# Service Manual

**FM/AM Stereo Receiver**

**SA-424 [PA], [PE]**

Areas

[PA] is available in Far East PX.
[PE] is available in European Military.

Please use this manual together with the service manual for Model No. SA-424 [Silver Type: EX, EG, EH, XA, XL] Order No. SD81051901C8.

## CHANGES

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### CHANGE OF SCHEMATIC DIAGRAM

- Tuner circuit
  **SA-424 [EX, EG, EH, XA, XL]**

![Schematic Diagram]

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**SA-424 [PA, PE]**

![Schematic Diagram]
### REPLACEMENT PARTS LIST

Cabinet, Chassis and Packing Parts

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.

2. △ indicates that only parts specified by the manufacturer be use for safety.

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### Accessory

A2 (RJP120ZBS)
Service Manual

FM/AM Stereo Receiver

SA-424
[EX], [EG], [EH], [XA], [XL]

SA-424(K)
[EG], [EH]

* The cabinet and front panel are available in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

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Specifications (Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

AMPLIFIER SECTION

20 Hz~20 kHz continuous power output
both channels driven
2 x 50W (4Ω)
2 x 45W (8Ω)

40 Hz~16 kHz continuous power output
both channels driven
2 x 50W (4Ω)
2 x 45W (8Ω)

1 kHz continuous power output
both channels driven
2 x 55W (4Ω)
2 x 48W (8Ω)

Total harmonic distortion
rated power at 20 Hz~1 kHz
0.015% (4Ω)
0.007% (8Ω)

rated power at 40 Hz~16 kHz
0.015% (4Ω)
0.007% (8Ω)

rated power at 1 kHz
0.007% (4Ω)
0.001% (8Ω)

half power at 20 Hz~1 kHz
0.007% (4Ω)

half power at 1 kHz
0.007% (8Ω)

-20 dB power at 1 kHz
0.07% (4Ω)

50 mW power at 1 kHz
0.12% (4Ω)

Intermodulation distortion
rated power at 250 Hz: 8 kHz=4:1, 4Ω
0.015%

rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω
0.01%

Power bandwidth
both channels driven, -3 dB
5 Hz~40 kHz (T.H.D. 0.04%, 4Ω)
5 Hz~40 kHz (T.H.D. 0.02%, 8Ω)

Damping factor
20 (4Ω), 40 (8Ω)

Input sensitivity and impedance
PHONO
2.5 mV/47kΩ

AUX
150 mV/22kΩ

TAPE 2
150 mV/22kΩ

TAPE 1 REC/PLAY
150 mV/25kΩ

PHONO maximum input voltage (1 kHz, RMS)
150 mV

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan
Technische Daten (Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(S/N) 45 500

**VERSTÄRKERTEIL**

Dauerleistung bei 20 Hz ~ 20 kHz
bekte Kanäle ausgesteuert
2 x 50W (4 Ω)
2 x 45W (8 Ω)

Dauerleistung bei 40 Hz ~ 16kHz
bekte Kanäle ausgesteuert
2 x 50W (4 Ω)
2 x 45W (8 Ω)

Dauerleistung bei 1 kHz
bekte Kanäle ausgesteuert
2 x 55W (4 Ω)
2 x 48W (8 Ω)

Gesamtlautstärke
Nennleistung bei 20 Hz ~ 20 kHz
0,015% (4 Ω)
0,007% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz
0,015% (4 Ω)
0,007% (8 Ω)
Nennleistung bei 1 kHz
0,007% (4 Ω)
0,001% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz
0,007% (8 Ω)

halb leistung bei 1 kHz
0,001% (8 Ω)

Immodulationsfaktor
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4Ω
0,015%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8Ω
0,01%

Leistungsbreite
beekte Kanäle ausgesteuert bei ≤3 dB
5 Hz ~ 40 kHz (T.H.D. 0,04%, 4 Ω)
5 Hz ~ 40 kHz (T.H.D. 0,02%, 8 Ω)

Dämpfungsfaktor
20 (4 Ω), 40 (8 Ω)

Eingangspfade
Phono
2,5 mV/47 kΩ
Aux
150 mV/22 kΩ
Tap 2
150 mV/22 kΩ
Tap 1 Aufnahme/Wiedergabe (TAP 1 REC/PLAY)
180 mV/25 kΩ

Maximale TA-Eingangsspannung (1 kHz, efl.)
150 mV

**GENERAL**

Power consumption
420W

Power supply
AC 50 Hz/60 Hz, 110V/120V/220V/240V

Dimensions (W×H×D)
430 × 120 × 350 mm
(16-1/16" × 4-23/32" × 13-25/32")

Weight
7,7 kg
(17.0 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).
Geräuschabstand
Nennleistung (4 Ω)
Phono 74 dB (nach IHF, A: 82 dB)
Aux, Tape 88 dB (nach IHF, A: 98 dB)
-26 dB Leistung (4 Ω)
Phono 63 dB
Aux, Tape 65 dB
50 mW Leistung (4 Ω)
Phono 60 dB
Aux, Tape 60 dB
Frequenzgang
Phono RIAA-Standardkurve
±0,5 dB (30 Hz ~ 15 kHz)
Aux, Tape 5 Hz ~ 80 kHz (-3 dB)
±0,2 dB (20 Hz ~ 20 kHz)
Klangregler
Baßregler (BASS) 50 Hz, ±10 dB ~ ±10 dB
Höhenregler (TREBLE) 20 kHz, ±10 dB ~ ±10 dB
Tiefenfilter
30 Hz, -6 dB/Okt.
Gehörrichte Lautstärkeregelung (Loudness)
(bei ~60 dB Ausgangsoptemanz)
50 Hz, +9 dB
Ausgangsspannung und -impedanz
Tape 1/2 Aufnahme (TAPE 1, 2 REC OUT) 150 mV
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)
30 mV/82 kΩ
Kanalabnahme (Aux, 250 Hz ~ 6300 Hz)
±1 dB
Übersprechdämpfung (Aux, 1 kHz)
55 dB
Kopfhörerpegel und -impedanz
450 mV/330 Ω
Lautsprecherimpedanz
MAIN oder REMOTE
4 Ω ~ 16 Ω
MAIN und REMOTE
8 Ω ~ 16 Ω

### UKW-TUNERTEIL

#### Wellenbereich
- 87,50 ~ 108,00 MHz (0,05-MHz-Schritte)
- 87,9 ~ 107,9 MHz (0,02-MHz-Schritte)

#### Eingangsempfindlichkeit (S/R 20 dB)
- S/R 30 dB 1,3 µV (75 Ω)
- S/R 26 dB 1,2 µV (75 Ω)
- S/R 20 dB 0,9 µV (75 Ω)
- S/R 30 dB 1,9 µV (300 Ω), 1,3 µV (75 Ω)
- S/R 26 dB 1,7 µV (300 Ω), 1,2 µV (75 Ω)
- S/R 20 dB 1,5 µV (300 Ω), 0,9 µV (75 Ω)

#### Nutzempfindlichkeit nach IHF
- 1,9 µV (nach IHF '58)

#### Stereounsichtseinschaltung bei 46 dB nach IHF
- 22 µV/75 Ω

#### Gesamtklirrrfaktor
- Mono 0,15%
- Stereo 0,2%

#### Geräuschabstand
- Mono 65 dB (75 dB nach IHF)
- Stereo 60 dB (70 dB nach IHF)

#### Frequenzgang
- 20 Hz ~ 15 kHz (+1 dB ~ -2 dB)

#### Entzerrung
- breit ±400 kHz 75 dB
- schmal ±300 kHz 75,5 dB

#### Einfangverhältnis
- Spiegelfilterfrequenz-Dämpfung bei 98 MHz 55 dB
- ZF-Dämpfung bei 98 MHz 75 dB
- Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz 82 dB
- AM-Unterdrückung 55 dB
- Übersprechdämpfung 1 kHz 45 dB
- 10 kHz 35 dB
- 19 kHz ±30 dB (±38 dB nach IHF)
- 38 kHz ±50 dB (±50 dB nach IHF)
- Kanalabnahme (250 Hz ~ 6300 Hz) ±1,5 dB
- Begrenzungseinsatz 1,2 µV
- Bandbreite ZF-Verstärker 180 kHz
- UKW-Demodulator 1000 kHz
- Antennenanschluß 75 Ω (unsymmetrisch) (Nur für Deutschland bestimmt)
- 300 Ω (symmetrisch) (Für andere Länder)
- 75 Ω (unsymmetrisch) (Für andere Länder)

### AM-TUNERTEIL

#### Wellenbereiche
- 522 ~ 1611 kHz (9-kHz-Schritte)
- 530 ~ 1620 kHz (10-kHz-Schritte)

#### Eingangsempfindlichkeit (S/R 20 dB)
- 30 µV, 300 µV/m

#### Trennschärfe
- 55 dB

#### Spiegelfilterfrequenz-Dämpfung bei 1000 kHz
- 50 dB

#### ZF-Dämpfung bei 1000 kHz
- 40 dB

### ALLGEMEINE DATEN

#### Leistungsaufnahme
- 420 W

#### Netzspannung
- Wechselstrom 50 Hz/60 Hz, 110/120V/220/240V

#### Abmessungen (B × H × T)
- 430 × 120 × 350 mm

#### Gewicht
- 7,7 kg

**Bemerkung:**
Der Gesamtklirrrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

**CARACTERISTIQUES (DIN 45 500)**

#### SECTION AMPLIFICATEUR

| Puissance de sortie continue de 20 Hz~20 kHz, les deux canaux en circuit | 2 × 50W (4Ω) | 2 × 45W (8Ω) |
| Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit | 2 × 50W (4Ω) | 2 × 45W (8Ω) |
| Puissance de sortie continue à 1 kHz, les deux canaux en circuit | 2 × 55W (4Ω) | 2 × 48W (8Ω) |

**Distorsion harmonique totale**

- à puissance nominale (20 Hz~20 kHz) 0,015% (4Ω)
- à puissance nominale (40 Hz~16 kHz) 0,007% (8Ω)
- à puissance nominale (1 kHz) 0,007% (4Ω)
- à demi-puissance (20 Hz~20 kHz) 0,007% (8Ω)
- à demi-puissance (1 kHz) 0,001% (8Ω)
- puissance de ~26 dB à 1 kHz 0,07% (4Ω)
- puissance de 50 mW à 1 kHz 0,12% (4Ω)

**Distorsion d'intermodulation**

- à puissance nominale à 250 Hz: 8 kHz:±4:1, 4Ω 0,015%
- à puissance nominale à 80 Hz: 7 kHz:±4:1, SMPTE, 8Ω 0,01%
<table>
<thead>
<tr>
<th>Réponse de fréquences</th>
<th>Sensibilité</th>
</tr>
</thead>
<tbody>
<tr>
<td>les deux canaux en circuit, –3 dB</td>
<td>S/B 30 dB, 1.9 μV (300Ω), 1.3 μV (75Ω)</td>
</tr>
<tr>
<td></td>
<td>S/B 28 dB, 1.7 μV (300Ω), 1.2 μV (75Ω)</td>
</tr>
<tr>
<td></td>
<td>S/B 20 dB, 1.5 μV (300Ω), 0.9 μV (75Ω)</td>
</tr>
<tr>
<td>Coefficient d’amortissement</td>
<td>Sensibilité utilisable IHF</td>
</tr>
<tr>
<td>20 (40Ω), 40 (8Ω)</td>
<td>1.9 μV (IHF '58)</td>
</tr>
<tr>
<td>Sensibilité et impédance d’entrée</td>
<td>Sensibilité stéréo au seuil de 46 dB, IHF</td>
</tr>
<tr>
<td>PHONO</td>
<td>2.5 mV/47kΩ</td>
</tr>
<tr>
<td>AUX (AUX)</td>
<td>150 mV/22kΩ</td>
</tr>
<tr>
<td>BANDE 2 (TAPE 2)</td>
<td>150 mV/22kΩ</td>
</tr>
<tr>
<td>BANDE 1, ENREGISTREMENT/LECTURE (TAPE 1 REC/PLAY)</td>
<td>180 mV/25kΩ</td>
</tr>
<tr>
<td>PHONO (tension d’entrée maximum, 1 kHz RMS)</td>
<td>150 mV</td>
</tr>
<tr>
<td>Signal/Bruit</td>
<td>à puissance nominale (4Ω)</td>
</tr>
<tr>
<td>PHONO</td>
<td>74 dB (IHF, A: 82 dB)</td>
</tr>
<tr>
<td>AUX, BANDE (AUX, TAPE)</td>
<td>88 dB (IHF, A: 98 dB)</td>
</tr>
<tr>
<td>puissance de –26 dB (4Ω)</td>
<td>63 dB</td>
</tr>
<tr>
<td>PHONO</td>
<td>65 dB</td>
</tr>
<tr>
<td>AUX, BANDE (AUX, TAPE)</td>
<td>65 dB</td>
</tr>
<tr>
<td>puissance de 50 mW (4Ω)</td>
<td>60 dB</td>
</tr>
<tr>
<td>PHONO</td>
<td>60 dB</td>
</tr>
<tr>
<td>AUX, BANDE (AUX, TAPE)</td>
<td>60 dB</td>
</tr>
<tr>
<td>Réponse de fréquence</td>
<td>Courbe nominale RIAA</td>
</tr>
<tr>
<td>PHONO</td>
<td>±0.5 dB (30 Hz–15 kHz)</td>
</tr>
<tr>
<td>AUX, BANDE (AUX, TAPE)</td>
<td>5 Hz–80 kHz (–3 dB)</td>
</tr>
<tr>
<td>Réglage de la tonalité</td>
<td>±0.2 dB (20 Hz–20 kHz)</td>
</tr>
<tr>
<td>BASSES (BASS)</td>
<td>50 Hz, +10 dB– –10 dB</td>
</tr>
<tr>
<td>HAUSSES (TREBLE)</td>
<td>20 kHz, +10 dB– –10 dB</td>
</tr>
<tr>
<td>Filtre subsonique</td>
<td>30 Hz, –6 dB/oct.</td>
</tr>
<tr>
<td>Compensateur physiologique (volume à –30 dB)</td>
<td>50 Hz, +9 dB</td>
</tr>
<tr>
<td>Tension de sortie et impédance</td>
<td>Sortie enregistrement/Bande 1, 2</td>
</tr>
<tr>
<td>(TAPE 1, 2 REC OUT)</td>
<td>150 mV</td>
</tr>
<tr>
<td>ENREGISTREMENT/LECTURE BANDE 1</td>
<td>30 mV/82kΩ</td>
</tr>
<tr>
<td>Equilibre des canaux, AUX 250 Hz–6 300 Hz</td>
<td>±1 dB</td>
</tr>
<tr>
<td>Séparation des canaux, AUX 1 kHz</td>
<td>55 dB</td>
</tr>
<tr>
<td>Niveau de sortie des casques et impédance</td>
<td>450 mV/330Ω</td>
</tr>
<tr>
<td>Impédance de charge</td>
<td>PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)</td>
</tr>
<tr>
<td></td>
<td>4Ω–16Ω</td>
</tr>
<tr>
<td>PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)</td>
<td>8Ω–16Ω</td>
</tr>
</tbody>
</table>

### SECTION SYNTONISATEUR AM

<table>
<thead>
<tr>
<th>Gamme de fréquence</th>
<th>522–1611 kHz (9 kHz par palier)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>530–1620 kHz (10 kHz par palier)</td>
</tr>
<tr>
<td>Sensibilité (S/B 20 dB)</td>
<td>30 μV, 300 μV/m</td>
</tr>
<tr>
<td>Sélectivité</td>
<td>55 dB</td>
</tr>
<tr>
<td>Réjection d’image à 1,000 kHz</td>
<td>50 dB</td>
</tr>
<tr>
<td>Réjection FI à 1,000 kHz</td>
<td>40 dB</td>
</tr>
</tbody>
</table>

### DIVERS

<table>
<thead>
<tr>
<th>Consommation</th>
<th>420W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alimentation</td>
<td>CA 50 Hz/60 Hz, 110V/120V/220V/240V</td>
</tr>
<tr>
<td>Dimensions (L–H–Pr)</td>
<td>430 × 120 × 350 mm</td>
</tr>
<tr>
<td>Poids</td>
<td>7.7 kg</td>
</tr>
</tbody>
</table>

**Remarque:**
On mesure la distorsion harmonique totale au moyen d’un analyseur de spectre digital (Système H.P. 3045).
**LOCATION OF CONTROLS**

- FM Antenna
  Note that the FM antenna terminals used on products for F.R. Germany [EG] are the 75Ω Type only.

**DISASSEMBLY INSTRUCTIONS**

- How to remove the cabinet
  1. Remove the 8 setscrews (Fig. 1: 1 ~ 8) on the side and 3 setscrews (Fig. 1: 9 ~ 11) on the back of the cabinet.
  2. Remove the cabinet.

- How to remove the bottom board
  1. Remove the 8 setscrews (Fig. 2: 10 ~ 16, 13 ~ 19) of the bottom board.
  2. Remove the bottom board.
  Note: Don’t remove the 1 setscrew (Fig. 2: 12) of the bottom board.
How to remove the FM/AM preset tuning printed circuit board and the analog frequency meter

1. Remove the cabinet.
2. Open the 2 "lead holders" of the lead connector (Fig. 3: ①, ②) and pull out the lead wires.
3. Remove the 2 lock pins (Fig. 3: ①, ②) to detach the stereo indicator drive printed circuit board.
4. The lead wires are squeezed in between the front chassis and the stereo indicator drive printed circuit board. Pull them out in the direction of arrow ④ in Fig. 3.
5. Remove the 6 setscrews (Fig. 2 and 3 ⑥ ~ ⑪) of the front panel.
6. Move the front panel in the direction of arrow ⑫ in Fig. 3.
7. Remove the 3 setscrews (Fig. 4: ② ~ ④) to detach the FM/AM preset tuning printed circuit board.
8. Remove the 2 setscrews (Fig. 5: ⑦ ~ ⑧) to detach the analog frequency meter in direction of the arrow ⑩, and 2 lugs (Reflector bracket of left and right side) to detach the reflector bracket from the analog frequency meter in direction of the arrow ⑩.
- **How to remove the power IC**
  1. Remove the cabinet and bottom board. (Refer to "How to remove the cabinet," and "How to remove the bottom board.")
  2. Remove the 4 setscrews (Fig. 6: ③～⑩) to detach the power transformer from rear panel in the direction of the arrow ③.
  3. Unsolder of power IC.
  4. Remove the 4 setscrews (Fig. 6: ③～⑩) used to secure the power IC on the heat sink, and then pull the power IC.
  5. When mounting the power IC, apply silicone compound (or equivalent heat diffuser) to the rear side of power IC, and then follow the steps 1～4 reversely.

- **How to replace chips (resistor, capacitor and jumper)**
  1. Unsolder from chip by using solder sucker.
  2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 7.
  3. Solder circuit board first and then solder chip in the direction of the arrow as shown in Fig. 8.

**Notes:**
1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.

- **Note for replacing chips**
  1. Do not heat chips more than three (3) seconds.
  2. Be careful not to damage the electrode of chips.
  3. Use soldering iron (less than 60W) and tweezers for replacing chips.

- **Precautions for repair**

When frequency is not indicated, FL (display tube), FL driver, digit circuit, and micro-computer must be checked by oscilloscope. In this case, take care not to allow short circuit between IC terminals or application of voltage from measuring instrument to IC terminals.
Note 1: Setscrews ① to ③ and ④ are screws with detents (Part No.: XTBX3+ 8BFZ21) as shown in Fig. 9-A in order to make the contact of electric circuit perfect. Take care not to mix up these screws with other screws. When substituting, use a 3 x 8mm tapping screw (Part No.: XTB3+8BFZ) and toothed lock washer (Part No.: XWC3B) as shown in Fig. 9-B. The teeth of the lock washer should be positioned on the chassis side.

Note 2: Setscrews ⑤ and ⑥ are plain washer-attached screws (Part No.: XTW3+10H). When substituting, use a 3 x 10mm tapping screw (Part No.: XTN3+ 10B) and plain washer (Part No.: XWG3B) as shown in Fig. 10.

* Since standardized parts are mentioned in the parts list, they are sometimes different in Part No. and Color from the product parts.

<table>
<thead>
<tr>
<th>Screw No.</th>
<th>Type</th>
<th>Color</th>
<th>Product Part No.</th>
<th>Figure No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>① ~ ③</td>
<td>4 x 8 mm, Tapping</td>
<td>Silver</td>
<td>XTB4+8BFN (Silver type model)</td>
<td>Fig. 1</td>
</tr>
<tr>
<td>④ ~ ⑥</td>
<td>3 x 10 mm, Tapping</td>
<td>Black</td>
<td>XTB3+8BFN (Silver type model)</td>
<td>Fig. 1</td>
</tr>
<tr>
<td>⑦ ~ ⑨</td>
<td>3 x 12 mm, Tapping (With plain washer)</td>
<td>Red</td>
<td>XTW3+12HFR</td>
<td>Fig. 2</td>
</tr>
<tr>
<td>⑩ ~ ⑫</td>
<td>3 x 8 mm, Tapping</td>
<td>Black</td>
<td>XTB3+8BFZ1</td>
<td>Fig. 2 and 3</td>
</tr>
<tr>
<td>⑬ ~ ⑭</td>
<td>3 x 10 mm, Tapping</td>
<td>Gold</td>
<td>XTB3+10B</td>
<td>Fig. 4</td>
</tr>
<tr>
<td>⑮ ~ ⑯</td>
<td>3 x 8 mm, Tapping</td>
<td>Gold</td>
<td>XTB3+8BFZ1</td>
<td>Fig. 4</td>
</tr>
<tr>
<td>⑰ ~ ⑱</td>
<td>3 x 10 mm Tapping (With plain washer)</td>
<td>Gold</td>
<td>XTW3+10H</td>
<td>Fig. 5</td>
</tr>
</tbody>
</table>

### MEASUREMENTS AND ADJUSTMENTS

#### AMPLIFIER ADJUSTMENT

- Setting of controls and instruments to be used
  - Before the adjustment, R657 and R658 should be turned to counter-clockwise direction.
  - 1. Speaker switch ............... Main
  - 2. Sound volume ................. 0 (minimum)
  - 3. DC voltmeter (capable to measure 5mV)

<table>
<thead>
<tr>
<th>No.</th>
<th>ADJUSTMENTS</th>
<th>DC VOLT METER CONNECTION</th>
<th>PARTS ADJUSTED</th>
<th>ADJUSTING PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC balance</td>
<td>Connect it to “Speaker” terminals of L and R channels.</td>
<td>R655 (L channel) R656 (R channel)</td>
<td>* Adjust it to zero (0) with as small measuring range as possible.</td>
</tr>
<tr>
<td>2</td>
<td>l_cq</td>
<td>(L channel) Between P602 and TP604 (minus probe) (R channel) Between P603 and TP604 (minus probe)</td>
<td>R657 (L channel) R658 (R channel)</td>
<td>* Adjust R657 (L ch) and R658 (R ch) to approx. 5 ~ 6mV after ten minutes warm-up time.</td>
</tr>
</tbody>
</table>

#### TUNER ADJUSTMENT

Note: AM OSC Coil (L202) and AM 2nd IFT (T202) have been already adjusted, and require no adjustment.

- Equipment used
  - 1. AC and DC electronic voltmeters (VTVM)
  - 2. AM signal generator (AM-SG)
  - 3. FM signal generator (FM-SG)
  - 4. Distortion analyzer
  - 5. Oscilloscope
  - 6. Frequency counter (19 kHz and 108 MHz measurable)
  - 7. FM 300Ω dummy antenna (Fig. 11)

- Setting
  - 1. Maintain line voltage at rated volts.
  - 2. Output of signal generator should be no higher than necessary to obtain an output reading.
  - 3. Pull the AM ferrite-bar antenna (L201) outward.
  - 4. Use a non-metal screwdriver for the adjustment.
  - 5. Set input selector to “tuner” position.
  - 6. Set band selector to AM (IAM adjustment) position
  - 7. Set FM muting/FM mode switch to “on/FM auto” position.
  - 8. Set tape monitor switch to “source” position.
  - 9. Set speaker selector to “main” position.
  - 10. Set automatic-scan switch to “off” position.
  - 11. Set FM/AM allocation selector to “0.2 MHz/10 kHz” position.
  - 12. Set FM IF band selector to “normal” position.
**Preparation of FM signal generator (FM-SG)**

1. Connect stereo modulator to FM-SG.
2. Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna.

3. The standard input of the set is 60 dB (1 mV), 400 Hz 100% modulation. (Because of using dummy antenna, SG output must be 12 dB plus (IHF). That is, when input is 60 dB SG output is to be 72 dB.

<table>
<thead>
<tr>
<th>Step No.</th>
<th>AM/FM SIGNAL GENERATOR</th>
<th>DISPLAY FREQUENCY</th>
<th>PREPARATIONS</th>
<th>PARTS ADJUSTED</th>
<th>ADJUSTING PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connect AM-SG to AM antenna terminal through 220pF capacitor. Common to chassis. (Powerful input)</td>
<td>450 kHz (30% Mod. with 400 Hz)</td>
<td>Frequency of non-interference</td>
<td>Connect AC VTM or scope to “Speaker” terminals of the set.</td>
<td>T201 (1st IFT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust the input frequency and adjustment points so that the output becomes maximum.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>No-Signal</td>
<td>100.1 MHz</td>
<td>Connect DC VTM between T101 and T102 through choke coil. (Refer to Fig. 13)</td>
<td>T101 (Discr. IFT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>No-Signal</td>
<td>90.1 MHz</td>
<td>Connect DC VTM to terminal.</td>
<td>L4 (FM Osc Coll)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust L4 so that voltage measured by DC voltmeter is 4.49 ± 0.05V.</td>
</tr>
<tr>
<td>4</td>
<td>Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna.</td>
<td>90.1 MHz (100% Mod. with 400 Hz) Weak input</td>
<td>90.1 MHz</td>
<td>Connect scope to “Speaker” terminals of the set.</td>
<td>L1 (FM ANT Coll) L2 (FM DET Coll) T1 (FM IFT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Add weak input so that noise is included in the output wave form.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Make the adjustment so that the output wave form is vertically symmetrical.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Refer to Fig. 14)</td>
</tr>
<tr>
<td>5</td>
<td>Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna.</td>
<td>106.1 MHz (100% Mod. with 400 Hz) Weak input</td>
<td>106.1 MHz</td>
<td>Connect scope to “Speaker” terminals of the set.</td>
<td>CT1 (FM Osc Trimmer)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Add weak input so that noise is included in the output wave form.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Make the adjustment so that the output wave form is vertically symmetrical.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Refer to Fig. 14)</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>No-Signal</td>
<td>107.9 MHz</td>
<td>VR102 (Frequency meter)</td>
<td>VR102 (Frequency meter)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust VR102 so that the frequency meter indicates 107.9 MHz. (Refer to Fig. 16)</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>No-Signal</td>
<td>530 kHz</td>
<td>Connect DC VTM to terminal.</td>
<td>L202 (AM Osc Coll)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust L202 so that voltage measured by DC voltmeter is 1.25 ± 0.05V.</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>No-Signal</td>
<td>1620 kHz</td>
<td>Connect DC VTM to terminal.</td>
<td>CT202 (AM Osc Trimmer)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust CT202 so that voltage measured by DC voltmeter is 25.0V.</td>
</tr>
<tr>
<td>9</td>
<td>Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)</td>
<td>610 kHz (30% Mod. with 400 Hz)</td>
<td>610 kHz</td>
<td>Connect AC VTM to scope to “Speaker” terminals of the set.</td>
<td>L201 (ANT Coll)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust for maximum output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Adjust ferrite of L201 by screwdriver.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Repeat step 9 until the frequency correctly matches the dial display.</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>No-Signal</td>
<td>1500 kHz</td>
<td>VR136 (Frequency meter)</td>
<td>VR136 (Frequency meter)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Adjust VR136 so that the frequency meter indicates 1500 kHz. (Refer to Fig. 17)</td>
</tr>
</tbody>
</table>

**FM MUTING LEVEL ADJUSTMENT**

<table>
<thead>
<tr>
<th>Step No.</th>
<th>AM/FM SIGNAL GENERATOR</th>
<th>DISPLAY FREQUENCY</th>
<th>PREPARATIONS</th>
<th>PARTS ADJUSTED</th>
<th>ADJUSTING PROCEDURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 16 dB to antenna terminal)</td>
<td>100.1 MHz (100% Mod. with 400 Hz)</td>
<td>100.1 MHz</td>
<td>Connect AC VTM or scope to “Speaker” terminals of the set.</td>
<td>VR101 (Muting level)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Set the FM muting/FM mode switch to “off/mono”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. With the FM muting/FM mode switch set to &quot;on/FM auto&quot; adjust VR101 so that the output is given with muting condition released.</td>
</tr>
</tbody>
</table>
### FM MPX PILOT (VCO) ADJUSTMENT

| 12 | 100.1 MHz (Non-modulated) | 100.1 MHz | Connect frequency counter to T404 terminal through resistor (100kΩ). | VR301 (VCO) | 1. Set the FM muting/FM mode switch to "on/FM auto".  
2. Adjust VR301 to 19 kHz ± 30 Hz. |
| Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal) |

### STEREO DISTORTION ADJUSTMENT

| 13 | 100.1 MHz (100% Mod. with 400 Hz) (L mode) | 100.1 MHz | Connect distortion analyser to "Speaker" terminals of the set. | T1 (IFT) | 1. Set the FM muting/FM mode switch to "on/FM auto".  
2. Re-adjust the already adjusted T1 within ± 90° from the preset core position so that the distortion of L ch is minimized. |
| Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal) |

### SEPARATION ADJUSTMENT

| 14 | 100.1 MHz (100% Mod. with 1 kHz) (L or R mode) | 100.1 MHz | Connect AC VTVM to "Speaker" terminal of the set. | VR302 (Normal IF separation) | 1. Set the IF band selector to "normal".  
2. Set the FM muting/FM mode switch to "on/FM auto".  
3. Adjust VR302 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode. |
| Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Pilot 10% Mod. stereo signal) |

### VERSTÄRKERJUSTIERUNG

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Einstellungen</th>
<th>Gleichstromvoltmeter-verbindingen</th>
<th>Einstellungspunkte</th>
<th>Einstellungsvorgang</th>
</tr>
</thead>
</table>
| 1   | Gleichstrom-Balance | An die Lautsprecherverbindung des linken und rechten Kanals anschließen. | R655 (L-Kanal)  
R656 (R-Kanal) | Mit Kleinste möglichem Messbereich auf Null (0) justieren. |
| 2   | Icq | L-Kanal  
Zwischen T1001 und T2003 (Minustest)  
R-Kanal  
Zwischen T4002 und T2004 (Minustest) | R657 (L-Kanal)  
R658 (R-Kanal) | R657 (L-Kanal) und R658 (R-Kanal) auf ungefähr 6mV, nach 10 Minuten Anwärmzeit, einstellen. |

### TUNER-JUSTIERUNG

Anmerkung: AM Osz.-Spule (L202) und AM 2. ZFT (T202) sind bereits justiert worden und benötigen keine Justierung.

* Verwendete Einrichtungen
1. Elektronischer Voltmeter für Wechsel- und Gleichstrom (VTVM)  
2. AM (MW)-Messer (AM-SG)  
3. UKW-Messender (FG-SG)  
4. Verzerrungsmesser  
5. Oszilloskop  
6. Signalfrequenzmesser (meßbar für 19 kHz und 108 Mhz)  
7. UKW 75-Ohm Konstanterne (Abb. 5)
**Zustand des Gerätes**

1. Netzspannung auf ihren Sollwerten halten.
2. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ableitung.
3. Die AM-Ferritstabantenne (L201) herausziehen.
4. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.
5. Den Eingangswähler auf die "tuner"-Position stellen

6. Bereichsschalter ... (AM (MW Abgleich)
7. FM Muting/Mode Schalter ................. on/FM auto
8. Monitorschalter ......................... source
9. Weitbereichsschalter .................... main
10. Sendsuchlauf-Schalter ................... off
11. UKW/MW-Frequenzinterschaltschalter ....... 0,2 MHz/10 kHz
12. FM/ZF-Bandbreitensucher ............... normal

**Vorbereitung AM UKW-Messender (FG-SG)**

1. Stereo-Modulator an FM-SG anschließen
2. SG-Ausgang über 75-Ohm UKW Kunststangen an den Antenneneingang des Gerätes schließen.
3. Der normale Eingang des Gerätes beträgt 60 dB (1mV) 400 Hz 100% Modulation. (Wegen Verwendung der Kunststangen muß der Signalausgang 12 dB plus (HF) sein: d.h. beim Eingang von 60 dB soll der Signalausgang 72 dB sein.)

<table>
<thead>
<tr>
<th>Nr.</th>
<th>ANSCHLUSS</th>
<th>FREQUENZ</th>
<th>ANZEIGE-FREQUENZ</th>
<th>VORBEREITUNG</th>
<th>ABGLEICHSPUNKTE</th>
<th>ABGLEICHSPUNKTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Einen MW-Signal generator über einen 200pF Kondensator mit dem MW-Antennen-Eingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)</td>
<td>450 kHz (400 Hz Modulat., 30%)</td>
<td>Kein Empfang</td>
<td>Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.</td>
<td>T201 (1, IF)</td>
<td>Die Eingangsfrequenz und die Einstellungspunkte so adjustieren, daß der Ausgang den maximalen Wert erreicht.</td>
</tr>
<tr>
<td>2</td>
<td>Kein Signal</td>
<td>100.1 MHz</td>
<td>Ein Gleichstromröhrenvoltmeter zwischen IF02 und IF03 über eine Drosselspule verbinden (Siehe Abb. 2)</td>
<td>T101 (Diskriminator FT)</td>
<td>Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0,5V im 300mV Bereich beträgt.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Kein Signal</td>
<td>90.1 MHz</td>
<td>Zwischen IF1 und Erdung Gleichstrom-Voltmeter schließen.</td>
<td>L4 (UKW Osc. Spule)</td>
<td>1. L4 so justieren, daß die mit Voltmeter gemessene Spannung 4,49 ± 0,05V beträgt.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Meßsender über eine Kunststangen an den UKW-Antennen-Eingang schließen.</td>
<td>90.1 MHz (400 Hz Modulat., 100%)</td>
<td>90.1 MHz</td>
<td>Oszilloskop über den Lautsprecher schließen.</td>
<td>L1 (Ant. Spule) L2 (HF Det. Spule) T1 (IF)</td>
<td>1. Einen schwachen Eingang geben, bei dem Geläusch in der Ausgangsweileform enthaltein wird. 2. So einstellen, daß die Ausgangsweileform vertikal symmetrisch wird. (Abb. 4)</td>
</tr>
<tr>
<td>5</td>
<td>Meßsender über eine Kunststangen an den UKW-Antennen-Eingang schließen.</td>
<td>106.1 MHz (400 Hz Modulat., 100%)</td>
<td>106.1 MHz</td>
<td>Oszilloskop über den Lautsprecher schließen.</td>
<td>CT1 (UKW Osc. Trimmer)</td>
<td>1. Einen schwachen Eingang geben, bei dem Geläusch in der Ausgangsweileform enthaltein wird. 2. So einstellen, daß die Ausgangsweileform vertikal symmetrisch wird. (Abb. 4) 3. Schritt (3) überprüfen, falls Abweichung vorhanden, L4 erneut justieren.</td>
</tr>
<tr>
<td>6</td>
<td>Kein Signal</td>
<td>107.9 MHz</td>
<td></td>
<td>VR102 (Analogfrequenz-Anzeiger)</td>
<td>1. VR102 so justieren, daß das Frequenzmeter 107,9 MHz anzeigt. (Siehe Abb. 5)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Kein Signal</td>
<td>530 kHz</td>
<td>Zwischen IF1 und Erdung Gleichstrom-Voltmeter schließen.</td>
<td>L202 (MW Osc. Spule)</td>
<td>1. L202 so justieren, daß die mit Voltmeter gemessene Spannung 1,25 ± 0,05V beträgt.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Kein Signal</td>
<td>1620 kHz</td>
<td>Zwischen IF1 und Erdung Gleichstrom-Voltmeter schließen.</td>
<td>CT202 (MW Osc. Trimmer)</td>
<td>1. CT202 so justieren, daß die mit Voltmeter gemessene Spannung 25,0V beträgt.</td>
<td></td>
</tr>
<tr>
<td>ANSCHLUSS</td>
<td>FREQUENZ</td>
<td>ANZEIGE-FREQUENZ DURCH VORBEREITUNG</td>
<td>VORBEREITUNG</td>
<td>ABGLEICHSPUNKTE</td>
<td>ABGLEICHVERFAHREN</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>-----------------------------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>Kein Signal</td>
<td>1500 kHz (400 Hz Modulat., 30%)</td>
<td>1500 kHz</td>
<td>Ozilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.</td>
<td>CT201 (Ant. Trimmer)</td>
<td>1. Auf max. Ausgang abschließen. 2. Die Schritte (7) wiederholen, bis die Frequenz genau mit der Skalenanzeige übereinstimmt.</td>
<td></td>
</tr>
</tbody>
</table>

**UKW-STUMMABSTIMMUNGSPEGELANZEIGER**

| Meßsender über eine Kunstantenne an den UKW-Antenennaufschaltverbinden. (16 dB in den Antennenwechselstrom-Voltmeter über den Lautsprecher schließen.) | 100.1 MHz (400 Hz Modulat., 100%) | 100.1 MHz | Ozilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen. | VR101 (UKW-Muting) | 1. Den UKW Muting/UKW-Betriebschalter auf "off/mono" einstellen. 2. "Muting" Schalter auf "on/ FM auto" stellen. VR101 so einstellen, daß der Ausgang unter Bewirken der Dämpfung gegeben wird. |

**UKW-MPX-PILOTABGLEICH (VCO)**

| Meßsender über eine Kunstantenne an den UKW-Antenennaufschaltverbinden. (Mono-Signal) | 100.1 MHz (Unmodulierter Wechselstrom-Voltmeter über den Lautsprecher schließen.) | 100.1 MHz | Den Signalfreqmessung durch 100kΩ Widerstand an Anschluß T1 (IFT) anschließen. | VR301 (VCO) | 1. Den UKW Muting/UKW-Betriebschalter auf "off/mono" einstellen. 2. VR301 so abgleichen, daß Ausgangsfrequenz von VR301 19 kHz ± 30 Hz. |

**STEREO-VERZERRUNGSABGLEICH**

| Meßsender über eine Kunstantenne an den UKW-Antenennaufschaltverbinden. (Stereo-Pilotsignal 10% moduliert.) | 100.1 MHz (400 Hz Modulat., 100%) L-Betriebsart | 100.1 MHz | Klirrfaktor-Meßbrücke über den Lautsprecher schließen. | T1 (IFT) | 1. Den UKW Muting/UKW-Betriebschalter auf "off/mono" einstellen. 2. VR302 so einstellen, daß vorliegende Kanalposition einstellen, sobald die Verzerrung des linken Kanals minimalisiert wird. |

**TRENNUNG-ABGLEICH**

| Meßsender über eine Kunstantenne an den UKW-Antenennaufschaltverbinden. (Stereo-Pilotsignal 10% moduliert.) | 100.1 MHz (400 Hz Modulat., 100%) L- oder R-Betriebsart | 100.1 MHz | Wechselstrom-Voltmeter über den Lautsprecher schließen. | VR302 (Normal IF Separation) | 1. FM-ZF Bandbreitschalter ..... normal. 2. Den UKW Muting/UKW-Betriebschalter auf "off/mono" einstellen. 3. VR302 auf minimale Anzeige des R-Ausangs bei Stereo-Modulator in L-Kanal (Modulator) einstellen, und auf minimale Anzeige des L-Ausangs in R-Modus abgleichen. |
| | | | | VR303 (Narrow IF Separation) | 1. FM-ZF Bandbreitschalter ..... narrow. 2. Den UKW Muting/UKW-Betriebschalter auf "off/mono" einstellen. 3. VR303 auf minimale Anzeige des R-Ausangs bei Stereo-Modulator in L-Kanal (Modulator) einstellen, und auf minimale Anzeige des L-Ausangs in R-Modus abgleichen. |
**MÉSURAGES ET RÉGLAGES**

**FRANÇAIS**

**RÉGLAGE DE L'AMPLIFICATEUR**

* Avant la mise au point, R657 et R658 devront être tournés dans la direction ou inverse des aiguilles d'une montre.
* Réglage des commandes et instruments à utiliser
  1. Commutateur du haut-parleur .................................. Principal
  2. Volume du son ......................................................... 0 (minimum)
  3. Voltmètre CC (pouvant mesurer 5mV)

<table>
<thead>
<tr>
<th>No.</th>
<th>Réglages</th>
<th>Connexions du voltmètre CC</th>
<th>Point de réglage</th>
<th>Procédé de réglage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Equilibrage C.C.</td>
<td>Le brancher aux bornes du “Speaker” (haut-parleur) des canaux de gauche et de droite.</td>
<td>R655 (Canal G)</td>
<td>L'ajuster sur zéro (0) avec une plaque de mesurage aussi petite que possible.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>R656 (Canal D)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>lca</td>
<td>Canal G. Entre T200A et T200C (sonde au moins)</td>
<td>R657 (Canal G)</td>
<td>Règle les R657 (canal gauche) et R658 (canal droit) sur env. 6mV après 10 mm, de préchauffage.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canal D. Entre T200A et T200C (sonde au moins)</td>
<td>R658 (Canal D)</td>
<td></td>
</tr>
</tbody>
</table>

**REGLAGE DU TUNER**

*NOTA:* La bobine oscillatrice de la modulation d’amplitude (L202) et le 2e transformateur de fréquence intermédiaire de la modulation d’amplitude (T202) ont été déjà réglés et ne nécessitent pas de mise au point.

* Equipment utilisé*
  1. Voltmètre électronique de courant altératif et de courant continu (VTVM).
  2. Générateur de signal AM (AM-SG).
  4. Jauge de distorsion.
  5. Oscilloscope.
  6. Compteur de fréquence (19 kHz et 108 MHz mesurable).
  7. Antenne fictive FM, 300 ohms (Fig. 11).
  8. Commutateur de silencieux/mode ................................ on/FM auto
  9. Sélecteurs de contrôle-pôle de la bande. ................. source
  10. Sélecteurs de gammes d’ondes. .............................. main
  11. Interrupteur de balayage automatique. ..................... off
  12. Sélecteur de disruction FM/AM ............................... 0.2 MHz/10 kHz

* Conditions de l'appareil*
  1. Conserver la tension du secteur à la tension nominale.
  2. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.
  3. Retirer l'antenne à tige de ferrite (L201) de la modulation d’amplitude.
  4. Utiliser un tournevis non-métallique pour le réglage.
  5. Sélecteur d'entrée sur la position “tuner”.
  6. Sélecteur de gamme ..... AM (Alignment AM)

* Préparation du générateur de signal FM (FM-SG)*
  1. Brancher la commande de réglage stéréophonique à FM-SG.
  2. Allumer la sortie SG à la borne de l'antenne de l'appareil, par l'antenne fictive FM, 300 ohms.
  3. L'entrée standard de l'appareil est de 60 dB (1mV), 400Hz, 100% de modulation (sauf dans le cas de l'utilisation de l'antenne fictive, la sortie SG doit être de plus de 12 dB (IHIF), 22.5 Hz qui signifie que quand l'entrée est de 60 dB, la sortie SG doit être de 72 dB.)

**AM/FM GENERATEUR***

<table>
<thead>
<tr>
<th>BRANCHEMENT</th>
<th>FREQUENCE</th>
<th>FREQUENCE D'AFFICHAGE PAR PREREGLAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PREPARATIONS**

<table>
<thead>
<tr>
<th>ELEMENTS REGLES</th>
<th>PROCEDURE DE REGLAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REGLAGE DE F1-AM**

1. Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Comm. au châssis. (Entrée sous puissante)

<table>
<thead>
<tr>
<th>No.</th>
<th>BRANCHEMENT</th>
<th>FREQUENCE</th>
<th>PREPARATIONS</th>
<th>ELEMENTS REGLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>450 kHz (modulé à 30% par 400 Hz)</td>
<td>Point sans signal</td>
<td>Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner</td>
<td>T201 (1 transfo F1)</td>
</tr>
</tbody>
</table>

**REGLAGE DE RF-FM**

2. Sans Signal 100.1 MHz

<table>
<thead>
<tr>
<th>No.</th>
<th>BRANCHEMENT</th>
<th>FREQUENCE</th>
<th>PREPARATIONS</th>
<th>ELEMENTS REGLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>100.1 MHz</td>
<td></td>
<td>Branchez le voltmètre électronique à c.c. aux bornes T201 et T201. (Voir la Fig. 13)</td>
<td>T101 (Transfo F1 discr.)</td>
</tr>
</tbody>
</table>

**REGLAGE DU FREQUENCEMETRE ANALOGIQUE FM-RF ET FM.**

3. Sans Signal 90.1 MHz

<table>
<thead>
<tr>
<th>No.</th>
<th>BRANCHEMENT</th>
<th>FREQUENCE</th>
<th>PREPARATIONS</th>
<th>ELEMENTS REGLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>90.1 MHz</td>
<td></td>
<td>Branchez le voltmètre à courant continu entre I58 et le prise de terre.</td>
<td>L4 (Bobine Osc.)</td>
</tr>
<tr>
<td></td>
<td>90.1 MHz</td>
<td></td>
<td>Branchez un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.</td>
<td>L1 (Bobin Ant.) L2 (détecteur) T1 (IFT)</td>
</tr>
<tr>
<td>AM/FM GENERATEUR</td>
<td>FREQUENCE</td>
<td>FREQUENCE D'AFFICHAGE PAR PREREGALAGE</td>
<td>PREPARATIONS</td>
<td>ELEMENTS REGLES</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------</td>
<td>--------------------------------------</td>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Branchement sur la prise d'antenne FM à travers une antenne fictive FM.</td>
<td>106.1 MHz (modulé à 100% par 400 Hz)</td>
<td>106.1 MHz</td>
<td>Branchez un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.</td>
<td>CT1 (Trimmer Osc.)</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sans signal</td>
<td>107.9 MHz</td>
<td></td>
<td></td>
<td>VR102 (Cadran analogique des fréquences)</td>
</tr>
<tr>
<td>7</td>
<td>sans signal</td>
<td>530 kHz</td>
<td>Branchez le voltmètre à courant continu entre 121 et la prise de terre.</td>
<td>L202 (Bobine Osc.)</td>
</tr>
<tr>
<td>8</td>
<td>sans signal</td>
<td>610 kHz (400 Hz Modulat., 30%)</td>
<td>Branchez le voltmètre à courant continu entre 121 et la prise de terre.</td>
<td>CT202 (Trimmer Osc.)</td>
</tr>
<tr>
<td>9</td>
<td>Brancher l'AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)</td>
<td>1500 kHz (400 Hz Modulat., 30%)</td>
<td>Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.</td>
<td>CT201 (Trimmer Ant.)</td>
</tr>
<tr>
<td>10</td>
<td>sans signal</td>
<td>1500 kHz</td>
<td></td>
<td>VR136 (Frequency meter)</td>
</tr>
<tr>
<td>11</td>
<td>Brancher sur la prise d'antenne FM à travers une antenne fictive FM. (Appliquer 16 dB à la borne de l'antenne.)</td>
<td>100.1 MHz (modulé à 100% par 400 Hz)</td>
<td>100.1 MHz</td>
<td>Branchez un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.</td>
</tr>
<tr>
<td>12</td>
<td>Brancher sur la prise d'antenne FM à travers une antenne fictive FM. (Signal monosous- tique).</td>
<td>100.1 MHz (Non modulé)</td>
<td>100.1 MHz</td>
<td>Branchez le compteur de fréquences à la borne 16 R25 par l'intermédiaire d'une résistance de 100kΩ</td>
</tr>
<tr>
<td>13</td>
<td>Brancher sur la prise d’antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)</td>
<td>100.1 MHz (modulé à 100% par 400 Hz) (Mode G)</td>
<td>100.1 MHz</td>
<td>Branchez un distorsionmètre sur les bornes de haut-parleur de l'appareil.</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REGLAGE DU FREQUENCEMETRE ANALOGIQUE AM-RF ET AM.**

**REGLAGE DU SEUIL DU SILENCEUX D'ACCORD**

**REGLAGE (VCO) PILOTE MULTIPLEX FM**

**REGLAGE DE LA DISTORSION STEREO**

1. Placer le commutateur de réglage silencieux de FM/mode FM sur "off/mono".
2. Avec le commutateur de mode/réglage silencieux, FM réglé sur la position "on/auto", régler le VR101 de telle sorte que la sortie fasse avec le réglage silencieux en position déclenchée.

1. Placer le commutateur de réglage silencieux de FM/mode FM sur "on/mono".
2. Régler VR301 de telle sorte que la fréquence de sortie de 100kΩ soit de 19 kHz ± 30 Hz.

1. Placer le commutateur de réglage silencieux de FM/mode FM sur "on/auto".
2. Régler le T1 déjà réglé à ± 90° de la position prééglée du rouet de telle sorte que la distorsion du canal gauche soit minimale.
### ADJUSTMENT POINTS

- **Amplifier adjustment**

- **FM/AM tuner adjustment**

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#### TABLE: REGLAGE DE LA SEPARATION DES CANAUX

<table>
<thead>
<tr>
<th>BRANCHEMENT</th>
<th>FREQUENCE D'AFFICHAGE PAR PREREGLAGE</th>
<th>PREPARATIONS</th>
<th>ELEMENTS REGLES</th>
<th>PROCEDURE DE REGLAGE</th>
</tr>
</thead>
</table>
| 14          | 100.1 MHz (modulé à 100% par 400 Hz) (Modèle G ou D) | VR302 (Normal IF Separation) | VR303 (Narrow IF Separation) | 1. Interrupteur de gamme FM-IF...normal.  
2. Placez le commutateur de réglage silencieux du FM mode FM sur "on/off".  
3. Régler VR302 de telle sorte que la sortie droite soit minimale quand la commande d'accord téléphonique est dans le mode gauche (modulation du canal gauche) et que la sortie gauche soit minimale dans mode droit. |

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#### DIAGRAMS:

- **[Fig. 11]** Abb. 1

- **[Fig. 14]** Abb. 4

- **[Fig. 13]** Abb. 3

- **[Fig. 12]** Abb. 2

- **[Fig. 15]** Abb. 5

- **[Fig. 16]** Abb. 6

- **[Fig. 17]** Abb. 7
Terminal guide of transistors, diodes and IC's:

- **SVJ4040**: SWK 8040
- **SVJ4057**: SVJ4057
- **SVJ4059**: SVJ4059
- **SVJ4105**: SVJ4105
- **SVJ4115**: SVJ4115
- **SVJ4135**: SVJ4135
- **SVJ4145**: SVJ4145
- **SVJ4155**: SVJ4155
- **SVJ4175**: SVJ4175
- **SVJ4195**: SVJ4195

- **SVJ4205**: SVJ4205
- **SVJ4215**: SVJ4215
- **SVJ4235**: SVJ4235
- **SVJ4255**: SVJ4255
- **SVJ4275**: SVJ4275
- **SVJ4295**: SVJ4295

- **SVJ4305**: SVJ4305
- **SVJ4315**: SVJ4315
- **SVJ4335**: SVJ4335
- **SVJ4355**: SVJ4355
- **SVJ4375**: SVJ4375
- **SVJ4395**: SVJ4395

- **SVJ4405**: SVJ4405
- **SVJ4415**: SVJ4415
- **SVJ4435**: SVJ4435
- **SVJ4455**: SVJ4455
- **SVJ4475**: SVJ4475
- **SVJ4495**: SVJ4495

- **SVJ4505**: SVJ4505
- **SVJ4515**: SVJ4515
- **SVJ4535**: SVJ4535
- **SVJ4555**: SVJ4555
- **SVJ4575**: SVJ4575
- **SVJ4595**: SVJ4595

- **SVJ4605**: SVJ4605
- **SVJ4615**: SVJ4615
- **SVJ4635**: SVJ4635
- **SVJ4655**: SVJ4655
- **SVJ4675**: SVJ4675
- **SVJ4695**: SVJ4695

- **SVJ4705**: SVJ4705
- **SVJ4715**: SVJ4715
- **SVJ4735**: SVJ4735
- **SVJ4755**: SVJ4755
- **SVJ4775**: SVJ4775
- **SVJ4795**: SVJ4795

- **SVJ4805**: SVJ4805
- **SVJ4815**: SVJ4815
- **SVJ4835**: SVJ4835
- **SVJ4855**: SVJ4855
- **SVJ4875**: SVJ4875
- **SVJ4895**: SVJ4895
null