

Service Manual

AM/FM Stereo Radio with Double
Cassette Tape Deck and Record Player

Stereo Music System

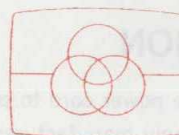
SG-D15

Color

(K) ... Black Type



Color	Area
(K)	[EX] ... Continental Europe



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SPECIFICATIONS

■ AMPLIFIER SECTION

MPO	2 x 10W (THD 10%, 4Ω)
Input sensitivity and impedance	
CD	250 mV/22kΩ
MIC	1.5 mV/1.5kΩ
Graphic equalizer	100 Hz, 330 Hz, 1 kHz, 3.3 kHz, 10 kHz, ±10 dB
Loudness control (volume at -30dB)	100 Hz, +6dB
Load impedance	4Ω ~ 16Ω

■ FM TUNER SECTION

Frequency range	87.5 ~ 108 MHz
Sensitivity	25.2 dBf (5 μV IHF, 58)
S/N 26dB	3.8 μV (40 kHz mod, 75Ω)
Total harmonic distortion (1kHz)	
MONO	0.3%
STEREO	0.5%
S/N	
MONO	60dB (65dB, IHF)
Image rejection at 98 MHz	35dB
Stereo separation	
1 kHz	35dB
Antenna terminals	75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	527 ~ 1605 kHz
Sensitivity (for 50mW)	250 μV/m (1000 kHz)

■ PHONO SECTION

Player system	Belt Drive Automatic Turntable
Phono motor	DC servo motor

Turntable size

28 cm

Turntable speeds

33-1/3 rpm, 45 rpm

Cartridge type

ceramic

(Part No. EPC-13STH)

Stylus

sapphire

(Part No. EPS-41ST)

Stylus pressure

5.5 g

■ CASSETTE DECK SECTION

Deck system	Auto-Stop Double Cassette System
Track system	4-track, 2-channel
Heads	
PLAY	Solid Permalloy head
REC/PLAY	Solid Permalloy head
Erasing	Double-gap ferrite head
Motors	DC servo motor
Recording system	AC bias
Erasing system	AC erase
Tape speed	4.8 cm/sec. (1-7/8 ips)
Frequency response	
NORMAL	50 Hz ~ 12 kHz (DIN)
S/N	50 dB (A-WTD)
Wow and flutter	0.15% (WRMS)

■ GENERAL

Power consumption	32W
Power supply	AC 50 Hz/60 Hz, 220V
Dimensions (W x H x D)	380 x 320 x 352 mm (14-31/32" x 12-17/32" x 13-27/32")
Weight	5.0 kg (11.0 lb.)

Specifications are subject to change without notice for further improvement.

Weight and dimensions shown are approximate.

Panasonic®

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P.O. Box 288, Central Osaka, Japan

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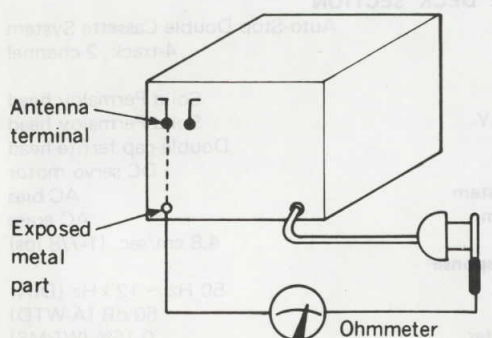
SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

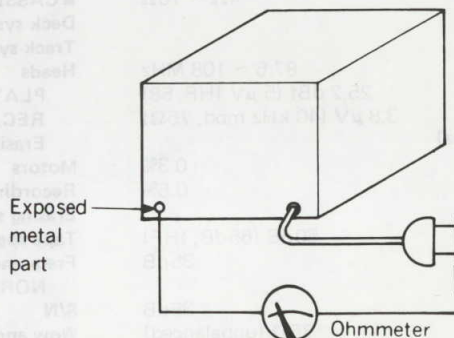
INSULATION RESISTANCE TEST

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between $3\text{M}\Omega$ and $5.2\text{M}\Omega$ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A) Resistance = $3\text{M}\Omega$ - $5.2\text{M}\Omega$



(Fig. B) Resistance = Approx. ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

SG-D15

AM/FM Stereo Radio with Double Cassette Tape Deck and Record Player

DEUTSCH

■ TECHNISCHE DATEN

(Die technischen Daten können infolge von Verbesserungen ohne Ankündigung geändert werden.)

■ VERSTÄRKERTEIL

MPO	2 x 10W (THD 10%, 4Ω)
Eingangsempfindlichkeit und-impedanz	
CD	250 mV/22 kΩ
Micro (MIC)	1,5 mV/1,5 kΩ
Frequenzang Equalizer	
100Hz, 330Hz, 1kHz, 3,3kHz, 10kHz, ±10dB	
Gehörhörige Lautstärkekorrektur (Loudness)	
(bei -30dB Ausgangsleistung) 100Hz, +6dB	
Lautsprecherimpedanz	4Ω ~ 16Ω

■ UKW-TUNERTEIL

Wellenbereich	87,5 ~ 108 MHz
Eingangsempfindlichkeit	
25,2 dBf (5 μV IHF, 58)	
S/R 26dB	3,8 μV (40 kHz mod. 75Ω)
Gesamtklirrfaktor (1 kHz)	
Mono	0,3%
Stereo	0,5%
Geräuschabstand	
Mono	60dB (65dB nach IHF)
Spiegelfrequenz-Dämpfung bei 98 MHz	35dB

Übersprechdämpfung

1 kHz	35dB
Antennenanschluß	75Ω (unsymmetrisch)

■ MW-TUNERTEIL

Wellenbereiche	527 ~ 1605 kHz
Eingangsempfindlichkeit (für 50 mW)	
250 μV/m (1000 kHz)	

■ PLATTENSPIELERTEIL

Plattenspielermotor	Riemenantrieb
Plattenspielermotor	
Electronisch gesteuerter Gleichstrommotor	
Plattenteller	28 cm
Plattentellerdrehzahl	
33-1/3 U/min. und 45 U/min.	

Tonabnehmer

Keramischer Tonabnehmer (EPC-13STH)	
Abtastnadel	Saphir-Spitze (EPS-41ST)
Auflagekraft der Abtastnadel	5,5 g

■ TONBANDTEIL

Typ	Bandendabschaltung Frontlader
Spurlage	4 Spuren/2 Kanäle

Tonkopfbestückung

Wiedergabe	Tonkopf aus Hartpermalloy
Aufnahme/Wiedergabe	
Tonkopf aus Hartpermalloy	
2-Spalt-Löschkopf aus Ferrit	
Gleichstrom-Servomotor	

Löschen

Motoren	
---------	--

Aufnahmesystem

Wechselstrom-Vormagnetisierung	
--------------------------------	--

Löschesystem	Wechselstrom-Löschung
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Bandgeschwindigkeit	4,8 cm/s (1-7/8 ips)
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Leistungsbandsbreite	
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Normal	50 Hz ~ 12 kHz (DIN)
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Max. Eingangspegelverbesserung	
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50 dB (A-WTD)	
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Gleichlaufschwankungen	0,15% (bewertet)
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■ ALLGEMEINE DATEN

Leistungsaufnahme	32 W
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Netzspannung	
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Wechselstrom 50 Hz/60 Hz, 220V	
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Abmessungen (B x H x T)	380 x 320 x 352 mm
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Gewicht	5,0 kg
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■ MESSUNGEN UND JUSTIERUNGEN

■ MW/UKW

Einstellungen der Bedienelemente und zu verwendende Geräte.

- MW/UKW-Meßsender (MW/UKW-MS)
- IF genescope
- Oszilloskop
- Elektronische Wechselstrom- und Gleichstrom-Voltmeter (EVM).
- Frequenzzähler
- Widerstand (330kΩ)

Anmerkung: Für **T203** (MW-ZFT) werden bereits justierte Ersatzteile geliefert.
Die Kerne dieser Teile daher nicht drehen.

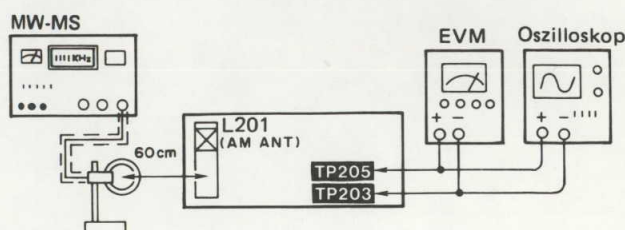
MW-HF-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Das Gerät auf "MW" einstellen.
3. Die Radiofrequenzanzeige und den Meßsender auf **510 kHz** einstellen.
4. **L203** auf maximale Ausgangsleistung abgleichen.
5. Die Radiofrequenzanzeige und den Meßsender auf **600 kHz** einstellen.
6. **L202** auf maximale Ausgangsleistung abgleichen.
7. Die Radiofrequenzanzeige und den Meßsender auf **1670 kHz** einstellen.
8. **CT204** und **CT203** auf maximale Ausgangsleistung abgleichen.
9. Die Schritte 3 – 8 wiederholen.

Anmerkung: Der Antenneneingang-Signalpegel muß so niedrig wie möglich und frei von automatischer Verstärkungsregelung (AGC) sein.

ZUSTAND DES MW-MESSENDERS

Modulation..... 30%
Modulationsfrequenz... 400 Hz



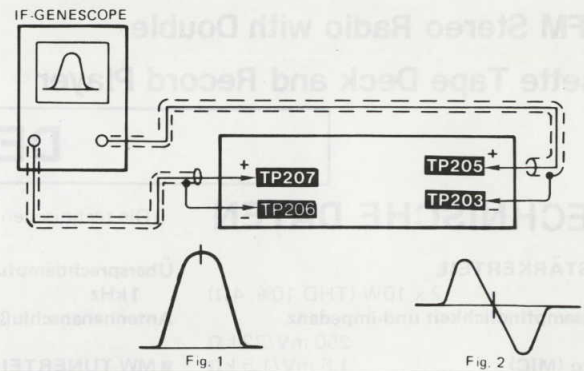
UKW-ZF-JUSTIERUNG

1. Testausrüstung wie gezeigt anschließen.
2. Gerät auf **"FM"** stellen.
3. Das Radio auf einen Punkt ohne Interferenzen abstimmen.
4. **T201** auf maximale Amplitude und symmetrische Kurve einstellen. (Siehe Abb. 1.)
5. **T202** auf maximale Amplitude und gute Linearität zwischen etwa den $\pm 100\text{kHz}$ Marken einstellen. (Siehe Abb. 2.)

HINWEIS:

Vor der Abgleichung den Kern von **T202** ganz in Gegen-
uhrzeigerrichtung drehen.

Zustand des ZF-Ablenkgenesopes:
Frequenz 10.7 MHz

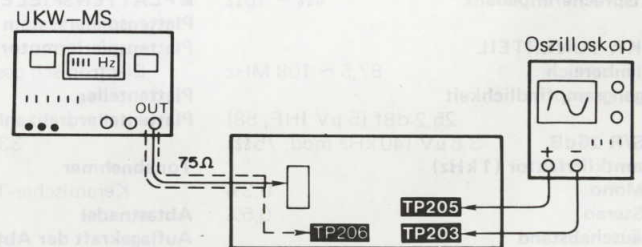


UKW-HF-JUSTIERUNG

1. Testausrüstung wie gezeigt anschließen.
2. Gerät auf **"FM"** stellen.
3. Radio und Signalgenerator auf **87.25MHz** einstellen.
4. **L205** und **L204** für maximalen Ausgang einstellen.
5. Radio und Signalgenerator auf **108.4 MHz** einstellen.
6. **CT202** und **CT201** für maximalen Ausgang einstellen.
7. Schritte 3 ~6. wiederholen.

ZUSTAND DES UKW-MESSENDERS

Modulation 100% Ausgangspegel 66dB
Modulationsfrequenz .400Hz

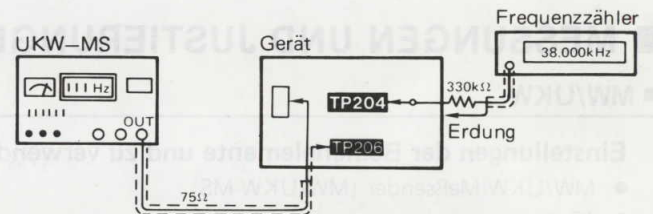


MPX-SGO-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Den UKW-Betriebsart-Wahlschalter in die **"FM/auto"**-Position stellen.
3. Radio und Meßsender auf **98.0kHz** einstellen.
4. **VR201** auf **38kHz \pm 50Hz** auf der Frequenzzähler-anzeige justieren.

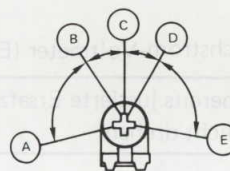
ZUSTAND DES UKW-MESSENDERS

Modulation . . 0% (mon-modulation)
Ausgangspegel 66dB



★ VERWENDUNG EINES ALTERNATIVSYSTEMS

1. Stereosignal vom Meßsender eingeben oder eine Stereo-Sendung empfangen.
2. **VR201** justieren, bis die Stereo-Anzeige aufleuchtet. Den Arm von **VR201** mit Lack sichern, wie in der Abbildung gezeigt.



A-B, D-E : Stereo AUS Position
B-D : Stereo EIN Position
(Anzeige leuchtet)
C : Punkt der Pilorschaltung justieren

MEßBEDINGUNGEN

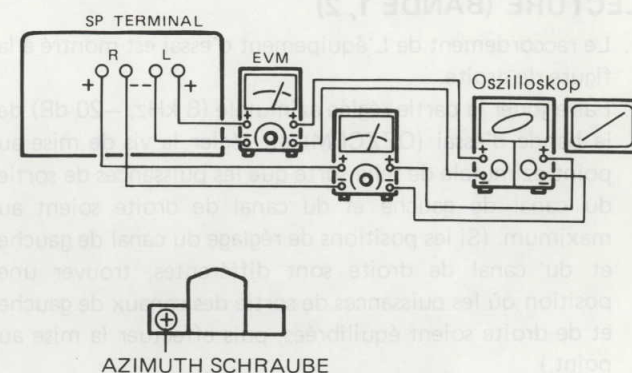
- Überprüfen, ob die Köpfe sauber sind.
- Überprüfen, ob die Bandantriebsachse und die Andruckrolle sauber sind.

TEST BAND

- Koptazimut-Justierung (8kHz, -20dB); QZZCFM
- Justierung der Bandgeschwindigkeit (3kHz, -10dB); QZZCWAT

KOPFAZIMUT-JUSTIERUNG (BAND 1, 2)

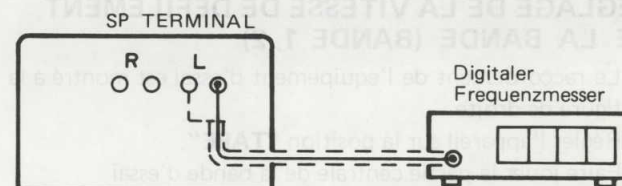
1. Die Anschlußverbindungen für die Testgeräte sind in Abbildung gezeigt.
2. Den Azimut-Justierungsteil (8kHz, -20dB) des Testbandes (QZZCFM) wiedergeben und die Winkeljustierung-Einstellschraube so verstellen, daß der Ausgang vom linken und rechten Kanal maximal wird. (Wenn die Justierpositionen für den linken und rechten Kanal verschieden sind, ist eine Position zu finden, wo der Ausgang des linken und rechten Kanals ausgeglichen ist, und dann ist die Justierung durchzuführen.)
3. Gleichzeitig eine Lissajous-Wellenform ziehen und Phasenablenkung eliminieren.
4. Nach erfolgter Justierung sind die Bandführungs-Höhen- und Winkeljustierschrauben zu sichern.



BANDGESCHWINDIGKEITS-JUSTIERUNG (BAND 1, 2)

1. Der Testaufbau ist in Abbildung gezeigt.
2. Das Gerät auf **"TAPE"** einstellen.
3. Den mittleren Teil des Testbandes (QZZCWAT) wiedergeben.
4. Den Drehwiderstand im Motor so justieren, daß die Ausgangsleistung dem Standard-Wert entspricht.

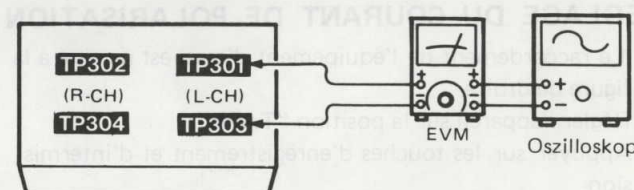
Standard-West: 3000 ± 20 Hz



INSTIERUNG DES VORMAGNETISIERUNGSSSTROMS (BAND 2)

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Das Gerät auf **"TAPE"** einstellen.
3. Die Aufnahmetaste und die Pausentaste drücken.
4. **VR401** für **4.1mV ± 0.3mV** auf Wechselstrom-EVM einstellen.

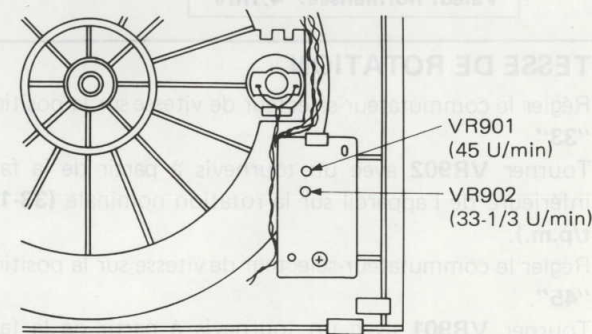
Standard-Werb: 4.1 mV



DREHZAHL

1. Den Drehzahl-Wahlschalter in die "33"-Position stellen.
2. Den Widerstand **VR902** von der Unterseite des Gerätes her mit einem Schraubendreher auf die Nenndrehzahl (**33-1/3 U/min**) einstellen.
3. Den Drehzahl-Wahlschalter in die "45"-Position stellen.
4. Den Widerstand **VR901** von der Unterseite des Gerätes her mit einem Schraubendreher auf die Nenndrehzahl (**45 U/min**) einstellen.

Hinweis: Die Einstellung für 33-1/3 U/min muß unbedingt zuerst durchgeführt werden.



FRANÇAIS

■ CARACTERISTIQUES (Sujet à changement sans preavis.)

■ SECTION AMPLIFICATEUR		Séparation stéréophonique 1 kHz		35 dB	Pistes Têtes	2 voies, 4 pistes
MPO	2 x 10W (THD 10%, 4Ω)	Bornes d'antenne	75 Ω (asymétrique)			
Sensibilité et impédance d'entrée		■ SECTION SYNTONISATEUR AM			Lecture	Tête Solid Permalloy
CD	250 mV/22 kΩ	Gamme de fréquence	527 ~ 1605 kHz		Enregistrement/Lecture	Tête Solid Permalloy
MICRO (MIC)	1,5 mV/1,5 kΩ	Sensibilité (pour 50 mW)	250 μV/m (1000 kHz)		Effacement	Tête ferrite 2 entrefers
Compensateur de fréquences	100 Hz, 330 Hz, 1 kHz, 3,3 kHz, 10 kHz, ±10 dB	■ SECTION TOURNE-DISQUE			Moteurs	Servomoteur C.C.
Compensateur physiologique		Système	Tourne-disque automatique entraîné par courroie		Système d'enregistrement	Polarisation C.A.
(volume à -30 dB)	100 Hz, +6 dB	Moteur phono			Effacement	Effacement C.A.
Impédance de charge	4 Ω ~ 16 Ω	Moteur CC à asservissement électronique			Vitesse de bande	4,8 cm/sec. (1-7/8 ips)
■ SECTION SYNTONISATEUR FM		Taille de plateau	28 cm		Réponse de fréquences	
Gamme de fréquence	87,5 ~ 108 MHz	Vitesse de rotation	33-1/3 et 45 t/mn.		Normal	50 Hz ~ 12 kHz (DIN)
Sensibilité	25,2 dBf (5 μV IHF, 58)	Cellule phonoélectrice	Céramique (EPC-13STH)		Amélioration du niveau d'entrée maximum	50 dB (A-WTD)
S/B 26 dB	3,8 μV (40 kHz mod. 75 Ω)	Pointe de lecture	Saphir (EPS-41ST)		Pleurage et scintillement	0,15% (WRMS)
Distorsion harmonique totale (1 kHz)		Plage de force d'appui	5,5 g		■ DIVERS	
MONO	0,3%	■ PLATINE CASSETTE			Consommation	32 W
STEREO	0,5%	Platine	Système cassette à arrêt automatique		Alimentation	CA 50 Hz/60 Hz, 220 V
Signal/Bruit					Dimensions (L x H x Pr)	380 x 320 x 352 mm
MONO	60 dB (65 dB, IHF)				Poids	5,0 kg
Rejection d'image à 98 MHz	35 dB					

■ MESURAGES ET REGLAGES

A.M./F.M.

Positionnements des commandes et équipement utilisé

- Générateur de signaux M.F. et A.M. (AM et FM-SG).
- IF genescope
- Analyseur de distorsion
- Oscilloscope
- Voltmètre électronique à C.A. et C.C. (EVM).
- Compteur de fréquence
- Résistance (330k Ω)

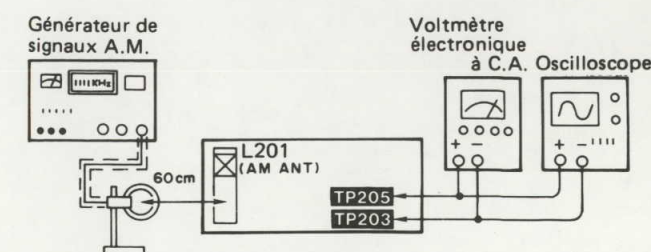
Nota: Pour **T203** (A.M.-Transf. de fréq. interm.), ajuster les éléments qui sont fournis. Aussi, ne pas tourner les noyaux de ces éléments.

REGLAGE DE RE-MW

1. Le raccordement de l'équipement d'essai est montré sur l'illustration.
2. Régler l'appareil sur la position **"MW"**.
3. Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **510 kHz**.
4. Régler **L203** pour une sortie maximale.
5. Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **600 kHz**.
6. Régler **L202** pour une sortie maximale.
7. Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **1670 kHz**.
8. Régler **CT204** et **CT203** pour une sortie maximale.
9. Répéter les étapes 3 ~ 8.

Nota: Le niveau d'entrée d'antenne doit être aussi bas que possible étant libéré de la commande automatique de gain.

CONDITION DU GENERATEUR
DE SIGNAUX A.M.
Modulation 30%
Fréquence de modulation . . 400 Hz



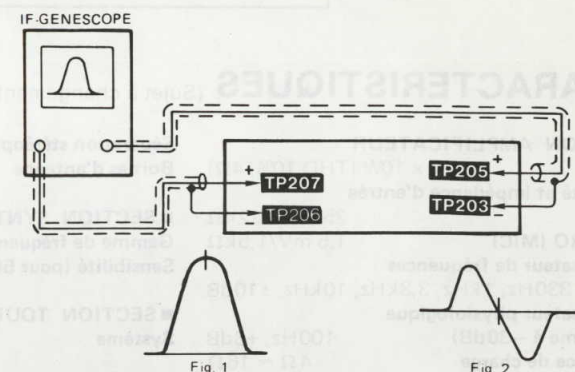
REGLAGE DE M.F.-F.I.

1. Le raccordement de l'équipement d'essai est indiqué à la figure.
2. Mettre l'appareil sur la position **"FM"**.
3. Régler le cadran radio sur le point de non interférence.
4. Régler **T201** pour obtenir une amplitude maximale et une courbe symétrique. (Se reporter à la Fig. 1)
5. Régler **T202** pour obtenir une amplitude maximale et une bonne linéarité entre les repères ± 100 kHz environ. (Se reporter à la Fig. 2)

Remarque:

Avant d'effectuer l'alignement, tourner **T202** entièrement dans le sens inverse des aiguilles d'une montre.

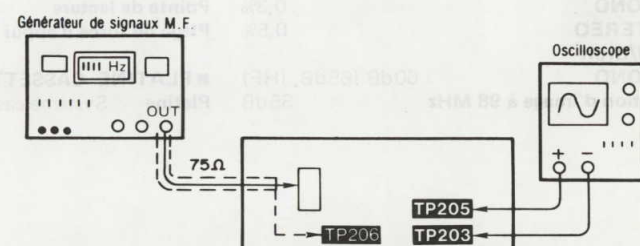
Condition du généscope IF de balayage:
Fréquence 10.7 MHz

**RÉGLAGE DE F.M.-H.F.**

1. Le raccordement de l'équipement d'essai est indiqué à la figure.
2. Mettre l'appareil sur la position **"FM"**.
3. Régler le cadran radio et le générateur de signaux sur **87.25MHz**.
4. Régler **L205** et **L204** pour obtenir une sortie maximale.
5. Régler le cadran radio et le générateur de signaux sur **108.4MHz**.
6. Régler **CT202** et **CT201** pour obtenir une sortie maximale.
7. Répéter la marche à suivre 3. ~ 6.

CONDITION DU GENERATEUR DE SIGNAUX M.F.

Modulation 100%
Fréquence de modulation . . . 400Hz
Niveau de sortie 66dB

**RÉGLAGE MULTIPLEX DE L'OSCILLATEUR COMMANDÉ PAR VARIATION DE TENSION**

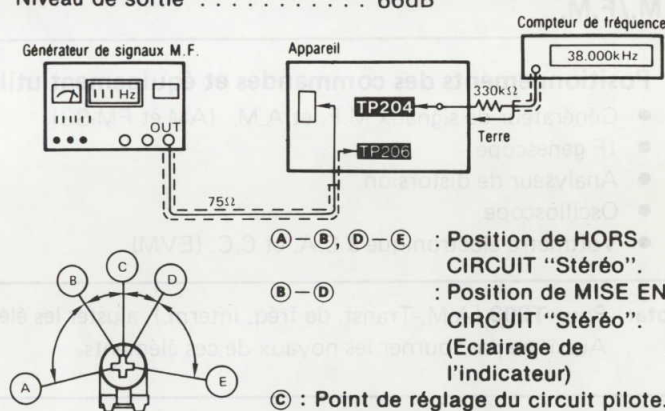
1. Le raccordement de l'équipement d'essai est montré sur la figure.
2. Régler l'appareil sur la position **"FM-auto"**.
3. Régler le cadran radio et le générateur de signaux sur **98.0 MHz**.
4. Ajuster **VR201** pour **38 kHz \pm 50 Hz** sur le compteur de lecture de fréquences.

★ EN UTILISANT UN SYSTÈME ALTERNATIF

1. Applique un signal stéréo à partir du générateur ou recevoir une émission stéréo.
2. Ajuster **VR201** jusqu'à ce que l'indicateur stéréo s'éclaire. Coller le bras de **VR201** comme il montré sur la figure.

CONDITION DU GENERATEUR DE SIGNAUX M.F.

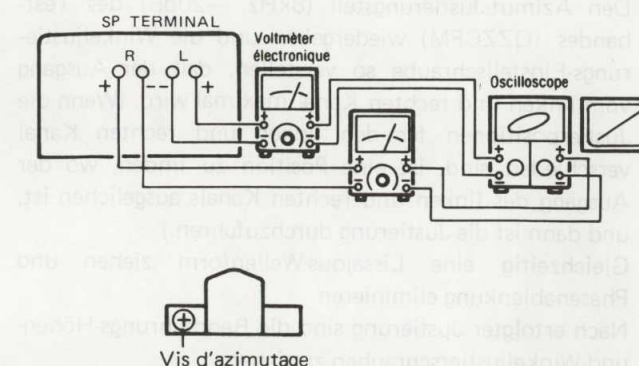
Modulation . . . 0% (mon-modulation)
Niveau de sortie 66dB

**BANDE D'ESSAI**

- Réglage de l'angle des têtes de lecture (8kHz, -20dB); QZZCFM
- Réglage de la vitesse de défilement de la bande (3kHz, -10dB); QZZCWAT

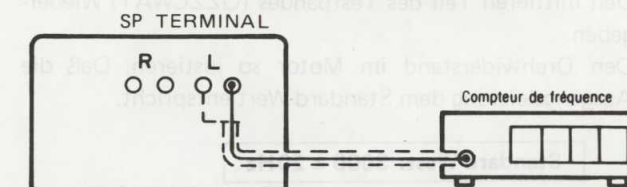
RÉGLAGE DE L'ANGLE DES TÊTES DE LECTURE (BANDE 1, 2)

1. Le raccordement de l'équipement d'essai est montré à la figure de droite.
2. Faire jouer la partie réglée azimutale (8 kHz, -20 dB) de la bande d'essai (QZZCFM) et régler la vis de mise au point azimutale de telle sorte que les puissances de sortie du canal de gauche et du canal de droite soient au maximum. (Si les positions de réglage du canal de gauche et du canal de droite sont différentes, trouver une position où les puissances de sortie des canaux de gauche et de droite soient équilibrées, puis effectuer la mise au point.)
3. En même temps, établir une forme d'onde de Lissajous et éliminer la déviation de phase.
4. Après le réglage, bloquer les vis du réglage angulaire et de la hauteur des guides de bande.

**RÉGLAGE DE LA VITESSE DE DÉFILEMENT DE LA BANDE (BANDE 1, 2)**

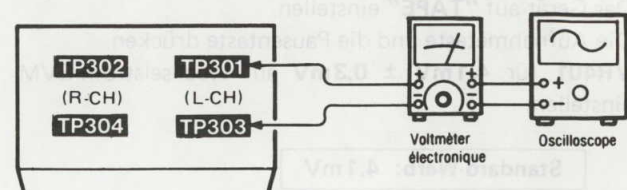
1. Le raccordement de l'équipement d'essai est montré à la figure de droite.
2. Régler l'appareil sur la position **"TAPE"**.
3. Faire jouer la partie centrale de la bande d'essai (QZZCWAT).
4. Régler **VR** dans le moteur de telle sorte que la puissance de sortie soit en deçà de la normale.

Valeur normalisée: 3000 \pm 20Hz

**RÉGLAGE DU COURANT DE POLARISATION (BANDE 2)**

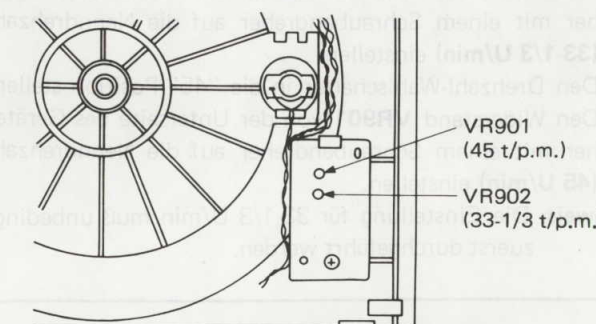
1. Le raccordement de l'équipement d'essai est montré à la figure de droite.
2. Régler l'appareil sur la position **"TAPE"**.
3. Appuyer sur les touches d'enregistrement et d'intermission.
4. Régler **VR401** sur **4.1mV \pm 0.3mV** du voltmètre électronique.

Valeur normalisée: 4.1mV

**VITESSE DE ROTATION**

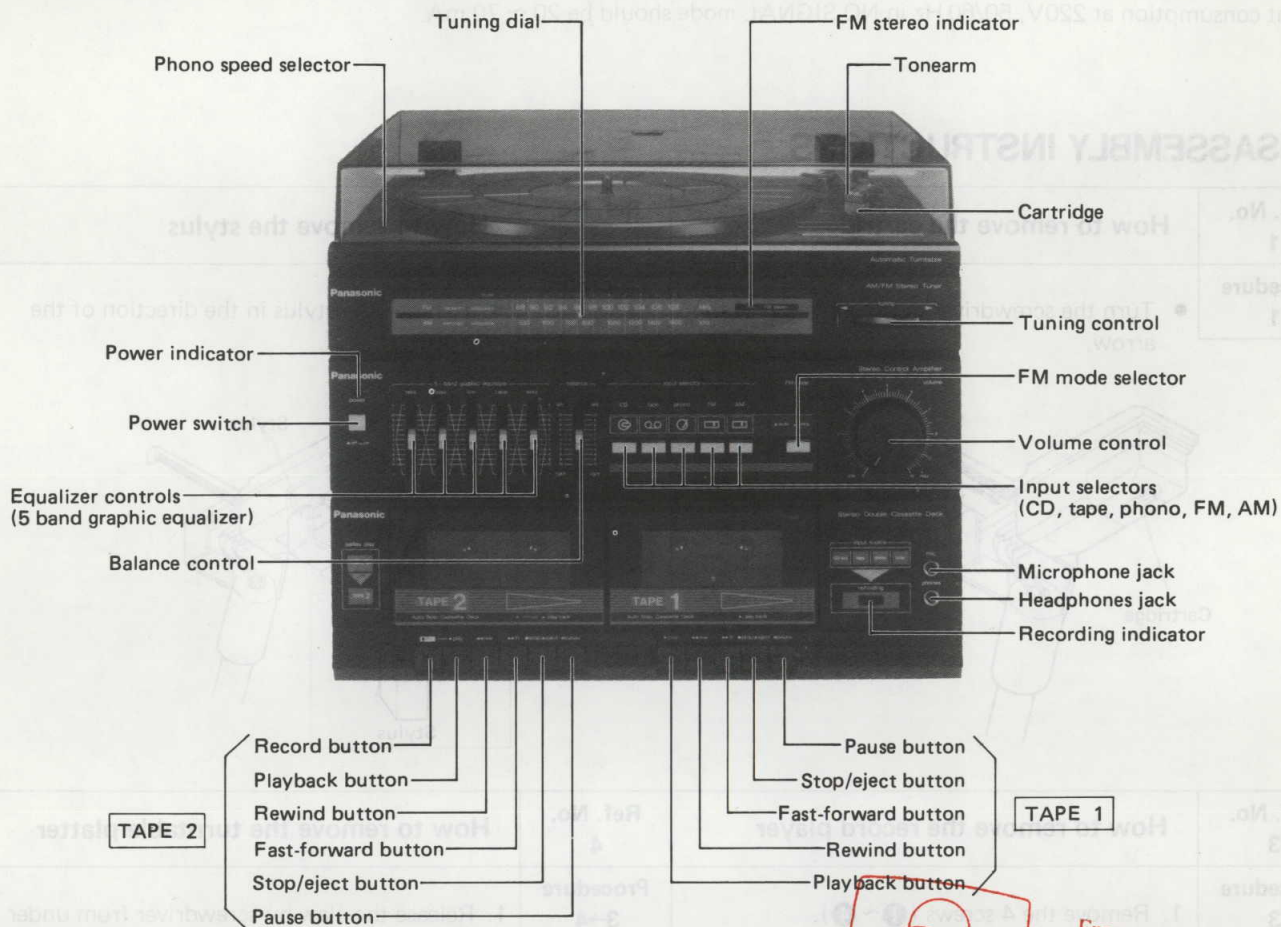
1. Régler le commutateur-sélecteur de vitesse sur la position **"33"**.
2. Tourner **VR902** avec un tournevis à partir de la face inférieure de l'appareil sur la rotation nominale (**33-1/3 t/p.m.**).
3. Régler le commutateur-sélecteur de vitesse sur la position **"45"**.
4. Tourner **VR901** avec un tournevis à partir de la face inférieure de l'appareil sur la rotation nominale (**45 t/p.m.**).

Nota: S'assurer d'effectuer tout d'abord le réglage pour 33-1/3 t/p.m.

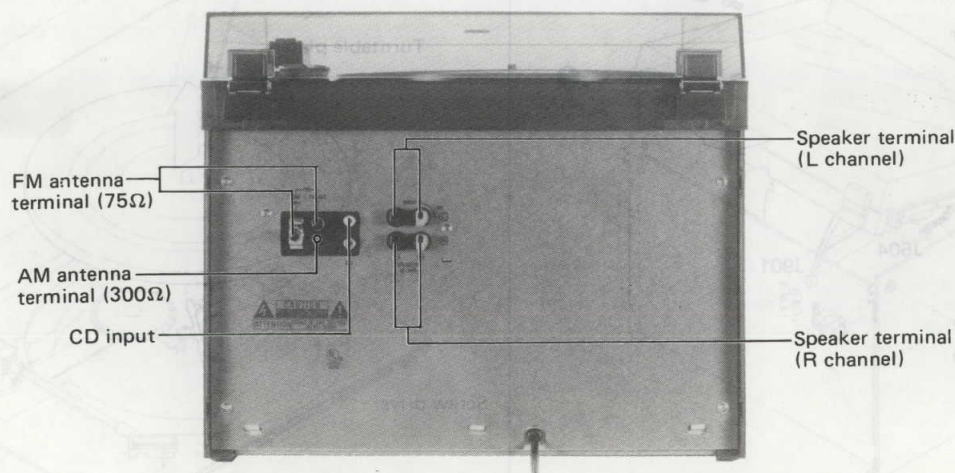


LOCATION OF CONTROLS

● Front panel



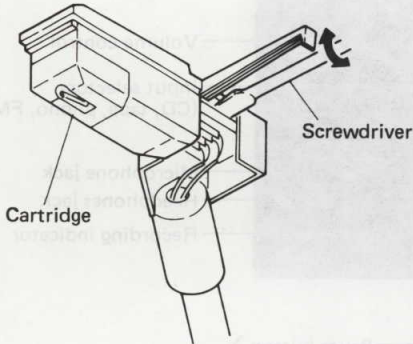
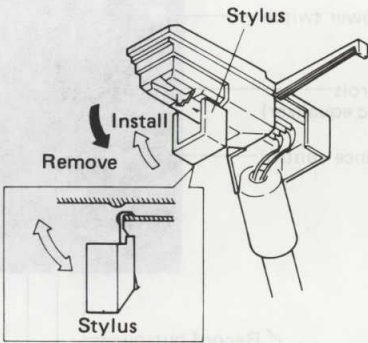
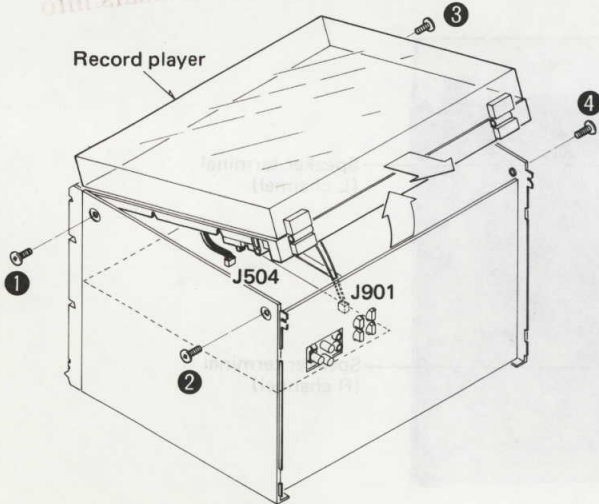
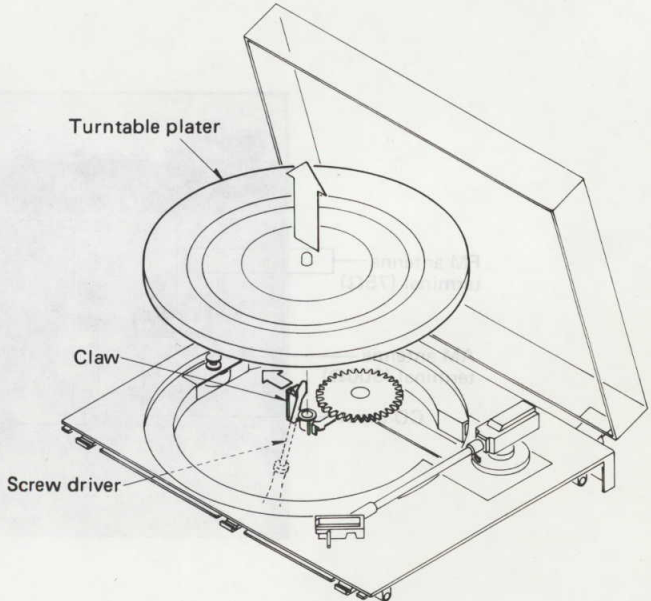
● Rear panel

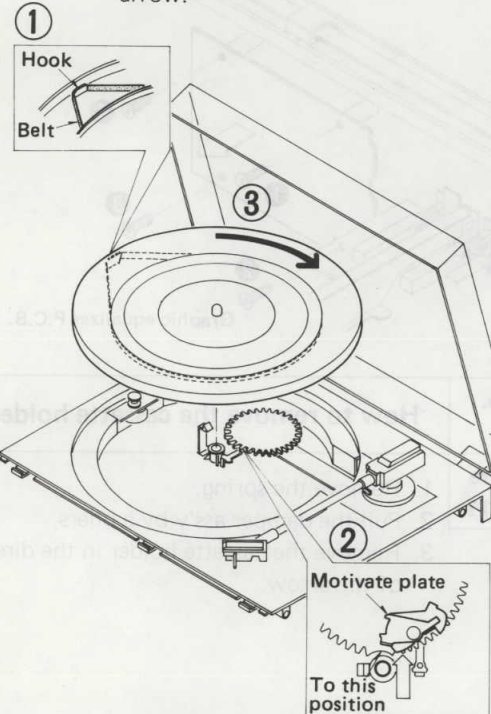
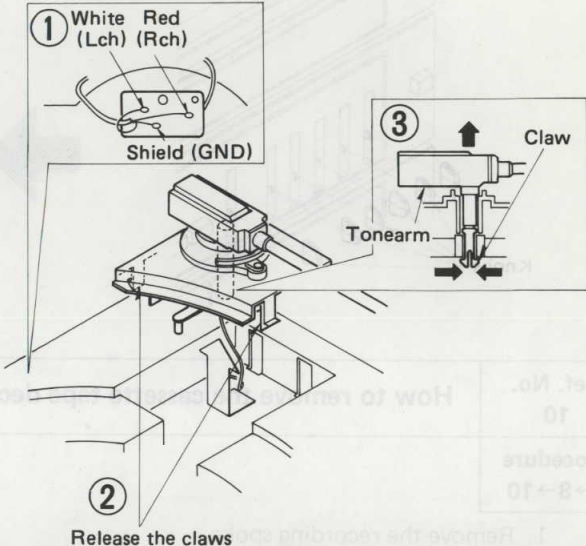
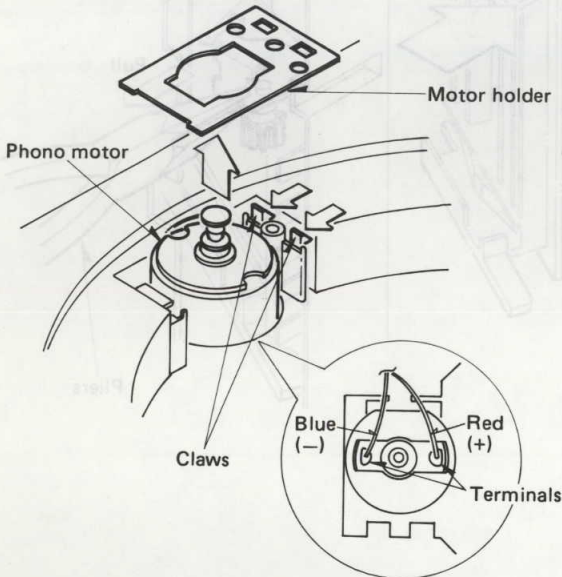
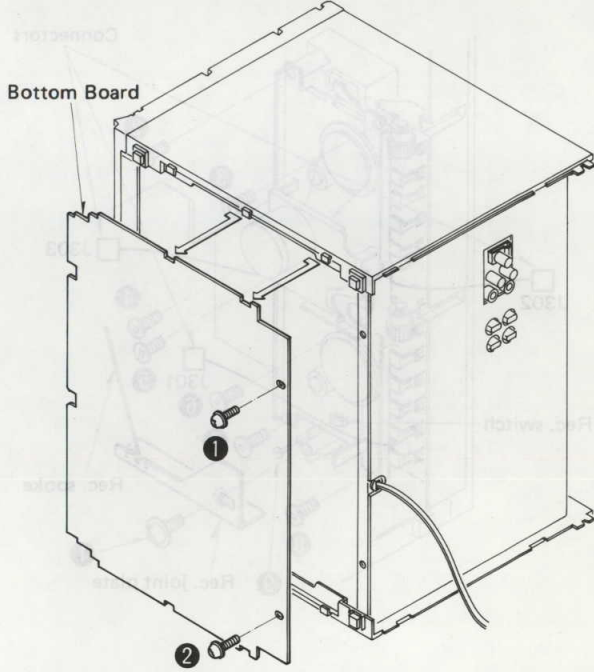


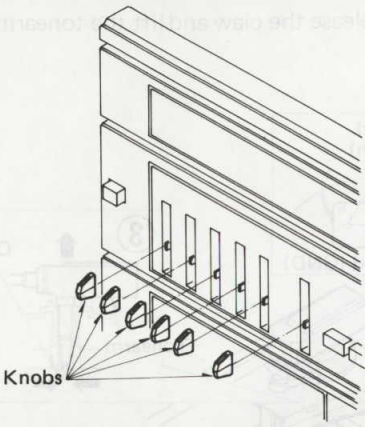
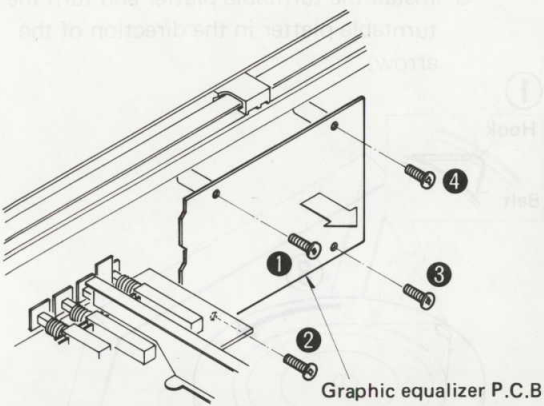
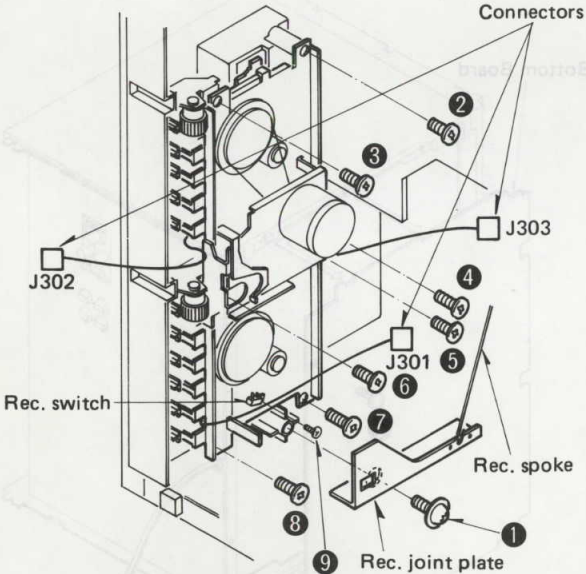
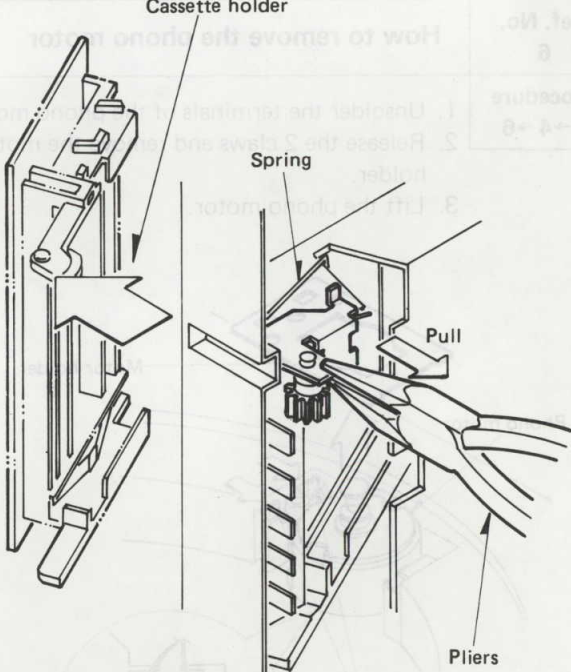
BEFORE REPAIR AND ADJUSTMENT

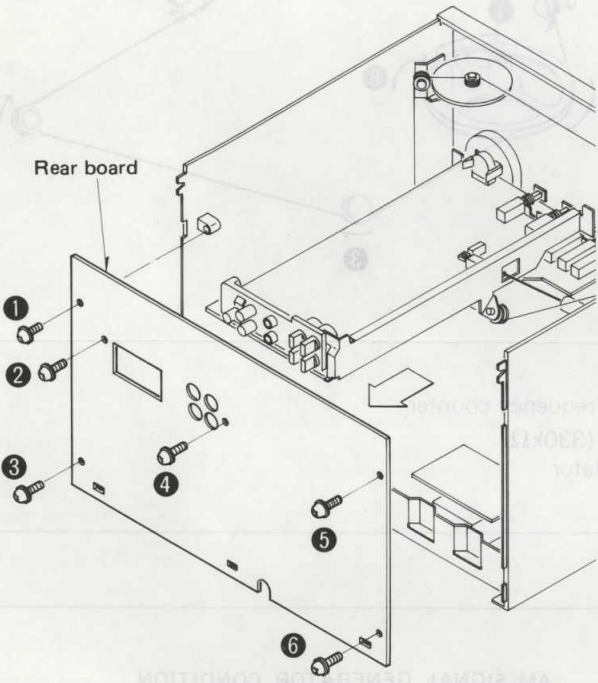
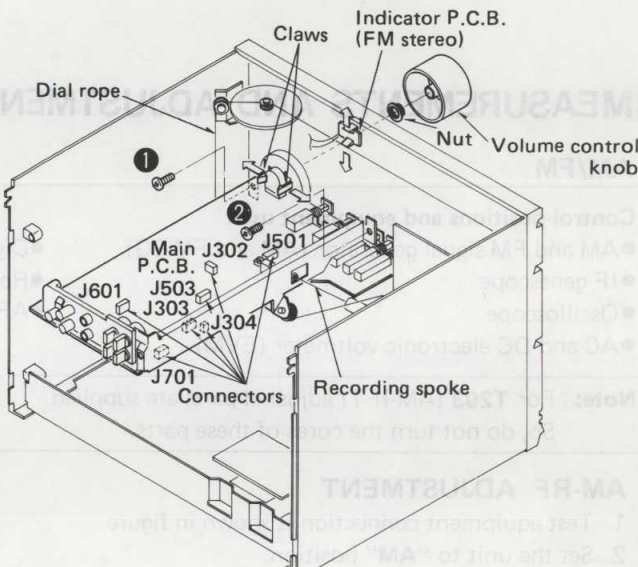
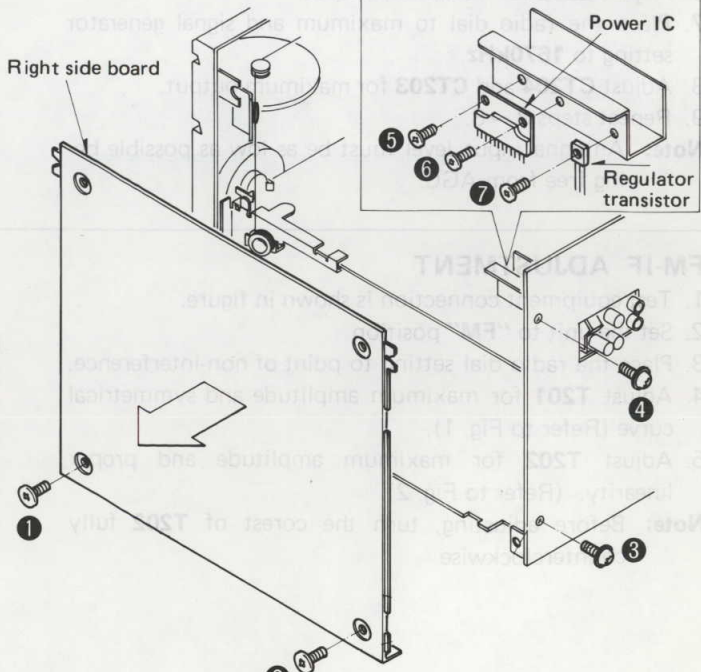
Disconnect AC power, Discharge both Power Supply Capacitor C702 through a 10 Ω , 5W resistor to ground.
DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices.
After repairs are completed, restore power gradually using a variac, to avoid overcurrent.
Current consumption at 220V, 50/60 Hz in NO SIGNAL mode should be 20 ~ 70 mA.

DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the cartridge	Ref. No. 2	How to remove the stylus
Procedure 1	<ul style="list-style-type: none"> Turn the screwdriver in the direction of the arrow. 	Procedure 2	<ul style="list-style-type: none"> Remove the stylus in the direction of the arrow.
			
Ref. No. 3	How to remove the record player	Ref. No. 4	How to remove the turntable platter
Procedure 3	<ol style="list-style-type: none"> Remove the 4 screws (1 ~ 4). Pull out the 2 connectors (J504 and J901). 	Procedure 3→4	<ol style="list-style-type: none"> Release the claw by screwdriver from under side. Lift the turntable platter.
			

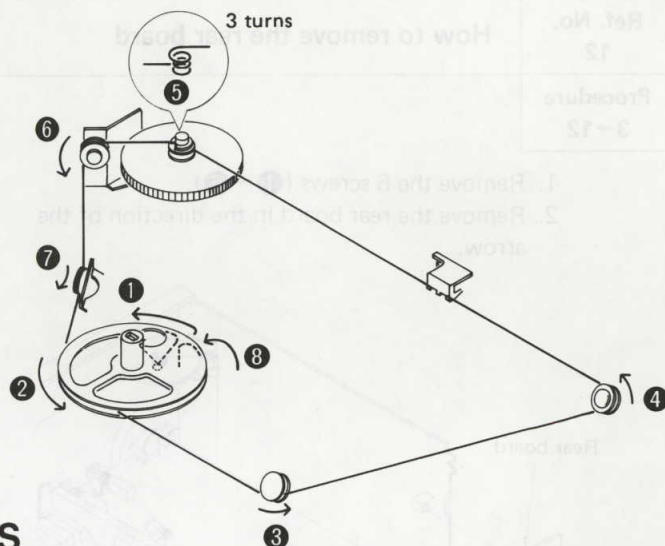
Ref. No. 5	How to install the turntable platter	Ref. No. 7	How to remove the tonearm
Procedure 3→4→5	<ol style="list-style-type: none"> 1. Fix the belt to the hook. 2. Set the motivate plate in the direction of the arrow. 3. Install the turntable platter and turn the turntable platter in the direction of the arrow. 	Procedure 3→7	<ol style="list-style-type: none"> 1. Unsolder the 3 leads. 2. Release the 2 claws and remove the tonearm base in the direction of the arrow. 3. Release the claw and lift the tonearm. 
Ref. No. 6	How to remove the phono motor	Ref. No. 8	How to remove the bottom board
Procedure 3→4→6	<ol style="list-style-type: none"> 1. Unsolder the terminals of the phono motor. 2. Release the 2 claws and remove the motor holder. 3. Lift the phono motor. 	Procedure 8	<ul style="list-style-type: none"> Remove the 2 screws (1, 2). 

Ref. No. 9	How to remove the graphic equalizer P.C.B.	
Procedure 3→9	1. Pull out the 6 knobs.	2. Remove the 4 screws (①~④). 3. Remove the graphic equalizer P.C.B.
		
Ref. No. 10	How to remove the cassette tape deck	Ref. No. 11
Procedure 3→8→10	Procedure 8→10→11	How to remove the cassette holder
1. Remove the recording spoke. 2. Remove the screw ① and remove the recording joint plate. 3. Remove the 7 screws (②~⑧). 4. Remove the screw ⑨ and remove the recording switch. 5. Remove the 3 connectors (J301~J303).		1. Remove the spring. 2. Pull the damper ass'y by a pliers. 3. Remove the cassette holder in the direction of the arrow. 

Ref. No. 12	How to remove the rear board	Ref. No. 13	How to remove main P.C.B.
Procedure 3→12	<ol style="list-style-type: none"> 1. Remove the 6 screws (①~⑥). 2. Remove the rear board in the direction of the arrow. 	Procedure 3→12→13	<ol style="list-style-type: none"> 1. Pull out the volume control knob and remove the nut. 2. Remove the dial rope. 3. Release the 2 claws and remove the indicator P.C.B. 4. Remove the recording spoke. 5. Remove the 2 screws (①, ②) 6. Pull out the 7 connectors. 
Ref. No. 14	How to remove the power IC and regulator transistor		
Procedure 3→14	<ol style="list-style-type: none"> 1. Remove the 4 screws (①~④). 2. Remove the right side board. 3. Unsolder the power IC or regulator transistor. 4. Remove the 3 screws (⑤~⑦). <ul style="list-style-type: none"> ● When mounting the power IC or regulator transistor. Apply silicone compound (SZZOL15) to the rear side of power IC or regulator transistor. 		

■ DIAL CORD INSTALLATION GUIDE

1. Prepare a fresh cord more than 140 cm length.
2. Bring the variable capacitor into a state where the drum is completely turned to the left (maximum capacity and lowest frequency for the variable capacitor.)
3. Direct the cord in the order from ① to ⑧.
4. Fix the knot of the cord with the adhesive.



■ MEASUREMENTS AND ADJUSTMENTS

● AM/FM

Control-positions and equipment used

- AM and FM signal generator (AM and FM-SG)
- IF genescope
- Oscilloscope
- AC and DC electronic voltmeter (EVM)
- Digital Frequency counter
- Resistor (330kΩ)
- AF oscillator

Note: For **T203** (AM-IFT) adjusted parts are supplied.
So, do not turn the cores of these parts.

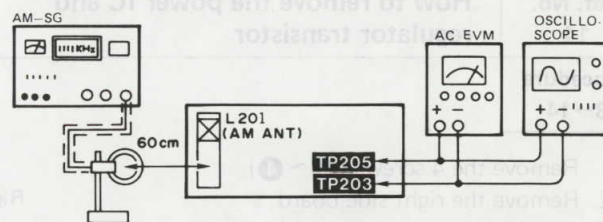
AM-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "AM" position.
3. Place the radio dial to minimum and signal generator setting to **510kHz**.
4. Adjust **L203** for maximum output.
5. Place the radio dial and signal generator setting to **600kHz**.
6. Adjust **L202** for maximum output.
7. Place the radio dial to maximum and signal generator setting to **1670kHz**.
8. Adjust **CT204** and **CT203** for maximum output.
9. Repeat steps 3 ~ 8.

Note: Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION

Modulation 30%
Modulation frequency 400 Hz



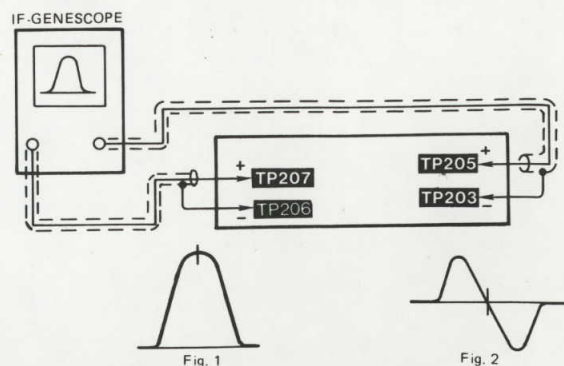
FM-IF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM" position.
3. Place the radio dial setting to point of non-interference.
4. Adjust **T201** for maximum amplitude and symmetrical curve (Refer to Fig. 1).
5. Adjust **T202** for maximum amplitude and proper linearity. (Refer to Fig. 2).

Note: Before adjusting, turn the core of **T202** fully counterclockwise.

GENESCOPE CONDITION

Frequency 10.7 MHz

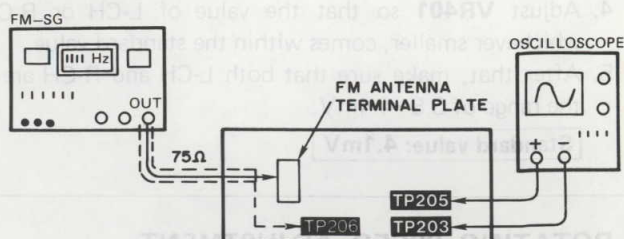


FM-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "FM" position.
3. Place the radio dial to minimum and signal generator setting to **87.25MHz**. Add weak input so that noise is included in the output waveform.
4. Adjust **L205** and **L204** so that the output waveform is vertically symmetrical.
5. Place the radio dial to maximum and signal generator setting to **108.4MHz**.
6. Adjust **CT202** and **CT201** so that the output waveform is vertically symmetrical.
7. Repeat steps 3 ~ 6.

FM SIGNAL GENERATOR CONDITION

Modulation 100%
Modulation frequency 400 Hz
Output level 66 dB

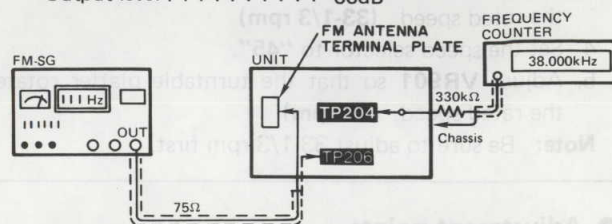


MPX VCO ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "auto" position.
3. Place the radio dial and signal generator setting to **98.0 MHz**.
4. Adjust **VR201** for **38kHz±0.1kHz** on frequency counter reading.
5. Modulate the pilot by 8% and make sure that the stereo EYE lights up.

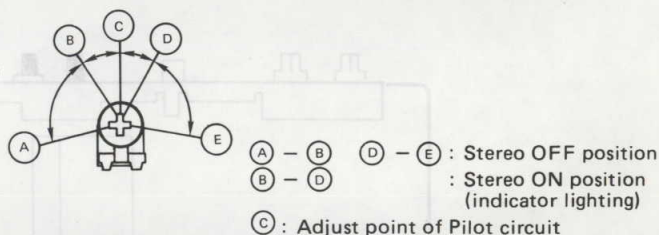
FM SIGNAL GENERATOR CONDITION

Modulation 0% (non-modulation)
Output level 66dB



★ USING ALTERNATE SYSTEM

1. Apply stereo signal from generator or receive the stereo broadcast.
2. Adjust **VR201** until stereo indicator lights up.
Cement arm of **VR201** as shown in figure.



●CASSETTE

MEASUREMENT CONDITON:

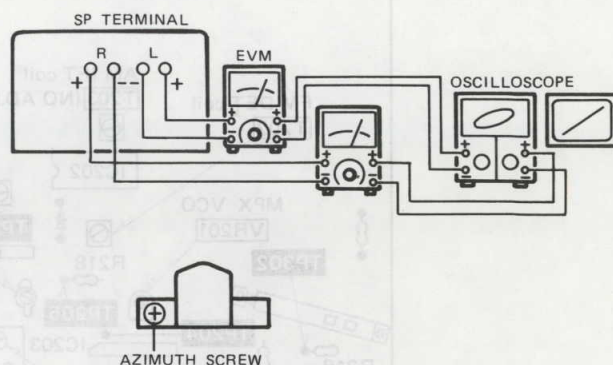
- Make sure heads are clean
- Make sure capstan and pressure roller are clean

TEST TAPE:

- Head azimuth adjustment (8kHz, -20dB): QZZCFM
- Tape speed adjustment (3kHz, -10dB): QZZCWAT

HEAD AZIMUTH ADJUSTMENT (Tape 1, 2)

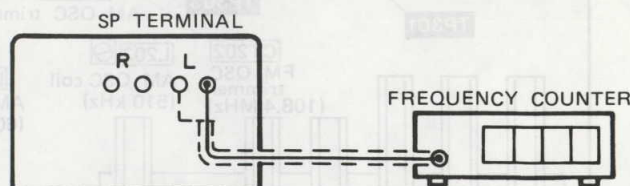
1. Test equipment connection is shown in figure.
2. Playback the azimuth adjusted part (8kHz, -20dB) of the test tape (QZZCFM) and regulate the angle adjusting screw so that the outputs of L-CH and R-CH are maximized. (When the adjusting positions are different with L-CH and R-CH, find a position where are the outputs of L-CH and R-CH are balanced, and then mark the adjustment.)
3. At the same time, draw a lissajous waveform and eliminate phase deflection.
4. After the adjustment, apply screw-lock to the angle adjusting value.



TAPE SPEED ADJUSTMENT (Tape 1, 2)

1. Test equipment connection is shown in figure.
2. Place unit into "TAPE" position.
3. Playback the middle part of the test tape (QZZCWAT).
4. Adjust the VR in the motor so that the output is within the standard.

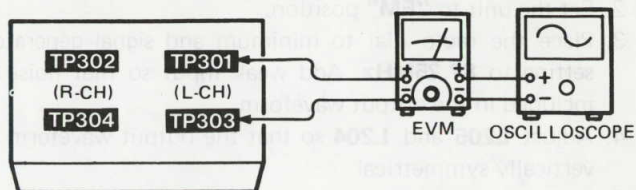
Standard value: **3000 ± 20Hz**



BIAS CURRENT ADJUSTMENT (Tape 2)

1. Test equipment connection is shown in figure.
2. Place unit into "TAPE" position.
3. Press the record button.
4. Adjust **VR401** so that the value of L-CH or R-CH, whichever smaller, comes within the standard value.
5. After that, make sure that both L-CH and R-CH are in the range of 3.8~4.4mV.

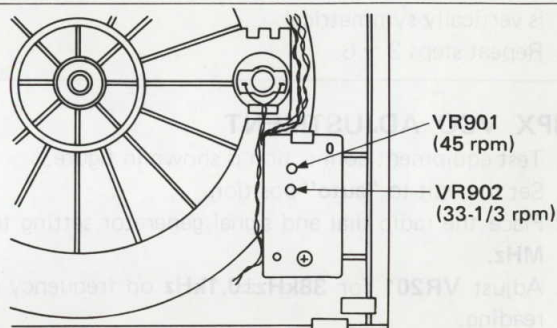
Standard value: 4.1mV



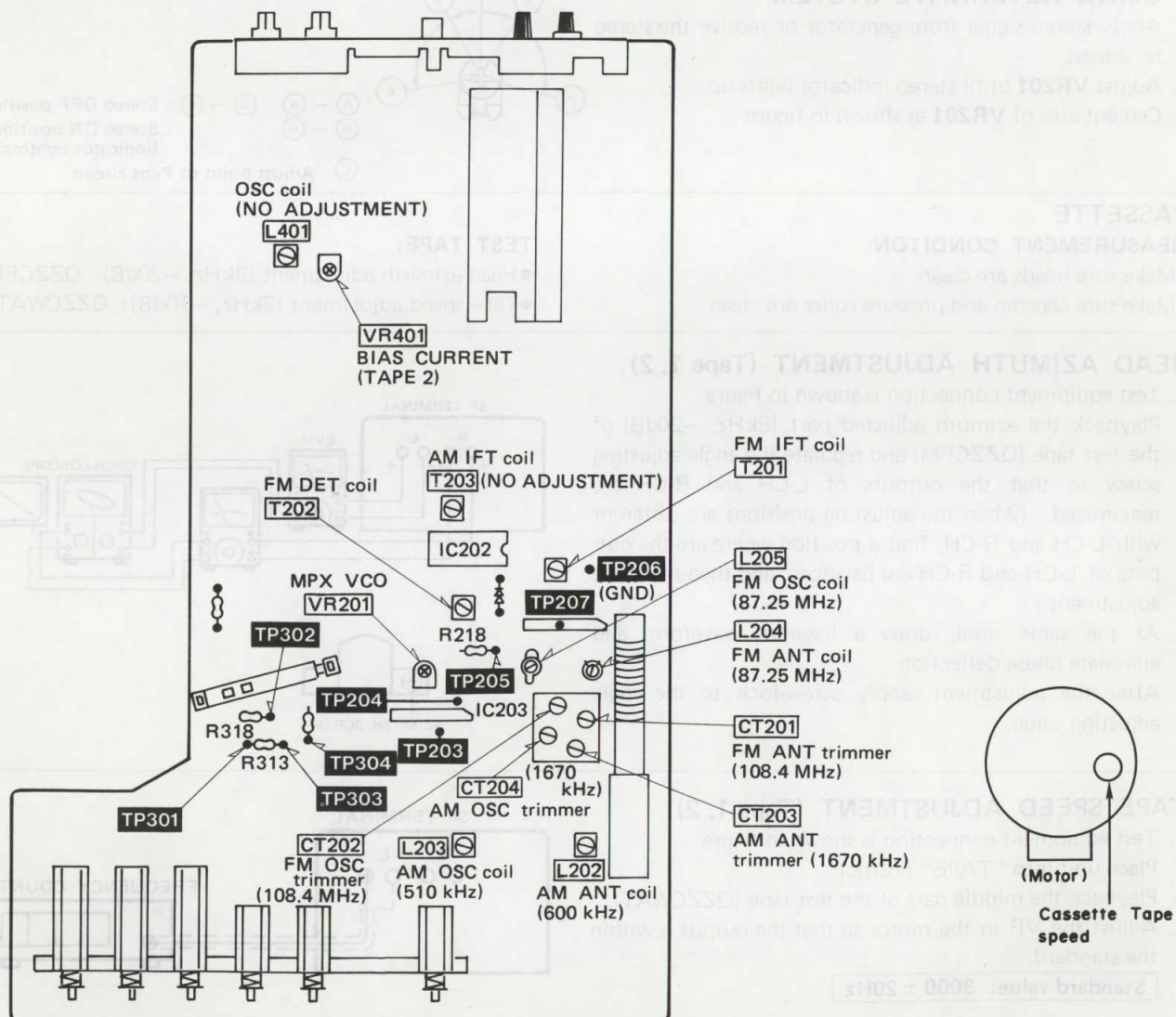
ROTATING SPEED ADJUSTMENT

1. Set the speed selector to "33".
2. Turn the power switch "on" and press the start button.
3. Adjust **VR902** so that the turntable platter rotates at the rated speed. (33-1/3 rpm)
4. Set the speed selector to "45".
5. Adjust **VR901** so that the turntable platter rotates at the rated speed. (45 rpm)

Note: Be sure to adjust 33-1/3 rpm first.



● Adjustment points



RESISTORS AND CAPACITORS

- Notes:**

 - Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
 - Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
- The unit of resistance is Ω (ohm).
K = 1000 Ω , M = 1000k Ω
 - The unit of capacitance is μ F (microfarad).
P = 10⁻⁶ μ F
 - Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Resistor Type	Wattage	Tolerance	Capacitor Type	Voltage		Tolerance
				ECEA Type	Other	
ERD : Carbon	25 : 1/4W S1 : 1/2W	G : \pm 2% J : \pm 5% K : \pm 10%	ECE ECC ECK ECQP ECGN ECFT ECQ	Electrolytic Ceramic Ceramic Polypropylene Ceramic Semiconduction Polyester	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1H : 50V 1H : 50V AC	C : \pm 0.25 μ F J : \pm 5% K : \pm 10% Z : +80%, -20% P : +100%, -0%

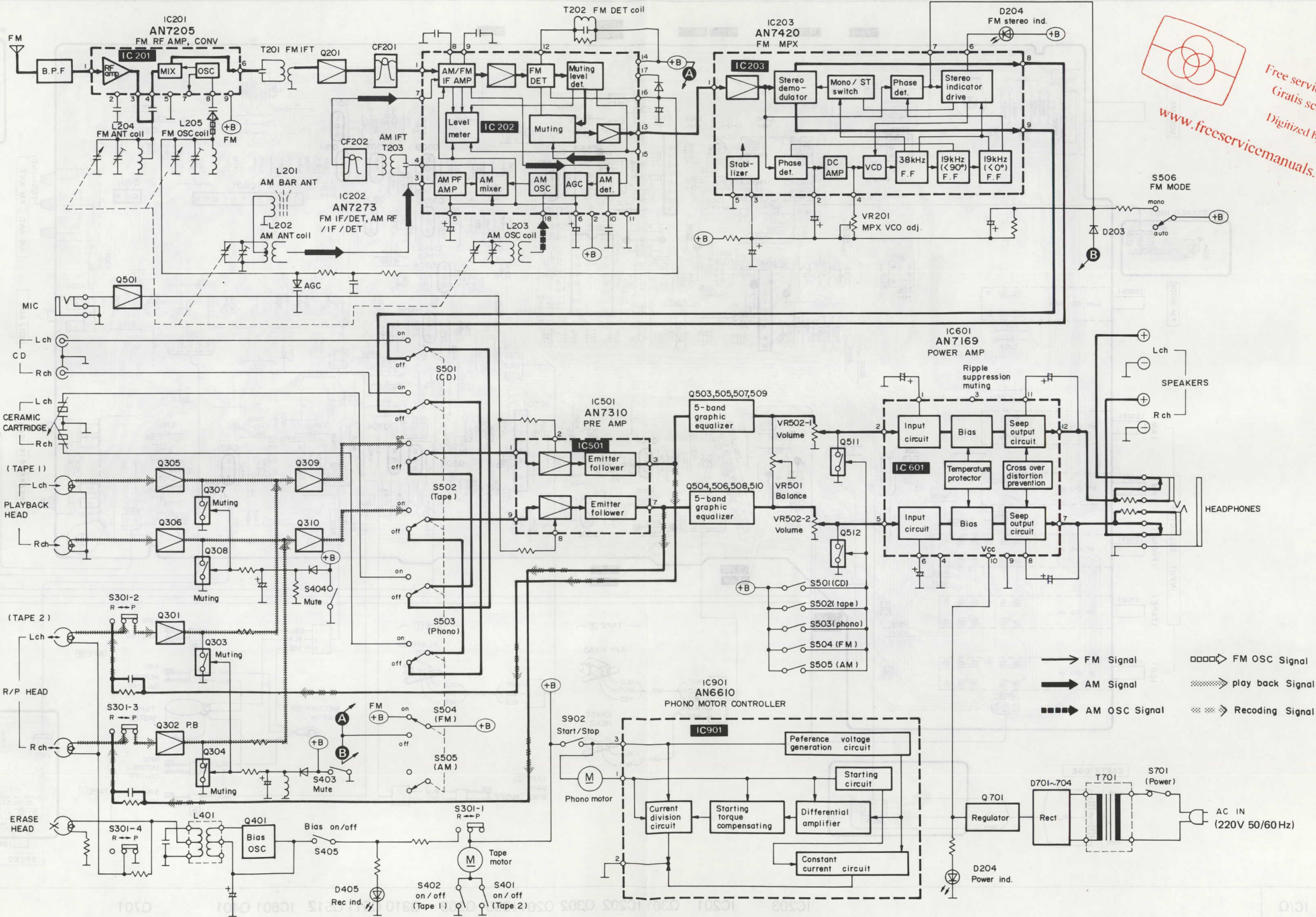
RESISTORS

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R201	ERD25FJ330	33	R307, 308	ERD25TJ153	15K	R409	ERD25FJ472	4.7K	R557, 558	ERD25FJ682	6.8K
R202	ERD25FJ470	47	R309, 310	ERD25FJ221	220	R410, 411	ERD25FJ332	3.3K	R559, 560	ERD25TJ823	82K
R203	ERD25TJ334	330K	R311, 312	ERD25TJ223	22K	R412	ERD25FJ821	82K	R561, 562	ERD25FJ471	470
R204	ERD25TJ474	470K	R313, 314	ERD25FJ100	10	R501, 502	ERD25FJ102	1K	R563, 564	ERD25FJ682	6.8K
R205	ERD25FJ222	2.2K	R315, 316	ERD25FJ561	560	R503, 504	ERD25TJ104	100K	R565, 566	ERD25TJ823	82K
R206	ERD25TJ224	220K	R317, 318	ERD25TJ183	18K	R505, 506	ERD25FJ122	1.2K	R567, 568	ERD25FJ471	470
R207	ERD25FJ101	100	R323, 324	ERD25FJ101	100	R507, 508	ERD25FJ391	39K	R569, 570	ERD25FJ682	6.8K
R208	ERD25FJ102	1K	R325, 326	ERD25TJ155	1.5M	R519	ERD25FJ221	220	R571	ERD25FJ221	220
R209	ERD25FJ821	820	R327, 328	ERD25FJ221	220	R520	ERD25FJ103	10K	R572, 573	ERD25FJ102	1K
R210	ERD25FJ222	2.2K	R329, 330	ERD25TJ153	15K	R521	ERD25FJ102	1K	R574	ERD25FJ102	1K
R211	ERD25FJ102	1K	R331, 332	ERD25TJ223	22K	R522	ERD25TJ474	470K	R576	ERD25FJ102	1K
R212	ERD25FJ470	47	R333, 334	ERD25TJ224	220K	R523	ERD25FJ472	4.7K	R577	ERD25FJ103	10K
R214	ERD25TJ105	1M	R335, 336	ERD25TJ155	1.5M	R524	ERD25FJ477	4.7	R578, 579	ERD25FJ102	1K
R215	ERD25FJ472	4.7K	R337, 338	ERD25TJ273	27K	R525, 526	ERD25TJ105	1M	R580	ERD25FJ472	4.7K
R216	ERD25FJ152	1.5K	R339, 340	ERD25FJ681	680	R527, 528	ERD25FJ822	8.2K	R581	ERD25FJ472	4.7K
R217	ERD25FJ331	330	R341, 342	ERD25FJ561	560	R529, 530	ERD25TJ223	22K	R582	ERD25FJ472	4.7K
R218	ERD25FJ181	180	R343, 344	ERD25TJ224	220K	R531, 532	ERD25FJ391	390	R601, 602	ERD25TJ563	56K
R219	ERD25FJ221	220	R345, 346	ERD25FJ472	4.7K	R533, 534	ERD25FJ103	10K	R603, 604	ERD25TJ683	68K
R220	ERD25FJ103	10K	R347, 348	ERD25FJ472	4.7K	R535, 536	ERD25FJ122	1.2K	R605, 606	ERD25FJ102	1K
R221, 222	ERD25FJ332	3.3K	R349	ERD25FJ472	4.7K	R537, 538	ERD25TJ223	22K	R607, 608	ERD25FJ271	270
R223, 224	ERD25TJ273	27K	R350, 351	ERD25FJ103	10K	R539, 540	ERD25FJ471	470	R702 Δ	ERD25FJ681	680
R225, 226	ERD25FJ222	2.2K	R401	ERD25FJ100	10	R541, 542	ERD25FJ272	2.7K	R703	ERD25FJ101	100
R227	ERD25TJ224	220K	R402	ERD25TJ180	1	R543, 544	ERD25FJ332	3.3K	R704	ERD25FJ122	1.2K
R228	ERD25FJ122	1.2K	R403	ERD25FJ100	10	R545, 546	ERD25TJ474	470K	R705	ERD25FJ477	4.7
R229	ERD25FJ821	820	R404	ERD25FJ477	4.7	R547, 548	ERD25FJ472	4.7K	R901, 902	ERD25FJ561	560
R230	ERD25FJ103	10K	R405	ERD25TJ104	100K	R549, 550	ERD25TJ334	330K	R903	ERD25FJ152	1.5K
R301, 302	ERD25TJ224	220K	R406	ERD25FJ472	4.7K	R551, 552	ERD25FJ182	1.8K	R904	ERD25FJ472	4.7K
R303, 304	ERD25FJ101	100	R407	ERD25FJ470	47	R553, 554	ERD25TJ124	120K			
R305, 306	ERD25TJ155	1.5M	R408	ERD25FJ477	4.7	R555, 556	ERD25FJ102	1K			

CAPACITORS

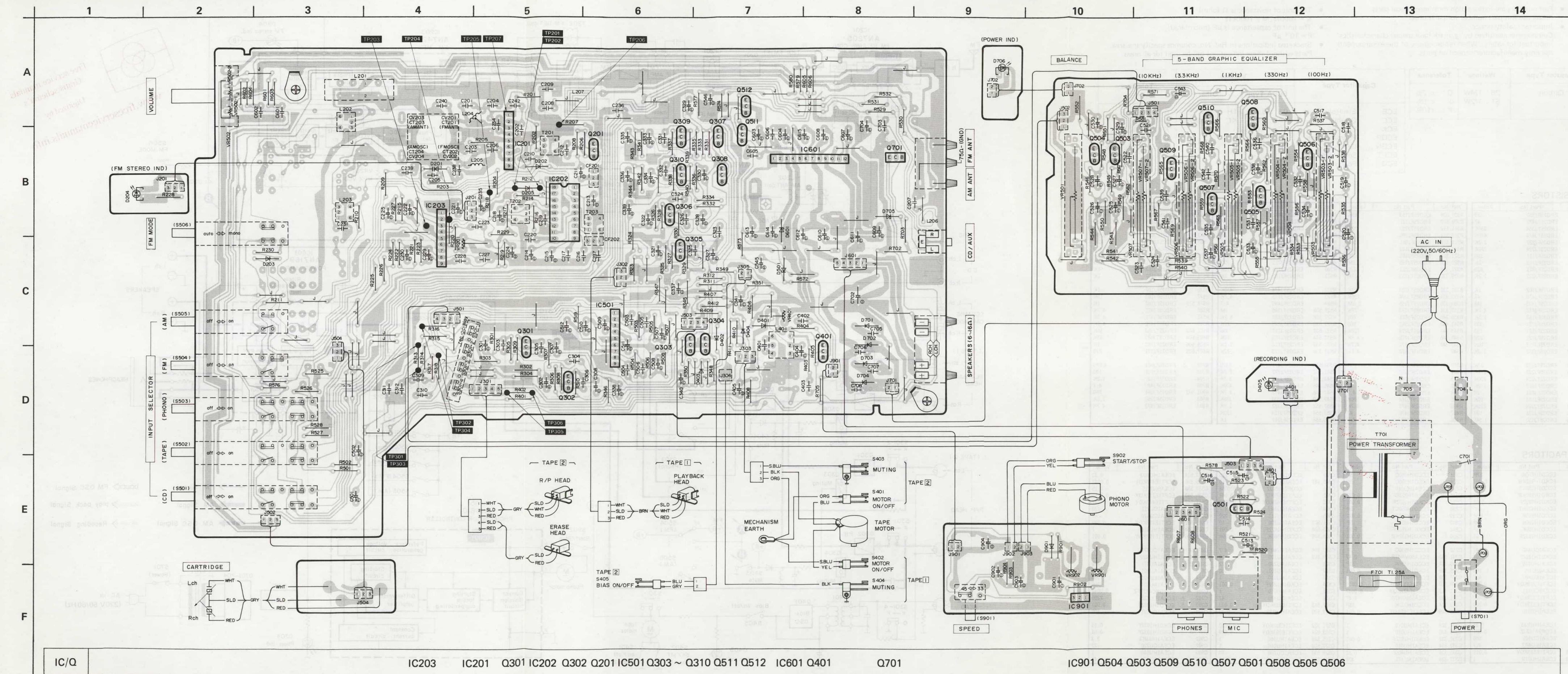
Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
C201	ECDD1H270K	27P	C231	ECDD1H050C	5P	C339	ECEA1AU221	220	C533, 534	ECEA1HUR33	0.33
C202	ECDD1H102KB	0.001	C234	ECDD1H050C	5P	C340, 341	ECEA1CU100	10	C535, 536	ECFT1E472KDY	0.0047
C203	ECDD1H150KT	15P	C235	ECEA1HU010	1	C401	ECFT1E472KDY	0.0047	C537, 538	ECFT1E472KDY	0.0047
C204	ECDD1H102KB	0.001	C236	ECDD1H223ZF	0.022	C402	ECFT1E473KDY	0.0047	C539, 540	ECFT1E152KDY	0.0015
C205	ECDD1H103ZF	0.01	C237	ECDD1H102ZF	0.001	C403	ECFT1E562KDY	0.0056	C541, 542	ECFT1E473KDY	0.0047
C206	ECDD1H470KT	47P	C238	ECDD1H050CT	5P	C404	ECEA1EU477	4.7	C543	ECEA1CU221	220
C207	ECDD1H820K	82P	C239	ECDD1H223ZF	0.022	C405	ECEA1CU221	220	C545, 546	ECEA1CU470	47
C208	ECDD1H100K	10P	C240	ECDD1H050C	5P	C601, 602	ECFT1E223KDY	0.022	C547, 548	ECFT1E223KDY	0.022
C209	ECDD1H100K	10P	C242	ECDD1H103ZF	0.01	C503, 504	ECDD1H102ZF	0.001	C603, 604	ECEA1HU010	1
C210	ECDD1H102KF	0.01	C245	ECDD1H102KB	0.001	C505, 506	ECDD1H560K	56P	C605, 606	ECFT1E102KDY	0.001
C211	ECEA1CU470	47	C252	ECDD1H030C	3P	C507, 508	ECEA1EU477	4.7	C607, 608 Δ	ECEA1CU470	47
C212	ECDD1H103ZF	0.01	C301, 302	ECEA50MR47R	0.47	C509, 510	ECEA1CU100	100	C609, 610 Δ	ECEA1HUR22	0.22
C213	ECEA1HU010	1	C303, 304	ECDD1H330K	33P	C511	ECEA1AU220	22	C611, 612 Δ	ECEA1AU471	470
C214	ECEA1HU010	100	C305, 306	ECDD1H102ZF	0.001	C512	ECEA1CU101	100	C613	ECEA1AU101	100
C215	ECEA1EU477	4.7	C307, 308	ECEA1HU010	1	C513	ECEA1EU010	100	C614	ECEA1EU101	100
C216, 217	ECFT1E223KDY	0.022	C309, 310	ECFT1E152KDY	0.0015	C514	ECDD1H102ZF	0.001	C615	ECEA1AU101	100
C218	ECEA1CU221	220	C311, 312	ECFT1E472KDY	0.0047	C515	ECEA1HU010	1	C701 Δ	ECDD1H472PFZ	0.0047
C219	ECFT1E223KDY	0.022	C321, 322	ECEA50MR47R	0.47	C516	ECEA1EU470	47	C702 Δ	ECEA1EU222	220
C220	ECFT1E333KDY	0.033	C323, 324	ECDD1H330K	33P	C517, 518	ECFT1E333KDY	0.033	C703 Δ	ECDD1H102ZF	0.001
C221	ECEA1HU010	1	C325, 326	ECFT1E102KDY	0.001	C519, 520	ECEA1HUR33	0.33	C704 Δ	ECEA1CU101	100
C222	ECEA1HUR33	0.33	C327, 328	ECEA1HU010	1	C521, 522	ECFT1E332KDY	0.0033	C705, 706 Δ	ECDD1H103ZF	0.01
C223	ECOP2A102JZ	0.001	C329, 330	ECEA1HU010	1	C523, 524	ECFT1E393KDY	0.039	C707, 708 Δ	ECDD1H103ZF	0.01
C224	ECEA1CU101	100	C331, 332	ECDD1H102ZF	0.001	C525, 526	ECEA1HUR33	3.3	C901	ECEA1HU3R3	3.3
C225	ECEA1EU477	4.7	C333, 334	ECEA1HU010	1	C527, 528	ECEA1HU010	1	C902	ECEA1CU220	22
C227, 228	ECFT1E183KDY	0.018	C335, 336	ECEA1HUR22	0.22	C529, 530	ECEA1CU100	10	C903	ECEA1HU010	1
C229, 230	ECEA1HU010	1	C337, 338	ECEA1AU471	470	C531, 532	ECFT1E562KDY	0.0056	C904	ECEA1CU470	47

BLOCK DIAGRAM



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CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

- S301-1~S301-4** : Recode/Playback selector switch in "playback" position.
- S401** : Tape 2 motor switch in "off" position.
- S402** : Tape 1 motor switch in "off" position.
- S403** : Tape 2 muting switch in "off" position.
- S404** : Tape 1 muting switch in "off" position.
- S405** : Rec inhibit (bias on/off) switch in "off" position.
- S501~S505** : Input selector switch in "FM" position.
- S506** : FM mode switch in "auto" position.
- S701** : Power switch in "on" position.
- S901** : Player speed selector switch in "33" position.
- S902** : Player start/stop switch in "stop" position.
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

* All voltage values shown in circuitry are DC voltage in FM signal (monaural signal) reception mode.

- Positive voltage lines
- AM signal
- AM OSC signal
- FM OSC signal
- FM signal
- PB signal
- AF signal
- MIC signal

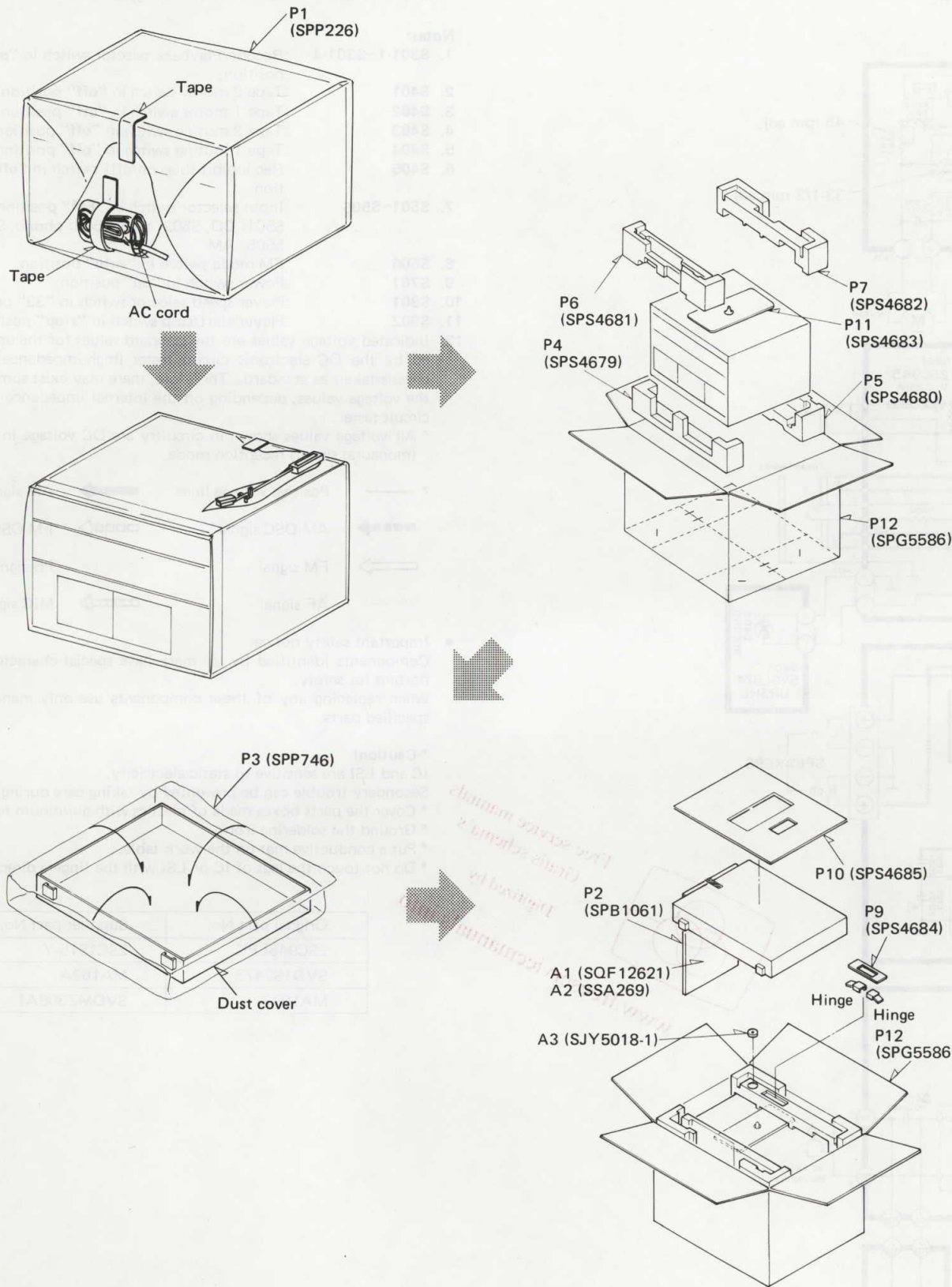
- Important safety notice:
Components identified by Δ mark have special characteristics important for safety.
When replacing any of these components use only manufacturer's specified parts.

- * Caution!**
IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
- * Cover the parts boxes made of plastics with aluminum foil.
- * Ground the soldering iron.
- * Put a conductive mat on the work table.
- * Do not touch the legs of IC or LSI with the fingers directly.

Original part No.	Supplier part No.
2SC945LPK	2SC1815-Y
SVD1S2473	MA162A
MA1082	SVDMZ308A1

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PACKING

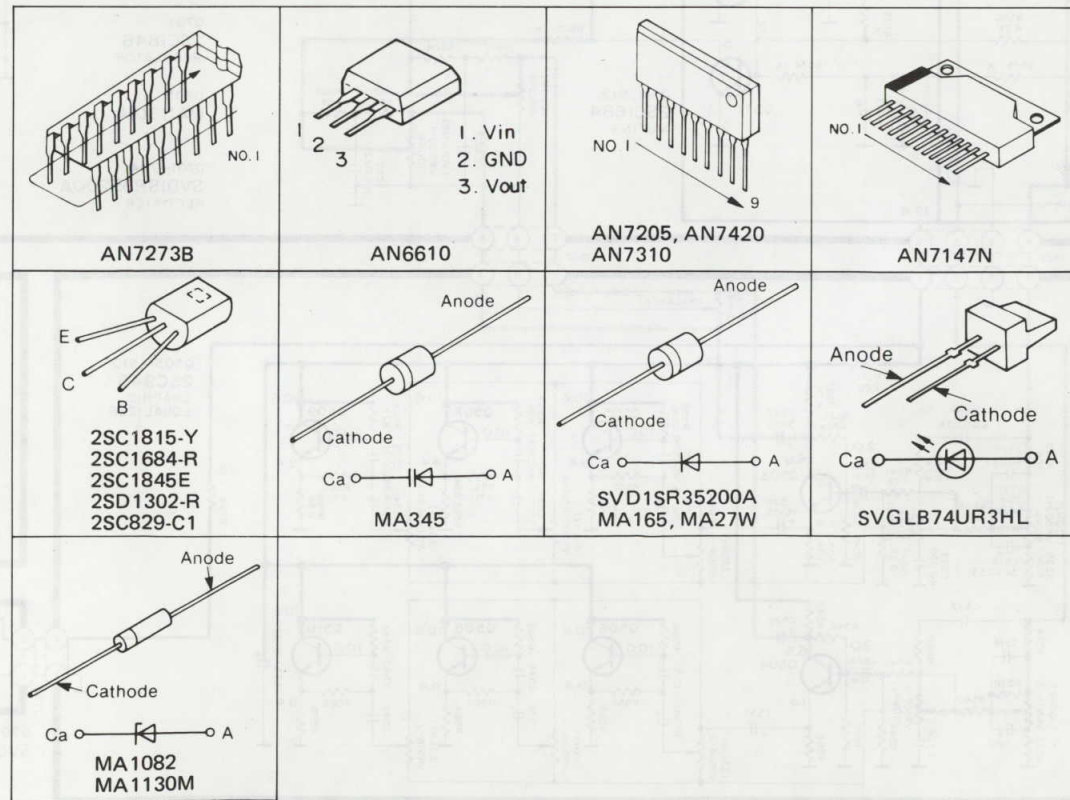


REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
INTEGRATED CIRCUITS			COILS			VARIABLE CAPACITOR		
IC201	AN7205	IC (MESA)	D402~404	MA162A	Diode	VR401	EVNK4AA00B24	Bias, 20k(B)
IC202	AN7273B	IC (MESA)	D405	SVGLB74UR3HL	L. E. D.	VR501	EWATJ3×0AG15	Balance, 100k(G) (MESA)
IC203	AN7420	IC (MESA)	D501	SVDMZ308A1	Diode	VR502	EWCTAF20A15	Volume, 100k(A)
IC501	AN7310N	IC (MESA)	D601	MA1180M	Diode	VR503	EWATA3×0AA54	G. E, 50k(A) (MESA)
IC601	AN7147N	IC (MESA)	D701~704	SVD1SR35200A	Rectifier	VR504~506	EWATA3×0AG54	G. E, 50k(A) (MESA)
IC901	AN6610	IC	D705	MA1130M	Diode	VR507	EWATA3×0AA54	G. E, 50k(A) (MESA)
TRANSISTORS			D706	SVGLB74UR3HL	L. E. D.	VR901	EVNK6AA00B13	45rpm, 1k(B)
Q201	2SC829-C1	Transistor	D901	MA162A	Diode	VR902	EVNK6AA00B23	33rpm, 2k(B)
Q301, 302	2SC1845E	Transistor	POWER TRANSFORMERS			SWITCHES		
Q303, 304	2SC945L-P	Transistor	L201	SLF6C1-0	AM Antenna (MESA)	S301	SSS165	P/R Switch
Q305, 306	2SC1845E	Transistor	L202	SLA2B7-M	AM Antenna	S401	SMQT1451	TAPE2 Motor
Q307~310	2SC945L-P	Transistor	L203	SLO2B13-M	AM OSC	S402	SMQT1451	TAPE1 Motor
Q401	2SD1302-R	Transistor	L204	SLD4N27-0	FM RF	S403	SMQT1466	TAPE2 Mute
Q501	2SC945L-P	Transistor	L205	SLO4P148-M	FM OSC (MESA)	S404	SMQT1466	TAPE1 Mute
Q503~510	2SC945L-P	Transistor	L401	SLO9215-M	Bias OSC (MESA)	S405	SMQT1615	Rec Switch (Tape 2 only)
Q511, 512	2SC1684-R	Transistor	CERAMIC FILTERS			S501~506	SSH653	Input Selector (MESA)
Q701	2SC1846-R	Transistor	T201, 202	SLI4B108-M	FM IFT	S701	SSH1071	Power Switch
DIODES			T203	SLI2B105-M	AM IFT	S901	SSS138	Phono Speed
D201	MA345	Diode	T701	SLT5K239-M	Power Transformer (MESA)	S902	SSP66	Phono Motor
D202, 203	MA162A	Diode	VARIABLE RESISTORS			FUSE		
D204	SVGLB74UR3HL	L. E. D.	CF201	SVFE107MA5	FM 10.7MHz	F701	XBA2C12TRO	250V, T.1.25A
D205	MA27W-A	Diode	CF202	SVFSFU450B3	AM 450kHz			
D401	MA27W-A	Diode						

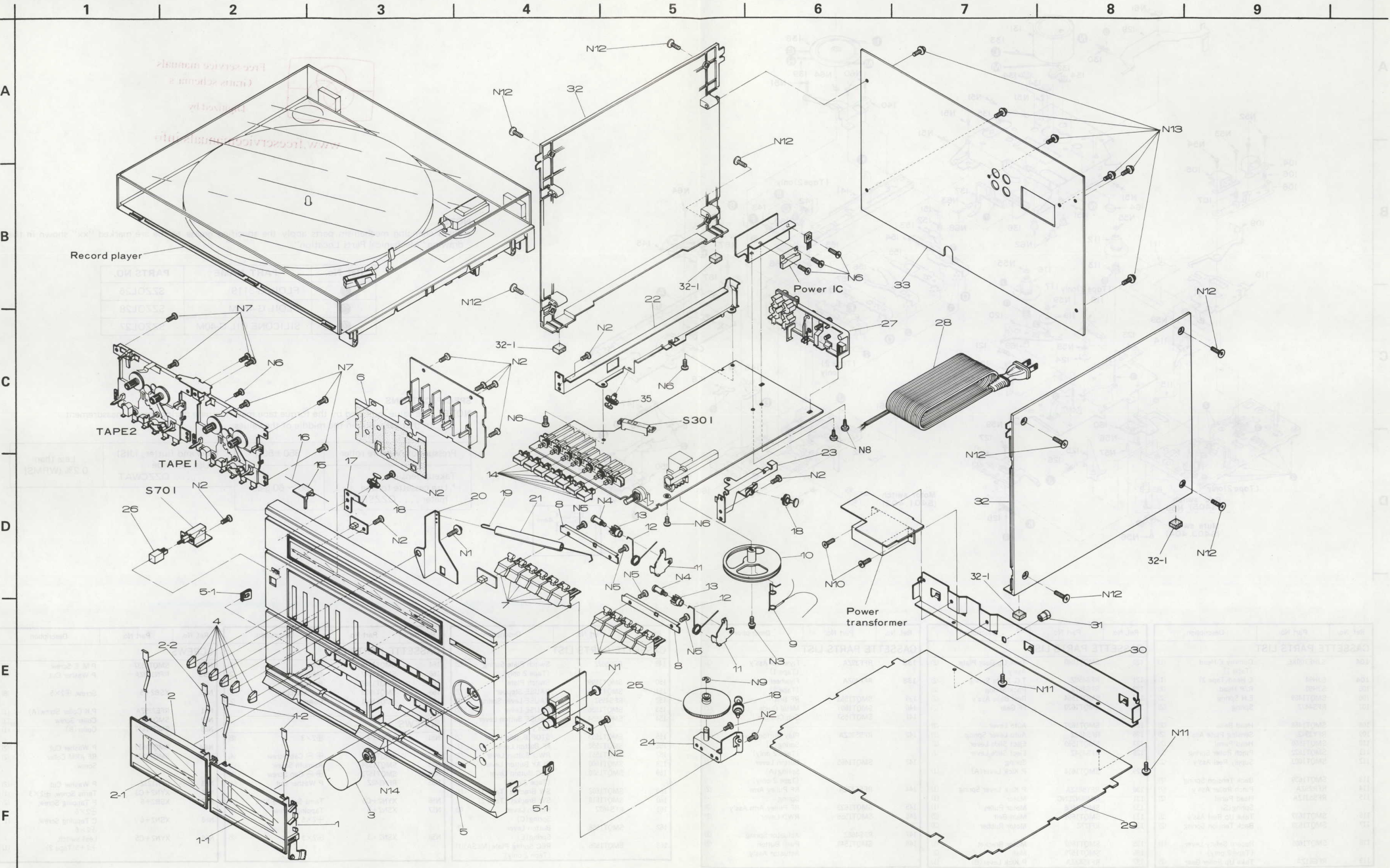
Terminal guide of IC's, transistors and diodes



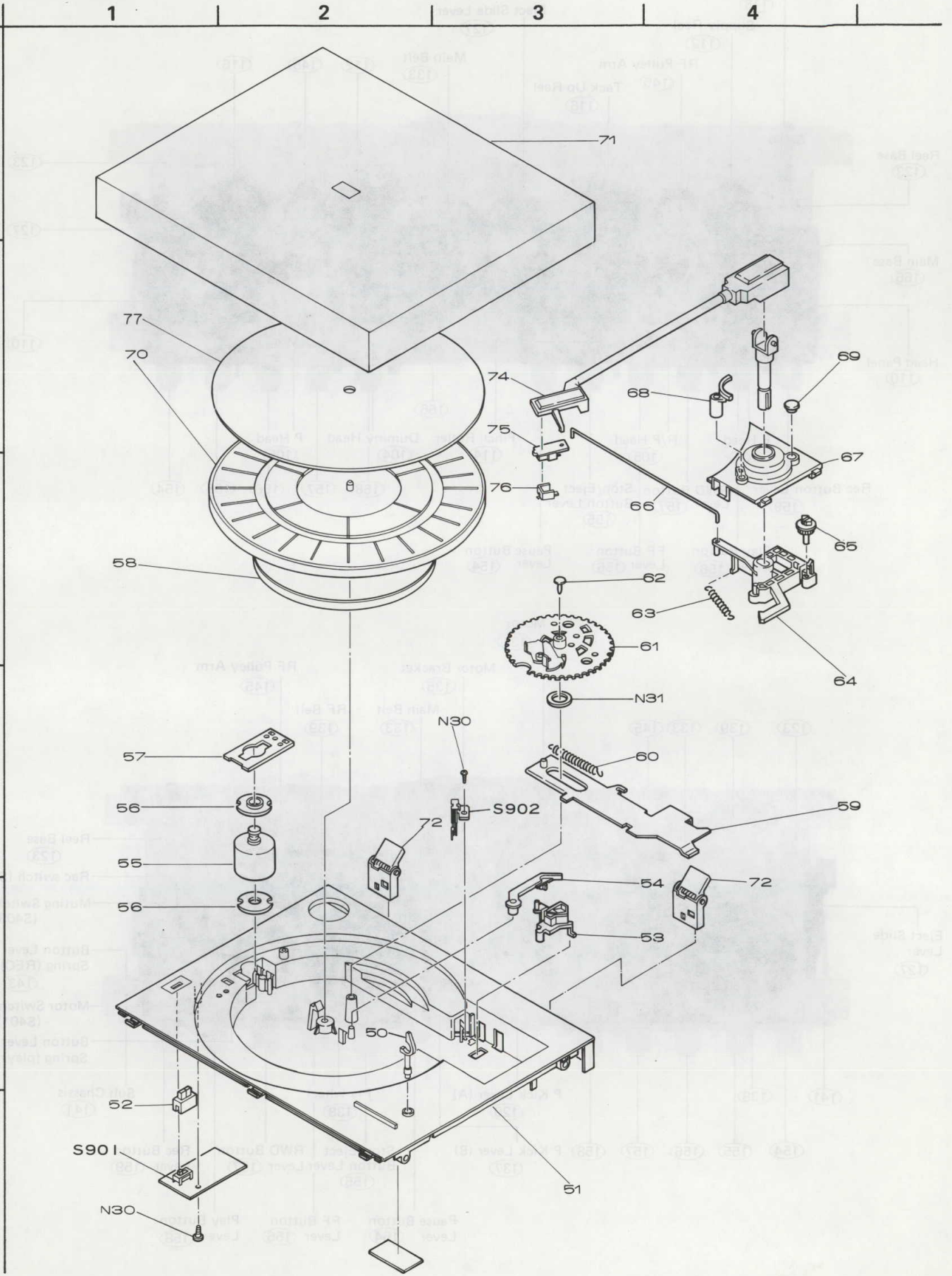
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
CABINET AND CHASSIS PARTS					
1	SGXGD15-KM	Holder(A), Cassette Tape1 (1) (MESA)	N11	XTW3+10TFR	Screw, $\Phi 3 \times 10$ (2)
1-1	SGK1988	Ornament Plate (MESA)(1)	N12	XTB4+12JFZ	Screw, $\Phi 4 \times 12$ (8)
1-2	SMQ60007	Spring, Holder (2)	N13	XTW3+10T	Screw, $\Phi 3 \times 10$ (6)
2	SGXGD15-KM1	Holder(B), Cassette Tape2 (1) (MESA)	N14	SNE4021	Nut (1)
2-1	SGK1989	Ornament Plate (MESA)(1)	RECORD PLAYER PARTS		
2-2	SMQ60007	Spring (2)	50	SJY5218	PU Rest (1)
3	SBN1203	Knob, Volume (MESA)(1)	51	SJYGD15-KM	Player Board (MESA)(1)
4	SBD118	Knob, Graphic Equalizer (MESA)	52	SBN1132	Knob (1)
5	SGYGD15-KE	Volume (6)	53	SJY5223	Operating Plate (MESA)(1)
5-1	SNE4060	Bracket (2)	54	SJY5222	Drive Lever (MESA)(1)
6	SJ1135	Cover, Volume (MESA)(1)	55	MMNGD15-KM	Motor Ass'y (MESA)(1)
7	SBC790	Button, operation (MESA)(1)	56	SHG9260	Motor Rubber (2)
8	SUW2995	Holder, Button (MESA)(2)	57	SJY90456	Motor Angle (MESA)(1)
9	SUS787	Spring, Rope (MESA)(1)	58	SJY90080-1	Belt (1)
10	SDD62-2	Drum, Dial (MESA)(1)	59	SJYGX7-KM1	Operating Plate Ass'y (MESA)(1)
11	SMQ30030	Bracket, Dumper (2)	60	SJY90406	Spring (1)
12	SMQ60019	Spring (2)	61	SJYGD15-KM1	Gear Ass'y (MESA)(1)
13	SMQ4096	Gear (2)	62	SHR417	Lock Pin (MESA)(1)
14	SBC663-1	Button, Selection (6)	63	SUS786	Spring (MESA)(1)
15	SDP1196	Indicator, Dial (1)	64	SJY5220	PU Fixing Arm (MESA)(1)
16	SDZ051-2	Rope (140cm)	65	SJY5221	PU Cam (MESA)(1)
17	SUR166	Bracket, Roller (MESA)(1)	66	SJY90455	Spoke Lever (MESA)(1)
18	SDB31	Roller (3)	67	SKM7540-2	Arm Base (MESA)(1)
19	SUB252	Rec (MESA)(1)	68	SJY5224-2	Lifter (MESA)(1)
20	SUB250	Angle, Rec (MESA)(1)	69	SHG9246-1	Rubber (1)
21	W5, 6UTB10	Tube, Rod (MESA)(1)	70	SJYGX7-KM	Turn Table Ass'y (1)
22	SUW2994	Bracket, Main Circuit Board (1) (MESA)	71	SYE1026-4	Dust Cover (MESA)(1)
23	SUW2996	Bracket, Roller (MESA)(1)	72	SBH9383	Hinge (2)
24	SDTGD15-KM	Bracket, Roller/Knob (1) (MESA)	74	EPA6455TA	Tonearm (MESA)(1)
25	SBN1196	Knob, Tuner (1)	75	EPC13STH	Cartridge (1)
26	SBC489	Button, Power (1)	76	EPS41ST	Stylus (1)
27	SJF8047-1N	Turntable Plate (MESA)(1)	77	SJY4075	Turn Table Sheet (1)
28	SJA138-3	Power Cord (1)	SCREWS AND WASHER		
29	SKU11380	Bottom Board (MESA)(1)	N30	XTB3+10G	Screw, $\Phi 3 \times 10$ (2)
30	SUW2991-1	Bracket (MESA)(1)	N31	XWE8D14	Washer (1)
31	SHR127	Holder, Power Cord (1)	N32	XTN26+18FFZ	Screw, $\Phi 2.6 \times 18$ (1)
32	SKMGD15-KM	Side Panel (MESA)(2)	ACCESSORIES		
32-1	SHS3276	Foot (4)	A1	SQF12838-2	Instruction Book (MESA)(1)
33	SGPGD15-KE	Rear Panel (MESA)(1)	A2	SSA269	FM Antenna Cord (1)
35	SDR33-1	Roller (MESA)(1)	A3	SJY5018-1	EP Adaptor (1)
PACKINGS					
N1	XTWS3+10Q	Screw, $\Phi 3 \times 8$ (2)	P1	SPP226	Set Cover (1)
N2	XTB3+10G	Screw, $\Phi 3 \times 10$ (2)	P2	SPB1061	Polyethylene Bag (Instruction Book) (1)
N3	XYN26+F7	Screw, $\Phi 2.6 \times 7$ (1)	P3	SPP746	Dust Cover Bag (MESA)(1)
N4	SNE2120	Screw (2)	P4	SPS4679	Pad, (MESA)(1)
N5	XTS3+10J	Screw, $\Phi 3 \times 10$ (4)	P5	SPS4680	Pad, (MESA)(1)
N6	XTB3+8J	Screw, $\Phi 3 \times 8$ (7)	P6	SPS4681	Pad, (MESA)(1)
N7	XTB3+10GFR	Screw, $\Phi 3 \times 10$ (7)	P7	SPS4682	Pad, (MESA)(1)
N8	XTB3+8JFZ	Screw, $\Phi 3 \times 8$ (2)	P9	SPS4684	Pad, (MESA)(1)
N9	XUC4	Retaining Ring (1)	P10	SPS4685	Pad, (MESA)(1)
N10	XTB4+8F	Screw, $\Phi 4 \times 8$ (2)	P11	SPS4683	Pad, (MESA)(1)
			P12	SPG5586	Carton Box (MESA)(1)

EXPLODED VIEWS

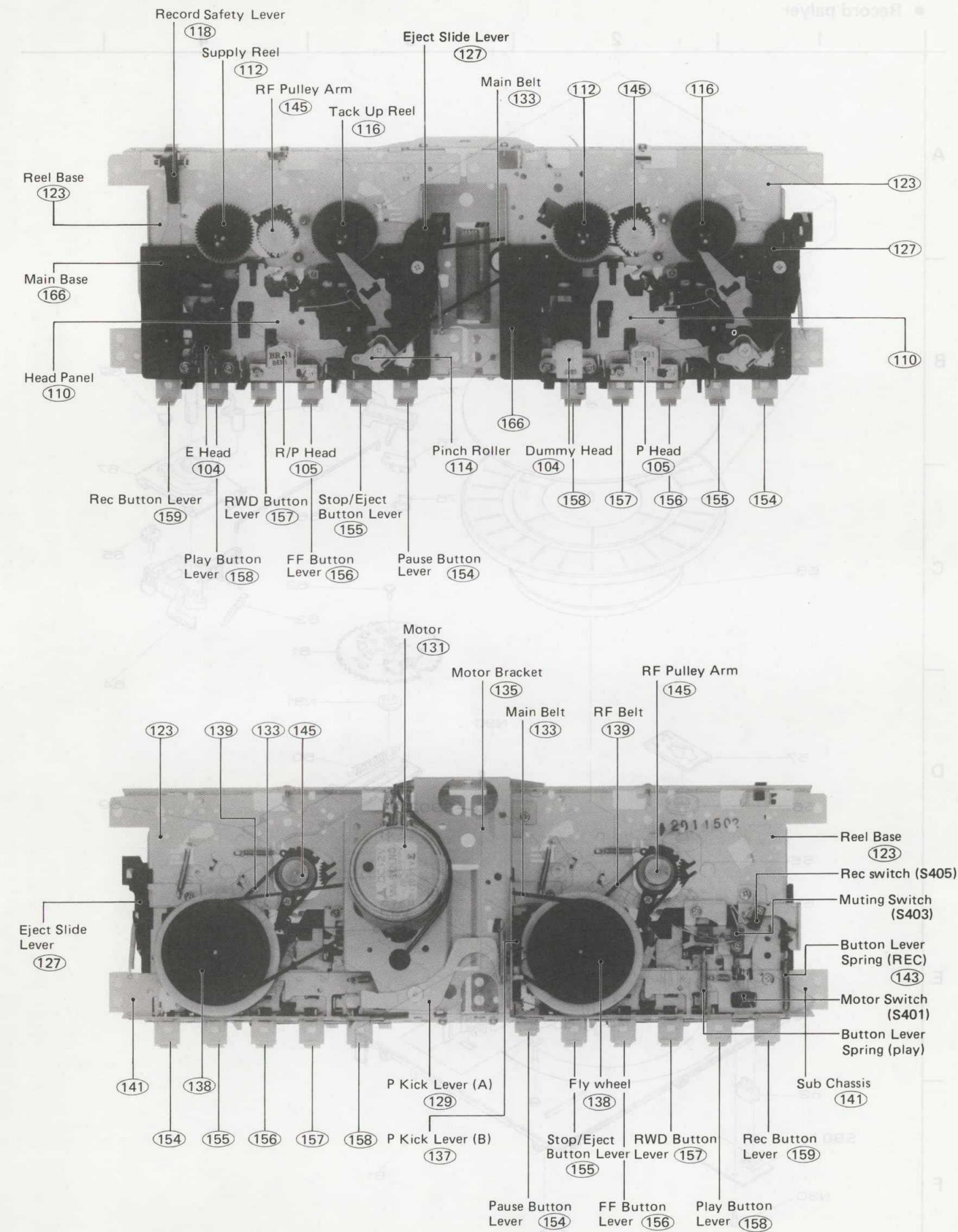
Cabinet and chassis



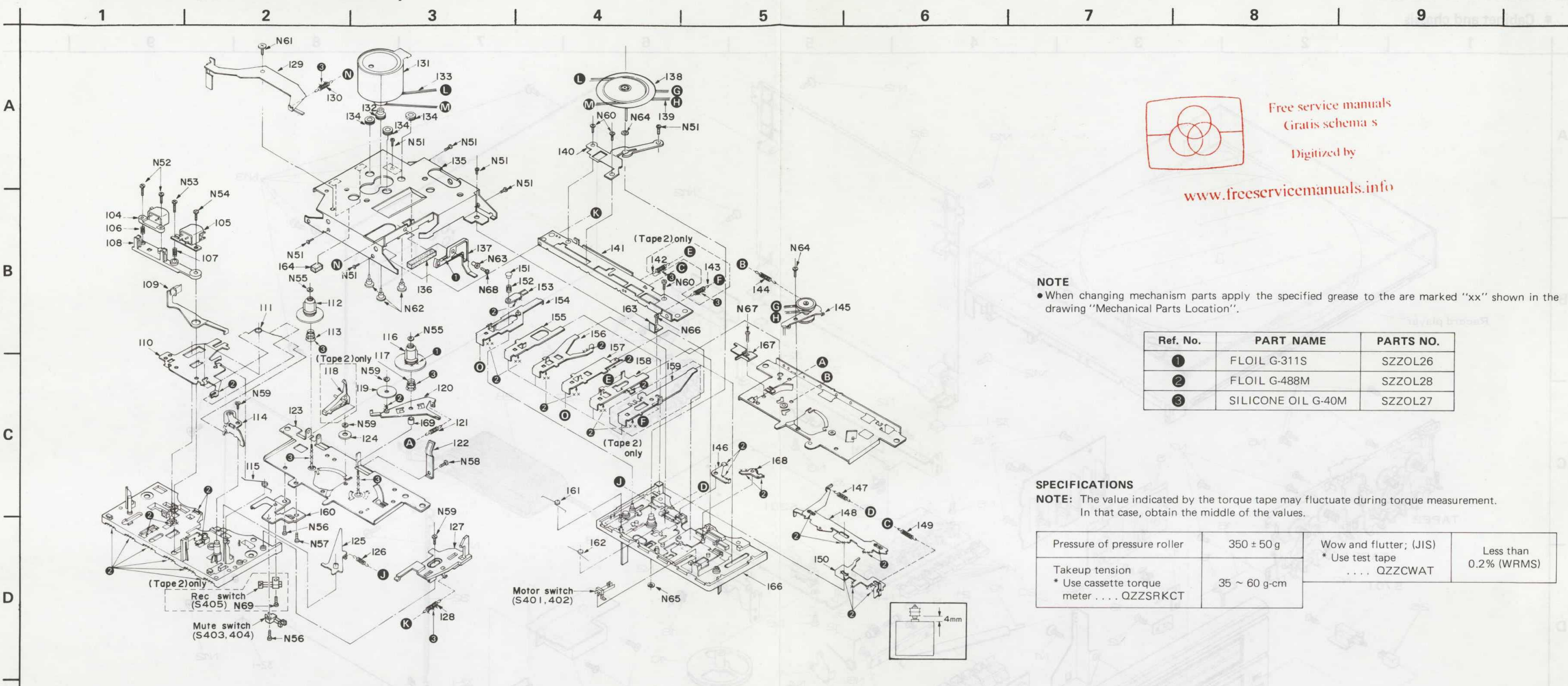
Record palyer



■PARTS LOCATION OF CASSETTE DECK MECHANISM



■EXPLODED VIEW (Cassette mechanism)



Ref. No.	Part No.	Description
CASSETTE PARTS LIST		
104	SJHE700XE	Dummy E Head (Tape 1)
104	SJH94	E Head (Tape 2)
105	SJH92	R/P Head
106	SMQT1469	E.H Spring
107	RFS447Z	Spring
108	SMQT1468	Head Base
109	RFY394Z	Sensing Plate Ass'y
110	SMQT1560	Head Panel
111	SMQT1622	Pinch Roller Spring
112	SMQT1603	Supply Reel Ass'y
113	SMQT1639	Back Tension Spring
114	RFR292A	Pinch Roller Ass'y
115	RFS531ZA	Head Panel Spring(S)
116	SMQT1637	Take Up Reel Ass'y
117	SMQT1638	Back Tension Spring
118	SMQT1605	Record Safety Lever
119	RF651ZA	Take Up Roller Gear

Ref. No.	Part No.	Description
CASSETTE PARTS LIST		
120	SMQT1640	Take Up Gear Plate Ass'y
121	RFS450Z	T.G. Plate Spring
122	RFS467Z	Pack Spring
123	SMQT1564	Reel Base Ass'y
124	SMQT1620	FF Gear
125	SMQT1627	Auto Lever
126	RFS453Z	Auto Lever Spring
127	SMQT1569	Eject Slide Lever
128	RFS454Z	Eject Slide Lever Spring
129	SMQT1614	P Kick Lever(A)
130	RFY585ZA	P Kick Lever Spring
131	MMI6N2LNC	Motor
132	SMQT1608	Motor Pulley
133	SMQT1609	Main Belt
134	RF127Z	Motor Rubber
135	SMQT1607	Motor Bracket
136	SMQT1579	Mat
137	RFY582ZA	P Kick Lever(B)

Ref. No.	Part No.	Description
CASSETTE PARTS LIST		
138	RFF39ZA	Flywheel Ass'y (Tape 1)
138	RFF40ZA	Flywheel Ass'y (Tape 2)
139	SMQT1563	RF Bolt
140	SMQT1601	Metal Guide
141	SMQT1557	Sub Chassis
142	RFS530ZA	Play Button Lever Spring(S)
143	SMQT1465	Button Lever Spring(A)
144	RFS532ZA	RF Pulley Arm Spring
145	SMQT1623	RF Pulley Arm Ass'y
146	SMQT1555	RWD Lever
147	RFS466Z	Actuator Spring
148	SMQT1548	Push Button Actuator Ass'y

Ref. No.	Part No.	Description
CASSETTE PARTS LIST		
149	RFS567Z	Switch Plate Spring (Tape 2 only)
150	SMQT1599	Switch Plate
151	SMQT1463	PAUSE Stopper
152	RFS459Z	PAUSE Lever Spring
153	SMQT1556	PAUSE Lever
154	SMQT1554	PAUSE Button Lever Ass'y
155	SMQT1553	STOP Button Lever
156	SMQT1552	FF Button Lever
157	SMQT1551	RWD Button Lever
158	SMQT1600	PLAY Button Lever
159	SMQT1580	REC Button Lever (Tape 2 only)
160	SMQT1602	SW Bracket (Tape 1)
160	SMQT1618	SW Bracket (Tape 2)
161	RFS462Z	Button Lever Spring(C)
162	SMQT1558	Button Lever Spring(E)
163	SMQT1626	REC Spring Plate(MESA)(Tape 2 only)

Ref. No.	Part No.	Description
CASSETTE PARTS LIST		
164	SMQT1616	Mat
166	SMQT1547	Main Base Ass'y
167	SMQT1568	Bracket
168	SMQT1628	R/P stopper
169	SMQT1641	Coller
SCREWS		
N51	XSN2+4	⌀2×3
N52	SMQT1570	⊕ ⊖ Cap Screw
N53	SMQT1534	Azimuth Screw
N54	SMQT1571	⊕ ⊖ Cap Screw
N55	RFN142Z	P Washer Cut
N56	XYN2+C5	Tams Screw, ⌀2×5
N57	XSN2+5	Tapping Screw, ⌀2×5
N58	XSN2+3	⌀2×3

Ref. No.	Part No.	Description
SCREWS		
N59	SMQT1537	P.M. E Screw
N59	RFN149ZA	P Washer Cut
N60	XSB2+5	Screw, ⌀2×5
N61	RFE239ZA	P.K Coller Screw(A)
N62	SMQ4918	Coller Screw
N63	SMQT1617	Coller(B)
N64	SMQT1611	P Washer Cut
N64	SMQT1624	RF ARM Coller Screw
N65	RFN123Z	P Washer Cut
N66	XYN2+C3	Tams Screw, ⌀2×3
N67	XSB2+6	P Tapping Screw, ⌀2×6
N68	XSN2+6	C Tapping Screw, ⌀2×6
N69	XYN2+C5	Leaf switch, ⌀2+5(Tape 2)