| R409LR     | 0129581  | Carbon film | oR547      | 0129669  | Carbon film |
| R410LR     | 0129681  | Carbon film | *R551      | 0129669  | Carbon film |
| R411LR     | 0129581  | Carbon film | oR601LR    | 0129607  | Carbon film |
| R412LR     | 0129681  | Carbon film | oR602LR    | 0129661  | Carbon film |
| R413LR     | 0129581  | Carbon film | oR604LR    | 0129661  | Carbon film |
| R414LR     | 0129681  | Carbon film | oR605LR    | 0129569  | Carbon film |
| *R415      | 0129701  | Carbon film | oR606LR    | 0129607  | Carbon film |
| oR415      | 0129661  | Carbon film | oR607LR    | 0129643  | Carbon film |
| *R416      | 0129701  | Carbon film | oR608LR    | 0129709  | Carbon film |
| oR416      | 0129705  | Carbon film | oR609LR    | 0129631  | Carbon film |
| *R417      | 0129705  | Carbon film | *R701LR    | 0129651  | Carbon film |
| oR417      | 0129661  | Carbon film | oR701LR    | 0129619  | Carbon film |
| R418       | 0129705  | Carbon film | R702LR     | 0129709  | Carbon film |
| *R419      | 0129705  | Carbon film | *R703LR    | 0129639  | Carbon film |
| oR419      | 0129701  | Carbon film | oR703LR    | 0129663  | Carbon film |
| *R420      | 0129661  | Carbon film | oR704LR    | 0129561  | Carbon film |
| oR420      | 0129701  | Carbon film |            |          |             |
| *R421      | 0129661  | Carbon film |            |          |             |
| oR421      | 0129705  | Carbon film |            |          |             |
| R422       | 0129705  | Carbon film |            |          |             |
| R423       | 0129705  | Carbon film |            |          |             |

\* marked parts used for only HTA-3F, ◦marked parts used for only HTA-4F

| SYMBOL No. | PART No. | DESCRIPTION           |       |      | SYMBOL No. | PART No. | DESCRIPTION |                       |       |      |         |
|------------|----------|-----------------------|-------|------|------------|----------|-------------|-----------------------|-------|------|---------|
| ◦R705LR    | 0129561  | Carbon film           | 100Ω  | ±5%  | SRD1/4P    | *R806    | 0129601     | Carbon film           | 1kΩ   | ±5%  | SRD1/4P |
| *R706LR    | 0129619  | Carbon film           | 5.6kΩ | ±5%  | SRD1/4P    | ◦R806    | 0129603     | Carbon film           | 1.2kΩ | ±5%  | SRD1/4P |
| ◦R706LR    | 0129583  | Carbon film           | 820Ω  | ±5%  | SRD1/4P    | R807     | 0129609     | Carbon film           | 2.2kΩ | ±5%  | SRD1/4P |
| *R707LR    | 0129709  | Carbon film           | 2.2MΩ | ±5%  | SRD1/4P    | △◦R808   | 0110625     | Metal (fuse resistor) | 220Ω  | ±5%  | RN1/4B  |
| ◦R707LR    | 0129615  | Carbon film           | 3.9kΩ | ±5%  | SRD1/4P    | *R809    | 0129605     | Carbon film           | 1.5kΩ | ±5%  | SRD1/4P |
| *R708LR    | 0129661  | Carbon film           | 100kΩ | ±5%  | SRD1/4P    | ◦R809    | 0129601     | Carbon film           | 1kΩ   | ±5%  | SRD1/4P |
| ◦R708LR    | 0129651  | Carbon film           | 68kΩ  | ±5%  | SRD1/4P    | *R810    | 0129609     | Carbon film           | 2.2kΩ | ±5%  | SRD1/4P |
| *R709LR    | 0129651  | Carbon film           | 68kΩ  | ±5%  | SRD1/4P    | ◦R810    | 0129617     | Carbon film           | 4.7kΩ | ±5%  | SRD1/4P |
| ◦R709LR    | 0129601  | Carbon film           | 1kΩ   | ±5%  | SRD1/4P    | *R811    | 0129619     | Carbon film           | 5.6kΩ | ±5%  | SRD1/4P |
| *R710LR    | 0129631  | Carbon film           | 10kΩ  | ±5%  | SRD1/4P    | ◦R811    | 0129617     | Carbon film           | 4.7kΩ | ±5%  | SRD1/4P |
| ◦R710LR    | 0129661  | Carbon film           | 100kΩ | ±5%  | SRD1/4P    | *R812    | 0129635     | Carbon film           | 15kΩ  | ±5%  | SRD1/4P |
| *R711LR    | 0129607  | Carbon film           | 1.8kΩ | ±5%  | SRD1/4P    | △*R813   | 0110623     | Metal (fuse resistor) | 150Ω  | ±5%  | RN1/4B  |
| ◦R711LR    | 0129601  | Carbon film           | 1kΩ   | ±5%  | SRD1/4P    | ◦R813    | 0123633     | Carbon film           | 1kΩ   | ±5%  | SRD1/4P |
| *R712LR    | 0129607  | Carbon film           | 1.8kΩ | ±5%  | SRD1/4P    | *R814    | 0129615     | Carbon film           | 3.9kΩ | ±5%  | SRD1/4P |
| △◦R712LR   | 0110605  | Metal (fuse resistor) | 22Ω   | ±5%  | RN1/4B     | ◦R814    | 0129617     | Carbon film           | 4.7kΩ | ±5%  | SRD1/4P |
| *R713LR    | 0129553  | Carbon film           | 82Ω   | ±5%  | SRD1/4P    | *R815    | 0129569     | Carbon film           | 220Ω  | ±5%  | SRD1/4P |
| ◦R713LR    | 0129631  | Carbon film           | 10kΩ  | ±5%  | SRD1/4P    | ◦R815    | 0129605     | Carbon film           | 1.5kΩ | ±5%  | SRD1/4P |
| *R714LR    | 0129631  | Carbon film           | 10kΩ  | ±5%  | SRD1/4P    | *R816    | 0129661     | Carbon film           | 100kΩ | ±5%  | SRD1/4P |
| △◦R714LR   | 0110621  | Metal (fuse resistor) | 100Ω  | ±5%  | RN1/4B     | △*R817   | 0110622     | Metal (fuse resistor) | 120Ω  | ±5%  | RN1/4B  |
| *R715LR    | 0129604  | Carbon film           | 1.3kΩ | ±5%  | SRD1/4P    | *R818    | 0129613     | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P |
| ◦R715LR    | 0129663  | Carbon film           | 120kΩ | ±5%  | SRD1/4P    | △◦R818   | 0110625     | Metal (fuse resistor) | 220Ω  | ±5%  | RN1/4B  |
| *R716LR    | 0129661  | Carbon film           | 100kΩ | ±5%  | SRD1/4P    | *R819    | 0129613     | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P |
| ◦R716LR    | 0129703  | Carbon film           | 1.2MΩ | ±5%  | SRD1/4P    | ◦R819    | 0129609     | Carbon film           | 2.2kΩ | ±5%  | SRD1/4P |
| *R717LR    | 0129561  | Carbon film           | 100Ω  | ±5%  | SRD1/4P    | *R820    | 0129631     | Carbon film           | 10kΩ  | ±5%  | SRD1/4P |
| ◦R717LR    | 0129621  | Carbon film           | 6.8kΩ | ±5%  | SRD1/4P    | ◦R820    | 0129635     | Carbon film           | 15kΩ  | ±5%  | SRD1/4P |
| *R718LR    | 0129561  | Carbon film           | 100Ω  | ±5%  | SRD1/4P    | *R821    | 0129613     | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P |
| ◦R718LR    | 0129619  | Carbon film           | 5.6kΩ | ±5%  | SRD1/4P    | △◦R821   | 0110625     | Metal (fuse resistor) | 220Ω  | ±5%  | RN1/4B  |
| *R719LR    | 0129645  | Carbon film           | 39kΩ  | ±5%  | SRD1/4P    | *R822    | 0129613     | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P |
| ◦R719LR    | 0129603  | Carbon film           | 1.2kΩ | ±5%  | SRD1/4P    | ◦R822    | 0129601     | Carbon film           | 1kΩ   | ±5%  | SRD1/4P |
| *R720LR    | 0129645  | Carbon film           | 39kΩ  | ±5%  | SRD1/4P    | *R823    | 0129631     | Carbon film           | 10kΩ  | ±5%  | SRD1/4P |
| ◦R720LR    | 0129583  | Carbon film           | 820Ω  | ±5%  | SRD1/4P    | ◦R823    | 0129613     | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P |
| ◦R721LR    | 0129613  | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P    | *R824    | 0129639     | Carbon film           | 22kΩ  | ±5%  | SRD1/4P |
| ◦R722      | 0129639  | Carbon film           | 22kΩ  | ±5%  | SRD1/4P    | ◦R824    | 0129577     | Carbon film           | 470Ω  | ±5%  | SRD1/4P |
| ◦R723      | 0129631  | Carbon film           | 10kΩ  | ±5%  | SRD1/4P    | ◦R825    | 0129605     | Carbon film           | 1.5kΩ | ±5%  | SRD1/4P |
| *R724LR    | 0129617  | Carbon film           | 4.7kΩ | ±5%  | SRD1/4P    | *R901    | 0129617     | Carbon film           | 4.7kΩ | ±5%  | SRD1/4P |
| ◦R724      | 0129613  | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P    | ◦R901    | 0129649     | Carbon film           | 56kΩ  | ±5%  | SRD1/4P |
| ◦R725LR    | 0129623  | Carbon film           | 8.2kΩ | ±5%  | SRD1/4P    | *R902    | 0129617     | Carbon film           | 4.7kΩ | ±5%  | SRD1/4P |
| *R726LR    | 0129581  | Carbon film           | 680Ω  | ±5%  | SRD1/4P    | ◦R902    | 0129649     | Carbon film           | 56kΩ  | ±5%  | SRD1/4P |
| ◦R727LR    | 0129581  | Carbon film           | 680Ω  | ±5%  | SRD1/4P    | *R903    | 0129633     | Carbon film           | 12kΩ  | ±5%  | SRD1/4P |
| *R728LR    | 0129583  | Carbon film           | 820Ω  | ±5%  | SRD1/4P    | ◦R903    | 0119532     | Metal oxide           | 820Ω  | ±10% | RS2B    |
| ◦R728LR    | 0129637  | Carbon film           | 18kΩ  | ±5%  | SRD1/4P    | *R904    | 0129561     | Carbon film           | 100Ω  | ±5%  | SRD1/4P |
| *R729LR    | 0129663  | Carbon film           | 120kΩ | ±5%  | SRD1/4P    | ◦R904    | 0119443     | Metal oxide           | 1.5kΩ | ±10% | RS1B    |
| ◦R729LR    | 0129583  | Carbon film           | 820Ω  | ±5%  | SRD1/4P    | *R905    | 0129615     | Carbon film           | 3.9kΩ | ±5%  | SRD1/4P |
| *R730LR    | 0129531  | Carbon film           | 10Ω   | ±5%  | SRD1/4P    | ◦R905    | 0129661     | Carbon film           | 100kΩ | ±5%  | SRD1/4P |
| ◦R730LR    | 0129663  | Carbon film           | 120kΩ | ±5%  | SRD1/4P    | *R906    | 0129635     | Carbon film           | 15kΩ  | ±5%  | SRD1/4P |
| R731LR     | 0129633  | Carbon film           | 12kΩ  | ±5%  | SRD1/4P    | ◦R906    | 0129647     | Carbon film           | 47kΩ  | ±5%  | SRD1/4P |
| R733LR     | 0129607  | Carbon film           | 1.8kΩ | ±5%  | SRD1/4P    | *R907    | 0129661     | Carbon film           | 100kΩ | ±5%  | SRD1/4P |
| *R734LR    | 0129637  | Carbon film           | 18kΩ  | ±5%  | SRD1/4P    | ◦R907    | 0129653     | Carbon film           | 82kΩ  | ±5%  | SRD1/4P |
| ◦R734LR    | 0129531  | Carbon film           | 10Ω   | ±5%  | SRD1/4P    | *R908    | 0129637     | Carbon film           | 18kΩ  | ±5%  | SRD1/4P |
| R735LR     | 0119134  | Metal                 | 1.8Ω  | ±5%  | RN2B       | *R909    | 0129621     | Carbon film           | 6.8kΩ | ±5%  | SRD1/4P |
| R736LR     | 0134366  | Composition           | 270Ω  | ±10% | RC1/2GF    | *R910    | 0134372     | Composition           | 820Ω  | ±10% | RC1/2GF |
| ◦R737LR    | 0129617  | Carbon film           | 4.7kΩ | ±5%  | SRD1/4P    | ◦R910    | 0129661     | Carbon film           | 100kΩ | ±5%  | SRD1/4P |
| ◦R738LR    | 0129561  | Carbon film           | 100Ω  | ±5%  | SRD1/4P    | }        | }           | }                     | }     | }    | }       |
| ◦R739LR    | 0129633  | Carbon film           | 12kΩ  | ±5%  | SRD1/4P    | ◦R913    | 0129661     | Carbon film           | 100kΩ | ±5%  | SRD1/4P |
| ◦R740LR    | 0129615  | Carbon film           | 3.9kΩ | ±5%  | SRD1/4P    | ◦R914    | 0129631     | Carbon film           | 10kΩ  | ±5%  | SRD1/4P |
| ◦R748LR    | 0134373  | Composition           | 1kΩ   | ±10% | RC1/2GF    | }        | }           | }                     | }     | }    | }       |
| *R801      | 0129649  | Carbon film           | 56kΩ  | ±5%  | SRD1/4P    | ◦R917    | 0129631     | Carbon film           | 10kΩ  | ±5%  | SRD1/4P |
| ◦R801      | 0134380  | Composition           | 3.9kΩ | ±10% | RC1/2GF    | ◦R918    | 0119041     | Metal                 | 10Ω   | ±10% | RN1B    |
| *R802      | 0134381  | Composition           | 4.7kΩ | ±10% | RC1/2GF    | ◦R919    | 0129609     | Carbon film           | 2.2kΩ | ±5%  | SRD1/4P |
| △◦R802     | 0113827  | Metal (fuse resistor) | 6.8Ω  | ±5%  | RN1/2B     | ◦R920    | 0129613     | Carbon film           | 3.3kΩ | ±5%  | SRD1/4P |
| △*R803     | 0118447  | Metal (fuse resistor) | 6.8Ω  | ±5%  | RN1/2B     | ◦R921    | 0129577     | Carbon film           | 470Ω  | ±5%  | SRD1/4P |
| ◦R803      | 0129609  | Carbon film           | 2.2kΩ | ±5%  | SRD1/4P    | ◦R922    | 0129561     | Carbon film           | 100Ω  | ±5%  | SRD1/4P |
| *R804      | 0129609  | Carbon film           | 2.2kΩ | ±5%  | SRD1/4P    | ◦R923    | 0129607     | Carbon film           | 1.8kΩ | ±5%  | SRD1/4P |
| ◦R804      | 0129605  | Carbon film           | 1.5kΩ | ±5%  | SRD1/4P    | ◦R930    | 0129581     | Carbon film           | 680Ω  | ±5%  | SRD1/4P |
| △*R805     | 0110623  | Metal (fuse resistor) | 150Ω  | ±5%  | RN1/4B     | ◦R931    | 0129581     | Carbon film           | 680Ω  | ±5%  | SRD1/4P |
| ◦R805      | 0129607  | Carbon film           | 1.8kΩ | ±5%  | SRD1/4P    |          |             |                       |       |      |         |

\* marked parts used for only HTA-3F, ◦ marked parts used for only HTA-4F

| SYMBOL No.                 | PART No. | DESCRIPTION    | SYMBOL No.    | PART No. | DESCRIPTION     |
|----------------------------|----------|----------------|---------------|----------|-----------------|
| <b>IC &amp; TRANSISTOR</b> |          |                |               |          |                 |
| IC201                      | 2368431  | AN278          | *Q801         | 2328652  | 2SC1740LN (S)   |
| IC202                      | 2387321  | AN7273         | ◦Q801         | 2317822  | 2SD880 (Y)      |
| IC301                      | 2367271  | HA1196         | *Q802         | 2317822  | 2SD880 (Y)      |
| IC401                      | 2368041  | NJM4558DX      | ◦Q802         | 2328652  | 2SC1740LN (S)   |
| IC402                      | 2368831  | CX770A         | *Q803         | 2317782  | 2SC2235 (Y)     |
| IC404                      | 2368831  | CX770A         | ◦Q803         | 2317822  | 2SD880 (Y)      |
| IC501                      | 2368741  | μPB553AC       | Q804          | 2317782  | 2SC2235 (Y)     |
| IC502                      | 2387421  | AN6873N        | *Q805         | 2317792  | 2SA965 (Y)      |
| IC503                      | 2369723  | μPD1704C - 545 | ◦Q805         | 2317832  | 2SB834 (Y)      |
| IC504                      | 2387511  | TD62706P       | *Q806         | 2317792  | 2SA965 (Y)      |
| IC701                      | 2369771  | STK2230        | *Q807         | 2329183  | 2SA1015 (GR)    |
| *IC901                     | 2368631  | IR - 2E01      | ◦Q807         | 2317792  | 2SA965 (Y)      |
| ◦IC901                     | 2367372  | HA - 12002R    | *Q808         | 2328652  | 2SC1740LN (S)   |
| ◦IC902                     | 2469931  | BA6109         | ◦Q808         | 2317792  | 2SA965 (Y)      |
| ◦IC903                     | 2387391  | IR2E27         | ◦Q809         | 2317782  | 2SC2235 (Y)     |
| Q151                       | 2328652  | 2SC1740LN (S)  | ◦Q901         | 2328652  | 2SC1740LN (S)   |
| Q201                       | 2328652  | 2SC1740LN (S)  | ◦Q902         | 2328652  | 2SC1740LN (S)   |
| Q301                       | 2329183  | 2SA1015 (GR)   | ◦Q903         | 2329183  | 2SA1015 (GR)    |
| Q351                       | 2328652  | 2SC1740LN (S)  | ◦Q904         | 2329183  | 2SA1015 (GR)    |
| Q354                       | 2328652  | 2SC1740LN (S)  | ◦Q905         | 2328652  | 2SC1740LN (S)   |
| Q355                       | 2329183  | 2SA1015 (GR)   | <b>DIODES</b> |          |                 |
| Q356                       | 2328652  | 2SC1740LN (S)  | D101          | 2337601  | 1S2473          |
| Q357                       | 2328652  | 2SC1740LN (S)  | D102          | 2337601  | 1S2473          |
| Q501                       | 2328653  | 2SC1740LN (E)  | D151          | 2338541  | KV - 1226       |
| Q502                       | 2328653  | 2SC1740LN (E)  | D152          | 2337601  | 1S2473          |
| Q504                       | 2328652  | 2SC1740LN (S)  | D153          | 2337601  | 1S2473          |
| Q505                       | 2328652  | 2SC1740LN (S)  | D301          | 2337601  | 1S2473          |
| Q506                       | 2329183  | 2SA1015 (GR)   | D302          | 2337601  | 1S2473          |
| Q507                       | 2328652  | 2SC1740LN (S)  | D351          | 2337601  | 1S2473          |
| Q508                       | 2329183  | 2SA1015 (GR)   | D352          | 2337601  | 1S2473          |
| Q509                       | 2328652  | 2SC1740LN (S)  | D353          | 2337601  | 1S2473          |
| Q510                       | 2329183  | 2SA1015 (GR)   | D354          | 2337601  | 1S2473          |
| Q511                       | 2328652  | 2SC1740LN (S)  | *D402         | 2337601  | 1S2473          |
| Q512                       | 2329183  | 2SA1015 (GR)   | D403          | 2337601  | 1S2473          |
| Q514                       | 2329183  | 2SA1015 (GR)   | Q517          | 2328652  | 2SC1740LN (S)   |
| ◦Q601LR                    | 2328652  | 2SC1740LN (S)  | D408          | 2337601  | 1S2473          |
| ◦Q602LR                    | 2328652  | 2SC1740LN (S)  | ◦D409         | 2337601  | 1S2473          |
| Q701LR                     | 2367656  | 2SC2259 (G)    | D501          | 2337601  | 1S2473          |
| *Q702LR                    | 2328862  | 2SB716 (E)     | D510          | 2337601  | 1S2473          |
| ◦Q702LR                    | 2329183  | 2SA1015 (GR)   | D513          | 2337601  | 1S2473          |
| *Q703LR                    | 2328862  | 2SB716 (E)     | D516          | 2337601  | 1S2473          |
| ◦Q703LR                    | 2327893  | 2SA872 (E)     | ◦D518         | 2337601  | 1S2473          |
| *Q704LR                    | 2328872  | 2SD756 (E)     | D519          | 2337601  | 1S2473          |
| ◦Q704LR                    | 2328862  | 2SB716 (E)     | D527          | 2337601  | 1S2473          |
| ◦Q705LR                    | 2328872  | 2SD756 (E)     | D528          | 2337751  | GL - 5PR6 (Red) |
| ◦Q706                      | 2329183  | 2SA1015 (GR)   | D530          | 2337751  | GL - 5PR6 (Red) |
| ◦Q707LR                    | 2327923  | 2SC1775A (E)   | *D531         | 2337519  | HZ6C - 3        |
| ◦Q708LR                    | 2328652  | 2SC1740LN (S)  | ◦D531         | 2337601  | 1S2473          |
| ◦Q709LR                    | 2329183  | 2SA1015 (GR)   | ◦D532         | 2337519  | HZ6C - 3        |
|                            |          |                | ◦D601LR       | 2337601  | 1S2473          |
|                            |          |                | ◦D602LR       | 2337601  | 1S2473          |
|                            |          |                | ◦D701LR       | 2337601  | 1S2473          |



\* marked parts used for only HTA-3F, o marked parts used for only HTA-4F

| SYMBOL No.                     | PART No. | DESCRIPTION              | SYMBOL No.                     | PART No. | DESCRIPTION                    |
|--------------------------------|----------|--------------------------|--------------------------------|----------|--------------------------------|
| *D702LR                        | 2337601  | 1S2473                   | T151                           | 2136503  | MW RF Coil                     |
| oD702LR                        | 2337762  | ERB12 - 01R              | T152                           | 2136493  | MW OSC Coil                    |
| oD703LR                        | 2337601  | 1S2473                   | T201                           | 2154493  | AM IF trans.                   |
| oD704LR                        | 2337151  | 1S2076A                  | T202                           | 2155174  | FM discri. coil                |
| oD705LR                        | 2337601  | 1S2473                   | T203                           | 2155175  | FM discri. coil                |
| oD706LR                        | 2337601  | 1S2473                   | <b>MISCELLANEOUS (HTA-3F)</b>  |          |                                |
| oD707LR                        | 2337601  | 1S2473                   | MF201,                         | 2134992  | FM ceramic filter MA8          |
| oD708LR                        | 2337921  | 1K34A                    | 202,                           |          |                                |
| oD709LR                        | 2337601  | 1S2473                   | MF203                          | 2155152  | AM ceramic filter 450F3        |
| oD710LR                        | 2337931  | 1K60R                    | CT151                          | 0283126  | Trimmer capacitor 11P          |
| *D801                          | 2337461  | S4VB20                   | RP501                          | 0189014  | 100 kΩ                         |
| oD801                          | 2337341  | S5VB20                   | RP502                          | 0189031  | 39 kΩ                          |
| D802                           | 2337762  | ERB12 - 01R              | RP503                          | 0189001  | 100 kΩ                         |
| }                              | }        | }                        | CP501                          | 0241892  | Capacitor array (300P × 7)     |
| D806                           | 2337762  | ERB12 - 01R              | △ S001                         | 2639869  | Power switch                   |
| *D807                          | 2337189  | HZ - 15 - 3              | S350                           | 2639931  | 2 keys push switch             |
| oD807                          | 2337762  | ERB12 - 01R              | S501                           | 2639682  | Tact switch                    |
| *D808                          | 2337519  | HZ6C - 3                 | }                              | }        | }                              |
| oD808                          | 2337122  | HZ6B                     | S510                           | 2639682  | Tact swtich                    |
| *D809                          | 2337122  | HZ6B                     | S511                           | 2638241  | Tact switch                    |
| oD809                          | 2337189  | HZ15 - 3                 | }                              | }        | }                              |
| *D810                          | 2337186  | HZ - 30 - 3              | S513                           | 2638241  | Tact switch                    |
| oD810                          | 2337555  | HZ11 - B2                | S514                           | 2639682  | Tact switch                    |
| *D811                          | 2337188  | HZ - 24 - 2              | }                              | }        | }                              |
| oD811                          | 2337519  | HZ6C - 3                 | S518                           | 2639682  | Tact switch                    |
| *D812                          | 2337549  | HZ - 7C - 3              | S519                           | 2638241  | Tact swtich                    |
| D813                           | 2337189  | HZ - 15 - 3              | S520                           | 2539931  | 2 keys push switch             |
| *D814                          | 2337601  | 1S2473                   | S701                           | 2639092  | 1 key push switch              |
| oD814                          | 2337188  | HZ24 - 2                 | S702                           | 2639092  | 1 key push switch              |
| *D815                          | 2337601  | 1S2473                   | S703                           | 2639941  | 2 keys push switch             |
| oD815                          | 2337549  | HZ7C - 3                 | S704                           | 2639941  | 2 keys push switch             |
| *D816                          | 2337762  | ERB12 - 01R              | △ B501                         | 2810161  | Lithium Battery                |
| oD816                          | 2337186  | HZ30 - 3                 | J001                           | 2677751  | Headphone jack                 |
| *D817                          | 2337601  | 1S2473                   | △ F001                         | 2727564  | Fuse (2.5A 125V)               |
| oD817                          | 2338371  | HZ22 - 1                 | △ F701LR                       | 2727223  | Fuse 3A 250V                   |
| oD818                          | 2338371  | HZ22 - 1                 |                                | 2688281  | 8P Push terminal               |
|                                |          |                          |                                | 2688203  | 5P screw terminal              |
|                                |          |                          |                                | 2425381  | FM tuner pack                  |
|                                |          |                          |                                | 2677612  | 6P US pin jack                 |
|                                |          |                          |                                | 2788613  | Flourescent display tube       |
|                                |          |                          | X501                           | 2789281  | Crystal oscillator 4.5 MHz     |
|                                |          |                          |                                | 2397031  | LED ass'y (D904 ~ D909)        |
| <b>VARIABLE RESISTOR</b>       |          |                          | <b>for REAR PLATE ASSEMBLY</b> |          |                                |
| R317                           | 0150958  | 10kΩ - (B)               | 4453751                        |          | Rear plate (for U.S.A.)        |
| oR610LR                        | 0158604  | 100kΩ - (B)              | 4453752                        |          | Rear plate (for Canada)        |
| oR611LR                        | 0166724  | 100kΩ - (M)              | 4575661                        |          | Earth screw                    |
| *R704LR                        | 0166727  | 200kΩ - (B) MAIN VOL.    | 4408861                        |          | Washer                         |
| *R705LR                        | 0166724  | 100kΩ - (MW) BALANCE     | △ 0043793                      |          | Bushing (3P - 4) (for U.S.A.)  |
| *R725LR                        | 0166725  | 50kΩ - (C) TREBLE        | △ 3913006                      |          | Bushing (4N - 4) (for Canada)  |
| oR726LR                        | 0166725  | 50kΩ - (C)               | △ 2702331                      |          | Power supply cord (for U.S.A.) |
| *R732LR                        | 0166725  | 50kΩ - (C) BASS          | △ 2700122                      |          | Power supply cord (for Canada) |
| oR732LR                        | 0166725  | 50kΩ - (C)               | △ 2657721                      |          | AC outlet (for U.S.A.)         |
| <b>COIL &amp; TRANSFORMERS</b> |          |                          | △ 2658372                      |          | AC outlet (for Canada)         |
| L701LR                         | 2227361  | Audio trap coil - 0.67μH |                                |          |                                |
| *T001                          | 2248361  | Power trans.             |                                |          |                                |
| oT001                          | 2248381  | Power trans.             |                                |          |                                |

| SYMBOL No.                         | PART No. | DESCRIPTION                         |
|------------------------------------|----------|-------------------------------------|
| <b>for FINAL ASSEMBLY</b>          |          |                                     |
|                                    | 4450411  | Cover                               |
|                                    | 4567463  | 4φ × 10 DT bind screw               |
| <b>for DIAL MECHANISM ASSEMBLY</b> |          |                                     |
|                                    | 4024551  | Front panel ass'y                   |
|                                    | 3297861  | Tape copy button ass'y              |
|                                    | 3297671  | Power button ass'y                  |
|                                    | 3297631  | Push button (SPEAKER)               |
|                                    | 3297591  | PRESET button                       |
|                                    | 3297581  | Push button (SM) Preset scan        |
|                                    | 3297582  | Push button (SM) Memory             |
|                                    | 3297611  | UP. Down button                     |
|                                    | 3297571  | Push button (AM)                    |
|                                    | 3297572  | Push button (FM)                    |
|                                    | 3297621  | Push button (Tuning Mode)           |
|                                    | 3297761  | Function button (L) ass'y (TAPE)    |
|                                    | 3297741  | Function button (S) ass'y (PHONO)   |
|                                    | 3297742  | Function button (S) ass'y (CD/AUX)  |
|                                    | 3902692  | Power display sheet                 |
|                                    | 3297601  | Push button (SUBSONIC FIL LOUDNESS) |
|                                    | 3296681  | Volume knob                         |
|                                    | 3297851  | Slide Inner Knob                    |
|                                    | 3296511  | Slide VR Knob                       |
|                                    | 4451151  | Slide VR plate                      |
|                                    | 3927411  | Leg                                 |
|                                    | 2757573  | Loop antenna                        |
|                                    | 4567413  | 3φ × 10 DT bind screw               |
|                                    | 4567422  | 4φ × 8 DT bind screw                |
|                                    | 4573552  | 3φ × 16 bind tapping screw          |
|                                    | 8691412  | 3φ × 12 bind tapping screw          |
|                                    | 4784106  | 3φ × 10 bind tapping screw          |
|                                    | 4567454  | 3φ × 12 DT bind screw               |
|                                    | 4567411  | 3φ × 6 DT bind screw                |
|                                    | 4580933  | 2φ × 3 pan head screw               |
|                                    | 4567432  | 3φ × 8 DT bind screw                |
|                                    | 4784106  | 3φ × 10 bind tapping screw          |
|                                    | 4568812  | 3φ × 8 DT flat head screw           |
|                                    | 4574605  | 3φ × 8 bind double thread screw     |
|                                    | 4567432  | 3φ × 8 DT bind screw                |
|                                    | 4567412  | 3φ × 8 DT bind screw                |
| <b>for ACCESSORIES</b>             |          |                                     |
|                                    | 2757522  | FM antenna                          |
| <b>MISCELLANEOUS (HTA-4F)</b>      |          |                                     |
| CT151                              | 0283126  | Trimmer capacitors 11P              |
| RP501                              | 0189014  | 100 kΩ                              |
| RP502                              | 0189031  | 39 kΩ                               |
| RP503                              | 0189001  | 100 kΩ                              |
| CP501                              | 0241892  | Capacitor array (300P × 7)          |
| MF201                              | 2134992  | FM Ceramic filter MA8               |
| MF202                              | 2134992  | FM Ceramic filter MA8               |
| MF203                              | 2155152  | AM Ceramic filter 450F3             |
| X501                               | 2789281  | Crystal oscillator 4.5MHz           |
| △ B501                             | 2810161  | Lithium battery CR2032              |

| SYMBOL No.                         | PART No. | DESCRIPTION                    |
|------------------------------------|----------|--------------------------------|
| △ S001                             | 2639869  | Power switch                   |
| S350                               | 2639931  | 2 keys push switch             |
| S501                               | 2639682  | Tact switch                    |
| }                                  | }        | }                              |
| S512                               | 2639682  | Tact switch                    |
| S513                               | 2638241  | Tact switch                    |
| S514                               | 2639682  | Tact switch                    |
| }                                  | }        | }                              |
| S522                               | 2639682  | Tact switch                    |
| S523                               | 2638241  | Tact switch                    |
| S524                               | 2639931  | 2 keys push switch             |
| S601                               | 2639932  | 2 keys push switch             |
| S602                               | 2639932  | 2 keys push switch             |
| S701                               | 2639942  | 2 keys push switch             |
| S702                               | 2639942  | 2 keys push switch             |
| △ F001                             | 2727565  | Fuse - 3A 125V                 |
| RY901                              | 2647221  | Miniature power relay          |
| J001                               | 2677751  | Headphone jack                 |
| TH701LR                            | 2347114  | Thermostat                     |
|                                    | 2677612  | 6P US pin jack                 |
|                                    | 2688201  | 5P screw terminal              |
|                                    | 2688281  | 8P push terminal               |
|                                    | 2425381  | FM tuner pack                  |
|                                    | 2788613  | Flourescent display tube       |
|                                    | 2397041  | Led bar                        |
| <b>for REAR PLATE ASSEMBLY</b>     |          |                                |
|                                    | 4451511  | Rear plate (for U.S.A.)        |
|                                    | 4451512  | Rear plate (for Canada)        |
|                                    | 4575661  | Earth screw                    |
|                                    | 4408861  | Washer                         |
| △ 0043793                          |          | Bushing (3P - 4) (for U.S.A.)  |
| △ 3913006                          |          | Bushing (4N - 4) (for Canada)  |
| △ 2702331                          |          | Power supply cord (for U.S.A.) |
| △ 2700122                          |          | Power supply cord (for Canada) |
| △ 2657721                          |          | AC outlet (for U.S.A.)         |
| △ 2658372                          |          | AC outlet (for Canada)         |
| 2757573                            |          | AM Loop antenna                |
| <b>for FINAL ASSEMBLY</b>          |          |                                |
|                                    | 4451522  | Cover                          |
|                                    | 4567463  | 4φ × 10 DT bind screw          |
|                                    | 4567452  | 3φ × 8 DT bind screw           |
| <b>for DIAL MECHANISM ASSEMBLY</b> |          |                                |
| T001                               | 2248381  | Power trans. AC 120V           |
|                                    | 4023551  | Front panel ass'y              |
|                                    | 3959352  | Display sheet                  |
|                                    | 3959351  | Display sheet                  |
|                                    | 3959331  | Blind A                        |
|                                    | 3959341  | Blind B                        |
|                                    | 3947541  | Nylon rivet B                  |

| SYMBOL No. | PART No. | DESCRIPTION                                  | SYMBOL No. | PART No. | DESCRIPTION                |
|------------|----------|--|------------|----------|----------------------------|
|            | 3298191  | Knob (14) PRESET SCAN                        |            | 4567413  | 3φ × 10 DT bind screw      |
|            | 3298201  | Knob (UD)                                    |            | 4784106  | 3φ × 10 bind tapping screw |
|            | 3298192  | Knob (14) MEMORY                             |            | 4567422  | 4φ × 8 DT bind screw       |
|            | 3298131  | Knob (T) ass'y TAPE - 1,2                    |            | 4573554  | 4φ × 16 bind tapping screw |
|            | 3298071  | Knob (B) ass'y AM FM                         |            | 4567454  | 3φ × 12 DT bind screw      |
|            | 3298101  | Knob (F) ass'y CD/AUX                        |            | 4567411  | 3φ × 6 DT bind screw       |
|            | 3298102  | Knob (F) ass'y PHONO                         |            | 4573552  | 3φ × 16 bind tapping screw |
|            | 3296511  | Slide volume knob<br>(BASS, TREBLE, BALANCE) |            | 4784106  | 3φ × 10 bind tapping screw |
|            | 3298181  | Knob (Volume) ass'y                          |            | 4567432  | 3φ × 8 DT bind screw       |
|            | 3298211  | Preset knob ass'y                            |            | 4567411  | 3φ × 6 DT bind screw       |
|            | 3249851  | Escutcheon                                   |            | 4567413  | 3φ × 10 DT bind screw      |
|            | 4568812  | 3φ × 8 DT flat head screw                    |            |          | <b>for ACCESSORIES</b>     |
|            | 4567411  | 3φ × 6 DT bind screw                         |            |          |                            |
|            | 4567413  | 3φ × 10 DT bind screw                        |            | 2757522  | FM Antenna                 |
|            | 4784106  | 3φ × 10 bind tapping screw                   |            |          |                            |
|            | 4784106  | 3φ × 10 bind tapping screw                   |            |          |                            |
|            | 4580933  | 2φ × 3 pan head screw                        |            |          |                            |
|            | 3960431  | Plastic rivet                                |            |          |                            |
|            | 4784103  | 3φ × 8 bind tapping screw                    |            |          |                            |
|            | 3298031  | Push button (S)                              |            |          |                            |
|            | 3298561  | Push (A) ass'y                               |            |          |                            |
|            | 3298051  | Power button ass'y                           |            |          |                            |
|            | 3927411  | Leg  |            |          |                            |



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**HTA-3F**    **TY**    **No. 378 EF**  
**HTA-4F**