

XM-440EX/440NX

SERVICE MANUAL

Canadian Model

AEP Model

E Model

XM-440EX

UK Model

XM-440NX



Photo : XM-440EX

SPECIFICATIONS

POWER OUTPUT AND TOTAL HARMONIC DISTORTION

40 watts per channel minimum continuous average power into 4 ohms, both channels driven from 20 Hz to 20 kHz with no more than 0.04% total harmonic distortion per Car Audio Ad Hoc Committee standards.

Other Specifications

Circuit system	OTL (output transformerless) circuit	Harmonic distortion	0.005 % or less (at 1kHz, 4 Ω)
	Pulse power supply	Input level adjustment range	0.2 – 4.0 V (RCA pin jacks)
Inputs	RCA pin jacks		0.4 – 8.0 V (High level input)
	High level input connector	High-pass filter	50 – 200 Hz, –12 dB/oct
Outputs	Speaker terminals	Low-pass filter	50 – 200 Hz, –12 dB/oct
Speaker impedance	2 – 8 Ω (stereo)	Power requirements	12 V DC car battery (negative ground)
	4 – 8 Ω (when used as a bridging amplifier)	Power supply voltage	10.5 – 16 V
Maximum outputs	Four speakers: 80 W \times 4 (at 4 Ω) 100 W \times 4 (at 2 Ω)	Current drain	at rated output: 24 A Remote input: 1.4 mA
	Two speakers: 200 W \times 2 (at 4 Ω , when used as a bridging amplifier)	Dimensions	Approx. 237 \times 52 \times 214 mm (w/h/d) (9 $\frac{1}{8}$ \times 2 $\frac{1}{8}$ \times 8 $\frac{1}{2}$ in.) not incl. projecting parts and controls
Rated outputs (supply voltage at 14.4 V)	Four speakers: 40 W \times 4 (20 Hz – 20 kHz, 0.04 % THD, at 4 Ω) 50 W \times 4 (20 Hz – 20 kHz, 0.1 % THD, at 2 Ω)	Mass	Approx. 1.9 kg (4 lb. 3 oz.) not incl. accessories
	Two speakers: 100 W \times 2 (20 Hz – 20 kHz, 0.1 % THD, at 4 Ω)	Supplied accessories	Mounting screws (4), Terminal cap (1)
Frequency response	5 Hz – 100 kHz (± 0 dB)	Design and specifications are subject to change without notice.	

STEREO POWER AMPLIFIER

SONY®



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SECTION 1 GENERAL

This section is extracted from instruction manual.

Features

- Maximum power output of 80 watts per channel (at 4 ohms).
- This unit can be used as a bridging amplifier with a maximum output of 200 watts.
- Direct connection can be made with the speaker outputs of your car audio if it is not equipped with the line output (High level input connection).
- Built-in variable LPF (Low-pass filter) and HPF (High-pass filter).
- Protection circuit and indicator provided.
- Pulse power supply* for stable, regulated output power.

* Pulse power supply

This unit has a built-in power regulator which converts the power supplied by the DC 12 V car battery into high speed pulses using a semiconductor switch. These pulses are stepped up by the built-in pulse transformer and separated into both positive and negative power supplies before being converted into direct current again. This is to regulate fluctuating voltage from the car battery. This light weight power supply system provides a highly efficient power supply with a low impedance output.

Caractéristiques

- Puissance de sortie maximale de 80 watts par canal (à 4 ohms).
- Cet appareil peut être utilisé comme amplificateur de pontage d'une sortie maximale de 200 watts.
- Une connexion directe est possible avec la sortie haut-parleur de votre autoradio si celle-ci n'est pas équipée d'une sortie de ligne (connexion d'entrée haut niveau).
- Filtre passe-bas (LPF) et filtre passe-haut (HPF) variables intégrés.
- Avec circuit et indicateur de protection.
- Alimentation électrique par impulsions* pour une puissance de sortie stable, régulée.

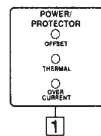
* Alimentation électrique par impulsions

Cet appareil est équipé d'un régulateur de puissance intégré qui convertit la puissance fournie par une batterie de voiture de 12 V CC en impulsions ultra-rapides au moyen d'un commutateur à semi-conducteur. Ces impulsions sont amplifiées par le transformateur d'impulsions intégré et séparées en alimentation positive et négative avant d'être reconvertis en courant continu. Ce processus permet de compenser les fluctuations de tension provenant de la batterie de la voiture. Ce système d'alimentation de faible poids assure une alimentation électrique très efficace pour une sortie d'impédance faible.

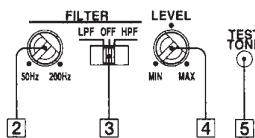
Location and Function of Controls

- 1 POWER/PROTECTOR indicator**
• OFFSET lights up in green during normal operation. The color will change from green to red when the voltage going out to the speaker terminal or the pin Jack is too high.
• THERMAL lights up in green during normal operation. The color will change from green to red when the temperature rises to an unsafe level. The color will return to green when the temperature returns to normal.
• OVER CURRENT lights up in green during normal operation. The color will change from green to red when receiving a powerful signal.
- 2 Cut-off frequency adjustment control (FRONT/REAR)**
Sets the cut-off frequency (50-200 Hz) for the low-pass or high-pass filters.
- 3 FILTER selector switch (FRONT/REAR)**
When the switch is in the LPF position, the filter is set to low-pass. When in the HPF position, the filter is set to high-pass.
- 4 LEVEL adjustment control (FRONT/REAR)**
The input level can be adjusted with this control when using source equipment made by other manufacturers. Turn it to MAX when the output level of the car audio seems low.
- 5 TEST TONE button**
To check the system's status, activate the built-in transmitter then press the TEST TONE button. If the tone is heard, the unit is functioning normally.

(right side/côté droit)



(left side/côté gauche)



1 Indicateur POWER/PROTECTOR

- OFFSET s'allume en vert en cours de fonctionnement normal. La couleur passe du vert au rouge lorsque la tension transmise via la borne de haut-parleur ou la prise Pin est trop élevée.
- THERMAL s'allume en vert en cours de fonctionnement normal. La couleur passe du vert au rouge lorsque la température dépasse le niveau de sécurité. La couleur repasse au vert dès que la température est revenue à un niveau normal.
- OVER CURRENT s'allume en vert en cours de fonctionnement normal. La couleur passe du vert au rouge lors de la réception d'un signal puissant.

2 Commandes de réglage de la fréquence de coupure (FRONT/REAR)

Règle la fréquence de coupure (50 - 200 Hz) des filtres passe-bas ou passe-haut.

3 Sélecteur FILTER (FRONT/REAR)

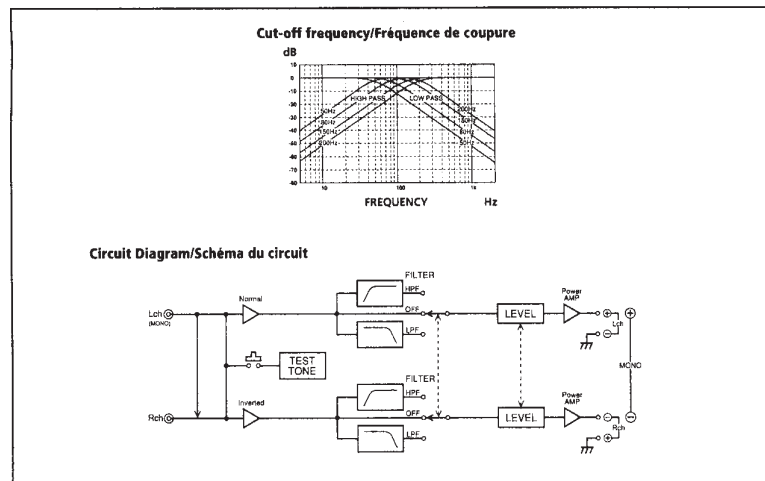
Lorsque le commutateur est en position LPF, le filtre est mis sur passe-bas. Lorsqu'il est en position HPF, le filtre est mis sur passe-haut.

4 Commande de réglage LEVEL (FRONT/REAR)

Le niveau d'entrée peut se régler avec cette commande lors de l'utilisation d'équipements source d'autres fabricants. Mettez-le sur MAX lorsque le niveau de sortie de l'installation audio paraît faible.

5 Touche TEST TONE

Pour contrôler le statut du système, activez le transmetteur intégré et appuyez ensuite sur la touche TEST TONE. Si vous entendez une tonalité, c'est que l'appareil fonctionne normalement.

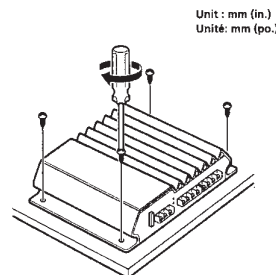


Installation

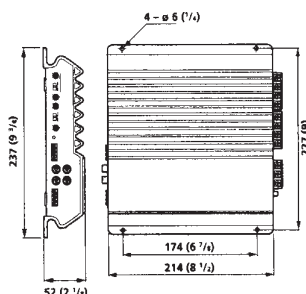
Before Installation

- Mount the unit either inside the trunk or under a seat.
- Choose the mounting location carefully so the unit will not interfere with the normal movements of the driver, and where it will not be exposed to direct sunlight or hot air from the heater.
- Do not install the unit under the floor carpet, where the heat dissipation from the unit will be considerably impaired.

First, place the unit where you plan to install it, and mark the positions of the four screw holes on the surface of the mounting board (not supplied). Then drill the holes approximately 3 millimeters (mm) in diameter and mount the unit onto the board with the supplied mounting screws. The supplied mounting screws are 15 mm long. Therefore, make sure that the mounting board is thicker than 15 mm.



Installation



Avant l'installation

- Installez l'appareil dans le coffre ou sous un siège.
- Choisissez soigneusement l'emplacement de montage afin d'éviter que l'appareil ne gêne les mouvements normaux du conducteur et qu'il ne soit pas exposé au rayonnement direct du soleil ni aux conduits d'air chaud du chauffage.
- N'installez pas l'appareil sous le tapis de sol car la dissipation thermique ne pourrait pas se faire correctement.

Présentez d'abord l'appareil à l'endroit où vous voulez l'installer et tracez un repère de positionnement pour les quatre vis sur la surface de la plaque de montage (non fournie). Percez des trous d'environ 3 millimètres (mm) de diamètre, puis fixez l'appareil sur la plaque à l'aide des vis fournies. Celles-ci font 15 mm de long; vérifiez, par conséquent, que la plaque fait au moins 15 mm d'épaisseur.

Connections

Precautions

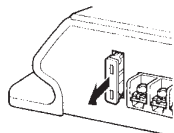
- This unit is designed for negative ground 12 V DC operation only.
- Use speakers with suitable impedance (2 - 8 ohms).
- Do not connect any active speakers (with built-in amplifiers) to the speaker terminals of the unit. Doing so may damage the active speakers.
- Avoid installing the unit in areas subject to:
 - high temperatures such as from direct sunlight or hot air from the heater
 - rain or moisture
 - dust or dirt.
- If your car is parked in direct sunlight and there is a considerable rise in temperature inside the car, allow the unit to cool down before use.
- When installing the unit horizontally, be sure not to cover the fans with the floor carpet, etc.
- If this unit is placed too close to the car radio, interference may occur. In this case, relocate the amplifier away from the car radio.
- If no power is being supplied to the master unit, check the connections.
- This power amplifier employs a protection circuit* to protect the transistors and speakers if the amplifier malfunctions. Do not attempt to test the protection circuits by covering the heat sink or connecting improper loads.
- Do not use the unit on a weak battery as its optimum performance depends on a good power supply.
- For safety reasons, keep your car audio volume moderate so that you can still hear sounds outside your car.

Fuse Replacement

If the fuse blows, check the power connection and replace the fuse. If the fuse blows again after replacement, there may be an internal malfunction. In such a case, consult your nearest Sony dealer.

Warning

When replacing the fuse, be sure to use one matching the amperage stated above the fuse holder. Never use a fuse with an amperage rating exceeding the one supplied with the unit as this could damage the unit.



*Protection circuit

This amplifier is provided with a protection circuit that activates in the following cases:

- when the unit is overheated
- when a DC current is generated
- when the speaker terminals are short-circuited.

The color of the POWER/PROTECTOR indicator will change from green to red, and the unit will shut down. If this happens, turn off the connected equipment, take out the cassette tape or disc, and determine the cause of the malfunction. If the amplifier has overheated, wait until the unit cools down before using again.

If you have any questions or problems concerning your unit that are not covered in this manual, please consult your nearest Sony dealer.

Connexions

Précautions

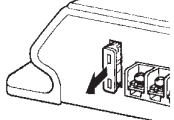
- Cet appareil est conçu pour fonctionner uniquement sur courant continu de 12 volts avec masse négative.
- Utilisez des haut-parleurs d'une impédance appropriée (2 - 8 ohms).
- Ne raccordez pas de haut-parleurs actifs (avec amplificateur intégré) aux bornes de haut-parleurs de cet appareil, ils pourraient être endommagés.
- N'installez pas l'appareil dans des endroits soumis:
 - à des températures élevées, comme en plein soleil ou près de la sortie d'air chaud du chauffage;
 - à l'humidité ou à la pluie;
 - à la poussière ou à la saleté.
- Si votre voiture était gantée en plein soleil et que la température a considérablement augmenté à l'intérieur, laissez refroidir l'appareil avant de l'utiliser.
- Si vous installez l'appareil à l'horizontale, ne recouvrez pas les ailettes de ventilation par le tapis de sol ou autre chose.
- Si cet appareil est placé trop près de l'autoradio, des interférences risquent de se produire. Éloignez autant que possible l'amplificateur de l'autoradio.
- Si l'appareil principal n'est pas alimenté, vérifiez les connexions.
- Cet amplificateur est équipé d'un circuit* destiné à protéger les transistors et les haut-parleurs en cas de défaillance. N'essayez pas de tester l'efficacité de ce circuit en recouvrant les dissipateurs thermiques ou en effectuant des connexions inadéquates.
- N'utilisez pas l'appareil sur une batterie faible, car sa performance maximale dépend d'une bonne alimentation en électricité.
- Pour des raisons de sécurité, écoutez l'autoradio à un volume modéré afin d'entendre les bruits extérieurs.

Remplacement du fusible

Si le fusible grille, vérifiez les connexions du fil d'alimentation et remplacez le fusible. S'il grille de nouveau, un mauvais circuit interne peut en être la cause. Dans ce cas, consultez votre concessionnaire Sony.

Avertissement

En cas de remplacement du fusible, veillez à utiliser un fusible dont l'intensité correspond à celle inscrite sur le porte-fusible. N'utilisez jamais de fusible dont l'intensité dépasse celle du fusible fourni avec l'appareil, car vous risqueriez d'endommager l'appareil.



*Circuit de protection

Cet amplificateur est équipé d'un circuit de protection qui s'active dans les cas suivants:

- Surchauffe de l'appareil
- Production d'un courant continu
- Court-circuit aux bornes des haut-parleurs.

La couleur du témoin POWER/PROTECTOR passe du vert au rouge et l'appareil s'arrête.

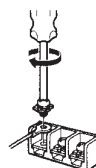
Si le cas se présente, coupez l'alimentation de l'appareil raccordez et éjectez la cassette ou le disque compact avant d'examiner la cause de la défaillance. Si l'amplificateur est trop chaud, attendez que l'appareil refroidisse avant de le réutiliser.

Pour toute question ou problème qui ne serait pas traité dans ce manuel, consultez votre concessionnaire Sony.

Caution

- Before making any connections, disconnect the ground terminal of the car battery to avoid short circuits.
- Be sure to use speakers with an adequate power rating. If you use small capacity speakers, they may be damaged.
- Do not connect the \ominus terminal of the speaker system to the car chassis, and do not connect the \ominus terminal of the right speaker with that of the left speaker.
- Install the input and output cords away from the power supply lead as running them close together can generate some interference noise.
- This unit is a high-power amplifier. Therefore, it may not perform to its full potential if used with the speaker cords supplied with the car.
- If your car is equipped with a computer system for navigation or some other purpose, do not remove the ground wire from the car battery. If you disconnect the wire, the computer memory may be erased. To avoid short circuits when making connections, disconnect the +12 V power supply lead until all the other leads have been connected.

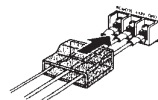
Make the terminal connections as illustrated below.



Note

When you tighten the screws, be careful not to apply too much torque* as doing so may damage the screws.

- The torque value should be less than 1 N*m.



Pass the leads through the cap, connect the leads, then cover the terminals with the cap.

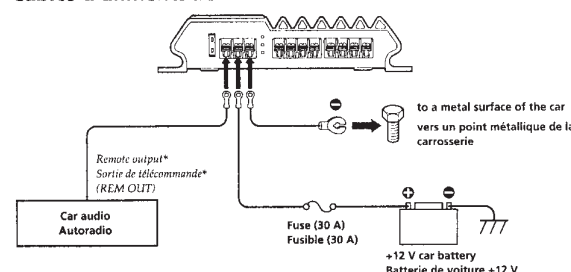
Remarque

Ne serrez pas la vis selon un couple* trop fort car vous pourriez l'endommager.

- La valeur du couple de serrage doit être inférieure à 1 N*m.

Faites passer les fils par le cache, raccordez les fils et recouvrez les bornes avec le cache.

Power Connection Leads Câbles d'alimentation



* If you have the factory original or some other car audio without a remote output on the amplifier, connect the remote input terminal (REMOTE) to the accessory power supply.

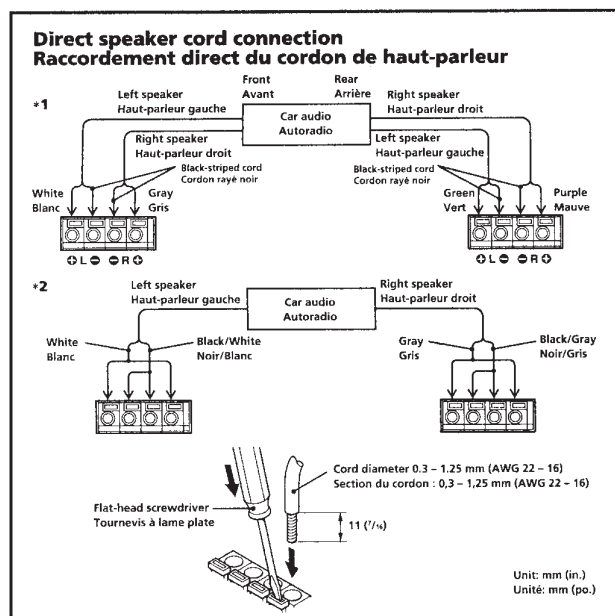
* Si vous disposez du modèle d'origine ou d'un autre autoradio dont l'amplificateur ne comporte pas de sortie de télécommande (REMOTE), raccordez la borne d'entrée de télécommande (REMOTE) à la prise d'alimentation accessoires.

Notes on the power supply

- Connect the +12 V power supply lead only after all the other leads have been connected.
- Be sure to connect the ground lead of the unit securely to a metal surface of the car. A loose connection may cause the amplifier to malfunction.
- Be sure to connect the remote control lead of the car audio to the remote terminal.
- When using a car audio without a remote output on the amplifier, connect the remote input terminal (REMOTE) to the accessory power supply.
- Use the power supply lead with a fuse attached (30 A).
- Place the fuse in the power supply lead as close as possible to the car battery.
- Make sure that the leads to be connected to the +12 V and GND terminals of this unit are larger than 10-Gauge (AWG-10) or have a sectional area of more than 5 mm².
- When using the optional RC-46 power amplifier connecting cord, consult that manual for proper use.

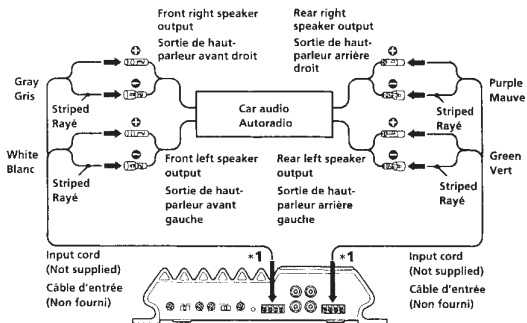
Remarques sur l'alimentation électrique

- Raccordez le câble d'alimentation +12 V uniquement après avoir réalisé toutes les autres connexions.
- Raccordez correctement le fil de masse de l'appareil à un point métallique de la voiture. Une connexion lâche risque de provoquer un dysfonctionnement de l'amplificateur.
- Veillez à raccorder le fil de télécommande de l'autoradio à la borne de télécommande.
- Si vous utilisez un autoradio dont l'amplificateur ne comporte pas de sortie de télécommande, raccordez la borne d'entrée de la télécommande (REMOTE) à la prise d'alimentation accessoires.
- Utilisez un câble d'alimentation muni d'un fusible (30 A).
- Fixez le câble d'alimentation le plus près possible de la batterie de voiture.
- Vous devez raccorder des câbles de calibre supérieur à 10 (AWG-10) ou d'une section supérieure à 5 mm² aux bornes +12V et GND.
- Lorsque vous utilisez le cordon de raccordement pour amplificateur RC-46 en option, consultez le manuel pour une utilisation correcte.



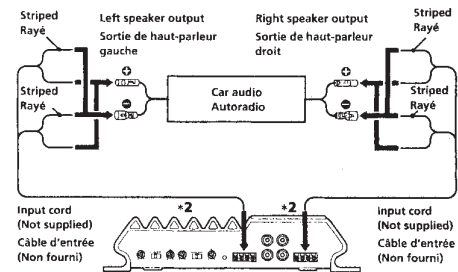
Input Connections

High Level Input Connection (with Speaker Connection 1, 2 or 4) Connexion d'entrée à haut niveau (avec connexion de haut-parleur 1, 2 ou 4)



Connexions d'entrée

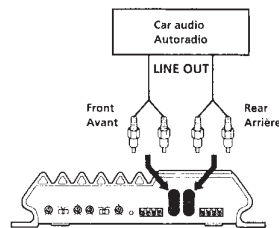
High Level Input Connection (with Speaker Connection 3) Connexion d'entrée à haut niveau (avec connexion de haut-parleur 3)



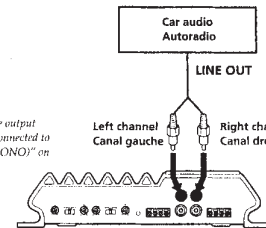
Note
Make sure that the right speaker output from the car audio is connected to the connector marked "R.F.A.R." on the unit.

Remarque
Assurez-vous que la sortie du haut-parleur droit de l'autoradio est raccordée au connecteur portant l'indication "R.F.A.R." sur l'appareil.

Line Input Connection (with Speaker Connection 1, 2 or 4) Connexion d'entrée de ligne (avec connexion de haut-parleur 1, 2 ou 4)



Line Input Connection (with Speaker Connection 3) Connexion d'entrée de ligne (avec connexion de haut-parleur 3)



Note
Make sure that the line output from the car audio is connected to the jack marked "L (MONO)" on the unit.

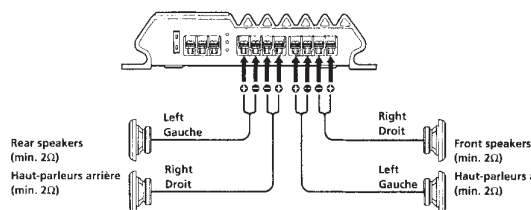
Remarque
Vérifiez que la sortie de ligne de l'autoradio est raccordée à la prise portant l'indication "L (MONO)" sur l'appareil.

Speaker Connections

4-Speaker System (with Input Connection A or C) Système à 4 haut-parleurs (avec connexion d'entrée A ou C)

For details on the settings of switches and controls, refer to "Location and Function of Controls."

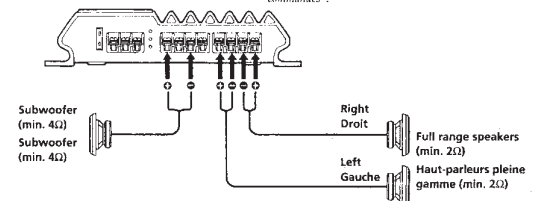
Pour plus de détails sur les réglages des commutateurs et commandes, reportez-vous à "Emplacement et fonction des commandes".



3-Speaker System (with Input Connection A or C) Système à 3 haut-parleurs (avec connexion d'entrée A ou C)

For details on the settings of switches and controls, refer to "Location and Function of Controls."

Pour plus de détails sur les réglages des commutateurs et commandes, reportez-vous à "Emplacement et fonction des commandes".



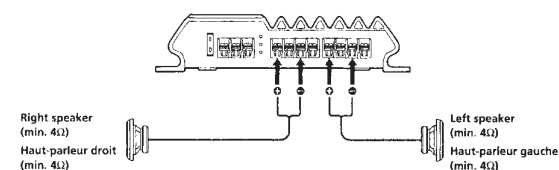
Notes
• In this system, the volume of the subwoofer will be controlled by the car audio fader control.
• In this system, the output signals to the subwoofer will be the combination of both the REAR L and R INPUT jacks or the REAR high-level input connector signals.

Remarques
• Dans ce système, le volume du subwoofer est contrôlé par le fader de l'autoradio.
• Dans ce système, les signaux de sortie vers le haut-parleur d'extrêmes-graves sont une combinaison des signaux des prises REAR L et R INPUT ou des signaux du connecteur d'entrée à haut niveau REAR.

2-Speaker System (with Input Connection B or D) Système à 2 haut-parleurs (avec connexion d'entrée B ou D)

For details on the settings of switches and controls, refer to "Location and Function of Controls."

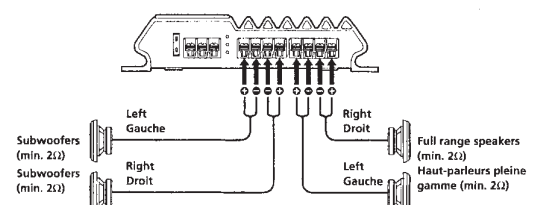
Pour plus de détails sur les réglages des commutateurs et commandes, reportez-vous à "Emplacement et fonction des commandes".



2-Way System (with Input Connection A or C) Système à 2 voies (avec connexion d'entrée A ou C)

For details on the settings of switches and controls, refer to "Location and Function of Controls."

Pour plus de détails sur les réglages des commutateurs et commandes, reportez-vous à "Emplacement et fonction des commandes".



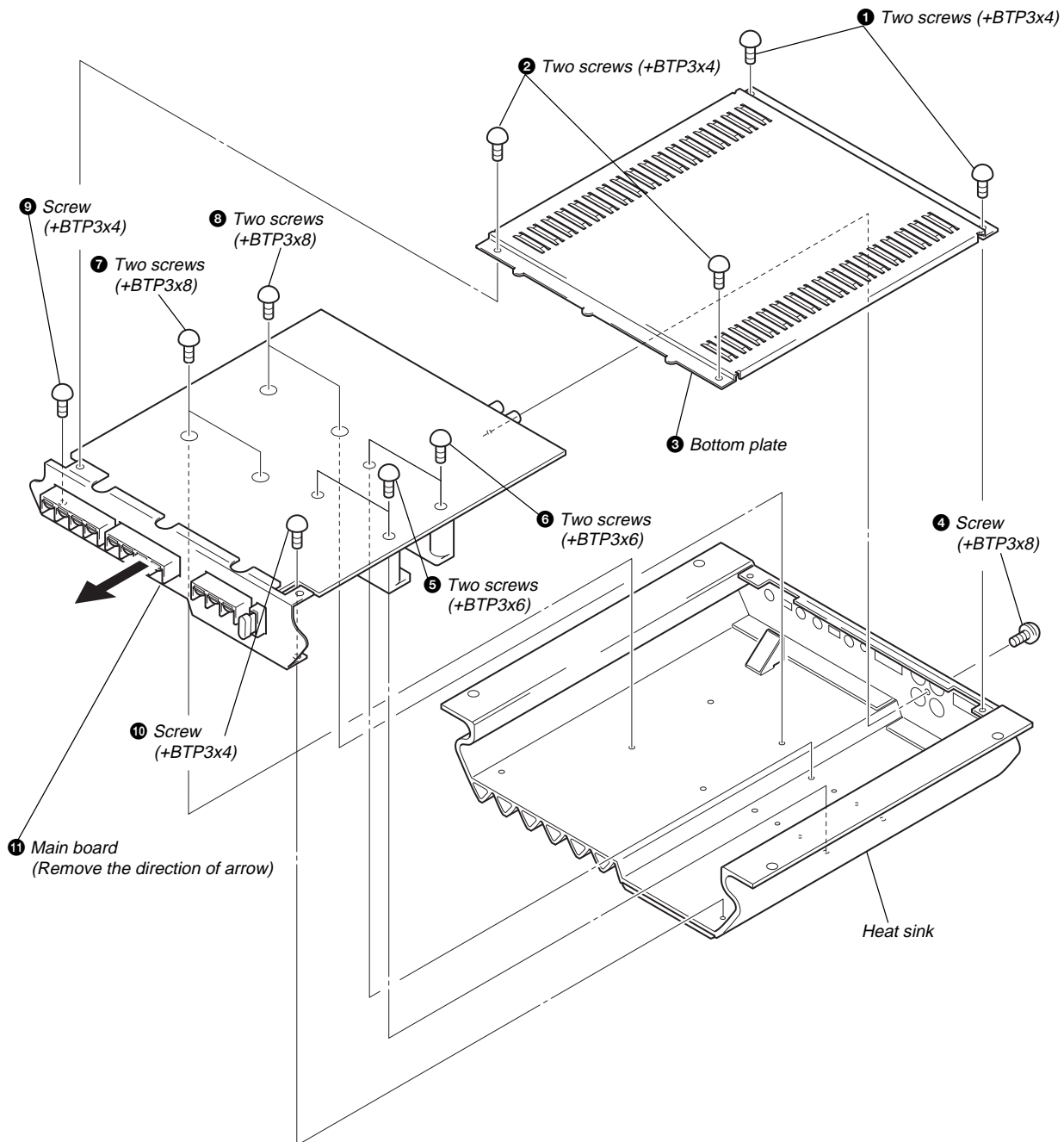
Note
In this system, the volume of the subwoofers will be controlled by the car audio fader control.

Remarque
Dans ce système, le volume des subwoofers est contrôlé par le fader de l'autoradio.

SECTION 2 DISASSEMBLY

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

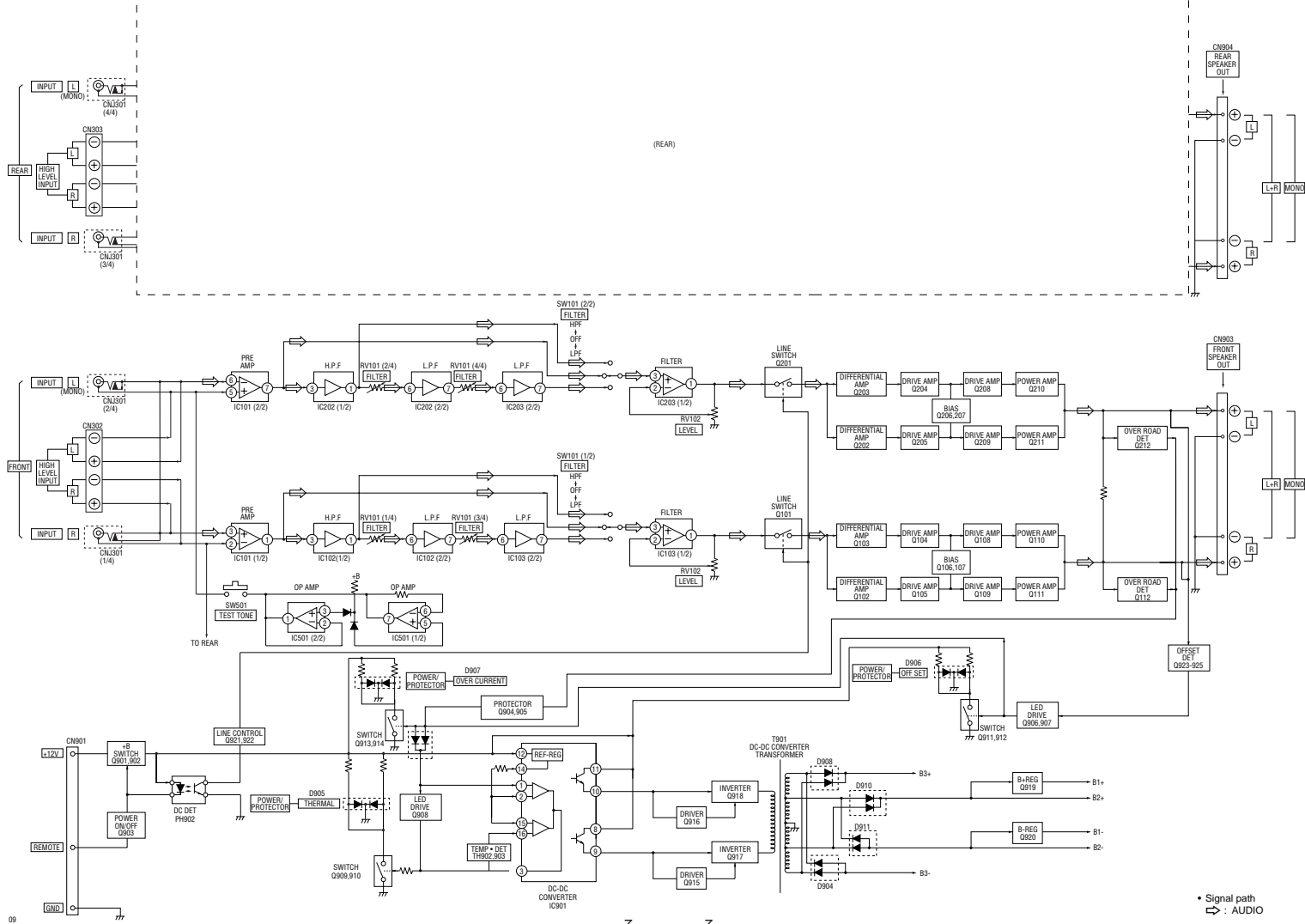
2-1. MAIN BOARD REMOVAL



SECTION 3 DIAGRAMS

XM-440EX/440NX




3-1. BLOCK DIAGRAM




XM-440EX/440NX

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

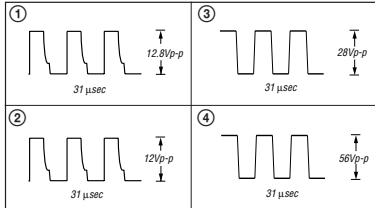
For schematic diagrams.

- Note:
- All capacitors are in μF unless otherwise noted. pF: μF 50 WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}$ W or less unless otherwise specified.
 -  : panel designation.
 -  : B+ Line.
 - Power voltage is dc 14.4V and fed with regulated dc power supply from ACC and BATT cords.
 - Voltages and waveforms are dc with respect to ground under no-signal conditions.
 - no mark : POWER ON
 - * : Impossible to measure
 - Voltage are taken with a VOM (Input impedance 10 M Ω).
Voltage variations may be noted due to normal production tolerances.
 - Signal path.
 -  : AUDIO

For printed wiring boards.

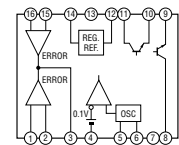
- Note:
-  : parts extracted from the component side.

• WAVEFORMS

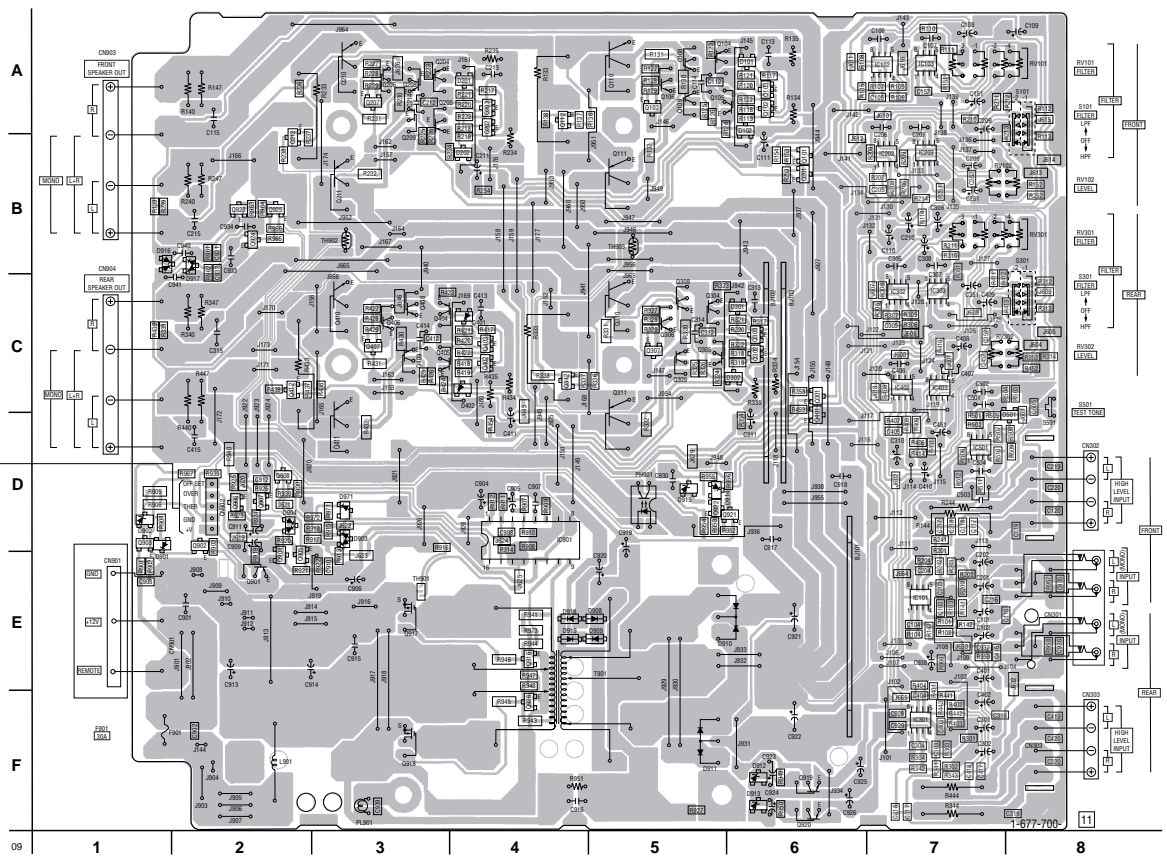


• IC BLOCK DIAGRAM

IC901 TL494CN

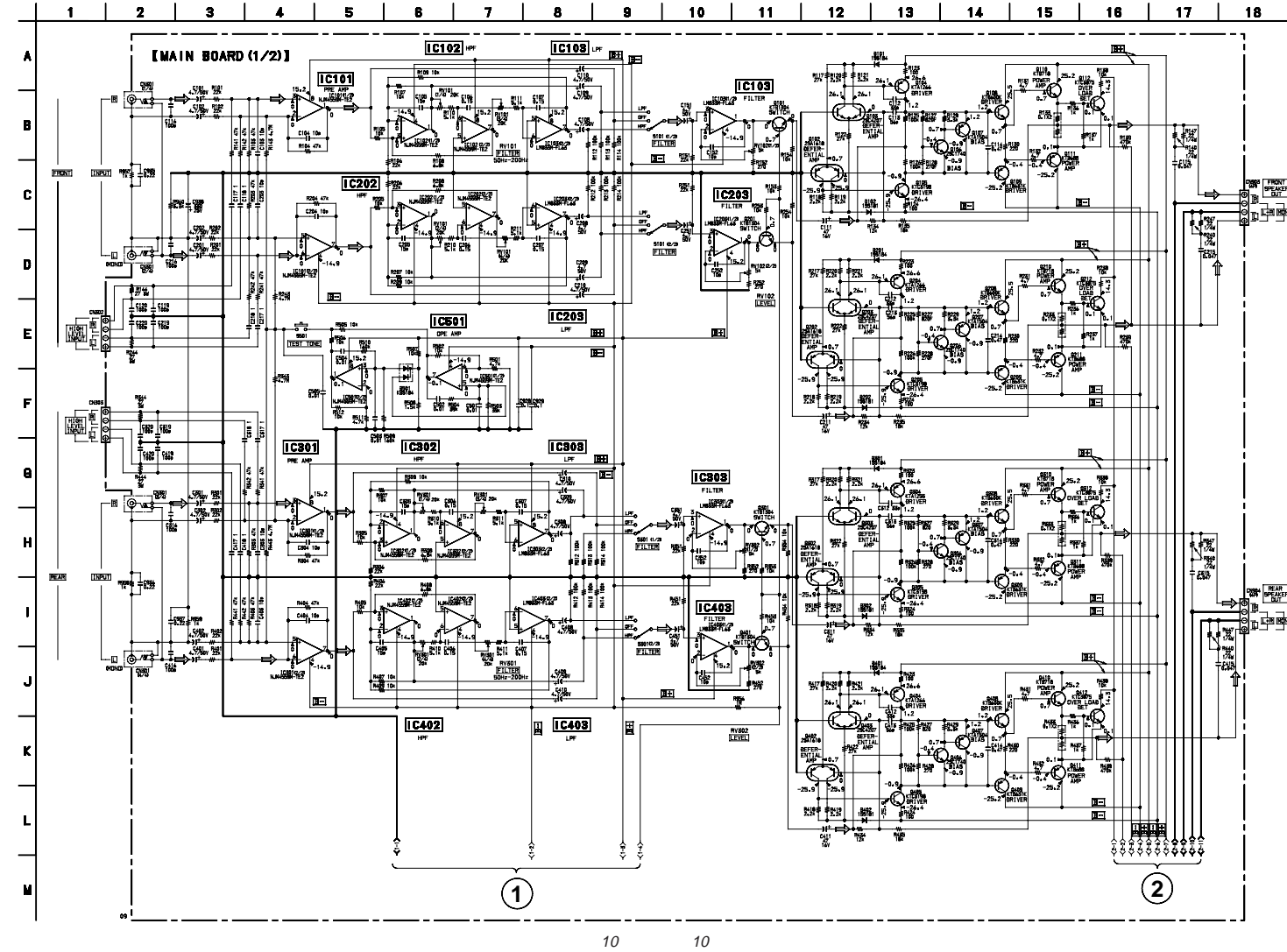


Ref. No.	Location	Ref. No.	Location
D101	A-6	Q203	A-4
D102	A-6	Q204	A-4
D201	A-4	Q205	A-3
D202	B-4	Q206	A-3
D301	C-6	Q207	A-3
D302	C-6	Q208	A-3
D401	C-6	Q209	A-3
D402	A-4	Q210	A-3
D501	D-8	Q211	B-3
D901	D-1	Q212	B-2
D902	D-1	Q213	C-6
D903	D-3	Q302	C-6
D904	D-2	Q303	C-6
D908	E-5	Q304	C-5
D909	E-5	Q305	C-5
D910	E-5	Q306	C-5
D911	F-5	Q307	C-5
D912	F-6	Q308	C-5
D913	F-6	Q309	C-5
D914	D-5	Q310	C-5
D915	D-5	Q311	C-5
D916	B-1	Q312	C-4
D917	B-2	Q401	D-6
D918	E-4	Q402	C-4
D919	E-4	Q403	C-4
D971	D-3	Q404	C-3
		Q405	C-3
IC101	E-7	Q406	C-3
IC102	A-7	Q407	C-3
IC103	A-7	Q408	C-3
IC202	B-7	Q409	C-3
IC203	B-7	Q410	C-3
IC301	F-7	Q411	C-3
IC302	C-7	Q412	C-3
IC303	C-7	Q901	E-2
IC402	C-7	Q902	D-2
IC403	C-7	Q903	D-1
IC501	D-7	Q904	E-2
IC901	D-4	Q905	E-2
		Q906	D-2
Q101	B-6	Q907	D-2
Q102	A-6	Q908	D-2
Q103	F-4	Q909	D-2
Q104	A-5	Q915	E-4
Q105	A-5	Q917	E-3
Q106	A-5	Q918	F-3
Q107	A-5	Q919	F-6
Q108	D-8	Q920	F-6
Q109	A-5	Q921	D-6
Q110	A-5	Q922	D-5
Q111	A-6	Q923	B-2
Q112	A-6	Q924	B-2
Q201	B-6	Q925	B-2
Q202	A-4		



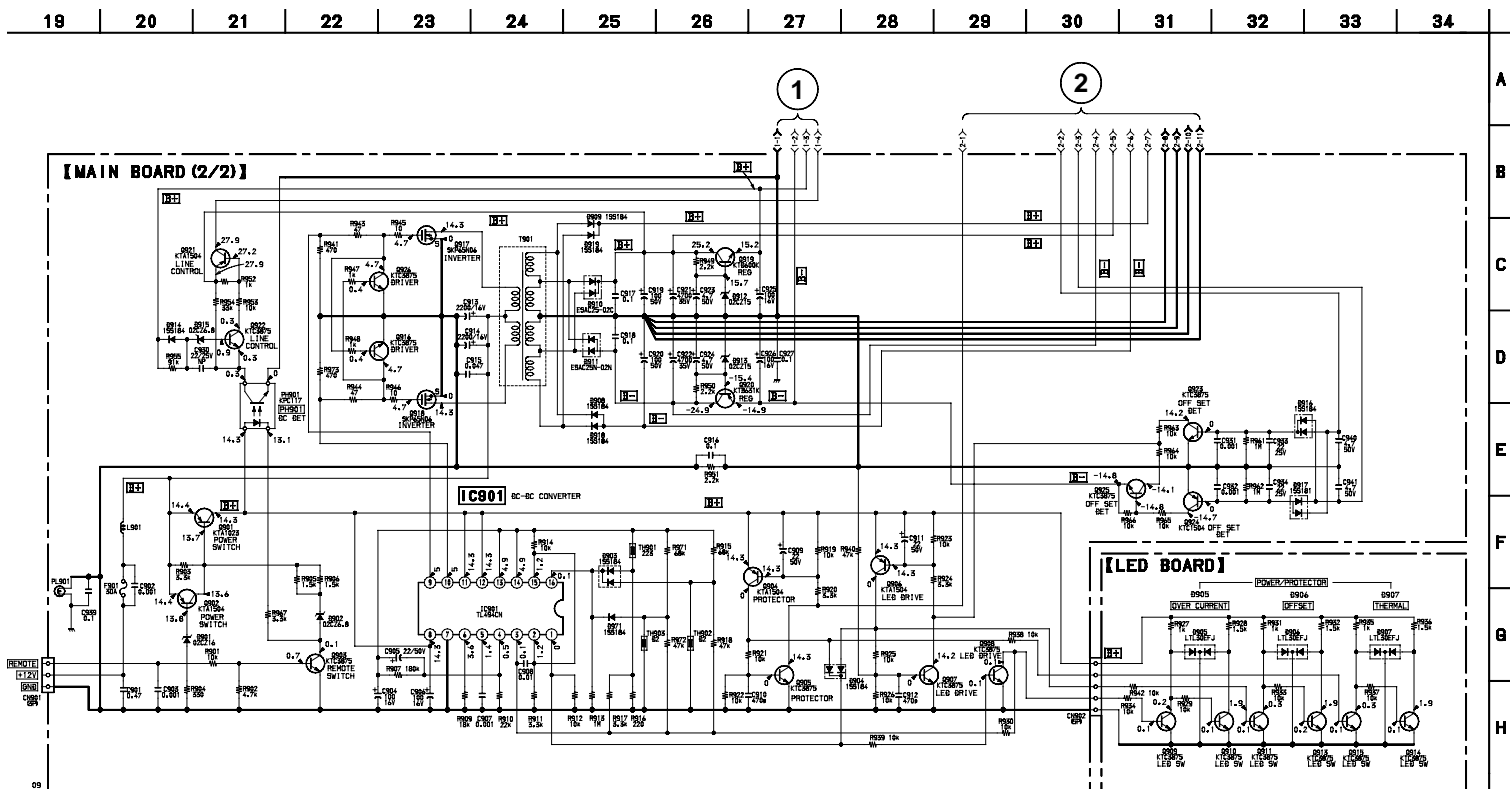
XM-440EX/440NX

3-3. SCHEMATIC DIAGRAMS – MAIN (1/2) SECTION –
• See page 8 for Waveforms.
• See page 9 for Printed Wiring Boards.



3-4. SCHEMATIC DIAGRAMS – MAIN (2/2) SECTION –

- See page 8 for IC Block Diagrams.
- See page 9 for Printed Wiring Boards.

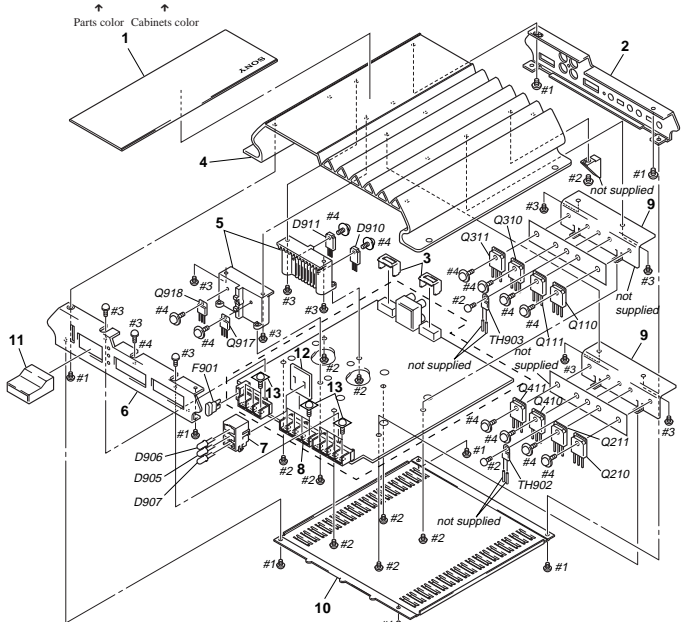


SECTION 4 EXPLODED VIEW

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
KNOB, BALANCE (WHITE) (RED)

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 1	3-045-635-01	PLATE, ORNAMENTAL (440EX)		D906	8-719-079-03	DIODE LTL-30EFJ	
* 1	3-045-635-11	PLATE, ORNAMENTAL (440NX)		D907	8-719-079-03	DIODE LTL-30EFJ	
* 2	3-045-633-01	PANEL (L) (440EX)					
* 2	3-045-633-11	PANEL (L) (440NX)		D910	8-719-912-51	DIODE ESAC25-02C	
* 3	3-045-622-01	BRACKET (HI-LEVEL)		D911	8-719-918-73	DIODE ESAC25-02N	
				F901	1-532-947-11	FUSE (BLADE TYPE) (AUTO FUSE)	
* 4	3-045-632-01	HEAT SINK (440EX)		Q110	8-729-052-06	TRANSISTOR KTD718	
* 4	3-045-632-11	HEAT SINK (440NX)		Q111	8-729-052-05	TRANSISTOR KT8688	
* 5	3-045-616-01	HEAT SINK (FET)					
* 6	3-045-634-01	PANEL (R) (440EX)		Q210	8-729-052-06	TRANSISTOR KTD718	
* 6	3-045-634-11	PANEL (R) (440NX)		Q211	8-729-052-05	TRANSISTOR KT8688	
				Q310	8-729-052-06	TRANSISTOR KTD718	
* 7	3-045-614-01	HOLDER (LED)		Q311	8-729-052-05	TRANSISTOR KT8688	
* 8	A-3326-387-A	MAIN BOARD, COMPLETE		Q410	8-729-052-06	TRANSISTOR KTD718	
* 9	3-045-615-01	HEAT SINK (TR)					
* 10	3-045-636-01	PLATE, BOTTOM		Q411	8-729-052-05	TRANSISTOR KT8688	
* 11	3-045-623-01	COVER		Q917	8-729-052-00	TRANSISTOR SKP65N06	
				Q918	8-729-052-00	TRANSISTOR SKP65N06	
* 12	1-677-609-11	LED BOARD		TH902	1-809-664-51	THERMISTOR, POSITIVE	
* 13	3-048-307-01	SCREW (P)		TH903	1-809-664-51	THERMISTOR, POSITIVE	
D905	8-719-079-03	DIODE LTL-30EFJ					

LED MAIN

Note:

When indicating parts by reference number, please include the board name.

SECTION 5 ELECTRICAL PARTS LIST

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...,
• CAPACITORS
uF: μ F
• COILS
uH: μ H
• Abbreviation
CND: Canadian model
G: German model

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-677-609-11	LED BOARD		C108	1-126-963-11	ELECT	4.7uF 20% 50V
		*****		C109	1-126-963-11	ELECT	4.7uF 20% 50V
				C110	1-126-963-11	ELECT	4.7uF 20% 50V
		< DIODE >		C111	1-104-664-11	ELECT	47uF 20% 16V
D905	8-719-079-03	DIODE LTL-30EFJ		C112	1-163-239-11	CERAMIC CHIP	33PF 5% 50V
D906	8-719-079-03	DIODE LTL-30EFJ		C113	1-101-884-00	CERAMIC	56PF 5% 50V
D907	8-719-079-03	DIODE LTL-30EFJ		C114	1-136-899-11	MYLAR	0.047uF 5% 50V
				C115	1-130-491-00	MYLAR	0.047uF 5% 50V
		< CONNECTOR >		C116	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
* PN901	1-506-653-11	PIN CONNECTOR, B-B 5P		C117	1-127-573-91	CERAMIC CHIP	1uF 10% 16V
				C118	1-127-573-91	CERAMIC CHIP	1uF 10% 16V
		< RESISTOR >		C119	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
				C120	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
R927	1-216-049-00	RES-CHIP 1K	5% 1/10W	C151	1-126-963-11	ELECT	4.7uF 20% 50V
R928	1-216-053-00	METAL CHIP 1.5K	5% 1/10W	C152	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V
R929	1-216-073-00	METAL CHIP 10K	5% 1/10W	C201	1-126-963-11	ELECT	4.7uF 20% 50V
R931	1-216-049-00	RES-CHIP 1K	5% 1/10W	C202	1-126-963-11	ELECT	4.7uF 20% 50V
R932	1-216-053-00	METAL CHIP 1.5K	5% 1/10W	C203	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V
R933	1-216-073-00	METAL CHIP 10K	5% 1/10W	C204	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V
R934	1-216-073-00	METAL CHIP 10K	5% 1/10W	C205	1-163-231-11	CERAMIC CHIP	15PF 5% 50V
R935	1-216-049-00	RES-CHIP 1K	5% 1/10W	C206	1-130-497-00	MYLAR	0.15uF 5% 50V
R936	1-216-053-00	METAL CHIP 1.5K	5% 1/10W	C207	1-130-497-00	MYLAR	0.15uF 5% 50V
R937	1-216-073-00	METAL CHIP 10K	5% 1/10W	C208	1-126-963-11	ELECT	4.7uF 20% 50V
R942	1-216-073-00	METAL CHIP 10K	5% 1/10W	C209	1-126-963-11	ELECT	4.7uF 20% 50V
				C210	1-126-963-11	ELECT	4.7uF 20% 50V
		< TRANSISTOR >		C211	1-104-664-11	ELECT	47uF 20% 16V
Q909	8-729-034-51	TRANSISTOR KTC3875		C212	1-163-239-11	CERAMIC CHIP	33PF 5% 50V
Q910	8-729-034-51	TRANSISTOR KTC3875		C213	1-101-884-00	CERAMIC	56PF 5% 50V
Q911	8-729-034-51	TRANSISTOR KTC3875					
Q913	8-729-034-51	TRANSISTOR KTC3875		C214	1-136-899-11	MYLAR	0.047uF 5% 50V
Q914	8-729-034-51	TRANSISTOR KTC3875		C215	1-130-491-00	MYLAR	0.047uF 5% 50V
Q915	8-729-034-51	TRANSISTOR KTC3875		C216	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
				C217	1-127-573-91	CERAMIC CHIP	1uF 10% 16V
				C218	1-127-573-91	CERAMIC CHIP	1uF 10% 16V
				C219	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
*	A-3326-389-A	MAIN BOARD, COMPLETE		C220	1-163-251-11	CERAMIC CHIP	100PF 5% 50V
		*****		C251	1-126-963-11	ELECT	4.7uF 20% 50V
				C252	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V
		< CAPACITOR >		C301	1-126-963-11	ELECT	4.7uF 20% 50V
C101	1-126-963-11	ELECT	4.7uF 20% 50V	C302	1-126-963-11	ELECT	4.7uF 20% 50V
C102	1-126-963-11	ELECT	4.7uF 20% 50V	C303	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V
C103	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V	C304	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V
C104	1-163-227-11	CERAMIC CHIP	10PF 0.50PF 50V	C305	1-163-231-11	CERAMIC CHIP	15PF 5% 50V
C105	1-163-231-11	CERAMIC CHIP	15PF 5% 50V	C306	1-130-497-00	MYLAR	0.15uF 5% 50V
C106	1-130-497-00	MYLAR	0.15uF 5% 50V	C307	1-130-497-00	MYLAR	0.15uF 5% 50V
C107	1-130-497-00	MYLAR	0.15uF 5% 50V	C308	1-126-963-11	ELECT	4.7uF 20% 50V

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
C309	1-126-963-11	ELECT	4.7uF	20%	50V	C919	1-126-968-11	ELECT	100uF	20%	50V
C310	1-126-963-11	ELECT	4.7uF	20%	50V	C920	1-126-968-11	ELECT	100uF	20%	50V
C311	1-104-664-11	ELECT	47uF	20%	16V	C921	1-126-955-11	ELECT	4700uF	20%	35V
						C922	1-126-955-11	ELECT	4700uF	20%	35V
C312	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	C923	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C313	1-101-884-00	CERAMIC	56PF	5%	50V	C924	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C314	1-136-899-11	MYLAR	0.47uF	5%	50V	C925	1-126-933-11	ELECT	100uF	20%	16V
C315	1-130-491-00	MYLAR	0.047uF	5%	50V	C926	1-126-933-11	ELECT	100uF	20%	16V
C316	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	C927	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C317	1-127-573-91	CERAMIC CHIP	1uF	10%	16V	C928	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C318	1-127-573-91	CERAMIC CHIP	1uF	10%	16V	C929	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C319	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	C930	1-107-715-11	ELECT	22uF	20%	25V
C320	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	C931	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C351	1-126-963-11	ELECT	4.7uF	20%	50V	C932	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C352	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V	C933	1-107-715-11	ELECT	22uF	20%	25V
C401	1-126-963-11	ELECT	4.7uF	20%	50V	C934	1-107-715-11	ELECT	22uF	20%	25V
C402	1-126-963-11	ELECT	4.7uF	20%	50V	C935	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V
C403	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V	C936	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V
C404	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V	C937	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V
C405	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	C938	1-126-940-11	ELECT	330uF	20%	16V
C406	1-130-497-00	MYLAR	0.15uF	5%	50V	C939	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C407	1-130-497-00	MYLAR	0.15uF	5%	50V	C940	1-107-713-11	CERAMIC	4.7uF	20%	50V
C408	1-126-963-11	ELECT	4.7uF	20%	50V	C941	1-107-713-11	CERAMIC	4.7uF	20%	50V
C409	1-126-963-11	ELECT	4.7uF	20%	50V			< CONNECTOR >			
C410	1-126-963-11	ELECT	4.7uF	20%	50V	CN301	1-779-078-41	JACK, PIN 4P (INPUT)			
C411	1-104-664-11	ELECT	47uF	20%	16V	CN302	1-794-219-11	CONNECTOR (4P)(HIGH LEVEL INPUT(FRONT))			
C412	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	CN303	1-794-219-11	CONNECTOR (4P)(HIGH LEVEL INPUT(REAR))			
C413	1-101-884-00	CERAMIC	56PF	5%	50V	CN901	1-694-691-11	TERMINAL BOARD (3P)(REMOTE/+12V/GND)			
C414	1-136-899-11	MYLAR	0.47uF	5%	50V	CN903	1-694-690-11	TERMINAL BOARD (4P)(FRONT SPEAKER OUT)			
C415	1-130-491-00	MYLAR	0.047uF	5%	50V	CN904	1-694-690-11	TERMINAL BOARD (4P)(REAR SPEAKER OUT)			
C416	1-163-251-11	CERAMIC CHIP	100PF	5%	50V			< DIODE >			
C417	1-127-573-91	CERAMIC CHIP	1uF	10%	16V	D101	8-719-801-78	DIODE 1SS184-TE85L			
C418	1-127-573-91	CERAMIC CHIP	1uF	10%	16V	D102	8-719-820-05	DIODE 1SS181-TE85L			
C419	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	D201	8-719-801-78	DIODE 1SS184-TE85L			
C420	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	D202	8-719-820-05	DIODE 1SS181-TE85L			
C451	1-126-963-11	ELECT	4.7uF	20%	50V	D301	8-719-801-78	DIODE 1SS184-TE85L			
C452	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V	D302	8-719-820-05	DIODE 1SS181-TE85L			
C501	1-130-483-00	MYLAR	0.01uF	5%	50V	D401	8-719-801-78	DIODE 1SS184-TE85L			
C502	1-130-483-00	MYLAR	0.01uF	5%	50V	D402	8-719-820-05	DIODE 1SS181-TE85L			
C503	1-130-483-00	MYLAR	0.01uF	5%	50V	D501	8-719-801-78	DIODE 1SS184-TE85L			
C504	1-130-483-00	MYLAR	0.01uF	5%	50V	D901	8-719-025-50	DIODE 02CZ16-TE85L			
C505	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	D902	8-719-025-34	DIODE 02CZ6.8-TE85L			
C901	1-136-899-11	MYLAR	0.47uF	5%	50V	D903	8-719-801-78	DIODE 1SS184-TE85L			
C902	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V	D904	8-719-801-78	DIODE 1SS184-TE85L			
C903	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V	D908	8-719-801-78	DIODE 1SS184-TE85L			
C904	1-126-933-11	ELECT	100uF	20%	16V	D909	8-719-801-78	DIODE 1SS184-TE85L			
C905	1-126-965-11	ELECT	22uF	20%	50V	D910	8-719-912-51	DIODE ESAC25-02C			
C906	1-126-933-11	ELECT	100uF	20%	16V	D911	8-719-918-73	DIODE ESAC25-02N			
C907	1-130-471-00	MYLAR	0.001uF	5%	50V	D912	8-719-025-49	DIODE 02CZ15-TE85L			
C908	1-163-021-11	CERAMIC CHIP	0.01uF	10%	50V	D913	8-719-025-49	DIODE 02CZ15-TE85L			
C909	1-126-965-11	ELECT	22uF	20%	50V	D914	8-719-801-78	DIODE 1SS184-TE85L			
C910	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	D915	8-719-025-34	DIODE 02CZ6.8-TE85L			
C911	1-126-965-11	ELECT	22uF	20%	50V	D916	8-719-801-78	DIODE 1SS184-TE85L			
C912	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	D917	8-719-801-78	DIODE 1SS184-TE85L			
C913	1-111-042-11	ELECT	2200uF	20%	16V	D918	8-719-801-78	DIODE 1SS184-TE85L			
C914	1-111-042-11	ELECT	2200uF	20%	16V	D919	8-719-801-78	DIODE 1SS184-TE85L			
C915	1-130-491-00	MYLAR	0.047uF	5%	50V	D971	8-719-801-78	DIODE 1SS184-TE85L			
C916	1-164-732-11	CERAMIC	0.1uF	20%	50V						
C917	1-130-495-00	MYLAR	0.1uF	5%	50V						
C918	1-130-495-00	MYLAR	0.1uF	5%	50V						

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
		< FUSE >				< PILOT LAMP >	
F901	1-532-947-11	FUSE (BLADE TYPE)(AUTO FUSE)(30A)		PL901	1-518-540-11	LAMP, PILOT	
		< IC >				< TRANSISTOR >	
IC101	8-759-394-81	IC NJM4559M-TE2		Q101	8-729-052-02	TRANSISTOR KTD1304	
IC102	8-759-394-81	IC NJM4559M-TE2		Q102	8-729-232-66	TRANSISTOR 2SA1618-YGRTE85L	
IC103	8-759-970-66	IC LM833M-FL63		Q103	8-729-014-86	TRANSISTOR 2SC4207-YGRTE85L	
IC202	8-759-394-81	IC NJM4559M-TE2		Q104	8-729-037-03	TRANSISTOR KTA1266GR-AT	
IC203	8-759-970-66	IC LM833M-FL63		Q105	8-729-036-90	TRANSISTOR KTC3198BL-AT	
IC301	8-759-394-81	IC NJM4559M-TE2		Q106	8-729-045-02	TRANSISTOR KTC3200GR-AT	
IC302	8-759-394-81	IC NJM4559M-TE2		Q107	8-729-034-50	TRANSISTOR KTA1504	
IC303	8-759-970-66	IC LM833M-FL63		Q108	8-729-052-04	TRANSISTOR KTD600K	
IC402	8-759-394-81	IC NJM4559M-TE2		Q109	8-729-052-03	TRANSISTOR KTB631K	
IC403	8-759-970-66	IC LM833M-FL63		Q110	8-729-052-06	TRANSISTOR KTD718	
IC501	8-759-394-81	IC NJM4559M-TE2		Q111	8-729-052-05	TRANSISTOR KTB688	
IC901	8-759-904-94	IC TL494CN		Q112	8-729-034-51	TRANSISTOR KTC3875	
		< JACK >		Q201	8-729-052-02	TRANSISTOR KTD1304	
J600	1-216-295-00	SHORT	0	Q202	8-729-232-66	TRANSISTOR 2SA1618-YGRTE85L	
J601	1-216-295-00	SHORT	0	Q203	8-729-014-86	TRANSISTOR 2SC4207-YGRTE85L	
J602	1-216-295-00	SHORT	0				
J603	1-216-295-00	SHORT	0	Q204	8-729-037-03	TRANSISTOR KTA1266GR-AT	
J604	1-216-296-00	SHORT	0	Q205	8-729-036-90	TRANSISTOR KTC3198BL-AT	
J605	1-216-296-00	SHORT	0	Q206	8-729-045-02	TRANSISTOR KTC3200GR-AT	
J606	1-216-295-00	SHORT	0	Q207	8-729-034-50	TRANSISTOR KTA1504	
J607	1-216-295-00	SHORT	0	Q208	8-729-052-04	TRANSISTOR KTD600K	
J608	1-216-295-00	SHORT	0				
J609	1-216-295-00	SHORT	0	Q209	8-729-052-03	TRANSISTOR KTB631K	
J610	1-216-295-00	SHORT	0	Q210	8-729-052-06	TRANSISTOR KTD718	
J611	1-216-295-00	SHORT	0	Q211	8-729-052-05	TRANSISTOR KTB688	
J612	1-216-295-00	SHORT	0	Q212	8-729-034-51	TRANSISTOR KTC3875	
J613	1-216-296-00	SHORT	0	Q301	8-729-052-02	TRANSISTOR KTD1304	
J614	1-216-296-00	SHORT	0				
J615	1-216-295-00	SHORT	0	Q302	8-729-232-66	TRANSISTOR 2SA1618-YGRTE85L	
J616	1-216-296-00	SHORT	0	Q303	8-729-014-86	TRANSISTOR 2SC4207-YGRTE85L	
J618	1-216-295-00	SHORT	0	Q304	8-729-037-03	TRANSISTOR KTA1266GR-AT	
J619	1-216-295-00	SHORT	0	Q305	8-729-036-90	TRANSISTOR KTC3198BL-AT	
J620	1-216-295-00	SHORT	0	Q306	8-729-045-02	TRANSISTOR KTC3200GR-AT	
J621	1-216-295-00	SHORT	0				
J622	1-216-295-00	SHORT	0	Q307	8-729-034-50	TRANSISTOR KTA1504	
J623	1-216-296-00	SHORT	0	Q308	8-729-052-04	TRANSISTOR KTD600K	
J624	1-216-295-00	SHORT	0	Q309	8-729-052-03	TRANSISTOR KTB631K	
J625	1-216-296-00	SHORT	0	Q310	8-729-052-06	TRANSISTOR KTD718	
J626	1-216-296-00	SHORT	0	Q311	8-729-052-05	TRANSISTOR KTB688	
J629	1-216-296-00	SHORT	0				
J630	1-216-295-00	SHORT	0	Q312	8-729-034-51	TRANSISTOR KTC3875	
J632	1-216-296-00	SHORT	0	Q401	8-729-052-02	TRANSISTOR KTD1304	
J645	1-216-296-00	SHORT	0	Q402	8-729-232-66	TRANSISTOR 2SA1618-YGRTE85L	
J646	1-216-296-00	SHORT	0	Q403	8-729-014-86	TRANSISTOR 2SC4207-YGRTE85L	
J664	1-216-296-00	SHORT	0	Q404	8-729-037-03	TRANSISTOR KTA1266GR-AT	
J665	1-216-296-00	SHORT	0				
		< COIL >		Q405	8-729-036-90	TRANSISTOR KTC3198BL-AT	
L901	1-411-180-11	INDUCTOR 0uH		Q406	8-729-045-02	TRANSISTOR KTC3200GR-AT	
		< PHOTO INTERRUPTER >		Q407	8-729-034-50	TRANSISTOR KTA1504	
PH901	8-749-017-47	IC KPC117GR		Q408	8-729-052-04	TRANSISTOR KTD600K	
				Q409	8-729-052-03	TRANSISTOR KTB631K	
				Q410	8-729-052-06	TRANSISTOR KTD718	
				Q411	8-729-052-05	TRANSISTOR KTB688	
				Q412	8-729-034-51	TRANSISTOR KTC3875	
				Q901	8-729-052-01	TRANSISTOR KTA1023	
				Q902	8-729-034-50	TRANSISTOR KTA1504	
				Q903	8-729-034-51	TRANSISTOR KTC3875	
				Q904	8-729-034-50	TRANSISTOR KTA1504	
				Q905	8-729-034-51	TRANSISTOR KTC3875	
				Q906	8-729-034-50	TRANSISTOR KTA1504	

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
Q907	8-729-034-51	TRANSISTOR	KTC3875			R147	1-249-883-11	CARBON	22	5%	1/4W
Q908	8-729-034-51	TRANSISTOR	KTC3875			R151	1-216-081-00	METAL CHIP	22K	5%	1/10W
Q916	8-729-034-51	TRANSISTOR	KTC3875			R152	1-216-035-00	METAL CHIP	270	5%	1/10W
Q917	8-729-052-00	TRANSISTOR	SKP65N06			R153	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q918	8-729-052-00	TRANSISTOR	SKP65N06			R154	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q919	8-729-052-04	TRANSISTOR	KTD600K			R201	1-216-081-00	METAL CHIP	22K	5%	1/10W
Q920	8-729-052-03	TRANSISTOR	KT631K			R202	1-216-081-00	METAL CHIP	22K	5%	1/10W
Q921	8-729-034-50	TRANSISTOR	KTA1504			R203	1-216-089-00	RES-CHIP	47K	5%	1/10W
Q922	8-729-034-51	TRANSISTOR	KTC3875			R204	1-216-089-00	RES-CHIP	47K	5%	1/10W
Q923	8-729-034-51	TRANSISTOR	KTC3875			R205	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q924	8-729-034-50	TRANSISTOR	KTA1504			R206	1-216-081-00	METAL CHIP	22K	5%	1/10W
Q925	8-729-034-51	TRANSISTOR	KTC3875			R207	1-216-073-00	METAL CHIP	10K	5%	1/10W
Q926	8-729-034-51	TRANSISTOR	KTC3875			R208	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
< RESISTOR >						R209	1-216-073-00	METAL CHIP	10K	5%	1/10W
R101	1-216-081-00	METAL CHIP	22K	5%	1/10W	R210	1-216-066-00	METAL CHIP	5.1K	5%	1/10W
R102	1-216-081-00	METAL CHIP	22K	5%	1/10W	R211	1-216-066-00	METAL CHIP	5.1K	5%	1/10W
R103	1-216-089-00	RES-CHIP	47K	5%	1/10W	R212	1-216-097-00	RES-CHIP	100K	5%	1/10W
R104	1-216-089-00	RES-CHIP	47K	5%	1/10W	R213	1-216-097-00	RES-CHIP	100K	5%	1/10W
R105	1-216-073-00	METAL CHIP	10K	5%	1/10W	R214	1-216-097-00	RES-CHIP	100K	5%	1/10W
R106	1-216-081-00	METAL CHIP	22K	5%	1/10W	R217	1-216-083-00	METAL CHIP	27K	5%	1/10W
R107	1-216-073-00	METAL CHIP	10K	5%	1/10W	R218	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R108	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R219	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R109	1-216-073-00	METAL CHIP	10K	5%	1/10W	R220	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R110	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	R221	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R111	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	R222	1-216-083-00	METAL CHIP	27K	5%	1/10W
R112	1-216-097-00	RES-CHIP	100K	5%	1/10W	R223	1-216-025-00	RES-CHIP	100	5%	1/10W
R113	1-216-097-00	RES-CHIP	100K	5%	1/10W	R224	1-216-025-00	RES-CHIP	100	5%	1/10W
R114	1-216-097-00	RES-CHIP	100K	5%	1/10W	R225	1-216-097-00	RES-CHIP	100K	5%	1/10W
R117	1-216-083-00	METAL CHIP	27K	5%	1/10W	R226	1-216-097-00	RES-CHIP	100K	5%	1/10W
R118	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R227	1-216-649-11	METAL CHIP	820	0.5%	1/10W
R119	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R228	1-216-637-11	METAL CHIP	270	0.5%	1/10W
R120	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R229	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R121	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R230	1-216-182-00	RES-CHIP	220	5%	1/8W
R122	1-216-083-00	METAL CHIP	27K	5%	1/10W	R231	1-216-142-00	RES-CHIP	4.7	5%	1/8W
R123	1-216-025-00	RES-CHIP	100	5%	1/10W	R232	1-216-142-00	RES-CHIP	4.7	5%	1/8W
R124	1-216-025-00	RES-CHIP	100	5%	1/10W	R233	1-205-991-11	METAL	0.1	10%	
R125	1-216-097-00	RES-CHIP	100K	5%	1/10W	R234	1-259-454-11	CARBON	12K	5%	1/6W
R126	1-216-097-00	RES-CHIP	100K	5%	1/10W	R235	1-259-458-11	CARBON	18K	5%	1/6W
R127	1-216-649-11	METAL CHIP	820	0.5%	1/10W	R236	1-216-049-00	RES-CHIP	1K	5%	1/10W
R128	1-216-637-11	METAL CHIP	270	0.5%	1/10W	R237	1-216-049-00	RES-CHIP	1K	5%	1/10W
R129	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	R238	1-216-073-00	METAL CHIP	10K	5%	1/10W
R130	1-216-182-00	RES-CHIP	220	5%	1/8W	R239	1-216-113-00	METAL CHIP	470K	5%	1/10W
R131	1-216-142-00	RES-CHIP	4.7	5%	1/8W	R240	1-249-883-11	CARBON	22	5%	1/4W
R132	1-216-142-00	RES-CHIP	4.7	5%	1/8W	R241	1-216-089-00	RES-CHIP	47K	5%	1/10W
R133	1-205-991-11	METAL	0.1	10%		R242	1-216-089-00	RES-CHIP	47K	5%	1/10W
R134	1-259-454-11	CARBON	12K	5%	1/6W	R243	1-208-291-11	RES-CHIP	4.7M	5%	1/10W
R135	1-259-458-11	CARBON	18K	5%	1/6W	R244	1-216-471-11	METAL OXIDE	27	5%	3W
R136	1-216-049-00	RES-CHIP	1K	5%	1/10W	R247	1-249-883-11	CARBON	22	5%	1/4W
R137	1-216-049-00	RES-CHIP	1K	5%	1/10W	R251	1-216-081-00	METAL CHIP	22K	5%	1/10W
R138	1-216-073-00	METAL CHIP	10K	5%	1/10W	R252	1-216-035-00	METAL CHIP	270	5%	1/10W
R139	1-216-113-00	METAL CHIP	470K	5%	1/10W	R253	1-216-073-00	METAL CHIP	10K	5%	1/10W
R140	1-249-883-11	CARBON	22	5%	1/4W	R254	1-216-073-00	METAL CHIP	10K	5%	1/10W
R141	1-216-089-00	RES-CHIP	47K	5%	1/10W	R301	1-216-081-00	METAL CHIP	22K	5%	1/10W
R142	1-216-089-00	RES-CHIP	47K	5%	1/10W	R302	1-216-081-00	METAL CHIP	22K	5%	1/10W
R143	1-208-291-11	RES-CHIP	4.7M	5%	1/10W	R303	1-216-089-00	RES-CHIP	47K	5%	1/10W
R144	1-216-471-11	METAL OXIDE	27	5%	3W	R304	1-216-089-00	RES-CHIP	47K	5%	1/10W
						R305	1-216-073-00	METAL CHIP	10K	5%	1/10W
						R306	1-216-081-00	METAL CHIP	22K	5%	1/10W

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
R307	1-216-073-00	METAL CHIP	10K	5%	1/10W	R419	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R308	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R420	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R309	1-216-073-00	METAL CHIP	10K	5%	1/10W	R421	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R310	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	R422	1-216-083-00	METAL CHIP	27K	5%	1/10W
R311	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	R423	1-216-025-00	RES-CHIP	100	5%	1/10W
R312	1-216-097-00	RES-CHIP	100K	5%	1/10W	R424	1-216-025-00	RES-CHIP	100	5%	1/10W
R313	1-216-097-00	RES-CHIP	100K	5%	1/10W	R425	1-216-097-00	RES-CHIP	100K	5%	1/10W
R314	1-216-097-00	RES-CHIP	100K	5%	1/10W	R426	1-216-097-00	RES-CHIP	100K	5%	1/10W
R317	1-216-083-00	METAL CHIP	27K	5%	1/10W	R427	1-216-649-11	METAL CHIP	820	0.5%	1/10W
R318	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R428	1-216-637-11	METAL CHIP	270	0.5%	1/10W
R319	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R429	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R320	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R430	1-216-182-00	RES-CHIP	220	5%	1/8W
R321	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R431	1-216-142-00	RES-CHIP	4.7	5%	1/8W
R322	1-216-083-00	METAL CHIP	27K	5%	1/10W	R432	1-216-142-00	RES-CHIP	4.7	5%	1/8W
R323	1-216-025-00	RES-CHIP	100	5%	1/10W	R433	1-205-991-11	METAL	0.1	10%	
R324	1-216-025-00	RES-CHIP	100	5%	1/10W	R434	1-259-454-11	CARBON	12K	5%	1/6W
R325	1-216-097-00	RES-CHIP	100K	5%	1/10W	R435	1-259-458-11	CARBON	18K	5%	1/6W
R326	1-216-097-00	RES-CHIP	100K	5%	1/10W	R436	1-216-049-00	RES-CHIP	1K	5%	1/10W
R327	1-216-649-11	METAL CHIP	820	0.5%	1/10W	R437	1-216-049-00	RES-CHIP	1K	5%	1/10W
R328	1-216-637-11	METAL CHIP	270	0.5%	1/10W	R438	1-216-073-00	METAL CHIP	10K	5%	1/10W
R329	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	R439	1-216-113-00	METAL CHIP	470K	5%	1/10W
R330	1-216-182-00	RES-CHIP	220	5%	1/8W	R440	1-249-883-11	CARBON	22	5%	1/4W
R331	1-216-142-00	RES-CHIP	4.7	5%	1/8W	R441	1-216-097-00	RES-CHIP	100K	5%	1/10W
R332	1-216-142-00	RES-CHIP	4.7	5%	1/8W	R442	1-216-097-00	RES-CHIP	100K	5%	1/10W
R333	1-205-991-11	METAL	0.1	10%		R443	1-208-291-11	RES-CHIP	4.7M	5%	1/10W
R334	1-259-454-11	CARBON	12K	5%	1/6W	R444	1-216-471-11	METAL OXIDE	27	5%	3W
R335	1-259-458-11	CARBON	18K	5%	1/6W	R447	1-249-883-11	CARBON	22	5%	1/4W
R336	1-216-049-00	RES-CHIP	1K	5%	1/10W	R451	1-216-081-00	METAL CHIP	22K	5%	1/10W
R337	1-216-049-00	RES-CHIP	1K	5%	1/10W	R452	1-216-035-00	METAL CHIP	270	5%	1/10W
R338	1-216-073-00	METAL CHIP	10K	5%	1/10W	R453	1-216-073-00	METAL CHIP	10K	5%	1/10W
R339	1-216-113-00	METAL CHIP	470K	5%	1/10W	R454	1-216-073-00	METAL CHIP	10K	5%	1/10W
R340	1-249-883-11	CARBON	22	5%	1/4W	R501	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R341	1-216-089-00	RES-CHIP	47K	5%	1/10W	R502	1-216-073-00	METAL CHIP	10K	5%	1/10W
R342	1-216-089-00	RES-CHIP	47K	5%	1/10W	R503	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R343	1-208-291-11	RES-CHIP	4.7M	5%	1/10W	R504	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R344	1-216-471-11	METAL OXIDE	27	5%	3W	R505	1-216-073-00	METAL CHIP	10K	5%	1/10W
R347	1-249-883-11	CARBON	22	5%	1/4W	R506	1-216-073-00	METAL CHIP	10K	5%	1/10W
R351	1-216-081-00	METAL CHIP	22K	5%	1/10W	R507	1-216-073-00	METAL CHIP	10K	5%	1/10W
R352	1-216-035-00	METAL CHIP	270	5%	1/10W	R508	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R353	1-216-073-00	METAL CHIP	10K	5%	1/10W	R509	1-216-102-00	RES-CHIP	160K	5%	1/10W
R354	1-216-073-00	METAL CHIP	10K	5%	1/10W	R510	1-216-102-00	RES-CHIP	160K	5%	1/10W
R401	1-216-081-00	METAL CHIP	22K	5%	1/10W	R511	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R402	1-216-081-00	METAL CHIP	22K	5%	1/10W	R512	1-216-073-00	METAL CHIP	10K	5%	1/10W
R403	1-216-089-00	RES-CHIP	47K	5%	1/10W	R901	1-216-073-00	METAL CHIP	10K	5%	1/10W
R404	1-216-089-00	RES-CHIP	47K	5%	1/10W	R902	1-216-065-00	RES-CHIP	4.7K	5%	1/10W
R405	1-216-073-00	METAL CHIP	10K	5%	1/10W	R903	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R406	1-216-081-00	METAL CHIP	22K	5%	1/10W	R904	1-216-037-00	METAL CHIP	330	5%	1/10W
R407	1-216-073-00	METAL CHIP	10K	5%	1/10W	R905	1-216-202-00	RES-CHIP	1.5K	5%	1/8W
R408	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	R906	1-216-202-00	RES-CHIP	1.5K	5%	1/8W
R409	1-216-073-00	METAL CHIP	10K	5%	1/10W	R907	1-216-103-00	METAL CHIP	180K	5%	1/10W
R410	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	R909	1-216-079-00	METAL CHIP	18K	5%	1/10W
R411	1-216-066-00	METAL CHIP	5.1K	5%	1/10W	R910	1-216-081-00	METAL CHIP	22K	5%	1/10W
R412	1-216-097-00	RES-CHIP	100K	5%	1/10W	R911	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R413	1-216-097-00	RES-CHIP	100K	5%	1/10W	R912	1-216-073-00	METAL CHIP	10K	5%	1/10W
R414	1-216-097-00	RES-CHIP	100K	5%	1/10W	R913	1-216-121-00	RES-CHIP	1M	5%	1/10W
R417	1-216-083-00	METAL CHIP	27K	5%	1/10W	R914	1-216-073-00	METAL CHIP	10K	5%	1/10W
R418	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	R915	1-216-093-00	RES-CHIP	68K	5%	1/10W
						R916	1-216-033-00	METAL CHIP	220	5%	1/10W
						R917	1-216-061-00	METAL CHIP	3.3K	5%	1/10W

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