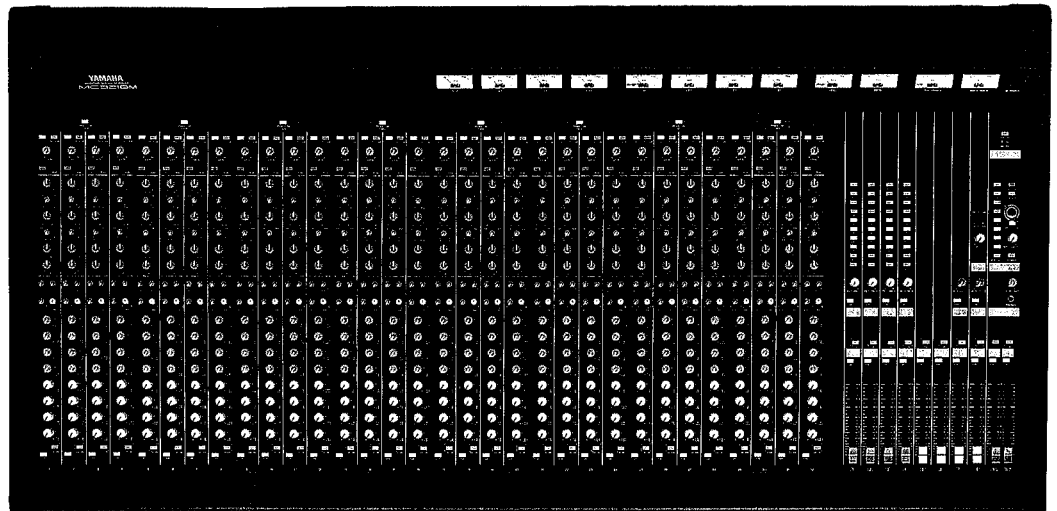


# MIXING CONSOLES

## MC2410M/MC3210M

### SERVICE MANUAL



MC3210M

MC2410M/MC3210M

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## IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury; destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that all service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

**IMPORTANT:** The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

**IMPORTANT:** Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

## WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and/or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

**DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHAT SO EVER!**

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

## SPECIFICATIONS

### GENERAL SPECIFICATIONS

<b>FREQUENCY RESPONSE</b>	20 Hz — 20 kHz+1/-3 dB (@600 $\Omega$ , +4 dB)
<b>TOTAL HARMONIC DISTORTION</b>	< 0.1% (20 Hz — 20 kHz) @+14 dB output into 600 $\Omega$
<b>NOISE LEVELS*1</b>	
Equivalent input noise	-128 dB (Rs = 150 $\Omega$ )
Residual output noise	-97 dB (balanced output)
<b>MAXIMUM VOLTAGE GAIN</b>	
CH IN → GROUP OUT (1 — 8,9/L,10/R)	80 dB
CH IN → AUX OUT	76 dB
CH IN → CH INSERT OUT	60 dB
RETURN → GROUP OUT (1 — 8,9/L,10/R)	16 dB
TALKBACK IN → GROUP OUT (1 — 8,9/L,10/R)	70 dB
SUB IN → GROUP OUT (1 — 8,9/L,10/R)	10 dB
SUB IN → AUX OUT	6 dB
CUE SUB IN → CUE OUT	6 dB
<b>Input gain control</b>	44 dB variable
<b>Input phase switch</b>	normal / reverse
<b>Input PAD switch</b>	20 dB
<b>EQUALIZER CHARACTERISTICS</b>	
Max. variable range	$\pm 15$ dB
HIGH	10 kHz*2 shelving
HIGH-MID	400 Hz — 8 kHz peaking
LOW-MID	80 Hz — 1.6 kHz peaking
LOW	100 Hz*2 shelving
<b>Input High Pass Filter</b>	12 dB/octave roll-off 80 Hz
<b>CROSSTALK</b>	
	-70 dB @ 1 kHz, adjacent input
	-70 dB @ 1 kHz, input to output

<b>CH Peak Indicator</b>	
CH Peak LED	turns on when post-EQ signal is above the level 3 dB lower than clipping level.

<b>Cue Signal Indicator</b>	
Cue Signal LED	turns on when cue signal is above the level 20 dB lower than nominal level.

<b>VU Meters</b> (0 dB=+4 dB output)	12 illuminated meters with Peak indicators turn on when output signal is above the level 3 dB lower than clipping level.
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<b>Phantom Power</b>	+48 (DC) is applied to balanced inputs for powering condenser microphones.
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### POWER REQUIREMENTS (Usable voltage range)

US & Canadian models	120 V, 60Hz
General model	230 V, 50 Hz

<b>POWER CONSUMPTION</b>	80 W
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### DIMENSIONS (W x H x D)

MC 2410M	1204 x 185 x 739 mm (47.4" x 7.3" x 29.1")
MC 3210M	1485 x 185 x 739 mm (58.5" x 7.3" x 29.1")

### WEIGHT

MC2410M	38 kg (84 lbs.)
MC3210M	46 kg (102 lbs.)

\*1 20 — 20 kHz (average)

Input Gain MAX, Input PAD SW off—Input sensitivity= -60 dB

\*2 Turnover/roll-off frequency: 3 dB below maximum variable level

● 0 dB = 0.775 V r.m.s.

## INPUTS

Input Terminals		PAD	GAIN TRIM	Actual Load Impedance	For Use with Nominal	Sensitivity* <sup>1</sup>	Input levels		Connector in Mixer
							Nominal	Maximum non-clipping level	
CH-INPUT MC2410M 1—24 MC3210M 1—32	OFF (0 dB)	-60 dB	(LO-Z) 5 k $\Omega$	50—600 $\Omega$ Microphones or 600 $\Omega$ Lines	-76 dB (0.12 mV)	-60 dB (0.78 mV)	-40 dB (7.75 mV)	(LO-Z) XLR-3-31type (Balanced)	
			(HI-Z) 10 k $\Omega$		-32 dB (19.5 mV)	-16 dB (0.123 V)	+4 dB (1.23 V)		(HI-Z) Phone Jack (TRS)* <sup>2</sup>
	ON (20 dB)	-16 dB	-12 dB (0.195 V)		+4 dB (1.23 V)	+24 dB (12.3 V)			
INSERT IN CH	MC2410M 1—24 MC3210M 1—32		10 k $\Omega$	600 $\Omega$ Lines	-16 dB (0.123 V)	0 dB (0.775 V)	+20 dB (7.75 V)	Phone Jack (TRS)* <sup>3</sup>	
INSERT IN GROUP (1—8,9/L,10/R)			10 k $\Omega$	600 $\Omega$ Lines	-10 dB (0.245 V)	0 dB (0.775 V)	+20 dB (7.75 V)	Phone Jack (TRS)* <sup>3</sup>	
RETURN (1,2,3,4)			20 k $\Omega$	600 $\Omega$ Lines	-12 dB (0.195 V)	+4 dB (1.23 V)	+24 dB (12.3 V)	Phone Jack (Unbalanced)	
SUB IN	GROUP (1—8,9/L,10/R) AUX (1,2) CUE (L,R)		10 k $\Omega$	600 $\Omega$ Lines	-6 dB (0.388 V)	+4 dB (1.23 V)	+24 dB (12.3 V)	Phone Jack (Unbalanced)	
TALKBACK IN			10 k $\Omega$	50—600 $\Omega$ Microphones	-66 dB (0.39 mV)	-50 dB (2.45 mV)	-24 dB (48.9 mV)	XLR-3-31 Type (Unbalanced)	

\*1) Sensitivity is the lowest level that will produce the nominal GROUP output level when the unit is set to maximum level.

\*2) HI-Z INPUT Jacks (T=HOT, R=COLD, S=GND)

\*3) Insert Phone Jacks (T=OUT, R=IN, S=GND)

● 0 dB is referenced to 0.775 Vrms.

## OUTPUTS

Output Terminals	Actual Source Impedance	For Use with Nominal	Output Level		Connector in Mixer
			Nominal	Max. before clip	
GROUP OUT (1-8,9/L,10/R)	150 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23 V)	+24 dB (12.3 V)	XLR-3-32 Type (Balanced)
AUX OUT(1,2)	75 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone Jack (Unbalanced)
TALKBACK OUT	75 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone Jack (Unbalanced)
CUE OUT (L,R)	75 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone Jack (Unbalanced)
INSERT OUT CH	MC2410M 1-24 MC3210M 1-32	10 k $\Omega$ Lines	0 dB (0.775 V)	+20 dB (7.75 V)	Phone Jack (TRS)* <sup>1</sup>
INSERT OUT GROUP (1-8,9/L,10/R)	600 $\Omega$	10 k $\Omega$ Lines	0 dB (0.775 V)	+20 dB (7.75 V)	Phone Jack (TRS)* <sup>1</sup>
PHONES OUT (L,R)	100 $\Omega$	8 $\Omega$ Phones	1 mW	20 mW	Stereo Phone Jack
		40 $\Omega$ Phones	3 mW	75 mW	

\*1) Insert Phone Jacks (T=OUT, R=IN, S=GND)

● 0 dB is referenced to 0.775 Vrms.



## ■ 総合仕様

### ■ 一般仕様

周波数特性	20Hz~20kHz +1/-3 dB (@600Ω, +4 dB)	
全高調波歪率	0.1%以下 (20Hz~20kHz @600Ω, +14 dB)	
ノイズレベル*1		
入力換算ノイズ	-128 dB (Rs = 150 Ω)	
残留ノイズ	-97 dB	
GROUP OUT (1~8)	-78 dB	マスターフェーダー → nominal All Input CH → minimum
	-64 dB	マスターフェーダー → nominal One Input CH → nominal
GROUP OUT (9/L, 10/R)	-75 dB	マスターフェーダー → nominal All Input CH → minimum
	-64 dB	マスターフェーダー → nominal One Input CH → nominal
AUX OUT	-79 dB	AUX OUTコントロール → nominal All AUX Input CH → minimum
	-64 dB	AUX OUTコントロール → nominal One Input CH → nominal
最大電圧利得		
CH IN → GROUP OUT	80 dB	
CH IN → AUX OUT	76 dB	
CH IN → CH INSERT OUT	60 dB	
RETURN → GROUP OUT	16 dB	
TALKBACK IN → GROUP OUT	70 dB	
SUB IN → GROUP OUT	10 dB	
SUB IN → AUX OUT	6 dB	
CUE SUB IN → CUE OUT	6 dB	
ゲインコントロール	44 dB Variable	
フェイズスイッチ	Normal/Reverse	
PAD スイッチ	20 dB	
イコライザー特性		
最大可変幅	±15 dB	
HIGH-EQ	10kHz*2	シェルビングタイプ
HIGH-MID-EQ	400Hz~8kHz	ピーキングタイプ
LOW-MID-EQ	80Hz~1.6kHz	ピーキングタイプ
LOW-EQ	100Hz*2	シェルビングタイプ

ハイパスフィルター	12 dB/octave	ロールオフ周波数: 80Hz
クロストーク (1kHz)	-70 dB	adjacent input
	-70 dB	input to output
インジケーター		
CH PEAK	クリッピングの3 dB手前で点灯 (Post EQ)	
CUE SIGNAL	規定レベルの20 dB手前で点灯	
VUメーター	GROUP 1~8, 9/L, 10/R AUX 1, 2 / CUE L, R	
ファントム電源	+48V (DC)	
電源	AC100V, 50/60Hz	
消費電力		
MC2410M	70 W	
MC3210M	85 W	
寸法 (W x H x D)		
MC2410M	1204 x 185 x 739 mm	
MC3210M	1485 x 185 x 739 mm	
重量		
MC2410M	38 kg	
MC3210M	46 kg	

\*1 @ 20~20kHz 平均値測定

\*2 ターンオーバー/ロールオフ周波数:

最大可変幅に対し3 dB下がった (±12 dB) ポイント

● 0 dB = 0.775Vr.m.s.

## ■ 入力仕様

入力端子	入力		ソース インピーダンス	ソース インピーダンス	感度*1	入力レベル		使用コネクター
	PAD	GAIN				規定レベル	最大ノン クリップレベル	
CH INPUT MC2410M 1~24 MC3210M 1~32	OFF (0 dB) ON (20 dB)	-60 dB	(LO-Z) 5k $\Omega$	50~600 $\Omega$ Microphones or 600 $\Omega$ Lines	-76 dB (0.12mV)	-60 dB (0.78mV)	-40 dB (7.75mV)	(LO-Z) XLR-3-31 type (Balanced)  (HI-Z) Phone Jack (TRS)*2
		-16 dB	(HI-Z) 10k $\Omega$		-32 dB (19.5mV)	-16 dB (0.123V)	+4 dB (1.23V)	
INSERT IN CH	MC2410M 1~24 MC3210M 1~32		10k $\Omega$	600 $\Omega$ Lines	-16 dB (0.123V)	0 dB (0.775V)	+20 dB (7.75V)	Phone Jack (TRS)*3
INSERT IN GROUP (1~8, 9/L, 10/R)			10k $\Omega$	600 $\Omega$ Lines	-10 dB (0.245V)	0 dB (0.775V)	+20 dB (7.75V)	Phone Jack (TRS)*3
RETURN (1, 2, 3, 4)			20k $\Omega$	600 $\Omega$ Lines	-12 dB (0.195V)	+4 dB (1.23V)	+24 dB (12.3V)	Phone Jack (Unbalanced)
SUB IN	GROUP (1~8, 9/L, 10/R) AUX (1, 2) CUE (L, R)		10k $\Omega$	600 $\Omega$ Lines	-6 dB (0.388V)	+4 dB (1.23V)	+24 dB (12.3V)	Phone Jack (Unbalanced)
TALKBACK IN			10k $\Omega$	50~600 $\Omega$ Microphones	-66 dB (0.39mV)	-50 dB (2.45mV)	-24 dB (48.9mV)	XLR 3-31 Type (Unbalanced)

\*1) 感度は、全てのフェーダーとレベルコントロールとを最大位置に設定した状態でGROUP OUTに規定レベル (+4 dB = 1.23V) を得るために必要な入力レベルです。

\*2) HI-Z INPUT Jacks (T = HOT, R = COLD, S = GND)

\*3) Insert Phone Jacks (T = OUT, R = IN, S = GND)

● 0dB = 0.775Vr.m.s.

## ■ 出力仕様

出力端子	出力インピーダンス	負荷インピーダンス	出力レベル		使用コネクター		
			規定レベル	最大ノン クリップレベル			
GROUP OUT (1~8, 9/L, 10/R)	150 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23V)	+24 dB (12.3V)	XLR 3-32 Type (Balanced)		
AUX OUT (1, 2)	75 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23V)	+20 dB (7.75V)	Phone Jack (Unbalanced)		
TALKBACK OUT	75 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23V)	+20 dB (7.75V)	Phone Jack (Unbalanced)		
CUE OUT (L, R)	75 $\Omega$	600 $\Omega$ Lines	+4 dB (1.23V)	+20 dB (7.75V)	Phone Jack (Unbalanced)		
INSERT OUT CH	MC2410M 1~24 MC3210M 1~32		600 $\Omega$	10k $\Omega$ Lines	0 dB (0.775V)	+20 dB (7.75V)	Phone Jack (TRS)*1
INSERT OUT GROUP (1~8, 9/L, 10/R)	600 $\Omega$	10k $\Omega$ Lines	0 dB (0.775V)	+20 dB (7.75V)	Phone Jack (TRS)*1		
PHONES OUT (L, R)	100 $\Omega$	8 $\Omega$ Phones	1 mW	20 mW	Stereo Phone Jack		
		40 $\Omega$ Phones	3 mW	75 mW			

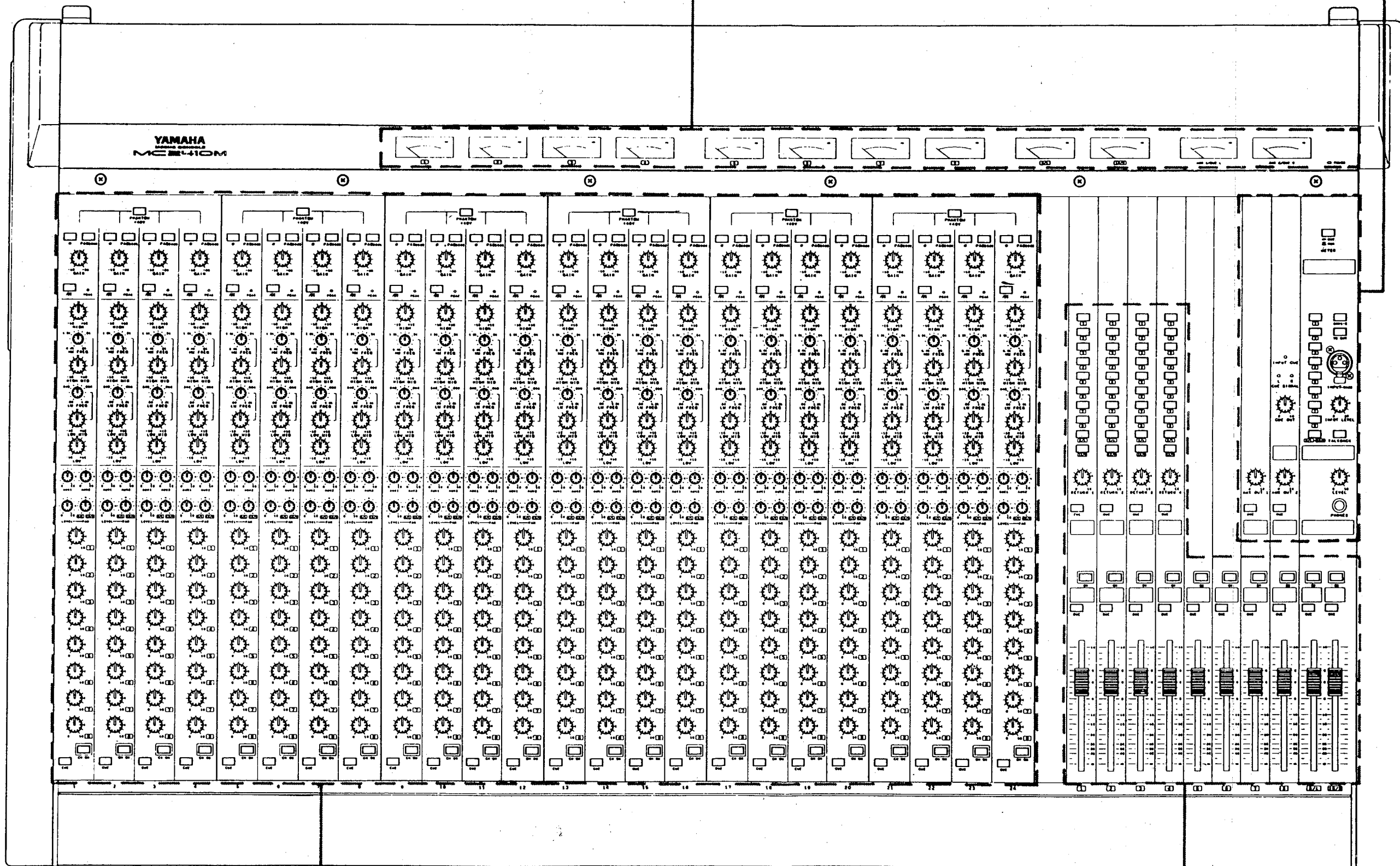
\*1) Insert Phone Jacks (T = OUT, R = IN, S = GND)

● 0 dB = 0.775Vr.m.s.

■ PANEL LAYOUT (パネルレイアウト)

VU METER SECTION

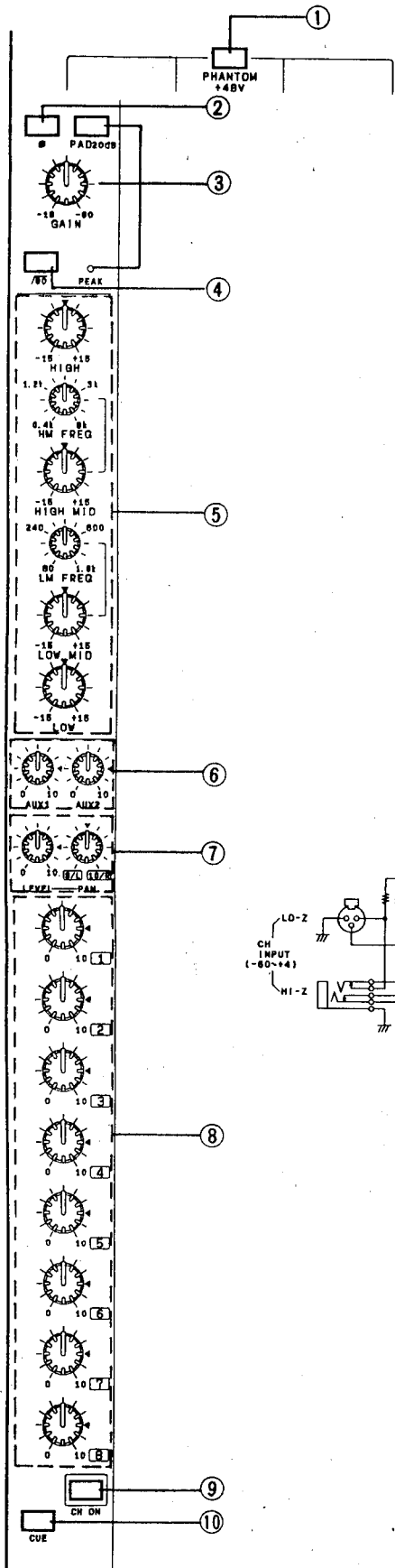
CUE, PHONES, AUX OUT & TALKBACK SECTIONS



CH. INPUT SECTION

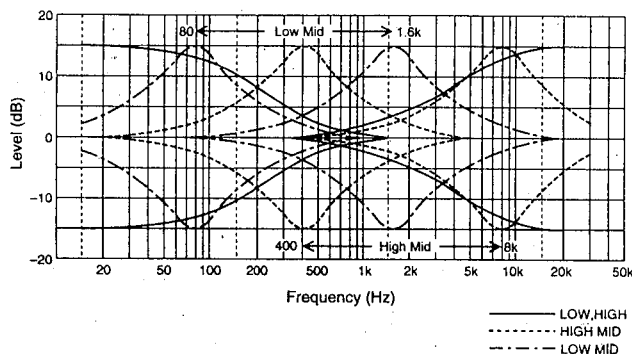
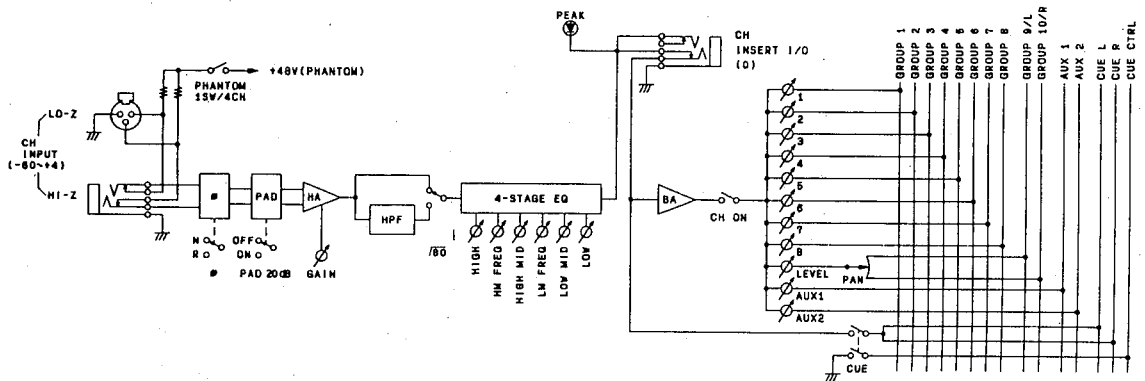
RETURN & GROUP OUT SECTIONS

● CH. INPUT SECTION

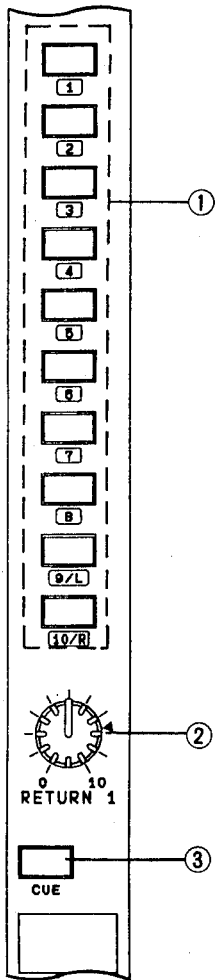


- ① PHANTOM power switch
- ② Phase (Polarity) Reverse switch
- ③ PAD switch, GAIN control and PEAK LED
- ④ /80 HPF switch
- ⑤ HIGH, HIGH-MID, LOW-MID and LOW controls
- ⑥ AUX 1 & 2 controls
- ⑦ 9/L-10/R LEVEL & PAN controls
- ⑧ Input Mix Level controls
- ⑨ CH ON switch
- ⑩ CUE switch

- ① PHANTOMスイッチ
- ② φ(フェイズ切換)スイッチ
- ③ PAD(インプットアッテネーター)スイッチ、GAINコントロール、PEAKインジケータ
- ④ ハイパスフィルター( /80)スイッチ
- ⑤ HIGHイコライザー、HM FREQコントロール/HI MIDイコライザー、LM FREQコントロール/LOW MIDイコライザー、LOWイコライザー
- ⑥ AUX1・2コントロール
- ⑦ グループ9/L、10/Rレベルコントロール/PAN(パンポット)コントロール
- ⑧ グループ1~8レベルコントロール
- ⑨ CH ONスイッチ
- ⑩ チャンネルCUEスイッチ



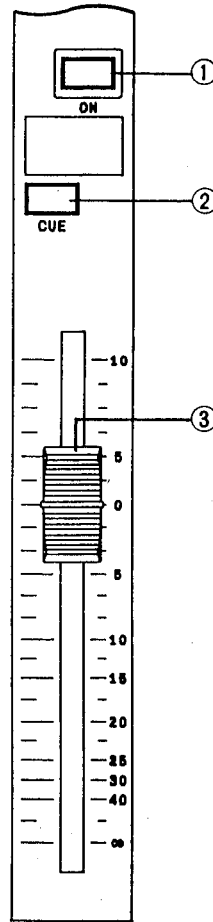
● RETURN SECTION



- ① Return assign switches
- ② RETURN level control
- ③ Return CUE switch

- ① リターンアサインスイッチ
- ② RETURNコントロール
- ③ リターンCUEスイッチ

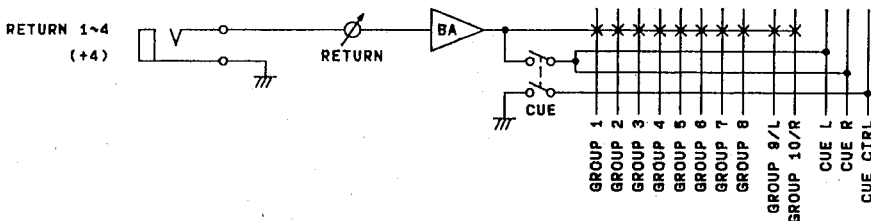
● GROUP OUT SECTION



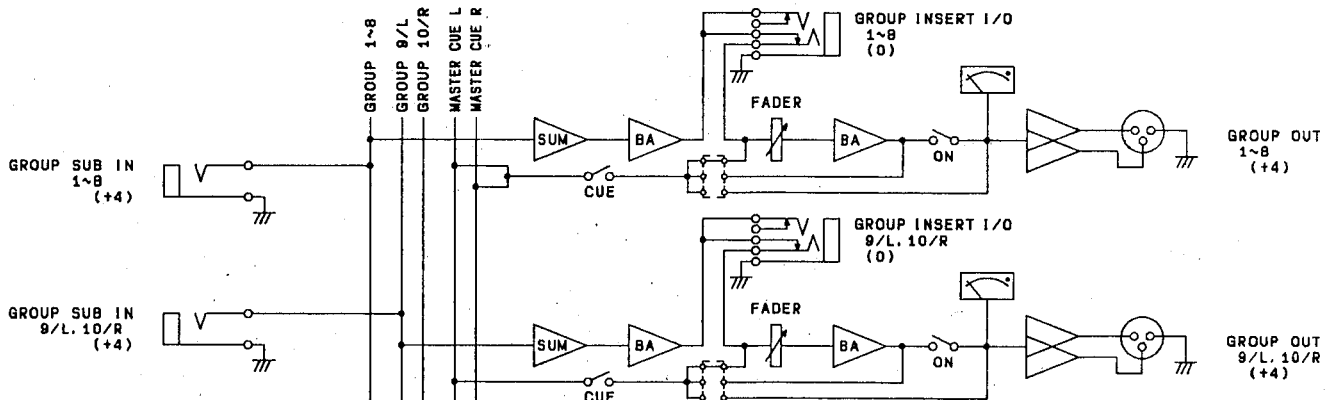
- ① Group ON switch
- ② Group CUE switch
- ③ Group fader

- ① グループONスイッチ
- ② グループ1~8、9/L、10/R CUEスイッチ
- ③ グループフェーダー

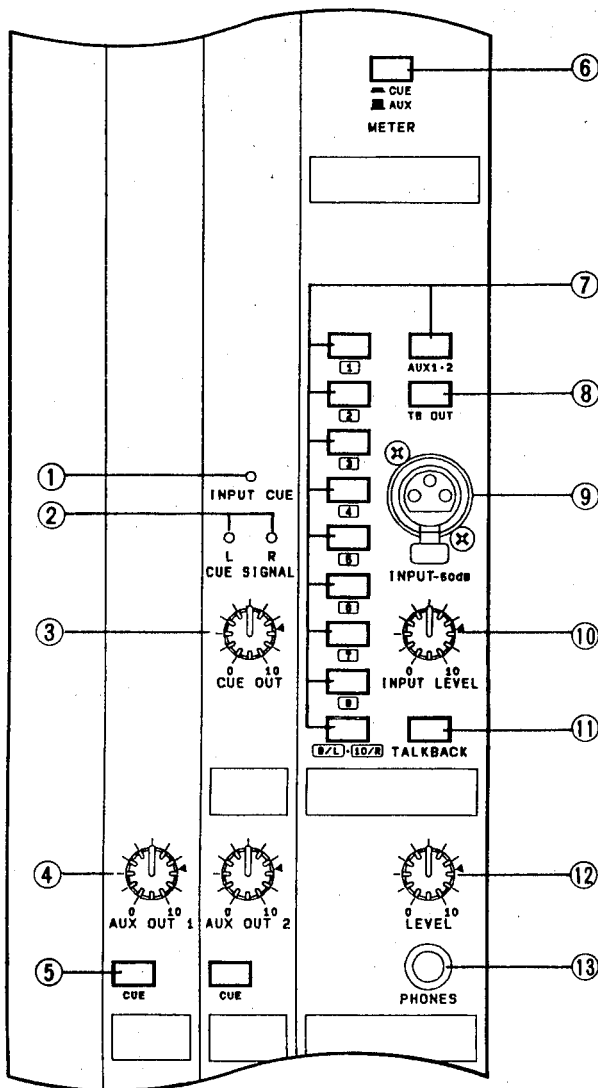
● Return Section



● Group Section

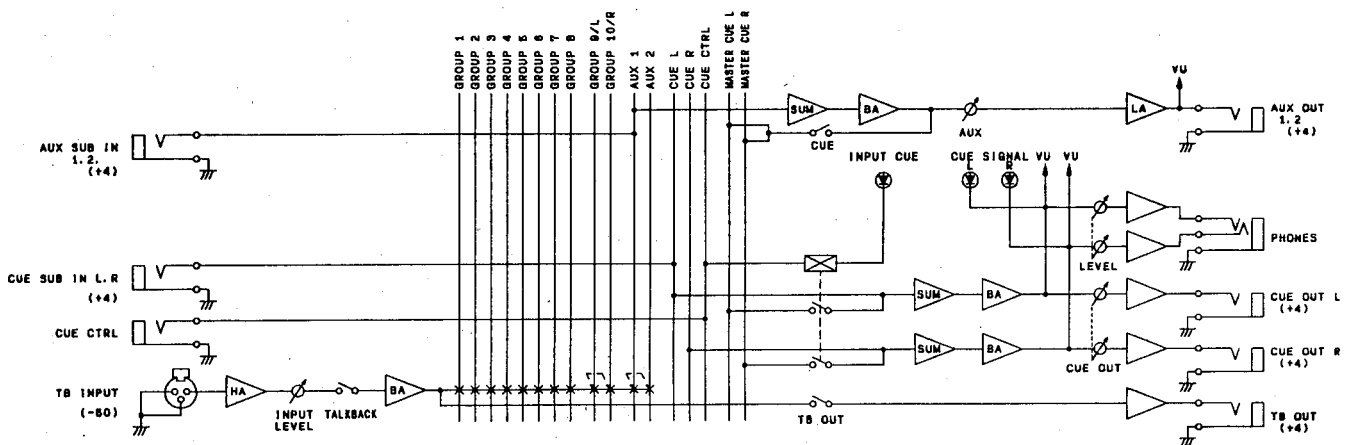


● CUE, PHONES, AUX OUT & TALKBACK SECTIONS

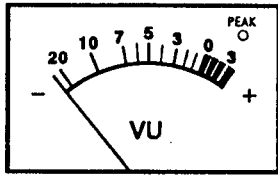


- ① INPUT CUE indicator
- ② CUE SIGNAL L-R indicators
- ③ CUE OUT control
- ④ AUX OUT level control
- ⑤ Aux out CUE switch
- ⑥ AUX-CUE METER select switch
- ⑦ Talkback Assign switches
- ⑧ TB OUT switch
- ⑨ Talkback INPUT
- ⑩ Talkback INPUT LEVEL control
- ⑪ TALKBACK switch
- ⑫ Phones LEVEL control
- ⑬ PHONES

- ① INPUT CUEインジケータ
- ② CUE SIGNALインジケータ
- ③ CUE OUTコントロール
- ④ AUX OUTコントロール
- ⑤ AUX CUEスイッチ
- ⑥ AUX、CUEメーターセレクトスイッチ
- ⑦ トークバックアサインスイッチ
- ⑧ TB OUTスイッチ
- ⑨ トークバックINPUT・-50dB
- ⑩ トークバックINPUT LEVELコントロール
- ⑪ TALKBACKスイッチ
- ⑫ ヘッドフォンLEVELコントロール
- ⑬ PHONES端子

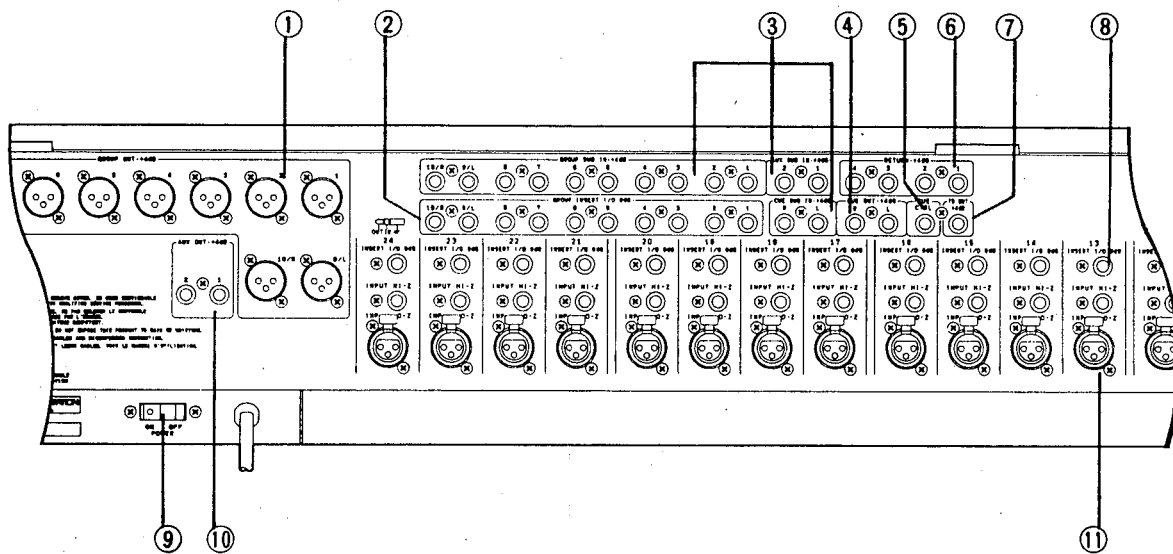


● VU METER SECTION



VU METER Reading (VUメーター指示)	-20VU	-10VU	-5VU	0VU	+3VU
Output level	-16 dB (0.123V)	-6 dB (0.388V)	-1 dB (0.691V)	+4 dB (1.23V)	+7 dB (1.74V)

● REAR PANEL SECTION

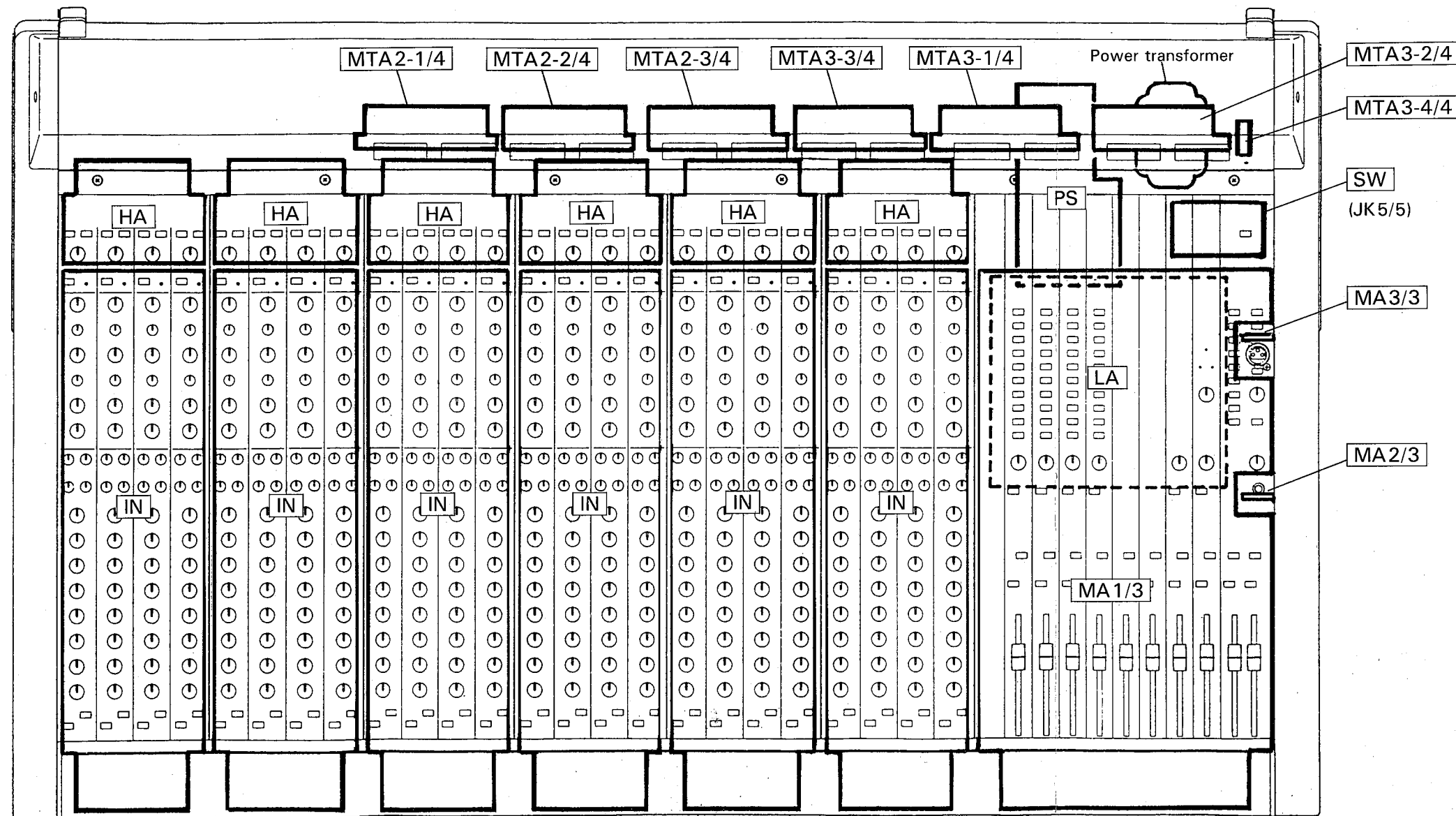
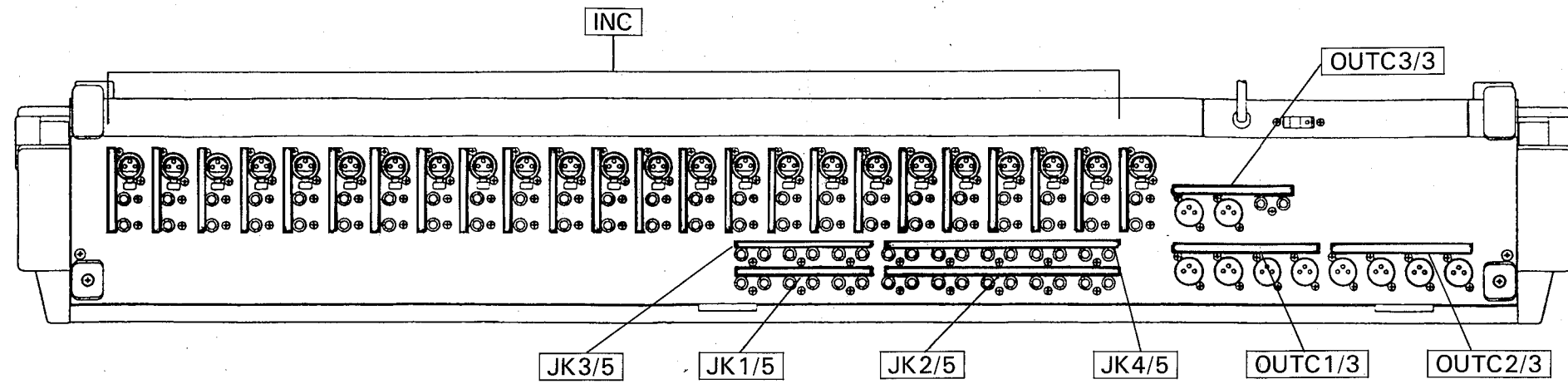


- ① GROUP OUT connectors
- ② GROUP INSERT I/O connectors
- ③ SUB IN (GROUP, AUX, CUE) connectors
- ④ CUE OUT connectors
- ⑤ CUE CTRL (Control) connector
- ⑥ RETURN connectors
- ⑦ TB OUT connector
- ⑧ CH (Channel) INSERT I/O connectors
- ⑨ POWER switch
- ⑩ AUX OUT connectors
- ⑪ CH (Channel) INPUT connectors

- ① GROUP OUT・+4dB
- ② GROUP INSERT I/O・0dB
- ③ GROUP SUB IN・+4dB、AUX SUB IN・4dB、CUE SUB IN・+4dB
- ④ CUE OUT・+4dB
- ⑤ CUE CTRL (CONTROL)
- ⑥ RETURN・+4dB
- ⑦ TB OUT・+4dB
- ⑧ チャンネルINSERT I/O・0dB
- ⑨ POWERスイッチ
- ⑩ AUX OUT・+4dB
- ⑪ チャンネルINPUT (LO-Z、HI-Z)

MC2410M/MC3210M

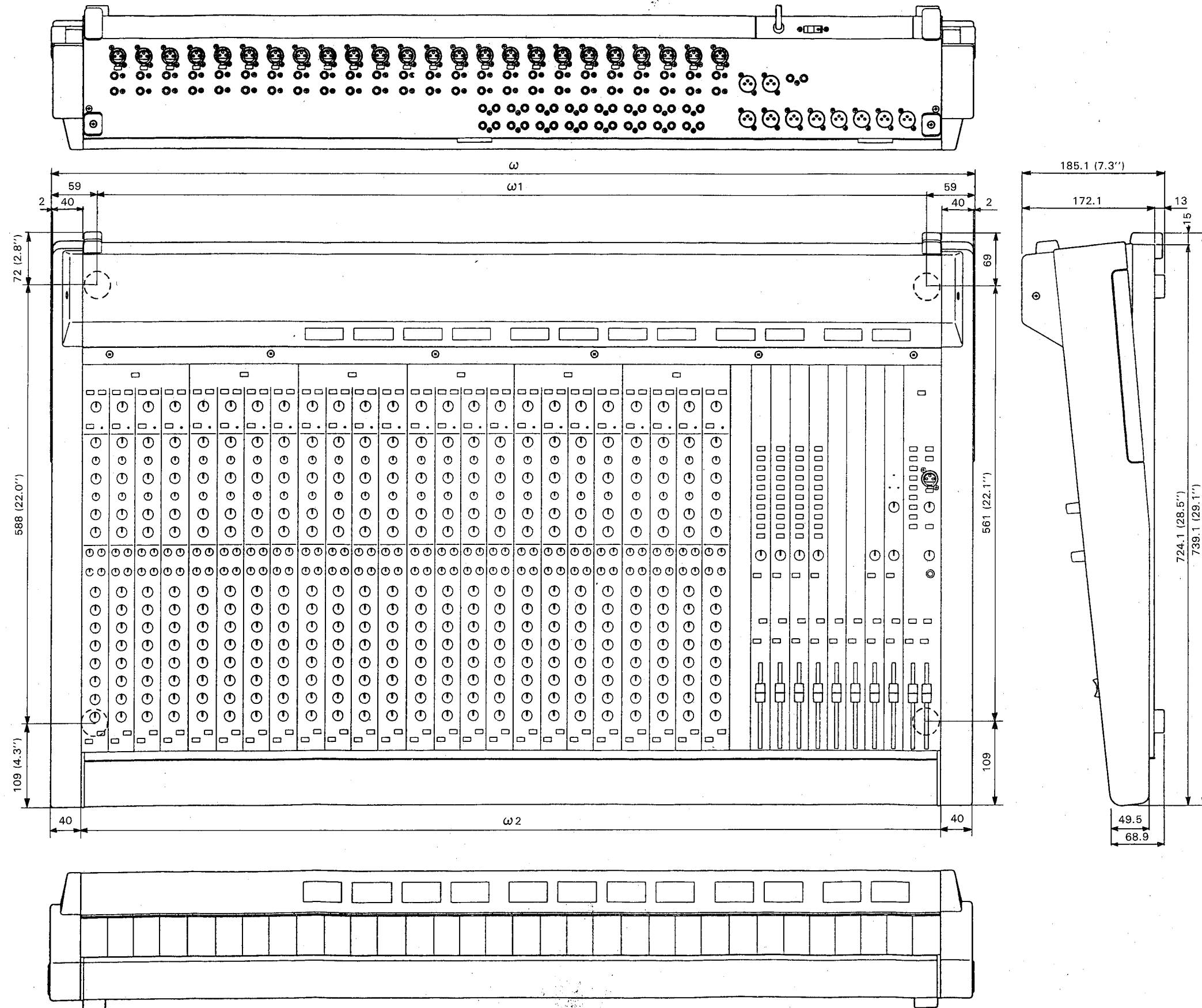
■ CIRCUIT BOARD LAYOUT (ユニットレイアウト)



MC2410M/MC3210M



■ DIMENSIONS (寸法図)

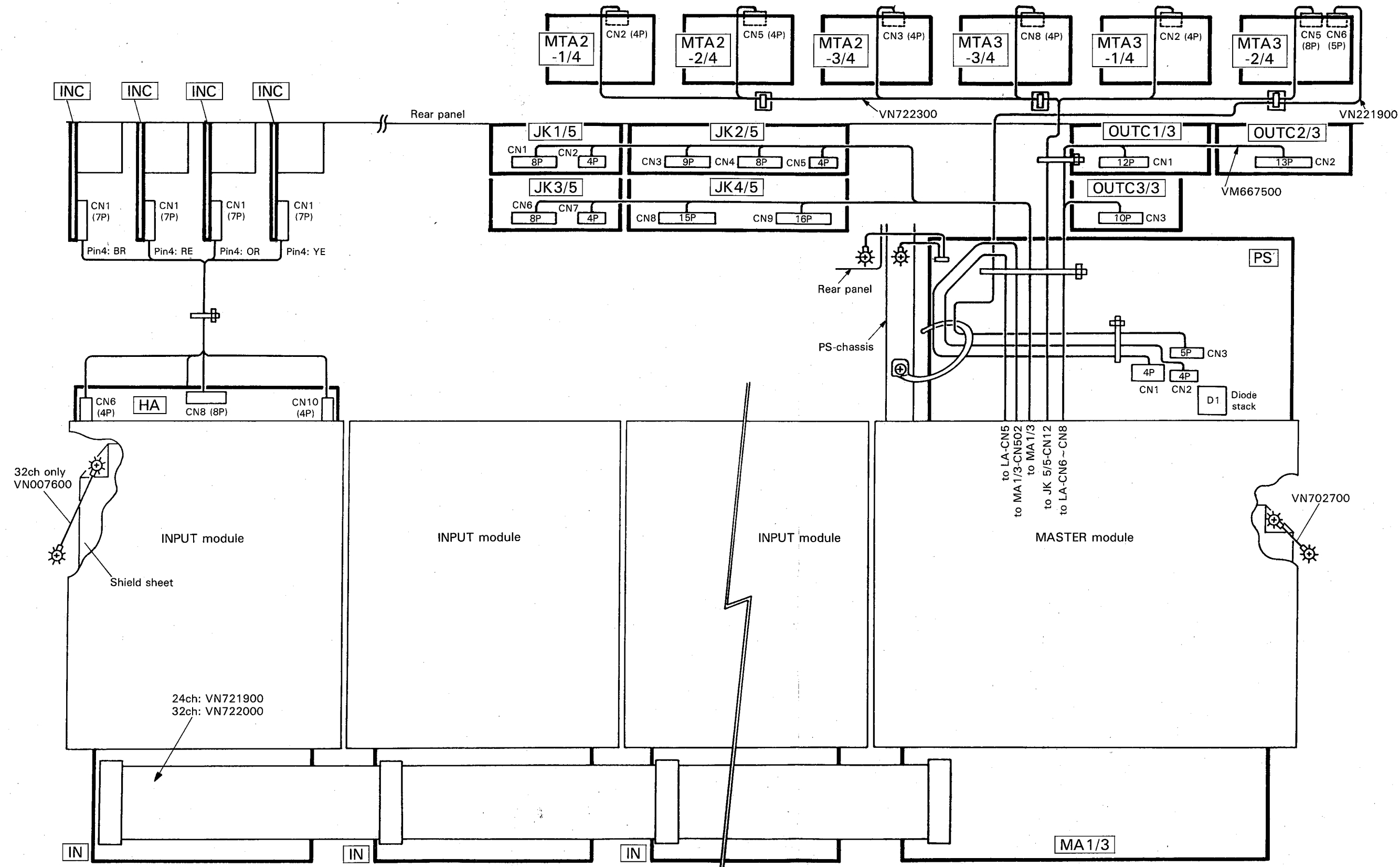


	$w$	$w_1$	$w_2$
MC2410M	1204 (47.4")	1082 (42.6")	1120 (44.1")
MC3210M	1485 (58.5")	1363 (53.6")	1401 (55.1")

Unit : mm (inch)

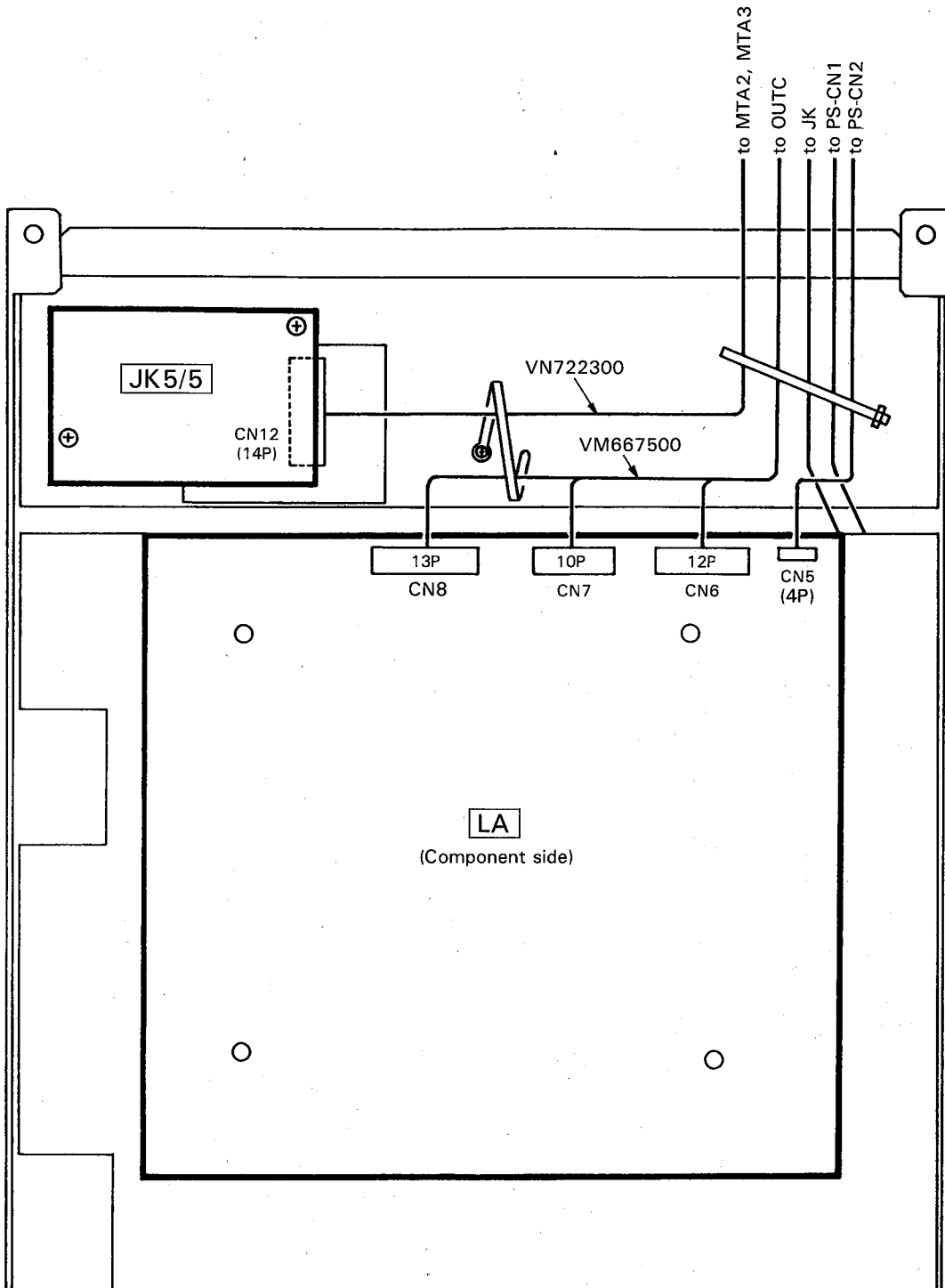
■ **CIRCUIT BOARD WIRING (基板結線図)**

● **Wiring of Overall Assembly 1/2 (総組立配線図1/2)**

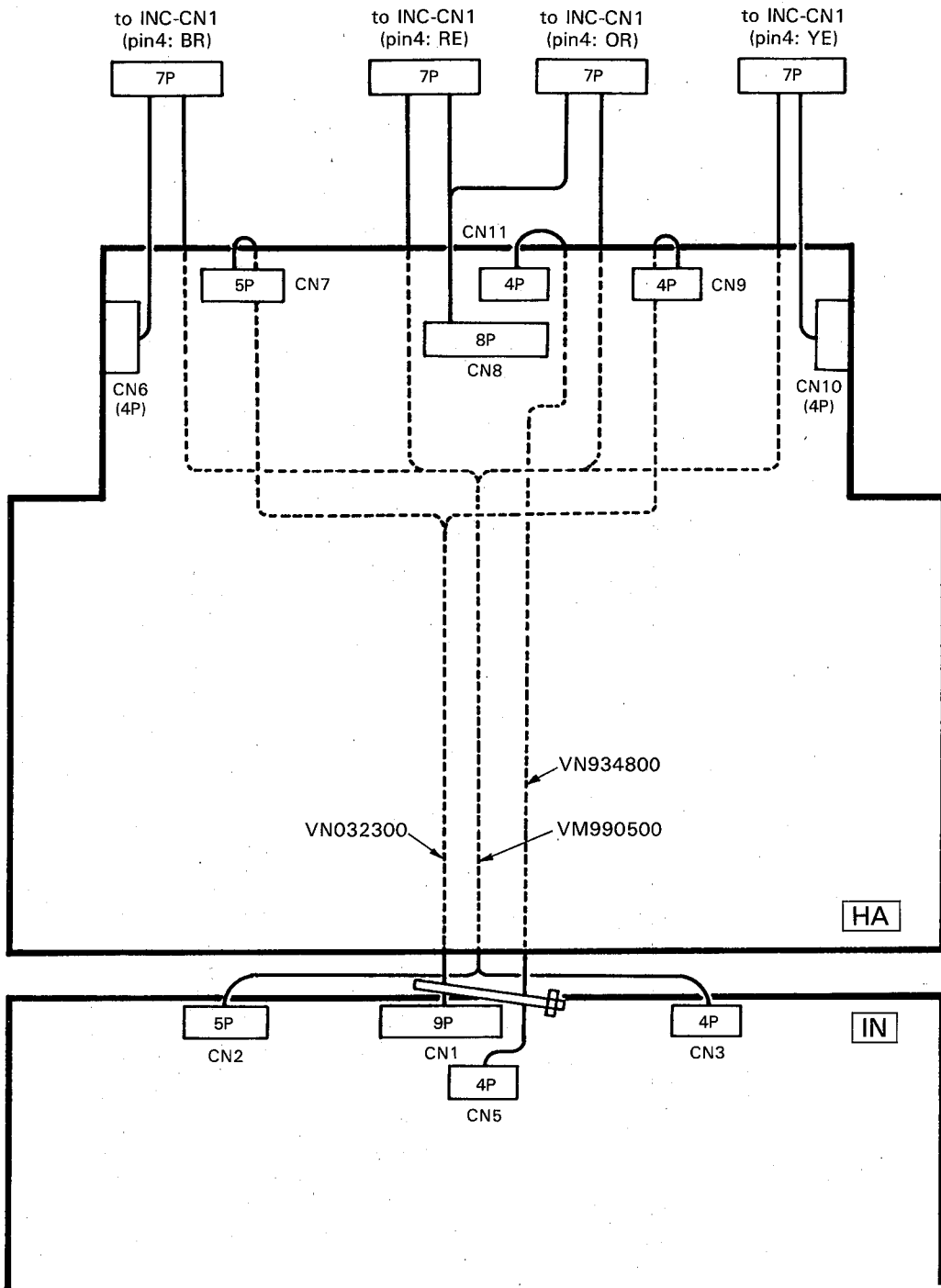


MC2410M/MC3210M

● Wiring of Overall Assembly 2/2 (総組立配線図2/2)

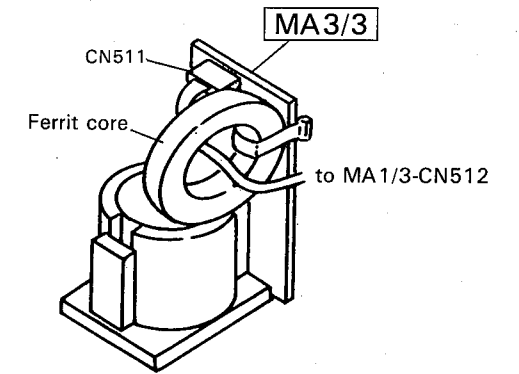
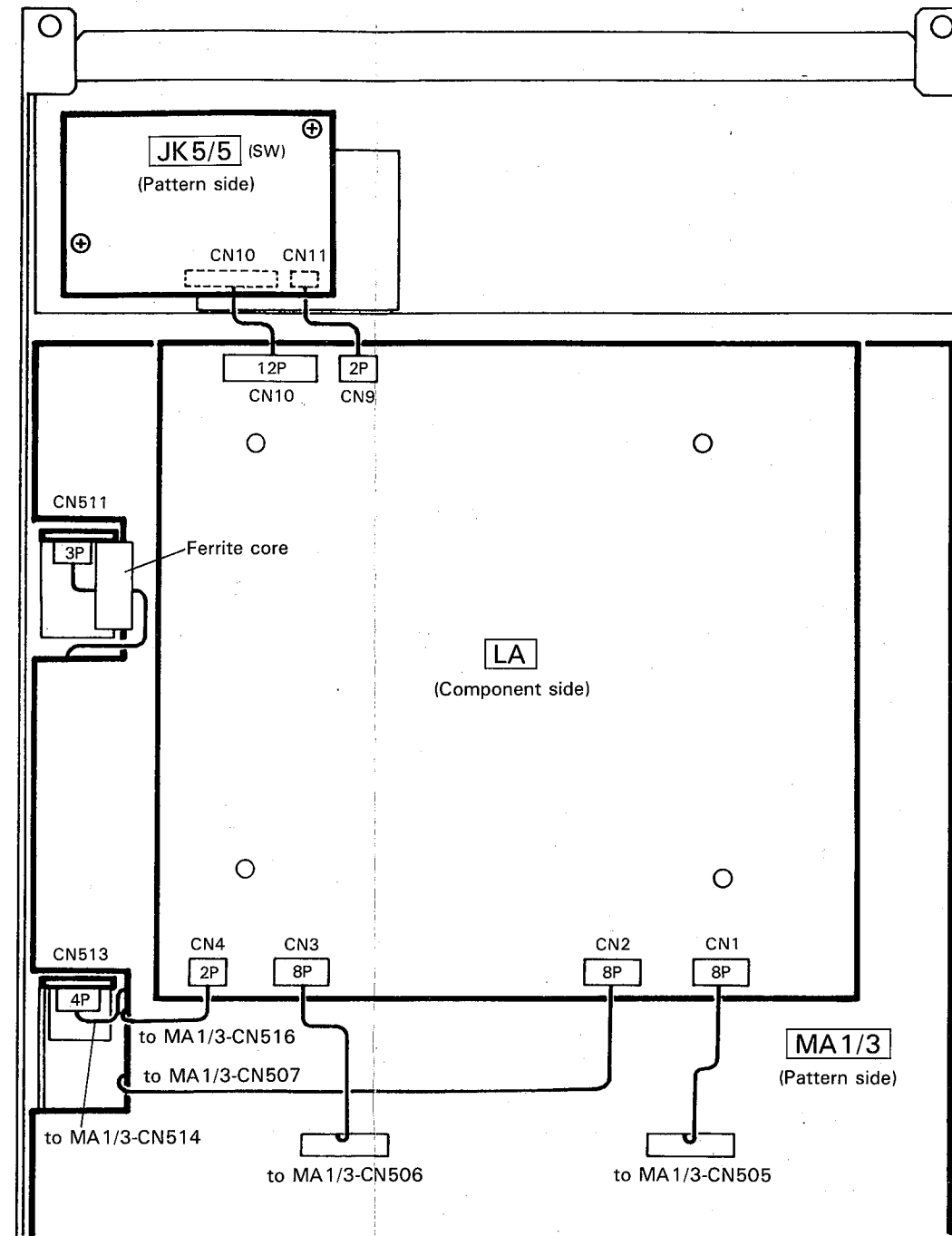
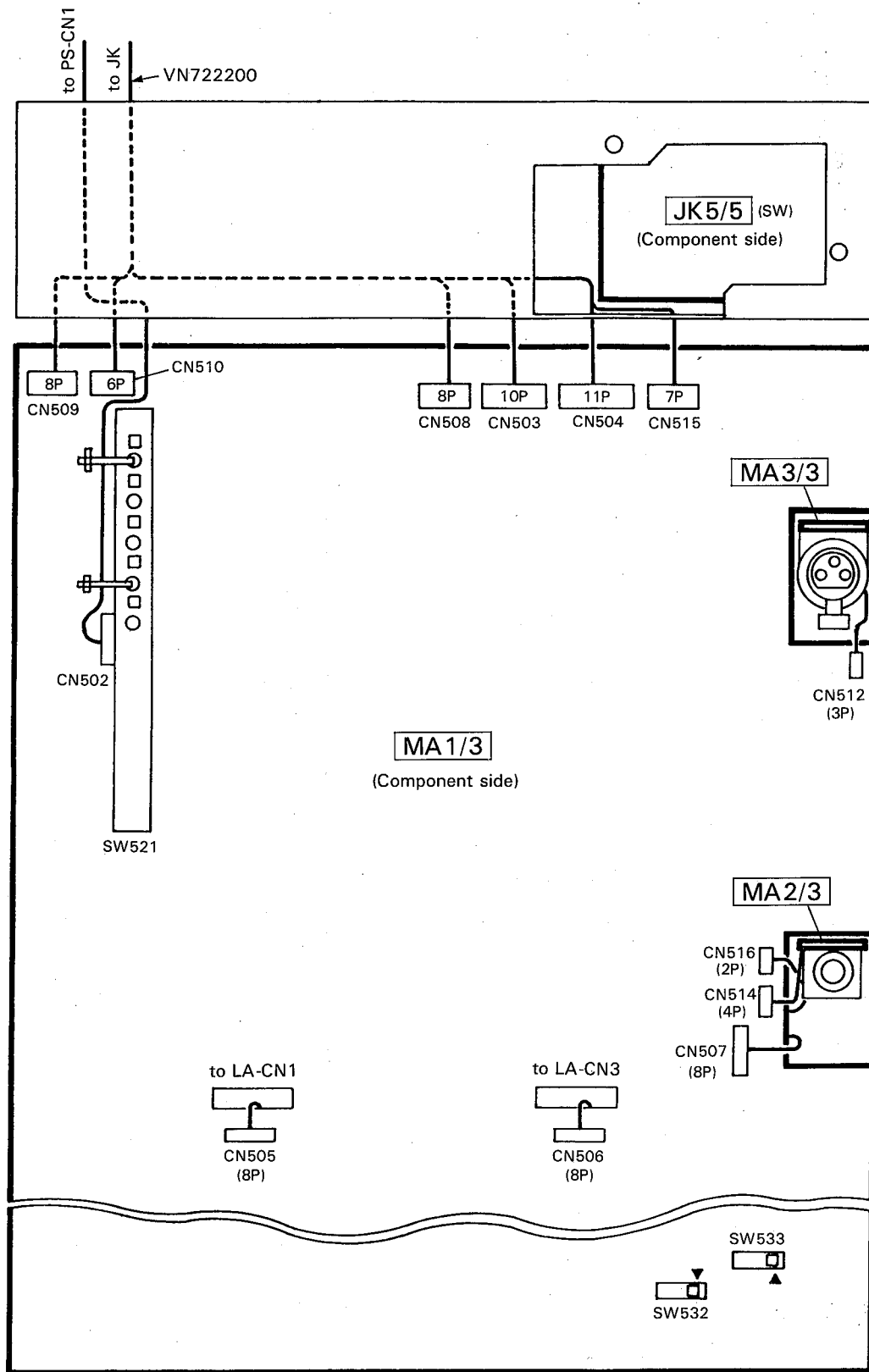


● Wiring of INPUT module (INモジュール配線図)

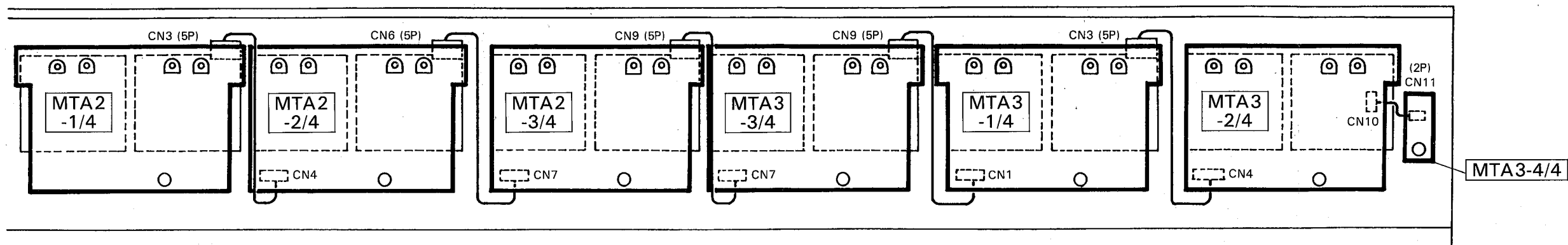


MC2410M/MC3210M

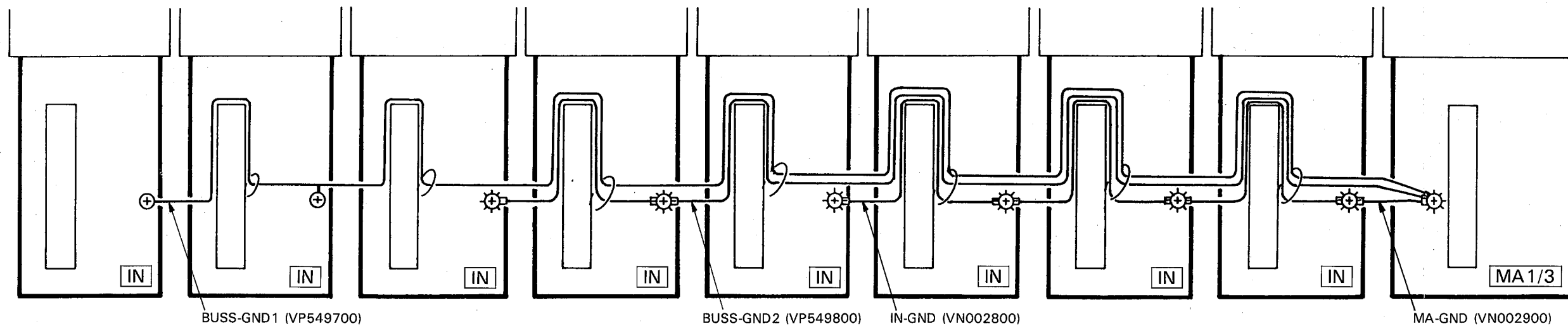
● Wiring of MASTER module (MAモジュール配線図)



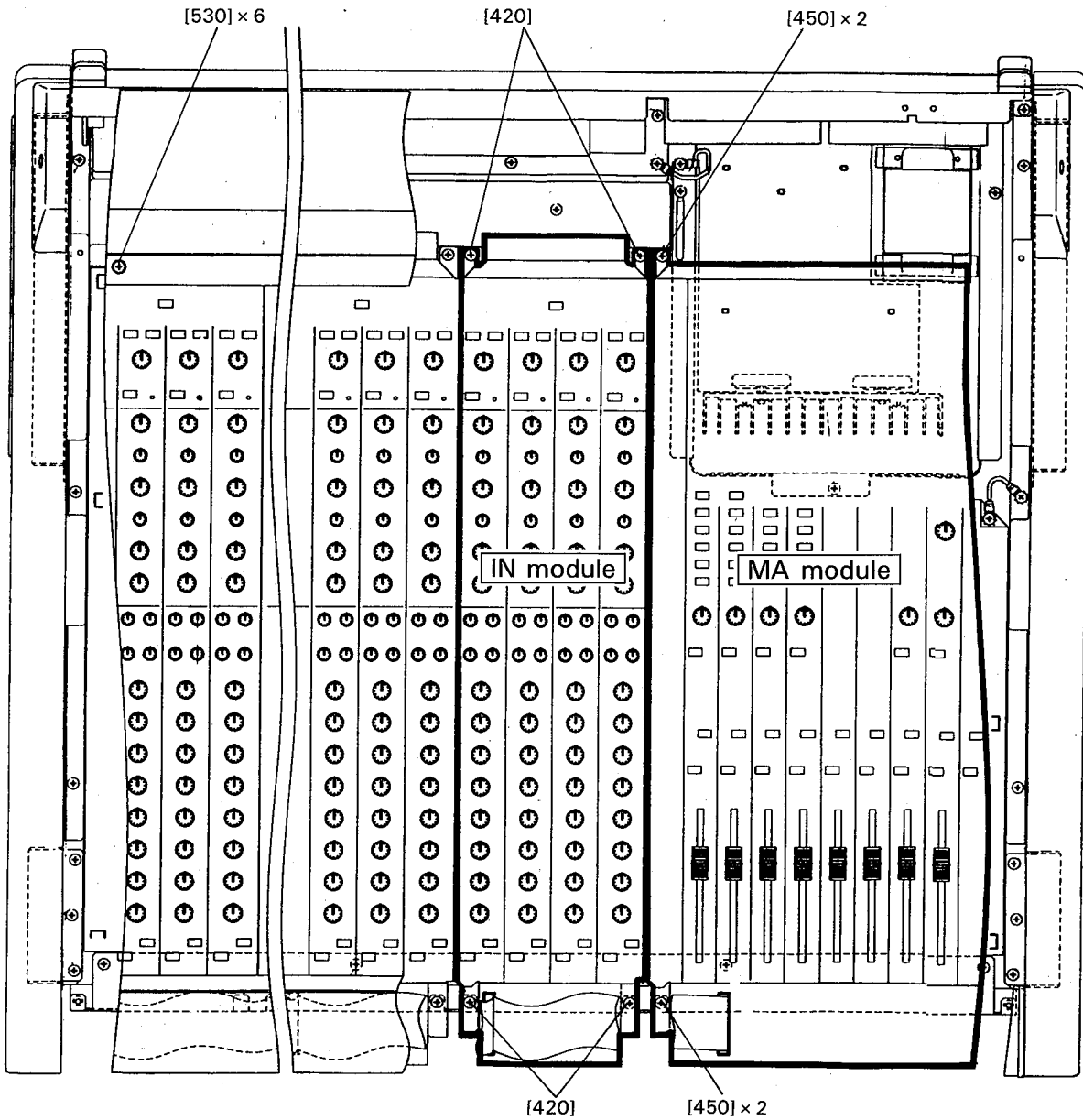
● Wiring of Meter Assembly (メーターAss'y配線図)



● GND Wiring of In Circuit Board (INシートGND線接続図)



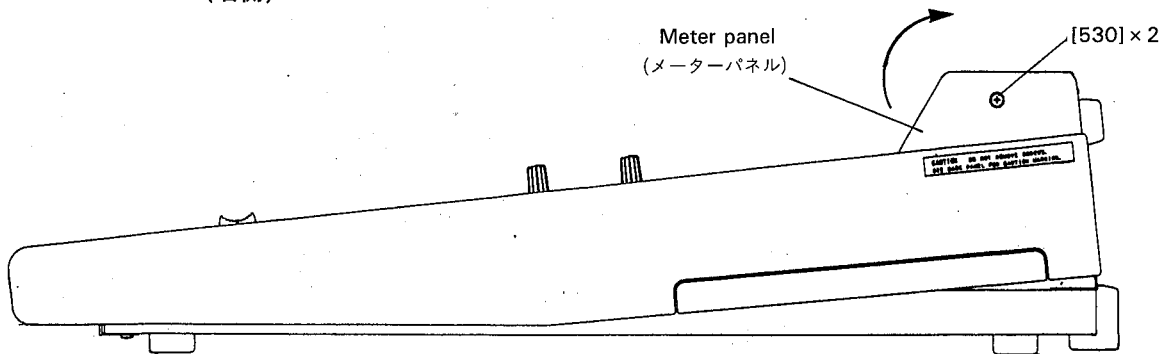
■ DISASSEMBLY PROCEDURE (分解手順)



- [420] : Bind Head Tapping Screw-B(+バインドBタイト) A4.0X8 ZMC2BL (VC688800)
- [450] : Bind Head Tapping Screw-B(+バインドBタイト) A4.0X8 ZMC2BL (VC688800)
- [500] : Bind Head Screw(+バインド小ネジ) A4.0X8 FCM3BL (EL000320)
- [530] : Bind Head Screw(+バインド小ネジ) A4.0X8 FCM3BL (EL000320)

(Fig. 1)

● Right side of the unit (右側)



- [530] : Bind Head Screw(+バインド小ネジ) A4.0X8 FCM3BL (EL000320)

(Fig. 2)

**1. Opening The Meter Panel**

1-1. Remove the eight (8) screws marked as [530] in the figure, then lift the meter panel from the front, it comes to rest. (Fig. 1 and Fig. 2)

**2. Front Pad Removal**

2-1. Remove the screws marked [560], then the front pad can be removed. (Fig. 3)  
The [560] screws used in MC2410M are eight (8), and ten (10) in MC3210M.

**1. メーターパネルの開け方**

1-1 [530]のネジ8本を外し、メーターパネルを開けます。  
(図1、図2)

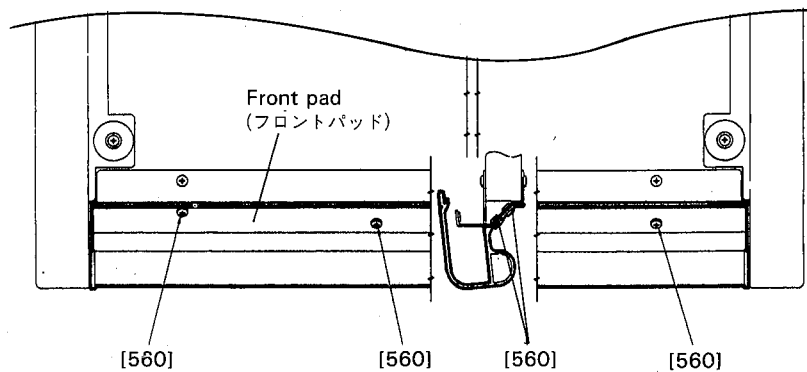
**2. フロントパッドの外し方**

2-1 [560]のネジを外し、フロントパッドを外します。

(図3)

[560]のネジは、MC2410Mで8本、MC3210Mで10本  
あります。

● Bottom side of the unit (底側)



[560] : Bind Head Screw(+バインド小ネジ) A4.0X8 FCM3BL (EL000320)

(Fig. 3)

**3. IN Module Removal**

The IN modules used in MC2410M are six (6), and eight (8) in MC3210M.

- 3-1. Open the meter panel. (see procedure 1)
- 3-2. Remove the front pad. (see procedure 2)
- 3-3. Pull the connector CN4 out.
- 3-4. Remove the screw retaining the GND wire(s).
- 3-5. Pull out the connector being connected to INC circuit boards.
- 3-6. Remove the four (4) screws marked [420], then a IN module can be removed. (Fig. 1)

**4. MA Module Removal**

- 4-1. Open the meter panel. (see procedure 1)
- 4-2. Remove the front pad. (see procedure 2)
- 4-3. Pull the connector CN501 out from the MA 1/3 circuit board.
- 4-4. Remove the screw marked [500] to remove the GND wire. (Fig. 1)
- 4-5. Remove the four (4) screws marked [450], consequently the MA module can be removed. (Fig. 1)

**3. INモジュールの外し方**

INモジュールは1個あたり4チャンネルの入力で構成されており、MC2410Mで6個、MC3210Mで8個あります。

- 3-1 メーターパネルを開けます。(1項参照)
- 3-2 フロントパッドを外します。(2項参照)
- 3-3 コネクタ-CN4の束線を外します。
- 3-4 アース束線を止めているネジを外します。
- 3-5 INCシートへの束線を外します。
- 3-6 [420]のネジ4本を外し、INモジュールを外します。

(図1)

**4. MAモジュールの外し方**

- 4-1 メーターパネルを開けます。(1項参照)
- 4-2 フロントパッドを外します。(2項参照)
- 4-3 MA1/3シートのコネクタ-CN501の束線を外します。
- 4-4 [500]のネジ1本を外し、アース束線を外します。
- 4-5 [450]のネジ4本を外し、MAモジュールを外します。

(図1)

(図1)

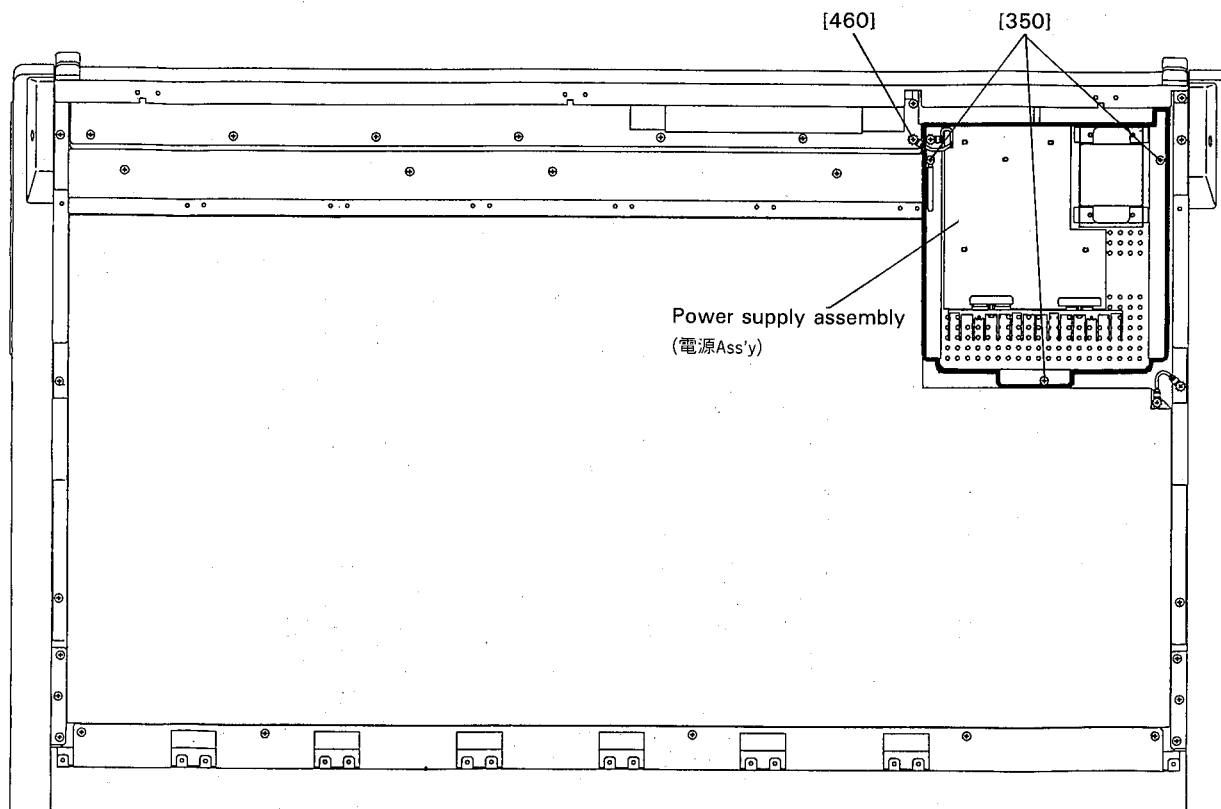


## 5. Power Supply Assembly Removal

- 5-1. Open the meter panel. (see procedure 1)
- 5-2. Remove the front pad. (see procedure 2)
- 5-3. Remove the MA module. (see procedure 4)
- 5-4. Pull out the connectors CN1, CN2 and CN3 of the PS circuit board.
- 5-5. Remove the three (3) screws marked [350] and the screw marked [460], so the power supply assembly can be removed. (Fig. 4)

## 5. 電源Ass'yの外し方

- 5-1 メーターパネルを開けます。(1項参照)
- 5-2 フロントパッドを外します。(2項参照)
- 5-3 MAモジュールAss'yを外します。(4項参照)
- 5-4 PSシートのコネクターCN1、CN2、CN3の束線を外します。
- 5-5 [350]のネジ3本と[460]のネジ1本を外し、電源Ass'yを外します。(図4)



[350] : Bind Head Screw(+バインド小ネジ) 4.0X20 FCM3BL (EG340070)  
 [460] : Bind Head Screw(+バインド小ネジ) A4.0X8 FCM3BL (EL000320)

(Fig. 4)

## 6. IN Circuit Board Removal

- 6-1. Open the meter panel. (see procedure 1)
- 6-2. Remove the front pad. (see procedure 2)
- 6-3. Remove a IN module. (see procedure 3)
- 6-4. Pull off the knobs listed below. (Fig. 5)
  - knobs marked [130a]: sixteen (16)
  - knobs marked [140a]: sixteen (16)
  - knobs marked [150a]: sixteen (16)
  - knobs marked [170]: eight (8)
  - knobs marked [180]: twelve (12)
  - knobs marked [200a]: four (4)
- 6-5. Remove the seventy two (72) hexagonal nuts marked [90a], consequently the the IN circuit board can be removed. (Fig. 5)
- 6-6. Pull off the switch knobs listed below. (Fig. 5)
  - knobs marked [230a]: four (4)
  - knobs marked [240a]: four (4)
  - knobs marked [250a]: four (4)

## 6. INシートの外し方

- 6-1 メーターパネルを開けます。(1項参照)
- 6-2 フロントパッドを外します。(2項参照)
- 6-3 INモジュールAss'yを外します。(3項参照)
- 6-4 ボリュームつまみ、[130a]16個と[140a]16個と[150a]16個と[170]8個と[180]12個と[200a]4個を引き抜きます。(図5)
- 6-5 [90a]の六角ナット72個を外し、INシートを外します。(図5)
- 6-6 スイッチつまみ、[230a]4個と[240a]4個と[250a]4個を引き抜きます。(図5)

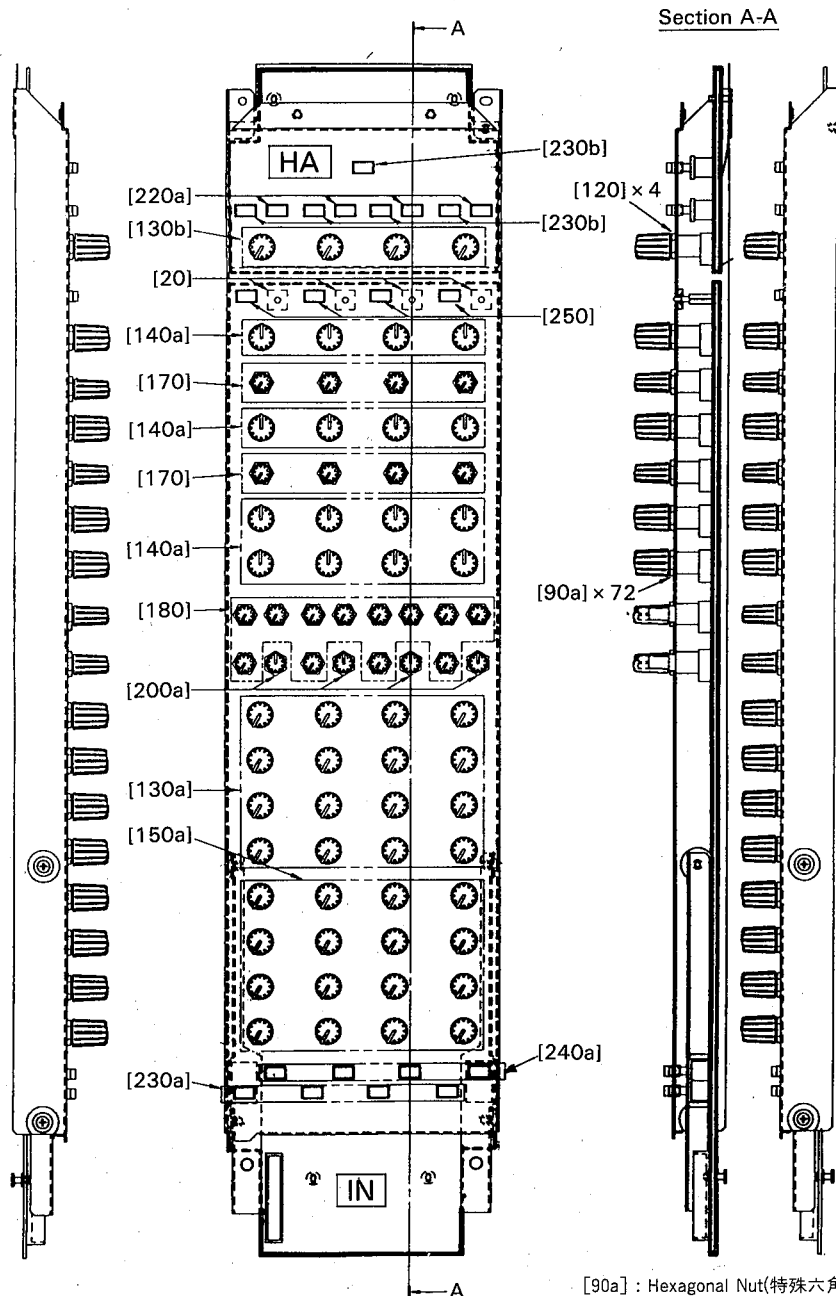
**7. HA Circuit Board Removal**

- 7-1. Open the meter panel. (see procedure 1)
- 7-2. Remove the front pad. (see procedure 2)
- 7-3. Remove a IN module. (see procedure 3)
- 7-4. Pull off the four (4) knobs marked [130b]. (Fig. 5)
- 7-5. Remove the four (4) hexagonal nuts marked [120], then the HA circuit board can be removed. (Fig. 5)
- 7-6. Pull off the switch knobs listed below. (Fig. 5)
  - knobs marked [220a]: four (4)
  - knobs marked [230b]: five (5)

**7. HAシートの外し方**

- 7-1 メーターパネルを開けます。(1項参照)
- 7-2 フロントパッドを外します。(2項参照)
- 7-3 INモジュールAss'yを外します。(3項参照)
- 7-4 [130b]のボリュームつまみ4個を引き抜きます。(図5)
- 7-5 [120]の六角ナット4個を外し、HAシートを外します。(図5)
- 7-6 スイッチつまみ、[220a]4個と[230b]5個を引き抜きます。(図5)

● IN module (INモジュール)



[90a] : Hexagonal Nut(特殊六角ナット) 9 ZMC2BL (VJ388000)  
 [120] : Hexagonal Nut(特殊六角ナット) 9 ZMC2BL (VJ388000)

(Fig. 5)

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**8. LA Circuit Board Removal**

- 8-1. Open the meter panel. (see procedure 1)
- 8-2. Remove the front pad. (see procedure 2)
- 8-3. Remove the MA module. (see procedure 4)
- 8-4. Remove the LA circuit board from the four (4) spacers marked [160a]. (Fig. 6)

**9. SW(JK5/5) Circuit Board Removal**

- 9-1. Open the meter panel. (see procedure 1)
- 9-2. Remove the front pad. (see procedure 2)
- 9-3. Remove the MA module. (see procedure 4)
- 9-4. Remove the two (2) screws marked [110a], then the SW(JK5/5) circuit board can be removed. (Fig. 6)
- 9-5. Pull off the switch knob marked [230c]. (Fig. 7)

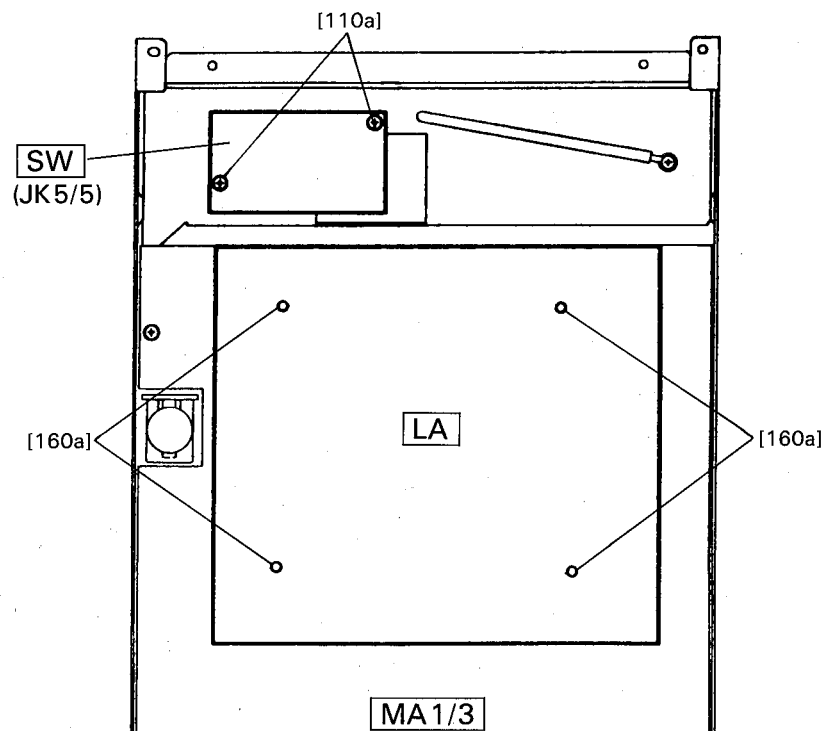
**8. LAシートの外し方**

- 8-1 メーターパネルを開けます。(1項参照)
- 8-2 フロントパッドを外します。(2項参照)
- 8-3 MAモジュールAss'yを外します。(4項参照)
- 8-4 [160a]のダブルロッキングスペーサ4個からLAシートを外します。(図6)

**9. SWシート (JK5/5シート) の外し方**

- 9-1 メーターパネルを開けます。(1項参照)
- 9-2 フロントパッドを外します。(2項参照)
- 9-3 MAモジュールAss'yを外します。(4項参照)
- 9-4 [110a]のネジ2本を外し、SWシート (JK5/5シート) を外します。(図6)
- 9-5 スイッチつまみ、[230c]1個を引き抜きます。(図7)

● Bottom side of the MA module (MAモジュールAss'y)



[110a] : Bind Head Tapping Screw-B(+バインドBタイト) A3.0X6 FCM3BL (VC791600)

(Fig. 6)

**10. MA1/3 and MA2/3 Circuit Boards Removal**

- 10-1. Open the meter panel. (see procedure 1)
- 10-2. Remove the front pad. (see procedure 2)
- 10-3. Remove the MA module. (see procedure 4)
- 10-4. Remove the LA circuit board. (see procedure 8)
- 10-5. Pull off the knobs listed below. (Fig. 7)
  - knobs marked [200b]: four (4)
  - knobs marked [210]: two (2)
  - knobs marked [220b]: two (2)
  - knob marked [225]: one (1)
- 10-6. Pull off the fader knobs listed below. (Fig. 7)
  - knobs marked [280]: four (4)
  - knobs marked [290]: four (4)
  - knobs marked [300]: two (2)
- 10-7. Remove the nine (9) hexagonal nuts marked [130c]. (Fig. 7)
- 10-8. Remove the four (4) screws marked [140b], then the MA1/3 circuit board can be removed. (Fig. 7)
- 10-9. Remove the U-shaped holder marked [80a], then the MA2/3 circuit board can be removed. (Fig. 7)
- 10-10. Remove the twenty (20) screws marked [60a] to remove the MF sub panel from the MA1/3 circuit board. (Fig. 7)
- 10-11. Pull off the switch knobs listed below. (Fig. 7)
  - knobs marked [230d]: twenty two (22)
  - knobs marked [240b]: thirty six (36)
  - knobs marked [250b]: nine (9)
  - knobs marked [260]: ten (10)
  - knob marked [270]: one (1)

**11. MA3/3 Circuit Board Removal**

- 11-1. Open the meter panel. (see procedure 1)
- 11-2. Remove the front pad. (see procedure 2)
- 11-3. Remove the MA module. (see procedure 4)
- 11-4. Remove the two (2) screws marked [150a], then the MA3/3 circuit board can be removed. (Fig. 7)

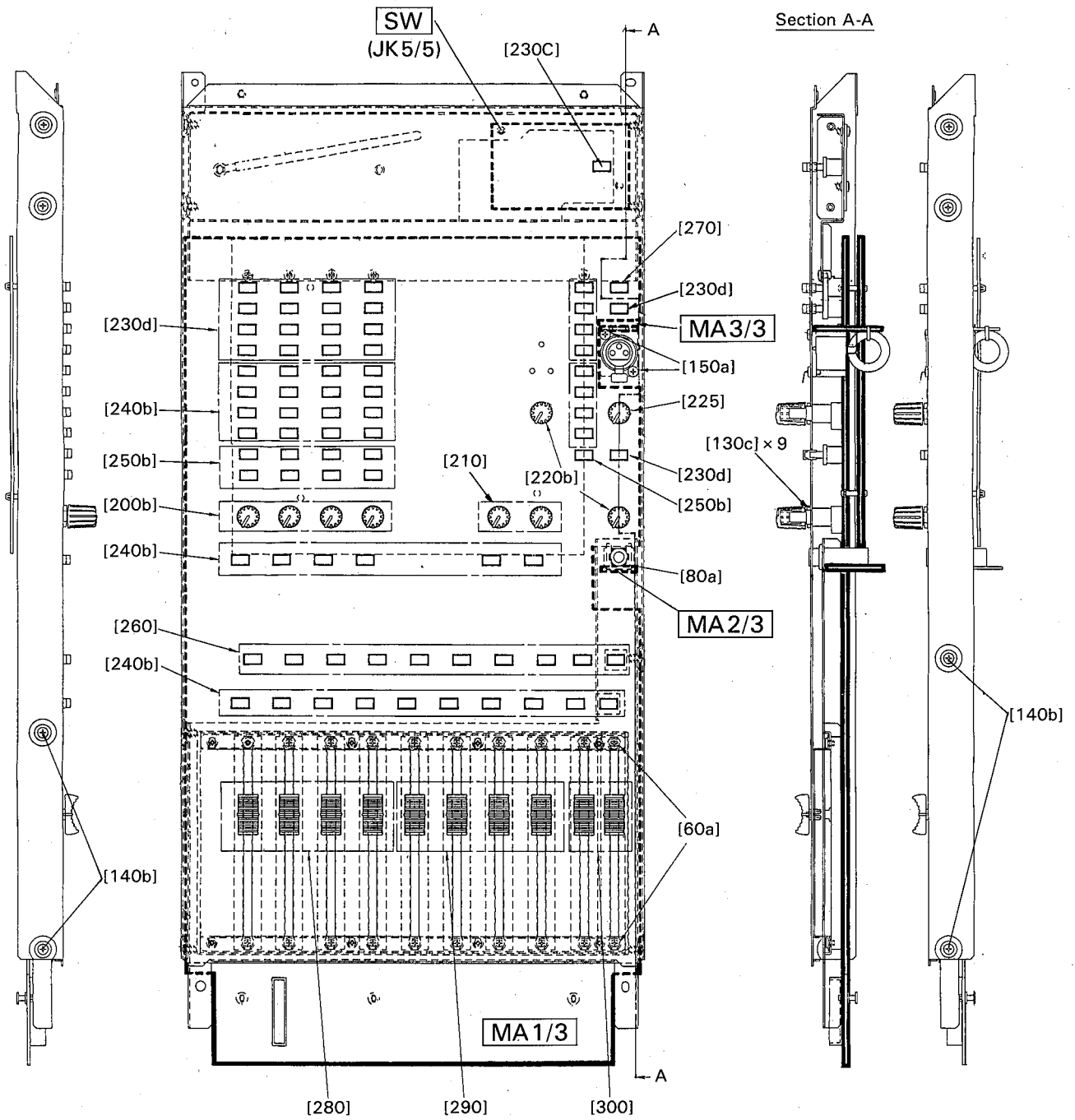
**10. MA1/3シートとMA2/3シートの外し方**

- 10-1 メーターパネルを開けます。(1項参照)
- 10-2 フロントパッドを外します。(2項参照)
- 10-3 MAモジュールAss'yを外します。(4項参照)
- 10-4 LAシートを外します。(8項参照)
- 10-5 ボリュームツマミ、[200]4個と[210]2個と[220b]2個と[225]1個を引き抜きます。(図7)
- 10-6 フェーダーツマミ、[280]4個と[290]4個と[300]2個と引き抜きます。(図7)
- 10-7 [130c]の六角ナット9個を外します。(図7)
- 10-8 [140b]のネジ4本を外し、MA1/3シートを外します。(図7)
- 10-9 [80a]のU字金具1個を外し、MA2/3シートを外します。(図7)
- 10-10 [60a]のネジ20本を外し、MA1/3シートからMFサブパネルを外します。(図7)
- 10-11 スイッチツマミ、[230d]22個と[240b]36個と[250b]9個と[260]10個と[270]1個を引き抜きます。(図7)

**11. MA3/3シートの外し方**

- 11-1 メーターパネルを開けます。(1項参照)
- 11-2 フロントパッドを外します。(2項参照)
- 11-3 MAモジュールAss'yを外します。(4項参照)
- 11-4 [150]のネジ2本を外し、MA3/3シートを外します。(図7)

● MA module (MAモジュール)



- [60a] : Bind Head Screw(+バインド小ネジ) 3.0X4 FCM3BL (EG330010)
- [130c] : Hexagonal Nut(特殊六角ナット) 9 ZMC2BL (VJ388000)
- [140b] : Bind Head Tapping Screw-B(+バインドBタイト) A3.0X6 FCM3BL (VC791600)
- [50a] : Bonding Head Screw(BONDING小ネジ) 3.0X6 FCM3BL (VC082800)

(Fig. 7)

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**12. PS Circuit Board Removal**

- 12-1. Open the meter panel. (see procedure 1)
- 12-2. Remove the front pad. (see procedure 2)
- 12-3. Remove the MA module. (see procedure 4)
- 12-4. Remove the power supply assembly. (see procedure 5)
- 12-5. Remove the two (2) screws marked [90b], then remove the two (2) transistor holders. (Fig. 8)
- 12-6. Remove the screw marked [160b] to remove the GND wire. (Fig. 8)
- 12-7. Remove the PS circuit board from the five (5) spacers marked [20]. (Fig. 8)

**13. Power Switch Removal**

- 13-1. Open the meter panel. (see procedure 1)
- 13-2. Remove the front pad. (see procedure 2)
- 13-3. Remove the MA module. (see procedure 4)
- 13-4. Remove the power supply assembly. (see procedure 5)
- 13-5. Remove the two (2) screws marked [110b], then the power switch can be removed. (Fig. 8)

**14. Power Transformer Removal**

- 14-1. Open the meter panel. (see procedure 1)
- 14-2. Remove the front pad. (see procedure 2)
- 14-3. Remove the MA module. (see procedure 4)
- 14-4. Remove the power supply assembly. (see procedure 5)
- 14-5. Remove the four (4) screws marked [40a], then the power transformer can be removed. (Fig. 8)

**12. PSシートの外し方**

- 12-1 メーターパネルを開けます。(1項参照)
- 12-2 フロントパッドを外します。(2項参照)
- 12-3 MAモジュールAss'yを外します。(4項参照)
- 12-4 電源Ass'yを外します。(5項参照)
- 12-5 [90b]のネジ2本を外し、トランジスタホルダー2個を外します。(図8)
- 12-6 [160b]のネジ1本を外し、アース束線を外します。(図8)
- 12-7 [20]のダブルロックingsペース5個からPSシートを外します。(図8)

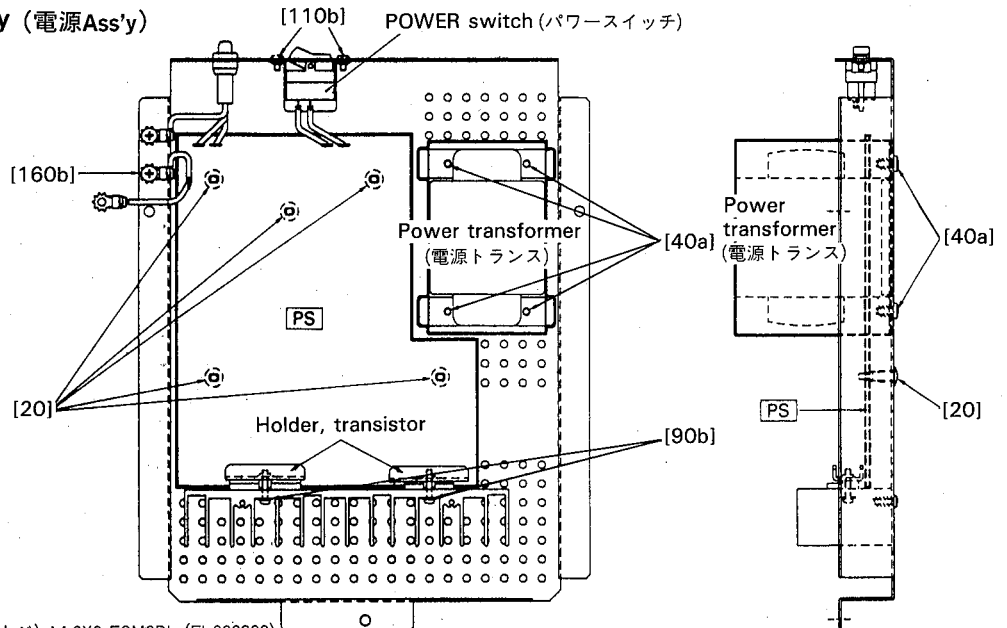
**13. パワースイッチの外し方**

- 13-1 メーターパネルを開けます。(1項参照)
- 13-2 フロントパッドを外します。(2項参照)
- 13-3 MAモジュールAss'yを外します。(4項参照)
- 13-4 電源Ass'yを外します。(5項参照)
- 13-5 [110b]のネジ2本を外し、パワースイッチを外します。(図8)

**14. 電源トランスの外し方**

- 14-1 メーターパネルを開けます。(1項参照)
- 14-2 フロントパッドを外します。(2項参照)
- 14-3 MAモジュールAss'yを外します。(4項参照)
- 14-4 電源Ass'yを外します。(5項参照)
- 14-5 [40a]のネジ4本を外し、電源トランスを外します。(図8)

● Power supply assembly (電源Ass'y)



(Fig. 8)

[40a] : Bind Head Screw(+バインド小ネジ) A4.0X8 FCM3BL (EL000320)  
 [90b] : Pan Head Screw(+ナベ小ネジ) SP 3.0X16 ZMC2Y (VC214100)  
 [110b] : Bonding Head Screw(BONDING小ネジ) 3.0X6 FCM3BL (VC082800)  
 [160b] : Bind Head Tapping Screw-B(+バインドBタイト) A4.0X8 ZMC2BL (VC688800)

**15. JK1/5 Circuit Board Removal**

- 15-1. Open the meter panel. (see procedure 1)  
 15-2. Remove the three (3) screws marked [60b], then the JK1/5 circuit board can be removed. (Fig. 9)

**16. JK2/5 Circuit Board Removal**

- 16-1. Open the meter panel. (see procedure 1)  
 16-2. Remove the five (5) screws marked [60c], then the JK2/5 circuit board can be removed. (Fig. 9)

**17. JK3/5 Circuit Board Removal**

- 17-1. Open the meter panel. (see procedure 1)  
 17-2. Remove the three (3) screws marked [60d], then the JK3/5 circuit board can be removed. (Fig. 9)

**18. JK4/5 Circuit Board Removal**

- 18-1. Open the meter panel. (see procedure 1)  
 18-2. Remove the five (5) screws marked [60e], then the JK4/5 circuit board can be removed. (Fig. 9)

**19. OUTC1/3 Circuit Board Removal**

- 19-1. Open the meter panel. (see procedure 1)  
 19-2. Remove the eight (8) screws marked [80b], then the OUTC1/3 circuit board can be removed. (Fig. 9)

**20. OUTC2/3 Circuit Board Removal**

- 20-1. Open the meter panel. (see procedure 1)  
 20-2. Remove the eight (8) screws marked [80c], then the OUTC2/3 circuit board can be removed. (Fig. 9)

**21. OUTC3/3 Circuit Board Removal**

- 21-1. Open the meter panel. (see procedure 1)  
 21-2. Remove the two (2) screws marked [80d] and the screw marked [90c], then the OUTC3/3 circuit board can be removed. (Fig. 9)

**22. INC Circuit Board Removal**

There are twenty four (24) INC circuit boards in the MC2410M, and thirty two (32) in the MC3210M.

Each INC circuit board can be removed in same manner as shown below.

- 22-1. Open the meter panel. (see procedure 1)  
 22-2. Remove the two (2) screws marked [30] and two (2) screws marked [40b], then a INC circuit board can be removed. (Fig. 9)

**15. JK1/5シートの外し方**

- 15-1 メーターパネルを開けます。(1項参照)  
 15-2 [60b]のネジ3本を外し、JK1/5シートを外します。(図9)

**16. JK2/5シートの外し方**

- 16-1 メーターパネルを開けます。(1項参照)  
 16-2 [60c]のネジ5本を外し、JK2/5シートを外します。(図9)

**17. JK3/5シートの外し方**

- 17-1 メーターパネルを開けます。(1項参照)  
 17-2 [60d]のネジ3本を外し、JK3/5シートを外します。(図9)

**18. JK4/5シートの外し方**

- 18-1 メーターパネルを開けます。(1項参照)  
 18-2 [60e]のネジ5本を外し、JK4/5シートを外します。(図9)

**19. OUTC1/3シートの外し方**

- 19-1 メーターパネルを開けます。(1項参照)  
 19-2 [80b]のネジ8本を外し、OUTC1/3シートを外します。(図9)

**20. OUTC2/3シートの外し方**

- 20-1 メーターパネルを開けます。(1項参照)  
 20-2 [80c]のネジ8本を外し、OUTC2/3シートを外します。(図9)

**21. OUTC3/3シートの外し方**

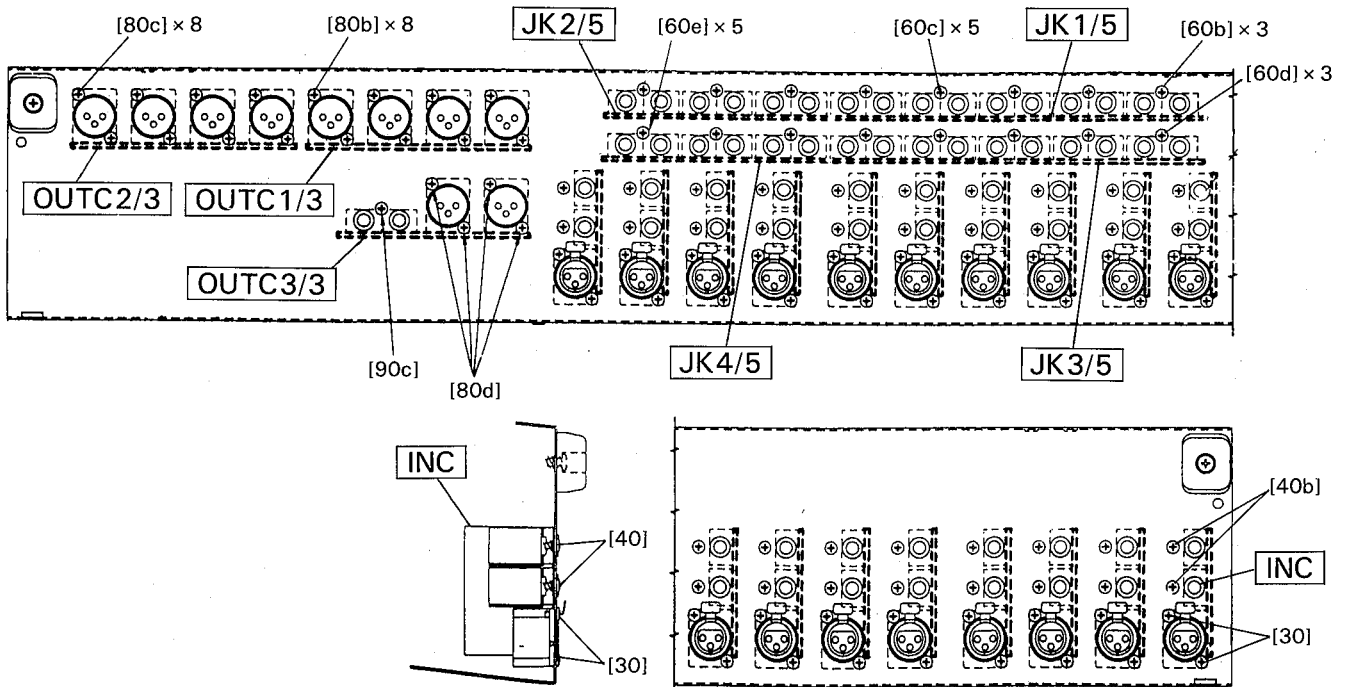
- 21-1 メーターパネルを開けます。(1項参照)  
 21-2 [80d]のネジ4本と[90c]のネジ1本を外し、OUTC3/3シートを外します。(図9)

**22. INCシートの外し方**

INCシートは、MC2410には24枚、M3210Mには32枚あります。

- 22-1 メーターパネルを開けます。(1項参照)  
 22-2 [30]のネジ2本と[40b]のネジ2本を外し、INCシートを外します。(図9)

● Rear panel (リアパネル)



- [30] : Bonding Head Screw(BONDING小ネジ) 3.0X6 FCM3BL (VC082800)
- [40b] : Bind Head Tapping Screw-B(+バインドBタイト) A3.0X6 FCM3BL (VC791600)
- [60] : Bind Head Tapping Screw-B(+バインドBタイト) A3.0X6 FCM3BL (VC791600)
- [80] : Bonding Head Screw(BONDING小ネジ) 3.0X6 FCM3BL (VC082800)
- [90c] : Bind Head Tapping Screw-B(+バインドBタイト) A3.0X6 FCM3BL (VC791600)

(Fig. 9)

23. MTA2-1/4, MTA2-2/4 & MTA2-3/4 Circuit Boards Removal

Each MTA2 circuit board can be removed in same manner as shown below.  
(MTA2-4/4 circuit board is not located in this unit.)

- 23-1. Open the meter panel. (see procedure 1)
- 23-2. Remove the four (4) screws marked [40c], then remove a MTA2 circuit board with meters and a holder. (Fig. 10)
- 23-3. Remove the screw marked [60f] to remove the holder. (Fig. 10)
- 23-4. Remove the two (2) meters by removing solder.

23. MTA2-1/4シート、MTA2-2/4シート、MTA2-3/4シートの外し方

(MC2410MとMC3210Mには、MTA2-4/4シートは使用されていません。)

MTA2-1/4シート、MTA2-2/4シート、MTA2-3/4シートは以下の手順で同じように外すことができます。

- 23-1 メーターパネルを開けます。(1項参照)
- 23-2 [40c]のネジ4本を外し、メーターホルダーと一緒にシートを外します。(図10)
- 23-3 [60f]のネジ1本を外し、メーターホルダーを外します。(図10)
- 23-4 半田を取って、シートからメーター2個を外します。



**24. MTA3-1/4, MTA3-2/4 & MTA3-3/4 Circuit Boards Removal**

Each MTA3 circuit board can be removed in same manner as shown below.

- 24-1. Open the meter panel. (see procedure 1)
- 24-2. Remove the four (4) screws marked [40d], then remove a MTA3 circuit board with meters and a holder. (Fig. 10)
- 24-3. Remove the screw marked [110c] to remove the holder. (Fig. 10)
- 24-4. Remove the two (2) meters by removing solder.

**24. MTA3-1/4シート、MTA3-2/4シート、MTA3-3/4シートの外し方**

MTA3-1/4シート、MTA3-2/4シート、MTA3-3/4シートは以下の手順で同じように外すことができます。

- 24-1 メーターパネルを開けます。(1項参照)
- 24-2 [40d]のネジ4本を外し、メーターホルダーと一緒にシートを外します。(図10)
- 24-3 [110c]のネジ1本を外し、メーターホルダーを外します。(図10)
- 24-4 半田を取って、シートからメーター2個を外します。

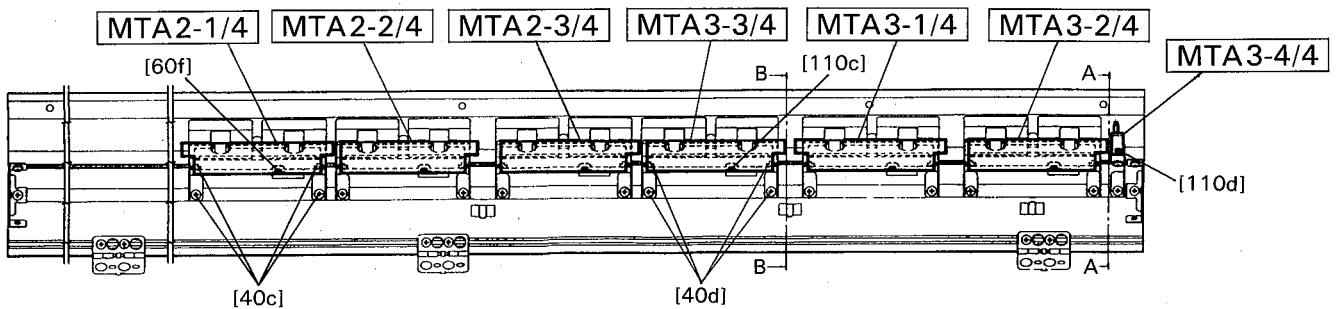
**25. MTA3-4/4 Circuit Board Removal**

- 25-1. Open the meter panel. (see procedure 1)
- 25-2. Remove the screw marked [110d], then the MTA4/4 circuit board can be removed. (Fig. 10)

**25. MTA3-4/4シートの外し方**

- 25-1 メーターパネルを開けます。(1項参照)
- 25-2 [110d]のネジ1本を外し、MTA3-4/4シートを外します。(図10)

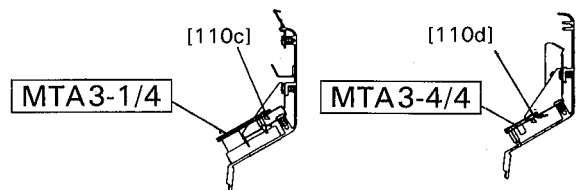
● Bottom side of the meter panel (メーターパネル裏側)



- [40] : Bind Head Tapping Screw-B(+バインドBタイト) A4.0X8 ZMC2BL (VC688800)
- [60] : Bind Head Tapping Screw-B(+バインドBタイト) A3.0X6 FCM3BL (VC791600)
- [110] : Bind Head Tapping Screw-B(+バインドBタイト) A3.0X6 FCM3BL (VC791600)

Section B-B

Section A-A

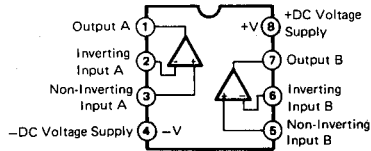
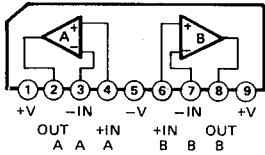


(Fig. 10)

■ IC BLOCK DIAGRAM (ICブロック図)

- NJM4558S (IG076800)
- $\mu$ PC4570HA (XB247A00)  
Dual Operational Amplifier

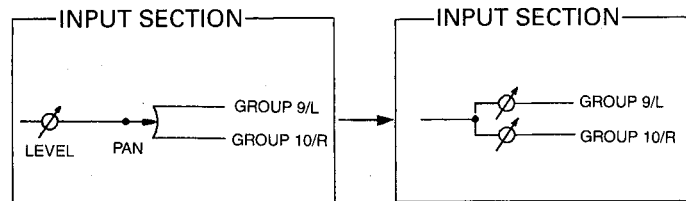
- BA4558-NK (XF128A00)
- NJM4556DD (XE803A00)
- NJM2068D-D (XA987A00)
- NJM2041D-D (IG069200)  
Dual Operational Amplifier



## MODIFYING THE MIXER (機能の変更について)

1. The PHANTOM power switches turn the internal phantom power supply on and off in 4 channel groups. If you want to supply the phantom power for each four channel bank, it can be set so that it is permanently off by setting the internal jumper on INC PCB.  
REFER TO THE INC CIRCUIT BOARD SECTION FOR DETAILS.

2. By setting internal jumper wires in each channel it is possible to make the LEVEL control work as the input mix level control for group 9/L and the PAN control work as the input mix level control for group 10/R.  
REFER TO THE IN CIRCUIT BOARD AND MA CIRCUIT BOARD SECTIONS FOR DETAILS.  
CAUTION: THE REPLACEMENT OF PARTS SHOULD BE DONE TOGETHER IN ALL CHANNELS.



3. By setting internal jumper wires on the MA PCB, the CUE signal can be pre Group fader, post Group fader or post Group ON switch.  
REFER TO THE MA CIRCUIT BOARD SECTION FOR DETAILS.

1. PHANTOMスイッチは、4チャンネルまとめてON/OFFします。INCシートのジャンパー線を取り外すことによって、スイッチとは無関係に常にOFFの状態をつくることができます。

2. INシート内のジャンパー線を切り換えることによって、PANコントロールを使わずに、グループ9/L、10/Rに入力する信号のレベルを独立してコントロールすることができます。このとき、グループ9/L、10/Rレベルコントロールがグループ9/Lコントロールとなり、PANコントロールがグループ10/Rレベルコントロールとなります。

注意：これらの変更は、全てのチャンネルについて一括して実施する必要があります。

3. MAシート内のジャンパー線を切り換えることによって、グループCUEスイッチでモニターできるグループ信号を、グループフェーダー前の信号からフェーダーの後またはグループONスイッチの後に変更することができます。

■ **CIRCUIT BOARDS** (シート基板図)

● **Circuit Board** (シート基板図)

MA Circuit Board .....page 38

IN Circuit Board .....page 42

HA Circuit Board .....page 46

LA Circuit Board .....page 46

MTA2 Circuit Board .....page 48

MTA3 Circuit Board .....page 50

INC Circuit Board .....page 52

OUTC Circuit Board .....page 53

JK & SW Circuit Board .....page 54

PS Circuit Board .....page 56

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JK & SW Circuit Board .....page 54

LA Circuit Board .....page 46

MA Circuit Board .....page 38

MTA2 Circuit Board .....page 48

MTA3 Circuit Board .....page 50

OUTC Circuit Board .....page 53

PS Circuit Board .....page 56





## Notes)

Circuit Board: MA (VN721400) XL001D0

1. IC  
IC501, 502, 505, 508, 514, 517, 524: UPC4570HA (XB247A00) OP AMP  
IC503, 504, 506, 507, 509, 510, 512, 513, 515, 518~521, 525, 527: NJM4558S (IG076800) OP AMP  
IC516, 523, 526, 528: NJM4556DD (XE803A00) OP AMP  
IC522: NJM2041D-D (IG069200) OP AMP
2. Transistor  
Q501, 502, 504: 2SA1015 O, Y (IA101590)  
Q503, 505: 2SC1815 Y, GR (IC1815M0)
3. Zener Diode  
ZD501, 502, 503: MTZ10B 10V (VA095900)  
D501: MTZ10B 10V (VA095900)
4. LED  
LED501, 502: GL2EG6 GR (VH325300) CUE SIGNAL L, R  
LED503: GL2HY6 YE (VJ471200) INPUT CUE
5. Mylar Cap.  
C508, 513: 0.0150 50V J (UA354150)  
C789, 793: 0.0470 50V J (UA354470)
6. Ceramic Cap.  
C506, 512, 516, 533, 547, 564, 578, 595, 610, 627, 641, 659, 670, 687, 731, 740, 745, 752, 763, 768, 775: B 220P 50V K (FG612220)  
C509, 510, 519, 520, 523, 524, 526, 538, 539, 550, 551, 554, 555, 557, 569, 570, 581, 582, 585, 586, 588, 600, 601, 603, 613, 614, 617, 618, 620, 632, 633, 644, 645, 648, 649, 651, 656, 657, 673, 674, 677, 678, 680, 692, 693, 705, 706, 707, 720, 721, 722, 734, 736, 738, 748, 749, 755, 756, 759, 760, 787, 788, 798, 799: F 0.0100 50V Z (FG644100)  
C517, 535, 549, 566, 580, 597, 612, 629, 643, 661, 672, 689, 753, 769: B 470P 50V K (FG612470)  
C518, 522, 528~530, 534, 537, 542, 543, 548, 553, 559, 560, 561, 565, 568, 573, 574, 575, 579, 584, 590, 591, 592, 596, 599, 605, 606, 607, 611, 616, 622, 623, 624, 628, 631, 636, 637, 638, 642, 647, 653, 654, 660, 663, 666, 667, 676, 682, 683, 684, 691, 696, 697, 698, 700, 702, 703, 704, 709, 711, 712, 713, 715, 717, 718, 719, 724, 726, 727, 728, 733, 742, 746, 754, 758, 764, 765, 770, 772, 776, 777, 785, 791, 795, 796: SL 100P 50V J (FG652100)  
C521, 536, 552, 567, 583, 598, 615, 630, 546, 662, 675, 690, 735, 741, 747, 757, 771: SL 47P 50V J (FG651470)

C655, 668, 671, 688, 797:  
C779, 780:  
C786, 792:SL 33P 50V J (FG651330)  
B 1000P 50V K (FG613100)  
SL 22P 50V J (FG651220)

## 7. Electrolytic Cap.

C501~504: 220.00 25.0V (UJ848220)  
C505, 511, 515, 532, 546, 563, 577, 594, 609, 626, 640, 658, 669, 686, 732, 751, 767: 100.00 16.0V (UJ838100)C525, 531, 540, 545, 556, 562, 571, 576, 587, 593, 602, 608, 619, 625, 634, 639, 650, 664, 679, 694, 701, 710, 716, 725, 730, 736, 739, 743, 744, 761, 762, 773, 774, 784, 790: 47.00 25.0V (UI547470)  
C527, 541, 558, 572, 589, 604, 621, 635, 652, 665, 708, 714, 723, 729, 794: 22.00 25.0V (UI547220)  
C681, 695: 22.00 25.0V (UJ847220)  
C685, 699: 47.00 25.0V (UJ847470)  
C750, 766, 778, 800: 220.00 16.0V (UJ838220)  
C781, 782: 470.00 25.0V (UJ748470)  
C783: 10.00 25.0V (UJ847100)

## 8. Flame Proof C. Resistor

R828, 829: 10.0 1/4 J (HV354100)

## 9. Metal Oxide Film Resistor

R816, 827: 100.0 1W J (VC731200)

## 10. Resistor Array

RA501, 502: RGLD12X183J (VP007600)

## 11. Slide Pot.

VR501~508, 511, 512: A10K (VL819600) GROUP FADER1-10

## 12. Variable Resistor

VR509, 510, 513~517: A20K (VL819100) RTN1-4, AUX OUT, TB INPUT LEVEL  
VR518, 519: A20K x 2 (VL899200) CUE OUT, HP LEVEL

## 13. Slide Switch

SW532, 533: SSS212 (KA401270) CANCEL

## 14. Push Switch

SW501~520, 522, 524, 526, 528, 529, 534, 535: SPEC12 NON-SHORT BE (VL891900) ON, CUE, TB  
SW521, 523, 525, 527: SPEC101 10 (VN720800) RTN assign  
SW530: SPEC91 9 (VN720900) TB assign1-10  
SW531: SPEC21 2 (VP034700) TB assign AUX, TB OUT

## 15. Phone Jack

JK 2: HLJ1520 (LB202300) PHONES

## 16. Cannon Connector

JK 1: XLM-3-31PCV (VL958600) TB INPUT

## 17. Relay

RY501: DC RY12W 12V (KC001900)

## 18. Base Post Connector

CN503: PH-10P TE (VB390600) to JK-CN8  
CN504: PH-11P TE (VB390700) to JK-CN9  
CN508: PH-8P TE (VB390400) to JK-CN1  
CN509: PH-8P TE (VB390400) to JK-CN3, CN4  
CN510: PH-6P TE (VB390200) to JK-CN2, CN5, CN7  
CN511: PH-3P TE (VB389900) to MA-CN512  
CN513: PH-4P TE (VB390000) to MA-CN514  
CN515: PH-7P TE (VB390300) to JK-CN6

## 19. Straight Header

CN501: HIF3FC30PA-2.54DSA to IN-CN4 (Bus connector)

## 20. Connector Assembly

CN502: PS to PS-CN1  
CN505: SAN & PH 8P 100L to LA-CN1  
CN506: SAN & PH 8P 100L to LA-CN3  
CN507: SAN & PH 8P 200L to LA-CN2  
CN512: SAN & PH 3P 80L to MA-CN511  
CN514: SAN & PH 4P 60L to MA-CN513  
CN516: SAN & PH 2P 80L to LA-CN4  
CN517: SAN & SAN 2P 60L to MA-CN518  
CN518: SAN & SAN 2P 60L to MA-CN517

\* When you have changed the setting internal jumper wires in each channel on the IN PCB to make the LEVEL control work as the input mix level control for group 9/L and the PAN control work as the input mix level control for group 10/R (refer to IN PCB diagram for details), you must replace resistors and capacitors on the MA PCB as shown below.

R654, 668, 697, 698, 717, 718, 737, 738, 757, 758, 865, 866: 56kΩ → 33kΩ  
R771, 772: 91kΩ → 51kΩ  
C671, 688: 33pF → 56pF

Also, remove the two (2) jumper wires, shown in red and surrounded with INDI-PAN mark in the diagram, and short the ----- marked circuit with wires. These jumper wires are installed beside the SW520.

CAUTION: THE REPLACEMENT OF PARTS SHOULD BE DONE TOGETHER IN ALL CHANNELS.

\* By setting internal jumper wires on the MA PCB, the CUE signal can be pre Group fader, post Group fader or post Group ON switch. These jumper wires, shown in red in the diagram, are located beside the COM prints.

To set post Group fader: Remove the jumper wire and short between the COM and PRE.

To set post Group ON switch: Remove the jumper wire and short between the COM and POST.

\* PANコントロールを使わずに、グループ9/L、10/Rレベルコントロールをグループ9/Lコントロールとし、PANコントロールをグループ10/Rレベルコントロールとして使用するためにINシート内のジャンパー線の接続を変更したときは、MAシート内の下記の抵抗とコンデンサの定数を変更する必要があります。

R654, 668, 697, 698, 717, 718, 737, 738, 757, 758, 865, 866 : 56kΩ → 33kΩ  
R771, 772 : 91kΩ → 51kΩ  
C671, 688 : 33pF → 56pF

また、SW520の側の基板表面印刷のINDI-PAN枠内に赤色で示した2本のジャンパー線を抜いて、点線で示した部分を線材で接続します。

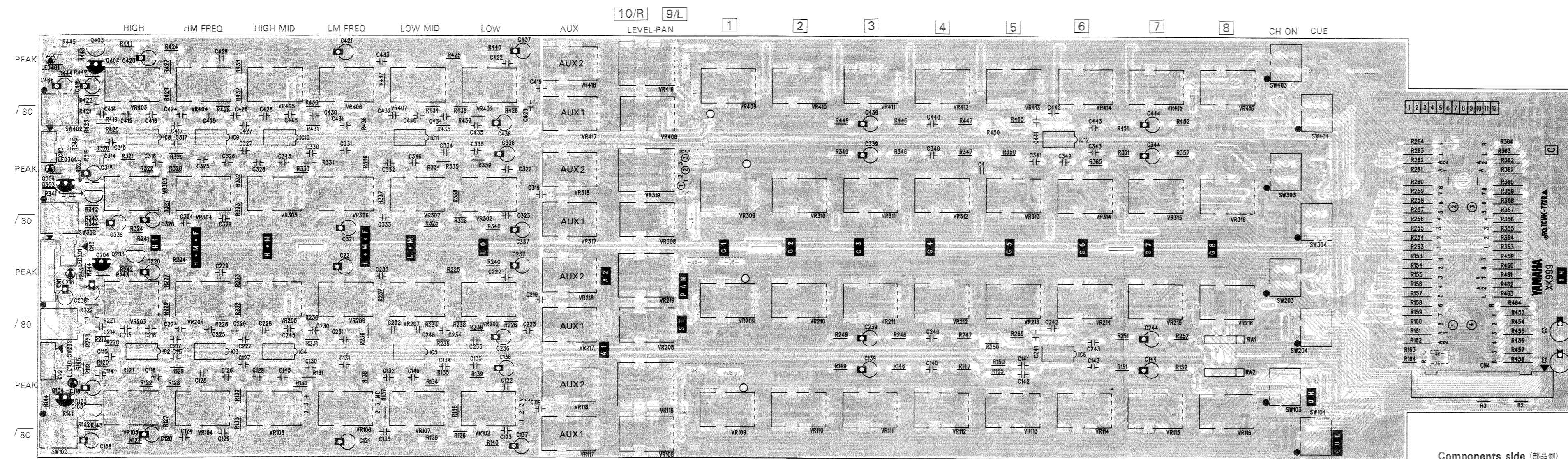
注意：これらの変更は、全てのチャンネルについて一括して実施する必要があります。

\* MAシート内のジャンパー線を切り換えることによって、グループCUEスイッチでモニターできるグループ信号を、グループフェーダー前の信号からフェーダーの後またはグループONスイッチの後に変更することができます。これらのジャンパー線は、基板表面印刷のCOMの側に赤色で示したジャンパー線です。

ポストグループフェーダー：ジャンパー線を外し、COMとPREを接続します。  
ポストグループONスイッチ：ジャンパー線を外し、COMとPOSTを接続します。

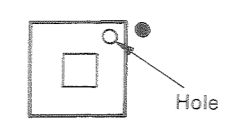


● IN Circuit Board



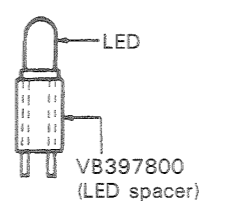
Components side (部品側)

● Push switch installation  
(プッシュスイッチの取付け)



[Set the hole of the switch at ● mark.]  
(プッシュスイッチの穴を表面印刷の●印に合わせる)

● LED installation  
(LEDの取付け)

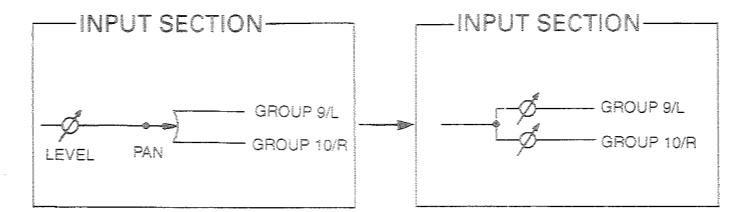


Notes)

- |   |  |   |   |  |
|---|--|---|---|--|
| Circuit Board:  | IN (VN721300) XK000C0  | 5. Ceramic Cap.<br>C 4, *17, *19, *27,<br>*31, *35, *43: F 0.0100 50V Z (FG644100)  | VR*09 ~ *18:<br>VR*19:                                      | A20K (VL819100) GROUP1-8, AUX1, 2<br>AC20Kx2 (CLICK) (VP032400) 9-10 PAN   |
| 1. IC<br>IC 2-5, 8-11:<br>IC 6, 12:   | NJM4556DD (XE803A00) OP AMP<br>BA4558-NK (XF128A00) OP AMP   | C*16, *25, *40 ~ *42,<br>*45, *46:<br>C*26:<br>C*30, *34:                           | 9. Push Switch<br>SW*02 ~ *04:                              | SPEC12 (VL891900) 80, CH ON, CUE   |
| 2. Transistor<br>Q*03:<br>Q*04:   | 2SA1015 O, Y (IA101590)<br>2SC1815 Y, GR (IC1815M0)  | 6. Electrolytic Cap.<br>C 2, 3, *44:<br>C*18, *20, *39:<br>C*21, *37, *38:<br>C*36: | 10. Base Post Connector<br>CN 1:<br>CN 2:<br>CN 3:<br>CN 5: | PH-9P TE (VB390500) to HA-CN9, CN7<br>PH-5P TE (VB390100) to INC(CH1)-CN1,<br>INC(CH2)-CN1<br>PH-4P TE (VB390000) to INC(CH4)-CN1,<br>INC(CH3)-CN1<br>PH-4P TE (VB390000) to HA-CN11 |
| 3. LED<br>LED*01:   | GL2PR6 RE (VH325200) PEAK  | 7. Resistor Array<br>RA 1, 2:   | 11. Straight Header<br>CN 4:                                | HIF3FC30PA-2.54DSA to MA-CN501(Bus connector)  |
| 4. Mylar Cap.<br>C*14, 15:<br>C*22, *23:<br>C*24:<br>C*28:<br>C*29:<br>C*32:<br>C*33: | 0.0910 50V J (UA354910)<br>0.0330 50V J (UA354330)<br>1200P 50V J (UA353120)<br>2400P 50V J (UA353240)<br>6200P 50V J (UA353620)<br>0.0120 50V J (UA354120)<br>0.0300 50V J (UA354300) | 8. Variable Resistor<br>VR*02, *03:<br>VR*04, *06:<br>VR*05, *07:<br>VR*08:         | (marked * = 1, 2, 3 or 4)                                   |  |

\* By setting internal jumper wires in each channel it is possible to make the LEVEL control work as the input mix level control for group 9/L and the PAN control work as the input mix level control for group 10/R. First, remove the jumper wires, shown in red, are installed beside VR109, VR209, VR309, VR409 and CN4. Then, short the ----- marked circuit with wires. At this time, you must replace resistors, capacitors and jumper wires on the MA PCB (refer to MA Circuit Board section for details).

CAUTION: THE REPLACEMENT OF PARTS SHOULD BE DONE TOGETHER IN ALL CHANNELS.



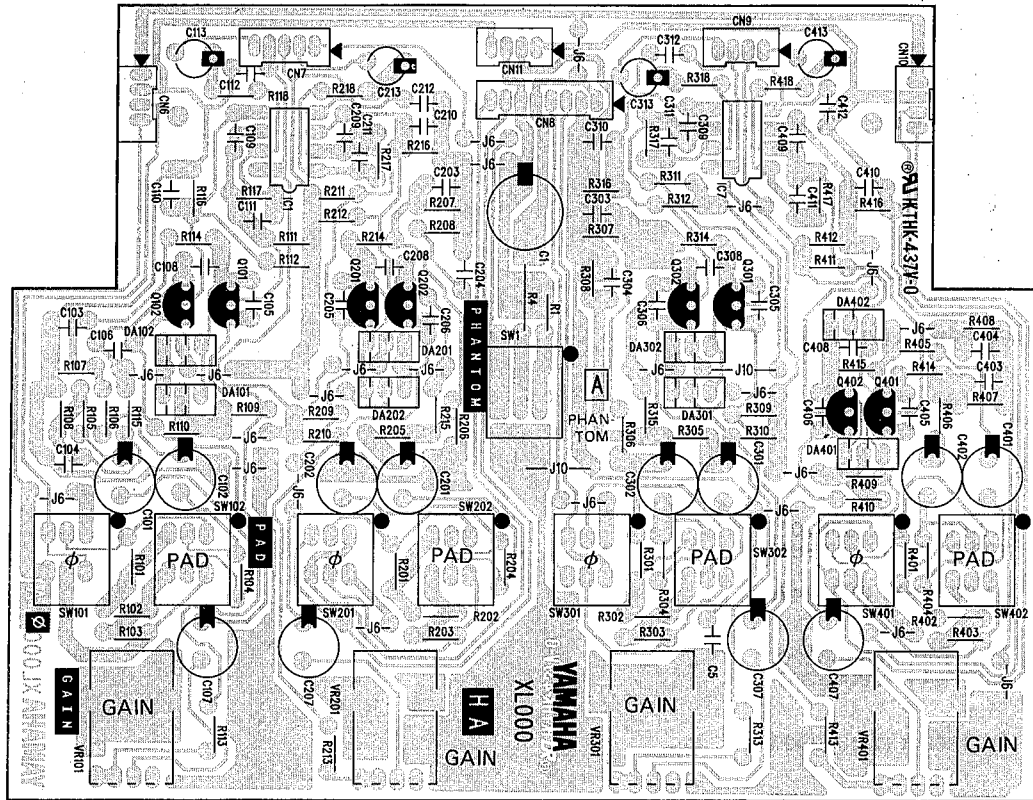
\* INシート内のジャンパー線を切り換えることによって、PANコントロールを使わずに、グループ9/L、10/Rに入力する信号のレベルを独立してコントロールすることができます。このとき、グループ9/L、10/Rレベルコントロールがグループ9/Lコントロールとなり、PANコントロールがグループ10/Rレベルコントロールとなります。まず、VR109、VR209、VR309、VR409、CN4の側に赤色で示したジャンパー線を抜きます。次に、線材などで……で示した箇所を接続します。このとき、MAシート内の下記の抵抗とコンデンサとジャンパー線を変更する必要があります。

注意：これらの変更は、全てのチャンネルについて一括して実施する必要があります。

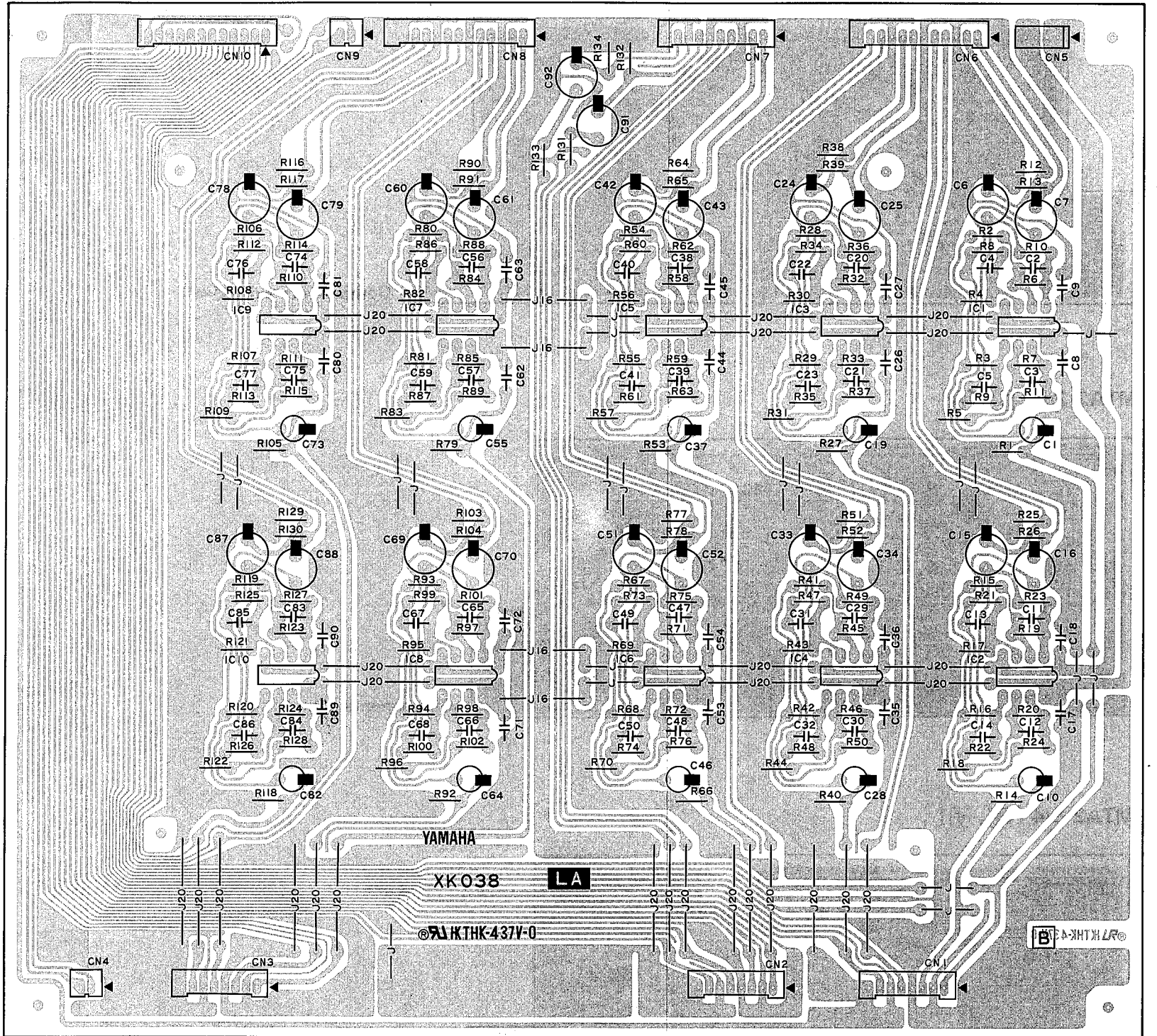


● HA Circuit Board

● LA Circuit Board



Components side (部品側)



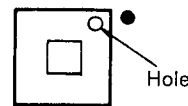
Components side (部品側)

Notes)

- Circuit Board: HA (VN721500) XL000A0
- IC  
IC 1, 7: NJM2068D-D (XA987A00) OP AMP
  - Transistor  
Q\*01, \*02: 2SA970 GR, BL (IA097030)
  - Diode Array  
DA\*01: DAN215 TL2 0.1A (VM977000)  
DA\*02: DAP215 TL2 0.1A (VM976900)
  - Ceramic Cap.  
C\*03, \*04: B 470P 50V K (FG612470)  
C\*05, \*06: B 220P 50V K (FG612220)  
C\*08: B 330P 50V K (FG612330)  
C\*09, \*10, \*11: SL 100P 50V J (FG652100)  
C\*12: F 0.0100 50V Z (FG644100)
  - Electrolytic Cap.  
C 1: 47.00 100.0V (UJ797470)  
C\*01, \*02: 10.00 63.0 (UL477100)  
C\*07: 470.00 6.3V (UJ818470)  
C\*13: 22.00 25.0V (UJ847220)
  - Flame Proof C. Resistor  
R 4: 390.0 1/4 J (HV355390)
  - Metal Film Resistor  
R\*01, \*03: 4.7K 1/4 F (VA074100)  
R\*02: 1.1K 1/4 F (VB065600)  
R\*04: 100.0K 1/4 F (VB069600)  
R\*07, \*08: 47.0K 1/4 F (VB068800)  
R\*09, \*10: 8.2K 1/4 F (VB067400)  
R\*11, \*12: 2.2K 1/4 F (VB066300)  
R\*13: 13.0 1/4 F (VB060400)  
R\*16, \*17: 27.0K 1/4 F (VB068300)
  - Variable Resistor  
VR\*01: W20K (VL818700) GAIN

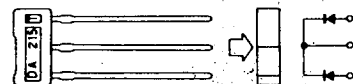
- Push Switch  
SW 1: SPEC12 NON-SHORT BE (VL891900) PHANTOM  
SW\*01, \*02: SPEC12 SHORT WH (VM967100) φ, PAD
- Base Post Connector  
CN 6: PH-4P TE (VB390000) to INC(CH1)-CN1  
CN 7: PH-5P TE (VB390100) to IN-CN1  
CN 8: PH-8P TE (VB390400) to INC(CH2)-CN1, INC(CH3)-CN1  
CN 9: PH-4P TE (VB390000) to IN-CN1  
CN 10: PH-4P TE (VB390000) to INC(CH1)-CN1  
CN 11: PH-4P TE (VB390000) to IN-CN5

● Push switch installation (プッシュスイッチの取付け)



[Set the hole of the switch at ● mark.]  
(プッシュスイッチの穴を表面印刷の●印に合わせる)

● Diode array installation (DA101~DA402)  
(ダイオードアレイの取付け DA101~DA402)



Notes)

- Circuit Board: LA (VM676400) XK038B0
- IC  
IC 1-10: NJM4556DD (XE803A00) OP AMP
  - Ceramic Cap.  
C 2-5, 11-14, 20-23, 29-32, 38-41, 47-50, 56-59, 65-68, 74-77, 83-86: SL 33P 50V J (FG651330)
  - Electrolytic Cap.  
C 1, 10, 19, 28, 37, 46, 55, 64, 73, 82: 47.00 25.0V (UJ847470)  
C 6, 7, 15, 16, 24, 25, 33, 34, 42, 43, 51, 52, 60, 61, 69, 70, 78, 79, 79, 87, 88, 91, 92: 220.00 16.0V (UJ838220)

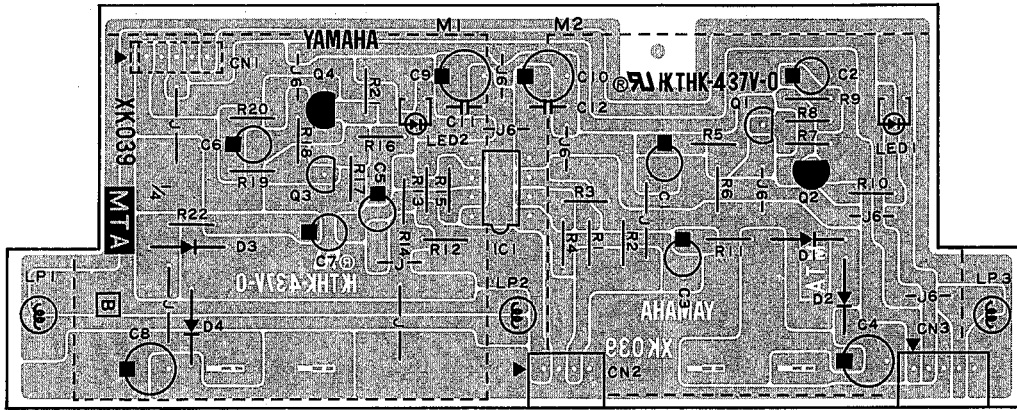
- Base Post Connector  
CN 1: PH-8P TE (VB390400) to MA-CN505  
CN 2: PH-8P TE (VB390400) to MA-CN507  
CN 3: PH-8P TE (VB390400) to MA-CN506  
CN 4: PH-2P TE (VB399800) to MA-CN516  
CN 6: PH12P TE (VB390800) to OUTC-CN1  
CN 7: PH10P TE (VB390600) to OUTC-CN3  
CN 8: PH13P TE (VF283100) to OUTC-CN2  
CN 9: PH-2P TE (VB399800) to JK-CN11  
CN 10: PH12P TE (VB390800) to JK-CN10
- Connector Assembly  
CN 5: SAN & PH 4P to PS-CN2

HA: 3NA-VN72150  
LA: 3NA-VM67640



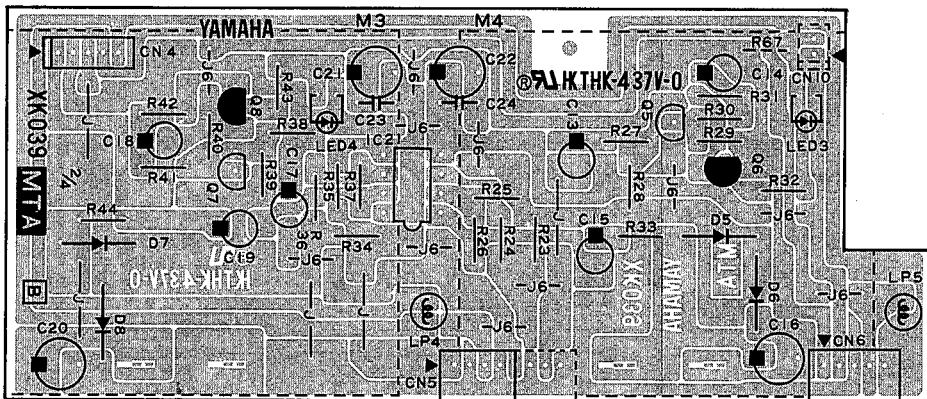
● MTA2 Circuit Board

MTA2 1/4 [ 1 , 2 ]



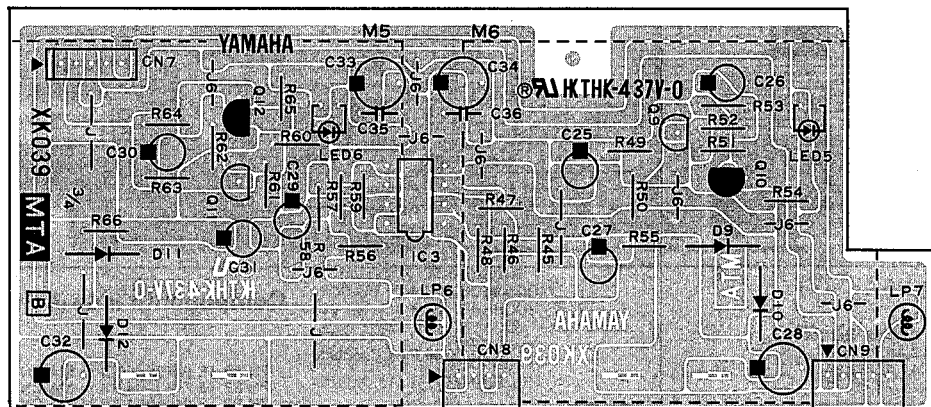
Components side (部品側)

MTA2 2/4 [ 3 , 4 ]



Components side (部品側)

MTA2 3/4 [ 5 , 6 ]



Components side (部品側)

# MC2410M/MC3210M

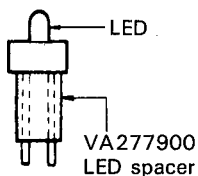
## Notes)

- Circuit Board: MTA2 (VN721600) XK039B0
1. IC  
IC 1, 2, 3: BA4558-NK (XF128A00) OP AMP
  2. Transistor  
Q 1, 3, 5, 7, 9, 11: 2SA1015 O, Y (IA101590)  
Q 2, 4, 6, 8, 10, 12: 2SC1815 Y, GR (IC1815M0)
  3. Diode  
D 1~12: OA95 (IF005640)
  4. LED  
LED 1~6: GL2PR6 RE (VH325200) PEAK
  5. Ceramic Cap.-F  
C11, 12, 23, 24, 35  
36: 0.0100 50V Z (FG644100)
  6. Electrolytic Cap.  
C 1~3, 5~7, 13~15,  
17~19, 25~27, 29~  
31: 1.00 50.0V (UI566100)  
C 4, 8, 16, 20, 28, 32: 100.00 16.0V (UI538100)  
C 9, 10, 21, 22, 33,  
34: 47.00 25.0V (UI547470)
  7. Metal Film Resistor  
R11, 22, 33, 44, 55,  
66: 2.0K 1/4 F (VB066200)  
2.0K 1/4 F (VB066200)
  8. Lamp  
LP 1~7: 8V 100mA (VM672900)
  9. Base Post Connector  
CN 2: PH-4P SE (VB858300) to JK-CN12  
CN 3: PH-5P SE (VB858400) to MTA2-CN4  
CN 5: PH-4P SE (VB858300) to JK-CN12  
CN 6: PH-5P SE (VB858400) to MTA2-CN7  
CN 8: PH-4P SE (VB858300) to JK-CN12  
CN 9: PH-5P SE (VB858400) to MTA3-CN7
  10. Connector Assembly  
CN 4: SAN & PH 5P 120L to MTA2-CN3  
CN 7: SAN&PH 5P 120L to MTA2-CN6

\* The MTA2-4/4 circuit board is not installed in this unit.

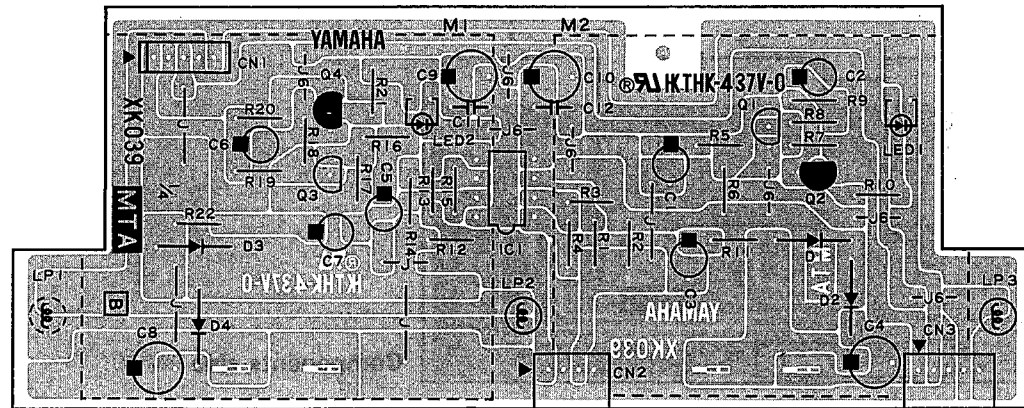
(MTA2 4/4シートは、本機には使用されていません。)

### • LED installation (LEDの取付け)



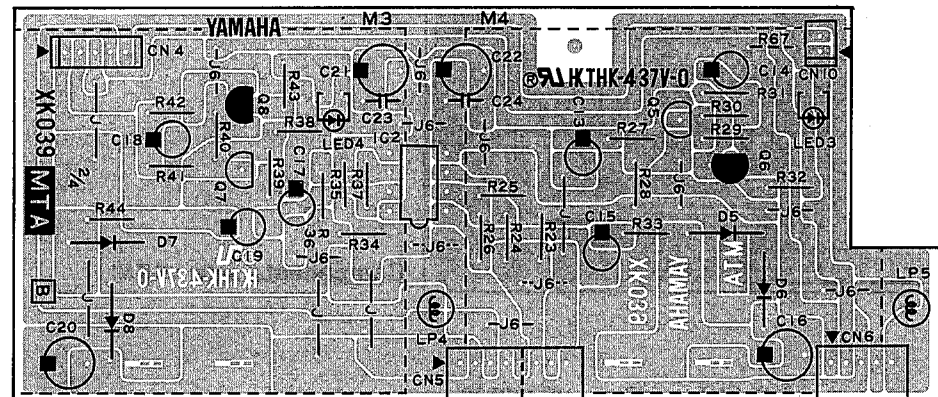
● MTA3 Circuit Board

MTA3 1/4 ( 9/L , 10/R )



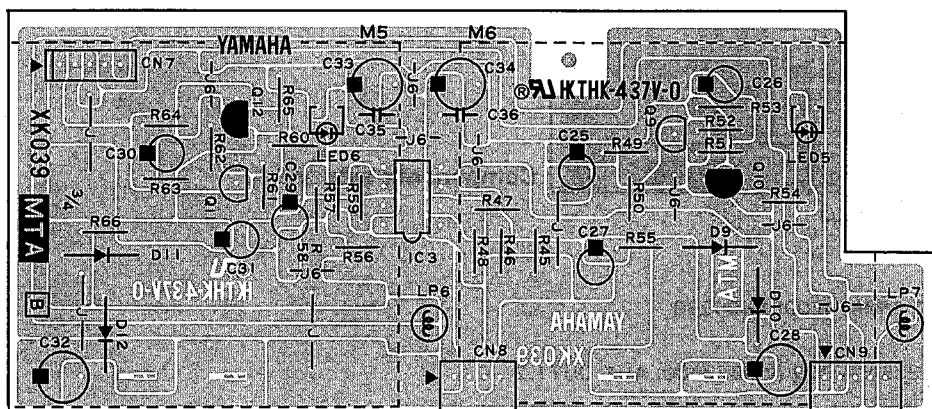
Components side (部品側)

MTA3 2/4 (AUX 1/CUE L, AUX 2/CUE R)



Components side (部品側)

MTA3 3/4 ( 7 , 8 )

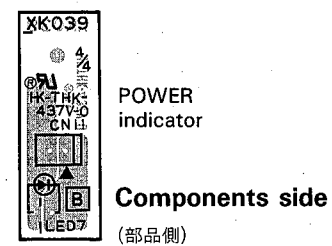


Components side (部品側)

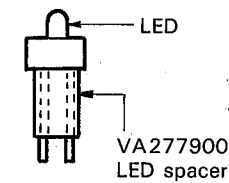
Notes)

- Circuit Board: MTA3 (VN721700) XK039B0
- IC  
IC 1, 2, 3: BA4558-NK (XF128A00) OP AMP
  - Transistor  
Q 1, 3, 5, 7, 9, 11: 2SA1015 O, Y (IA101590)  
Q 2, 4, 6, 8, 10, 12: 2SC1815 Y, GR (IC1815M0)
  - Diode  
D 1~12: OA95 (IF005640)
  - LED  
LED 7: GL3PR8 RE (VG261500) POWER indicator  
LED 1~6: GL2PR6 RE (VH325200) PEAK indicator
  - Ceramic Cap.-F  
C11, 12, 23, 24, 35, 36: 0.0100 50V Z (FG644100)
  - Electrolytic Cap.  
C 1~3, 5~7, 13~15, 17~19, 25~27, 29~31: 1.00 50.0V (UI566100)  
C 4, 8, 16, 20, 28, 32: 100.00 16.0V (UI538100)  
C 9, 10, 21, 22, 33, 34: 47.00 25.0V (UI547470)
  - Metal Film Resistor  
R11, 22, 33, 44, 55, 66: 2.0K 1/4 F (VB066200)
  - Lamp  
LP 2~7: 8V 100MA (VM672900)
  - Base Post Connector  
CN 2: PH-4P SE (VB858300) to JK-CN12  
CN 3: PH-5P SE (VB858400) to MTA3-CN4  
CN 5: PH-8P SE (VB858700) to JK-CN12  
CN 6: PH-5P SE (VB858400) to PS-CN3  
CN 8: PH-4P SE (VB858300) to JK-CN12  
CN 9: PH-5P SE (VB858400) to MTA3-CN1
  - Connector Assembly  
CN 1: SAN & PH 5P 120L to MTA3-CN9  
CN 4: SAN & PH 5P 120L to MTA3-CN3  
CN 7: SAN & PH 5P 120L to MTA2-CN9  
CN10: SAN & SAN 2P 80L to MTA3-CN11  
CN11: SAN & SAN 2P 80L to MTA3-CN10

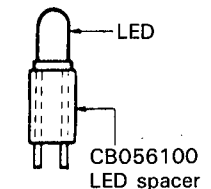
MTA3 4/4



● LED1~LED6 installation (LED1~LED6の取付け)

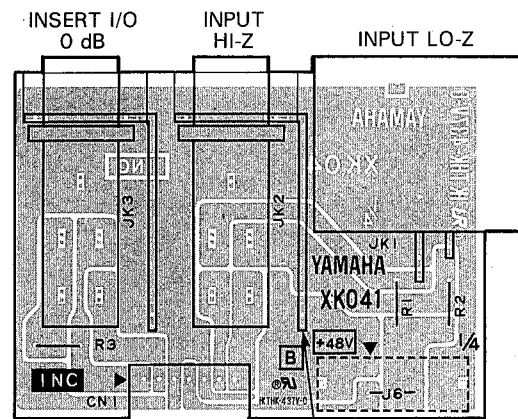


● LED7 installation (LED7の取付け)



● INC Circuit Board

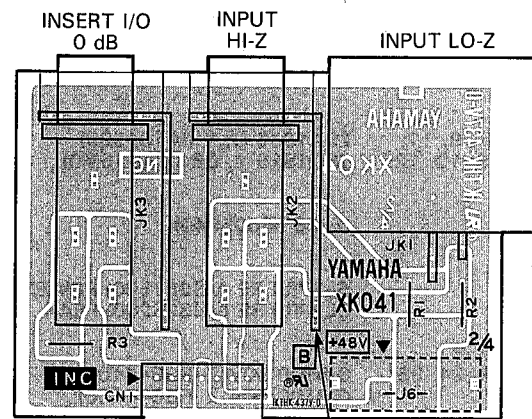
INC (CH1)



VM485700  
Angle Bracket, JACK  
(JACKアングル)

Components side (部品側)

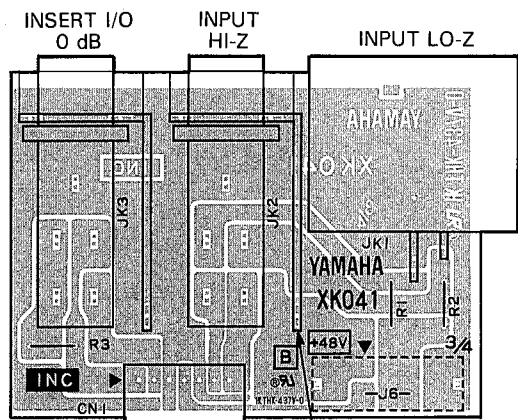
INC (CN2)



VM485700  
Angle Bracket, JACK  
(JACKアングル)

Components side (部品側)

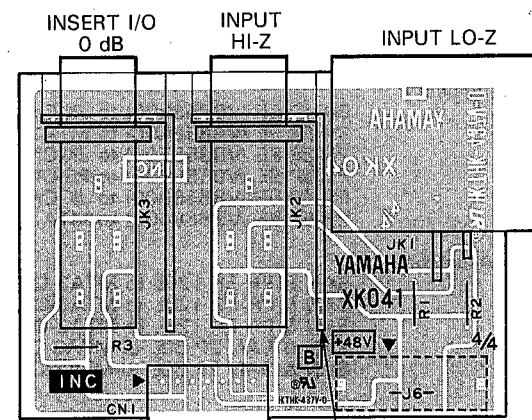
INC (CN3)



VM485700  
Angle Bracket, JACK  
(JACKアングル)

Components side (部品側)

INC (CN4)



VM485700  
Angle Bracket, JACK  
(JACKアングル)

Components side (部品側)

Notes)

- Circuit Board: INC (VM676500) XK041B0
1. Carbon Resistor R 3: 560.0 1/4 J (HF755560)
  2. Metal Film Resistor R 1, 2: 6.8K 1/4 F (VB067300)
  3. Phone Jack JK 2, 3: HLJ2305 STEREO (LB202700) INPUT H, INS I/O
  4. XLM Connector JK 1: XLM-3-31PCH-L (VM651800) INPUT LO-Z

5. Base Post Connector CN 1: PH-7P SE (VB858600) CH1: to HA-CN3  
CH2: to HA-CN8  
CH3: to HA-CN8  
CH4: to HA-CN10

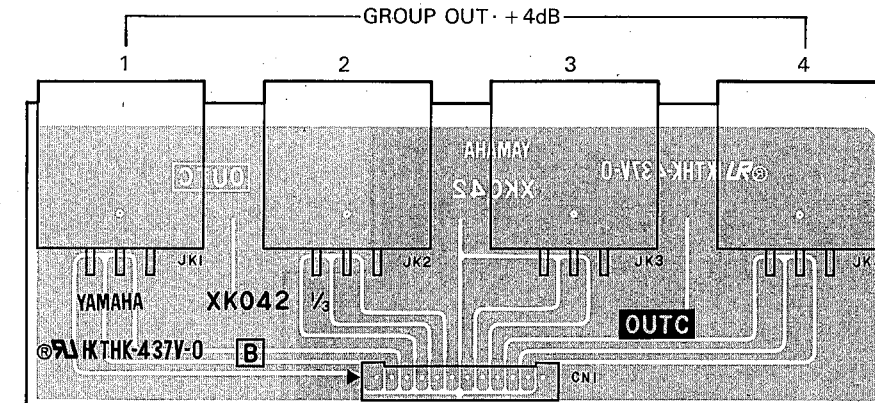
6. Jumper Wire J 6: 0.55 (VA078900)

\* The PHANTOM power switches turn the internal phantom power supply on and off in 4 channel groups. If you want to supply the phantom power for each four channel bank, it can be set so that it is permanently off by setting the internal jumper -J6- on INC PCB.

\*PHANTOMスイッチは、4チャンネルまとめてON/OFFします。INCシート内ジャンプ一線を取り外すことによって、スイッチとは無関係に常にOFFの状態をつくることができます。

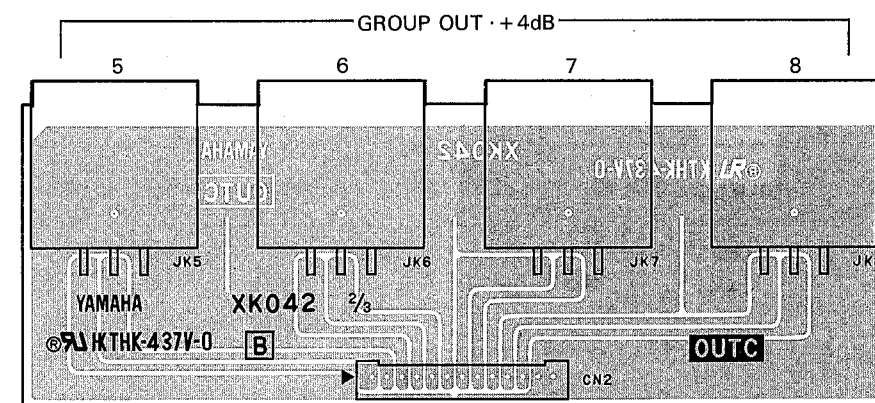
● OUTC Circuit Board

OUTC 1/3



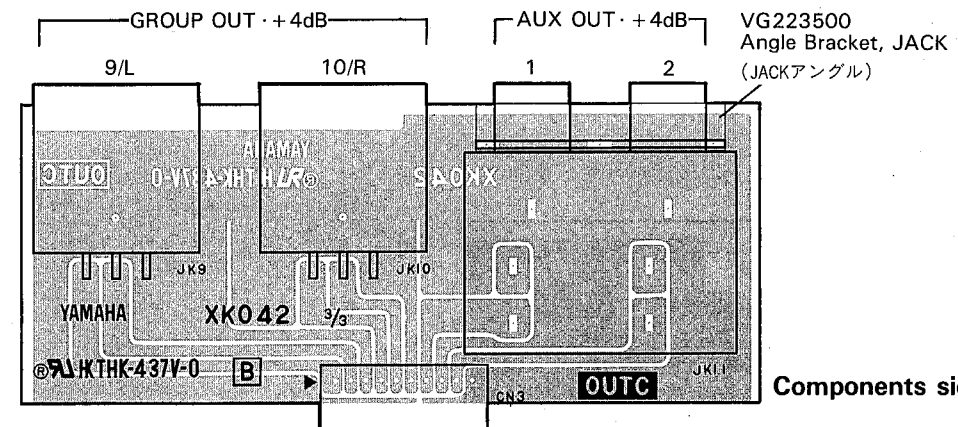
Components side (部品側)

OUTC 2/3



Components side (部品側)

OUTC 3/3



Components side (部品側)

Notes)

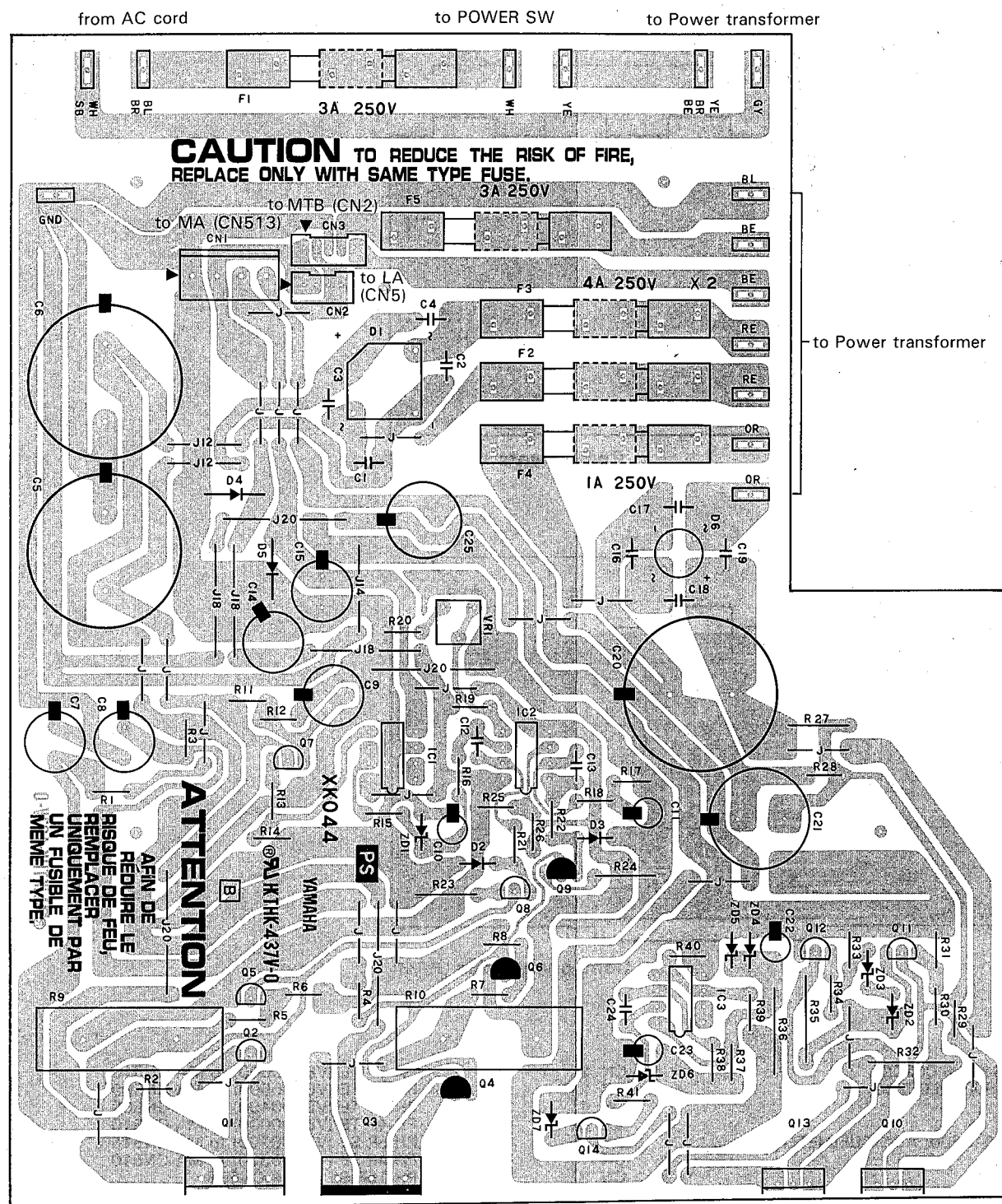
- Circuit Board: OUTC (VM676600) XK042B0
1. Phone Jack JK11: HLJ2335 STEREO (VM673600) AUX OUT1,2
  2. XLM Connector JK 1~10: XLM-3-32PCV (VL958700) GROUP OUT1-10
  3. Base Post Connector CN 1: PH-12P TE (VB390800) to LA-CN6  
CN 2: PH-13P TE (VF283100) to LA-CN8  
CN 3: PH-10P SE (VB858900) to LA-CN7

INC: 3NA-VM67650   
OUTC: 3NA-VM67660





● PS Circuit Board



Components side (部品側)

Notes)

- |  |  |  |
|--|--|--|
| Circuit Board:   | PS (VM677200) XK044B0 (J)<br>PS (VM677300) XK044B0 (U, C, V)<br>PS (VM677400) XK044B0 (H, B)   | 10. Flame Proof C. Resistor<br>R23, 24: 22.0 1/4 J (HV354220)<br>R27: 1.0K 1/4 J (HV356100)  |
| 1. IC<br>IC 1~3:   | BA4558-NK (XF128A00) OP AMP  | 11. Metal Film Resistor<br>R19: 10.0K 1/4 F (VA074400)<br>R20: 4.3K 1/4 F (VB067000)<br>R25, 26: 15.0K 1/4 F (VA074600)  |
| 2. Transistor<br>Q 1/3:<br>Q 2, 5, 8:<br>Q 4, 6, 9:<br>Q 7:<br>Q10, 13:<br>Q11, 12, 14:  | 2SC4385/2SA1670 Y (VM977100)<br>2SC1509 O, R (IC150930)<br>2SA777 Q, R (IA077730)<br>2SC1815 Y, GR (IC1815M0)<br>2SD2015 (VM923000)<br>2SC2240 GR, BL (IC224030)   | 12. Metal Oxide Film Resistor<br>R32: 3.3 1W J (VC726800)<br>R35: 12.0K 1W J (VC736900)<br>R36: 3.3K 1W J (VC735400)   |
| 3. Diode<br>D 2, 3:<br>D 4, 5:   | 1SS133, 1SS176 (VB941200)<br>1SR35-100A (VE170000)   | 13. Wire Wound Resistor<br>R 9, 10: 0.68 5W K (HM752680)   |
| 4. Diode Stack<br>D 1:<br>D 6:   | S4VB20 2.6A (IH001090)<br>1G4B1 1.5A (IH001400)  | 14. Trimmer Potentiometer<br>VR 1: B2.0K (VI444400) + 15V adj.   |
| 5. Zener Diode<br>ZD 1:<br>ZD 2:<br>ZD 3:<br>ZD 4, 5:<br>ZD 6, 7:  | MTZ5.1B 5.1V (VA780300)<br>RD33EB2 33.0V (IF005650)<br>RD27EB3 27.0V (IF005660)<br>RD24EB2 24.0V (IF005670)<br>RD5.6EB3 5.6V (IF001690)  | 15. Fuse<br>F 1, 5: T 3.00A 250V (KB000360) J<br>F 2, 3: T 4.00A 250V (KB000380) J<br>F 4: T 1.00A 250V (KB000330) J<br>F 1, 5: T 3.00A 250V (KB002650) U, C, V<br>F 2, 3: T 4.00A 250V (KB002640) U, C, V<br>F 4: T 1.00A 250V (KB001060) U, C, V<br>F 1: T 1.60A 250V (KB000740) H, B<br>F 2, 3, 5: T 3.15AL/250V (KB000760) H, B<br>F 4: T 1.00A 250V (KB000730) H, B |
| 6. Mylar Cap.<br>C12, 13, 24:  | 0.0100 50V K (UA314100)  | 16. Base Post Connector<br>CN 1: VH-4P TE (LB932040) to MA-CN502<br>CN 2: PH-4P TE (VB390000) to LA-CN5<br>CN 3: PH-5P TE (VB390100) to MTA3-CN6   |
| 7. Ceramic Cap.<br>C 1~4, 16~19:   | E 0.0047 500V M (FH223470) U, C, V   |  |
| 8. Electrolytic Cap.<br>C 5, 6:<br>C 7~9:<br>C10, 11:<br>C14, 15:<br>C20:<br>C21:<br>C22, 23:<br>C25:  | 10000.0 35V (VM678700)<br>220.00 35.0V (UJ858220)<br>10.00 25.0V (UJ847100)<br>470.00 35.0V (UJ858470)<br>2200. 100V (VM681400)<br>470.00 100.0V (UJ798470)<br>10.00 50.0V (UJ867100)<br>100.00 100.0V (UJ798100)  |  |
| 9. Carbon Resistor<br>R 1~4, 16~18, 21,<br>22, 38:<br>R 5, 7:<br>R 6, 8, 12, 31:<br>R11, 33, 37:<br>R13:<br>R14:<br>R15:<br>R28:<br>R29:<br>R30:<br>R34:<br>R39:<br>R40:<br>R41: | 1.0K 1/4 J (HF756100)<br>2.7K 1/4 J (HF756270)<br>100.0K 1/4 J (HF758100)<br>10.0K 1/4 J (HF757100)<br>68.0K 1/4 J<br>33.0K 1/4 J (HF757330)<br>33.0 1/4 J<br>47.0K 1/4 J (HF757470)<br>4.3K 1/4 J<br>820.0 1/4 J (HF755820)<br>2.2K 1/4 J (HF756220)<br>56.0K 1/4 J (HF757560)<br>7.5K 1/4 J<br>4.7K 1/4 J (HF756470) |  |

## ■ INSPECTIONS

### 1. PREPARATIONS

- 1) Adjust the potentiometer VR1 on the PS circuit board so that the voltage between PIN 2 (+15V) and PIN 1 (GND) of connector CN1 on the PS circuit board is  $+15.1 \pm 0.1V$  when no signal is applied to the input.
- 2) Unless specified, the signal applied should be an 1k Hz - 70 dbS sine wave and the impedance of the signal source should be 150 ohms.

The load resistance of each output terminal should be as follows:

- PHONES (STEREO) ..... 8 ohms (Greater than 5W)
- CH. GROUP INSERT ..... 10k ohms
- Other output ..... 600 ohms

\* The signal level referred to in these specifications is 0 dbS = 0.775 V.

- 3) Unless specified, set the knobs as follows:

#### CH INPUT (CH1 TO 24, 32)

PHANTOM SWITCH:	OFF
PHASE SWITCH:	OFF
20 db PAD SWITCH:	OFF
GAIN CONTROL:	MAX. (-60db)
80Hz HPF SWITCH:	OFF
EQ CONTROL (LO, HI):	CENTER
EQ CONTROL (LO-MID, HI-MID):	CENTER
EQ CONTROL (LO-MID, HI-MID FREQ):	MIN.
AUX 1, 2 LEVEL CONTROLS:	MAX for measuring CH only, MIN for all others.
PAN CONTROL:	CENTER
9/L - 10/R LEVEL CONTROL:	MAX for measuring CH only, MIN for all others.
GROUP 1 TO 8 LEVEL CONTROLS:	MAX for measuring CH only, MIN for all others.
ON SWITCH:	Only measuring CH ON, all others OFF.
CUE SWITCH:	Only measuring CH ON, all others OFF.

#### MASTER

##### GROUP 1 TO 8, 9/L, 10/R

ON SWITCH:	ON during measurement only, OFF at all other times.
CUE SWITCH:	ON during measurement only, OFF at all other times.
FADER:	MAX.

##### AUX OUT 1, 2

AUX OUT LEVEL CONTROL:	MAX during measurement only, MIN at all other times
CUE SWITCH:	ON during measurement only, OFF at all other times.

##### RETURN 1 TO 4

RETURN LEVEL CONTROL:	MAX.
ASSIGN SWITCH (1 TO 8, 9/L, 10/R):	ON during measurement only, OFF at all other times.
CUE SWITCH:	ON during measurement only, OFF at all other times.

#### TALKBACK

ASSIGN SWITCH (1 TO 8, 9/L, 10/R, AUX1-2, TB OUT):	ON during measurement only, OFF at all other times.
TB LEVEL CONTROL:	MAX.
ON SWITCH:	ON during measurement only, OFF at all other times.

#### OTHERS

PHONES LEVEL CONTROL:	MAX.
CUE OUT LEVEL CONTROL:	MAX.
METER SELECT:	AUX1-2
SW532, 533 (internal switches on the MA circuit board):	Set the switches at the ▼ mark.

2. GAIN

2-1. INPUT MODULE

In status 1, the output levels should be within the range given in Tables 2.1 and 2.2.

Table 2.1 Input Terminal [INPUT CH1 TO 24, 32]

Input terminal	Condition			Measured output (unit [dbs])			
	Input level	Gain	PAD sw	G1 to 8	9/L, 10/R	AUX1, 2	CH INSERT OUT
☆ LO-Z	-70	MAX	OFF	+10 $\pm$ <sub>-2.5</sub> <sup>2.0</sup>	+10 $\pm$ <sub>-1.5</sub> <sup>3.0</sup>	+6 $\pm$ <sub>-2.5</sub> <sup>2.0</sup>	-10 $\pm$ <sub>-2.0</sub> <sup>2.5</sup>
* LO-Z	-26	MIN	OFF	+10 $\pm$ <sub>-2.5</sub> <sup>2.0</sup>	—	—	—
* LO-Z	-26	MIN	ON	-10 $\pm$ <sub>-2.5</sub> <sup>2.0</sup>	—	—	—
* HI-Z	-70	MAX	OFF	+10 $\pm$ <sub>-2.5</sub> <sup>2.0</sup>	—	—	—
* CH INSERT	-20	MIN	OFF	+0 $\pm$ <sub>-2.5</sub> <sup>1.5</sup>	—	—	—

- 1) When CUE SW of CH corresponding to each input CH in the condition shown by the ☆ mark are ON, the INPUT CUE LED of the master module should light up and the levels of both the L and R outputs at PHONES OUT should be -22.5 $\pm$ <sub>-2.0</sub><sup>2.5</sup> dbs. Confirm at least once that the output becomes less than -90 dbs when you minimize PHONES LEVEL control.
- 2) The difference in level between INPUT (CH1 to 24, 32) of each output should be less than 2 db.
- 3) Perform the following inspections at least once.  
When you minimize the GROUP 1 to 8, 9/L-10/R and AUX level controls 1 and 2, check that the output becomes less than -40 dbs. Also, check that the output becomes less than -60 dbs when the CUE SW of CH is pressed ON. You should also confirm that the output is less than -90 dbs when the ON SW of each output are switched ON.
- 4) Measure the input terminal marked \* at either one of the output terminals of GROUP OUT 1 to 8.

Table 2.2 Input Terminal [INPUT CH 1 TO 24, 32]

Input terminal	Condition	Measured output (units [dbs])	
	PAN	G9/L	G10/R
LO-Z	Rotate fully counterclockwise	+13 $\pm$ <sub>-1.5</sub> <sup>3.0</sup>	less than -40
LO-Z	Rotate fully clockwise	less than -40	+13 $\pm$ <sub>-1.5</sub> <sup>3.0</sup>

Next, apply the signal to INPUT CH1. In condition of the ☆ mark of Table 2.1, when each CUE SW of GROUP 1 to 8, and AUX 1, 2 are switched ON, you should check that the output levels of Table 2.3 at CUE OUT L/R are obtained. However, the INPUT CUE LED should not light up at this stage. Also, rotate the PAN control of CH module and confirm that the output levels of Table 2.4 are obtained at each output.

Table 2.3 Input Terminal INPUT CH1 Units [dbs]

CUE SW \ OUTPUT	GROUP1 TO 8 9/L, 10/R	AUX1,2
CUE OUT L/R	+6 $\pm$ 2	+6 $\pm$ 2

Table 2.4 Input Terminal INPUT CH1 Units [dbs]

CUE SW \ OUTPUT	Both G9/L and G10/R are ON	
	CH PAN	
	Rotate fully counterclockwise	Rotate fully clockwise
CUE OUT L	+9.0 $\pm$ <sub>-1.5</sub> <sup>3.0</sup>	less than -40
CUE OUT R	less than -40	+9.0 $\pm$ <sub>-1.5</sub> <sup>3.0</sup>
PHONES L	-13.5 $\pm$ <sub>-1.5</sub> <sup>3.0</sup>	less than -40
PHONES R	less than -40	-13.5 $\pm$ <sub>-1.5</sub> <sup>3.0</sup>

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Next, in the final status mentioned above, the CUE OUT L/R levels should change to  $0 \pm 2.5$  db when the INPUT CUE SW of CH1 is ON (Check INPUT CUE priority circuit). Also, the output should become less than  $-70$  db when the CUE OUT level control is minimized.

## 2-2. RETURN, TALKBACK

The output levels of Table 2.5 to Table 2.6 should be obtained in status 1.

Table 2.5 RETURN Units [dbs]

Input terminal	Input level	G1 to 8	G9/L, G10/R	CUE OUT L/R
RETURN 1 to 4	-6	$+10 \pm 2$	$+10 \pm 2$	$+6 \pm 2$

- 1) Switch on the RETURN CUE SW when measuring CUE OUT. The INPUT CUE LED should be lit up at this stage.
- 2) Confirm at least once that the output becomes less than  $-50$  db when you minimize RETURN level control. And also check that the output becomes less than  $-50$  db when you switch off the assign SW.
- 3) The difference in level between RETURN 1 to 4 of each output should be less than 2 db.
- 4) The difference in output levels between GROUP OUT 1 to 8 should be less than 2 db. Also, confirm the difference in output levels between GROUP OUT 9/L, 10/R, CUE OUT L, R should be less than 2 db.

Table 2.6 TALKBACK Units [dbs]

Input terminal	Input level	G1 TO 8	G9/L, G10/R	AUX1, 2	TB OUT
TB INPUT	-60	$+10 \pm 2$	$+10 \pm 2$	$+6 \pm 2$	$+0 \pm 2$

- 5) Make sure that the output becomes less than  $-50$  db when you switch off the TB ON SW or when you minimize the TB level control. Also confirm that the output level of the TB OUT becomes less than  $-80$  db when the TB OUT SW is turned OFF.
- 6) The difference in output levels between GROUP OUT 1 to 8 should be less than 2 db. Also, confirm the difference in output levels between GROUP OUT 9/L, 10/R, CUE OUT L, R should be less than 2 db.

## 2-3 MASTER INSERT

The output levels of Table 2.7 should be obtained in status 1.

Table 2.7 MASTER INSERT Units [dbs]

Input terminal	Input level	Output terminals corresponding to input	
		GROUP1 TO 8	G9/L, G10/R
GROUP1 TO 8	-10	$+4 \pm 2$	-
G9/L, G10/R	-10	-	$+4 \pm 2$

The difference in output levels between GROUP OUT 1 to 8 should be less than 2 db. Also, confirm the difference in output levels between GROUP OUT 9/L and 10/R should be less than 2 db.

## 2-4. SUB IN

The output levels of Table 2.8 should be obtained in status 1.

Table 2.8 SUB IN Units [dbs]

Input terminal	Input level	INSERT OUT corresponding to input		AUX OUT corresponding to input	CUE OUT L/R corresponding to input
		GROUP1 TO 8	G9, G10		
GROUP1 TO 8	+4	$0 \pm 2$	-	-	-
G9/L, G10/R	+4	-	$0 \pm 2$	-	-
AUX1, 2	+4	-	-	$+10 \pm 2$	-
CUE L/R	+4	-	-	-	$+10 \pm 2$

- 1) The difference in output levels between GROUP OUT 1 to 8 should be less than 2 db. Also, confirm the difference in output levels between GROUP OUT 9/L, 10/R, CUE OUT L, R should be less than 2 db.

### 3. FREQUENCY CHARACTERISTICS

If the applied signal frequencies are changed to 20 Hz, 20k Hz in status 1, the output level of each output terminal should be within  $0 \pm 0.5$  db with the level at 1k Hz used as reference.

### 4. EQ CHANGE CHARACTERISTICS

When the EQ controls of INPUT CH are operated in status 1, the output level of each frequency obtained in GROUP OUT 1 should fall within the range given in Table 4, with the output level when the control is set as a reference in the middle.

Table 4 EQ Change Characteristics

Units [dbs]

Knob	GAIN	FREQ CONTROL	Applied frequency	Change in amplitude
LO	MAX	—	100 Hz	+12 ± 2
	MIN			-12 ± 2
LO-MID	MAX	MIN	80 Hz	+15 ± 2
	MIN	MAX	1.6k Hz	-15 ± 2
HI-MID	MAX	MIN	400 Hz	+15 ± 2
	MIN	MAX	8k Hz	-15 ± 2
HI	MAX	—	10k Hz	+12 ± 2
	MIN			-12 ± 2

### 5. HPF CHANGE CHARACTERISTICS

In status 1, if the applied signal is 80 Hz and the HPF SW of INPUT CH is switched ON, the output level of GROUP OUT 1 should be within  $-3 \pm 2$  db, with the level when HPF is OFF as the reference.

### 6. SEPARATION

In status 1, set the GROUP1 level control at maximum, and the GROUP2 to 8, 9/L, 10/R and AUX1, 2 at minimum.

If the output level of GROUP OUT 1 is set at +20 dbs, the leakage level to each output of GROUP OUT 2 to 8, 9/L, 10/R and AUX1, 2 should be less than -50 dbs. Also, when the G9/L — G10/R level control is set at maximum and the PAN control is rotated fully counterclockwise and the output level of G9/L set at +20 dbs, the leakage level to G10/R should be less than -50 dbs. Also, if the PAN control is rotated fully clockwise and if the output level of G10/R is set at +20 dbs, the leakage level to G9/L should be less than -50dbs.

### 7. PEAK LED LIGHT-UP LEVEL (INPUT CH)

When the signal has been applied from LO-Z in each channel in status 1, and if the signal input level is -41 dbs, the PEAK LED should light up and go out at -45 dbs.

### 8. CUE SIGNAL LED LIGHT-UP LEVEL

Set the GAIN control of CH1 to MIN and switch on the CUE SW of CH1 in status 1. When the applied signal input level is -38 dbs, the CUE SIGNAL LED L/R should go out. At -34 dbs, the CUE SIGNAL LED L/R should light up.

**9. DISTORTION FACTOR**

Set each FADER and level control to the NOMINAL POSITION while applying signals from LO-Z IN to each CH in status 1. When a +14 db output is obtained at each output terminal of GROUP OUT 1 to 8, G9/L, G10/R, AUX OUT 1, 2, CUE OUT L/R and TB OUT, the distortion factor should be less than 0.1%.

Also, when an output of -18.5 db is obtained at PHONES OUT, the distortion factor should be less than 0.1%.

**10. MAXIMUM OUTPUT**

When a +24 db output is obtained at each output terminal of GROUP OUT 1 to 8, G9/L, G10/R in status 1, the distortion factor should be less than 1%.

Also, the distortion factor should be less than 1% when +20 db is obtained at each output terminal of AUX OUT 1, 2, CUE OUT L/R and TB OUT, the distortion factor should be less than 1%.

Also, when -5 db output is obtained at PHONES OUT, the distortion factor should be less than 1%.

**11. VU METER**

When the output levels of GROUP OUT 1 to 8, G9/L, G10/R, AUX OUT 1, 2 in status 1 are +4 db, the indication on the VU meter should be  $0 \pm 1$  VU. When the meter selector SW is changed over to CUE and when the output levels of CUE OUT L/R are +10 db, the VU meter indication of CUE L/R should be  $0 \pm 1$  VU.

Also, the built-in PEAK LED should light up when the output of GROUP OUT 1 to 8, G9/L, G10/R is  $+21 \pm 2$  db, and the output of AUX 1, 2 is  $+17 \pm 2$  db.

**12. NOISE LEVEL**

When the HOT, COLD of LO-Z IN of each CH is shorted with 150 ohms in status 1, the noise level at GROUP OUT 1 should be less than -44 db.

\* If the noise level is more than -44 db, find the noise level by input conversion. If this noise level is less than -128 db, then it is acceptable.

**13. RESIDUAL NOISE**

Set the GROUP OUT 1 to 8, G9/L, G10/R, AUX 1, 2 level controls of all CH at MIN in status 1. In this state, the noise level when MASTER FADER and MASTER level controls have been set at maximum or minimum should fall within the levels shown in Table 13.

Table 13 Residual Noise

Units [db]

FADER & CONTROLS	GROUP1 TO 8	G9/L,G10/R	AUX1,2	CUE L/R	TB OUT
MAX	-68	-65	-73	-	-
MIN	-97	-97	-99	-99	-95

**14. PHASE**

The signal phase applied to each input terminal and the signal phase obtained at each output terminal should be the same.

And check that the applied signal to each input terminal and the signal obtained at each output terminal should be in negative phase when the PHASE SW of each input is switched ON.

\* Pin polarity of balanced type input / output terminal

PIN 1: GND

PIN 2: HOT (+)

PIN 3: COLD (-)

**15. PHANTOM**

When the PHANTOM SW of the measuring INPUT module has been switched ON, the load resistance (10k ohms, 1W or greater) connected between the input connector pins 1 and 2 of each CH, and 2 and 3 are shorted, a voltage of  $+35 \pm 3V$  should be obtained at both ends of the load resistance.

**16. CUE CONTROL**

Confirm that the input CUE LED should light up when the CUE CONTROL terminal is shorted to ground.

**17. STABILITY**

**17-1 POWER SUPPLY VOLTAGE FLUCTUATION**

Even a fluctuation of  $\pm 10\%$  in the rated power supply voltage should pose no problems in the operations.

**18. MEASURING EQUIPMENT**

18-1 The output impedance of the oscillator should be less than 100 ohms.

18-2 The input impedance of the oscilloscope and the level meter should be more than 100k ohms.

18-3 Noise level should be measured using a 12.7k Hz, -6db/oct. low-pass filter.

18-4 We recommend that balanced input type measuring instruments are to be used. However, if usage of an unbalanced impedance input type measuring instrument is unavoidable, care should be taken because the maximum output level of the balance output terminal will drop.

## ■ 検査

### 1. 準備

○PSシートのコネクタCN1の②PIN(+15V)–①PIN(GND)間の電圧、および①PIN(GND)–③PIN(–15V)間の電圧が、 $+15.1 \pm 0.1V$ の範囲内に入るようにPSシートの半固定VR1を調整します。なお、入力は無信号状態とします。

○特に指定のない場合、加える信号は1kHz・–70dBsの正弦波とし、信号源インピーダンスは150Ωとします。また、各出力端子の負荷抵抗は下記の通りです。

PHONES(STEREO) ……………8Ω(5W以上)  
 CH、GROUP INSERT ……………10kΩ  
 その他出力 ……………600Ω

※調整・検査において取り扱う信号レベルは、0dBs=0.775Vです。

○特に指定のない場合、ツマミ類は以下のように設定します。

#### ・CH INPUT(1~24、32)

PHANTOM SWITCH ……………OFF  
 PHASE SWITCH ……………OFF  
 20dB PAD SWITCH ……………OFF  
 GAIN ……………MAX(–60dB)  
 80Hz HPF SWITCH ……………OFF  
 EQ(LO,HI) ……………CENTER  
 EQ(LO-MID,HI-MID) ……………CENTER  
 EQ(LO-MID,HI-MID FREQ) ……………MIN  
 AUX 1~2 LEVEL ……………測定CHのみMAX、他はMIN  
 PAN ……………CENTER  
 ST LEVEL ……………測定CHのみMAX、他はMIN  
 GROUP 1~8 LEVEL ……………測定CHのみMAX、他はMIN  
 ON SWITCH ……………測定CHのみON、他はOFF  
 CUE SWITCH ……………測定CHのみON、他はOFF

#### ・MASTER

##### GROUP(1~8、9/L、10/R)

ON SWITCH ……………測定時のみON、他はOFF  
 CUE SWITCH ……………測定時のみON、他はOFF  
 FADER ……………MAX

##### AUX OUT(1~2)

AUX OUT LEVEL ……………測定時のみMAX、他はMIN  
 CUE SWITCH ……………測定時のみON、他はOFF

##### RETURN(1~4)

RETURN LEVEL ……………MAX  
 ASSIGN SWITCH ……………測定時のみON、他はOFF  
 CUE SWITCH ……………測定時のみON、他はOFF

TALKBACK

- ASSIGN SWITCH.....測定時のみON、他はOFF
- TB LEVEL .....MAX
- ON SWITCH .....測定時のみON、他はOFF

PHONES

- LEVEL .....MAX

CUE OUT

- LEVEL .....MAX

・その他

- METER SELECT .....AUX 1・2
- MAシート内SW532、SW533 .....▼印

2. 利得

2-1. INPUT MODULE

1項の状態で、各出力端子に表2.1～表2.2の範囲内の出力レベルの信号が得られることを確認します。

表2.1 入力端子[INPUT CH1～24、32]

入力端子	条 件			被測定出力 (単位[dBs])			
	インレベル	GAIN	PAD-SW	G1～8	9/L,10R	AUX1～2	CH-INS-OUT
☆ LO-Z	-70	MAX	OFF	+10 ± 2.0	+10 ± 3.0	+6 ± 2.0	-10 ± 2.5
* LO-Z	-26	MIN	OFF	+10 ± 2.0	-	-	-
* LO-Z	-26	MIN	ON	-10 ± 2.0	-	-	-
* HI-Z	-70	MAX	OFF	+10 ± 2.0	-	-	-
* CH-INS	-20	MIN	OFF	+0 ± 1.5	-	-	-

- ☆印の条件で各入力CHに対応したCHのCUE SWをONしたときは、マスター部のINPUT CUE LEDが点灯し、PHONES OUTに出力されるレベルがL、R共に-22.5 ± 2.5dBsであることを確認します。  
また、PHONES LEVELを絞ったときの出力が-90dBs以下になることを、必ず一度は確認して下さい。
- 各出力のINPUT(CH1～24、32)間レベル差が、2dB以内であることを確認します。
- CHのGROUP1～8、ST、AUX1～2のVRを絞った場合の出力が-40dBs以下になり、またCH ON SWをOFFしたときの出力が-60dBs以下になり、そして各OUTのON SWをOFFしたときの出力が-90dBs以下になることを必ず1回は確認して下さい。
- \*印の付いた測定は、GROUP OUT 1～8いずれかの出力端子にて測定して下さい。

表2.2 入力端子[INPUT CH1～24、32]

入力端子	条 件	被測定出力 (単位[dBs])	
	PAN	G9/L	G10/R
LO-Z	左へ回しきり	+13 ± 3.0	-40以下
LO-Z	右へ回しきり	-40以下	+13 ± 3.0

次に、INPUT CH1に信号を入力し、表2.1の☆印の条件でGROUP OUT1~8、AUX 1~2のCUE SWをONしたとき、CUE OUT L・Rには表2.3の出力レベルの信号が得られることを確認します(ただし、このときINPUT CUE LEDは点灯しないこと)。また、GROUP OUT 9/L、10/RのCUEの場合は、CHモジュールのPAN VRを回したときに表2.4の出力レベルが得られることを確認します。

表2.3 入力端子INPUT CH1 単位[dBs]

出力端子	CUE SW	GROUP 1~8, 9/L, 10/R	AUX1~2
CUE OUT L・R		+6±2	+6±2

表2.4 入力端子INPUT CH1 単位[dBs]

出力端子	CUE SW	G9/L, 10/R 両方ON	
		CH PAN 左へ回し切り	CH PAN 右へ回し切り
CUE OUT L		+9± $\frac{3.0}{1.5}$	-40以下
CUE OUT R		-40以下	+9± $\frac{3.0}{1.5}$
PHONES L		-13.5± $\frac{3.0}{1.5}$	-40以下
PHONES R		-40以下	-13.5± $\frac{3.0}{1.5}$

次に、表2.4の出力が得られた状態で、さらにCH1のINPUT CUE SWをONしたときにCUE OUT L・Rのレベルが共に $0 \pm \frac{3.0}{1.5}$ dBsに変化することを確認します(INPUT CUE優先回路のチェック)。また、CUE OUT VRを絞ったときの出力が-70dBs以下になることを確認します。

## 2-2.RETURN、TALKBACK

1項の状態、表2.5~表2.6の出力レベルの信号が得られることを確認します。

表2.5 RETURN 単位[dBs]

入力端子	IN レベル	G1~8	G9/L, G10/R	CUE OUT L・R
RETURN 1~4	-6	+10±2	+10±2	+6±2

- CUE OUTを測定するときは、RETURN CUE SWをONにして下さい。また、このときにINPUT CUE LEDが点灯することを確認して下さい。
- RETURN VRを絞ったときの出力が-50dBs以下となり、アサインSWをOFFしたときの出力が-50dBs以下となることを必ず1回は確認して下さい。
- 各出力のRETURN 1~4間レベル差が、2dB以内であることを確認します。
- GROUP OUT 1~8の出力レベル差が2dB以内、またGROUP OUT 9/L~10/R間、CUE OUT L~R間の出力レベル差が2dB以内であることを確認します。

表2.6 TALKBACK

単位[dBs]

入力端子	IN レベル	G1~8	G9/L,G10/R	AUX 1,2	TB OUT
TB IN	-60	+10±2	+10±2	+6±2	+0±2

- TALKBACK SWをOFFしたとき、またはTB LEVELを絞ったときの出力レベルが-50dBs以下であることを確認します。また、TB OUT SWをOFFしたときのTB OUT出力レベルが-80dBs以下であることを確認します。
- GROUP OUT 1~8間の出力レベルの差が2dB以内、またGROUP OUT 9/L~10/R間、CUE OUT L~R間の出力レベル差が2dB以内であることを確認します。

2-3. MASTER INSERT

1項の状態、表2.7の出力レベルの信号が得られることを確認します。

表2.7 MASTER INSERT

単位[dBs]

入力端子	INレベル	入力に対応する各出力端子	
		GROUP 1~8	G9/R, G10/R
GROUP 1~8	-10	+4±2	-
G/9, G10/R	-10	-	+4±2

- GROUP OUT 1~8間の出力レベルの差が2dB以内、またGROUP OUT 9/L~10/R間の出力レベル差が2dB以内であることを確認します。

2-4. SUB IN

1項の条件で、表2.8の各出力レベルの信号が得られることを確認します。

表2.8 各SUB IN

単位[dBs]

入力端子	INレベル	入力に対応するINS-OUT		入力に対応する AUX OUT	入力に対応する CUE OUT L・R
		GROUP 1~8	G9/L,G10/R		
GROUP 1~8	+4	0±2	-	-	-
G9/L,G10/R	+4	-	0±2	-	-
AUX 1~2	+4	-	-	+10±2	-
CUE L・R	+4	-	-	-	-10±2

- GROUP OUT 1~8間の出力レベルの差が2dB以内、またGROUP OUT 9/L~10/R間、AUX OUT 1~2間、CUE OUT L~R間の出力レベル差が2dB以内であることを確認します。

3. 周波数特性

1項の状態に加える信号の周波数を20Hz、20kHzとしたとき、各出力端子で得られる信号の出力レベルが、1kHzを基準として0±2dBの範囲内にあることを確認します。

4. EQ変化特性

1項の状態でINPUT CHの各EQ GAINをそれぞれ動かしたとき、GROUP OUT 1に得られる各周波数における出力レベルが、VRがCENTERのときの出力レベルを基準として表4の範囲内にあることを確認します。



表4 EQ変化特性

単位[dBs]

ツマミ	GAIN	f VR	印可周波数	変化幅
LO	MAX / MIN	—	100Hz	+12±2 / -12±2
LO-MID	MAX / MIN	MIN	80Hz	+15±2
		MAX	1.6kHz	-15±2
HI-MID	MAX / MIN	MIN	400Hz	+15±2
		MAX	8kHz	-15±2
HI	MAX / MIN	—	10kHz	+12±2 / -12±2

### 5. HPF変化特性

1項の状態に加える信号の周波数を80Hzとし、INPUT CHのHPF SWをONにしたときのGROUP OUT 1の出力レベルが、HPFがOFFのときのレベルを基準として $-3\pm 2$ dBの範囲内であることを確認します。

### 6. セパレーション

1項の状態で測定CHのGROUP 1のVRをMAXにし、GROUP 2~8、ST LEVEL、AUX 1~2のVRをMINにします。そして、GROUP OUT 1の出力レベルを+20dBsとしたときのGROUP OUT 2~8、9/L、10/Rへの漏れレベルが-50dBs以下であることを確認します。また、AUX 1~2への漏れレベルが-50dBs以下であることを確認します。そして、ST LEVELのVRをMAXとしてPAN VRを左方向に回し切り、GROUP OUT 9/Lの出力レベルを+20dBsとしたときのGROUP OUT 10/Rへの漏れレベルが-50dBs以下であることを確認します。なお、PAN VRを右方向に回し切り、GROUP OUT 10/Rの出力レベルを+20dBsとしたときのGROUP OUT 9/Lへの漏れレベルが-50dBs以下であることも確認します。

### 7. PEAK LED 点灯レベル (INPUT CH)

1項の状態で各CHにLO-Z INより信号を加えます。そして、信号入力レベルが-41dBsのときPEAK LEDが点灯し、-45dBsのとき消灯することを確認します。

### 8. CUE SIGNAL LED 点灯レベル

1項の状態でCH1のGAINをMINにし、CH1のCUE SWをONにします。加える信号のレベルが-38dBsのときCUE SIGNAL LED L・Rは消灯し、-34dBsのときにCUE SIGNAL LED L・Rが点灯することを確認します。

### 9. 歪率

1項の状態で各FADER、VRをNOMINAL POSITIONとし、各CHにLO-Z INより信号を加えます。このときにGROUP OUT 1~8、9/L、10/R、AUX OUT 1~2、CUE OUT L・R、TB OUTの各出力端子に+14dBsの出力が得られたときの歪率が、0.1%以下であることを確認します。

また、PHONES OUTに-18.5dBsの出力が得られたときの歪率が、0.1%以下であることを確認します。

### 10. 最大出力

1項の状態、GROUP OUT 1~8、9/L、10/Rの各出力端子に+24dBsの出力が得られたときの歪率が、1%以下であることを確認します。また、AUX OUT 1~2、CUE OUT L・R、TB OUTの各出力に+20dBsが得られたときの歪率が1%以下であることを確認します。

そして、PHONES OUTに-5dBsの出力が得られたときの歪率が、1%以下であることも確認します。

### 11. VUメーター

1項の状態、GROUP1~8、9/L、10/R、AUX OUT 1~2の各出力レベルが+4dBsのとき、VUメーターの指示が $0 \pm 1$ VUであることを確認します。メーターセレクトSWをCUEに切り替え、CUE OUT L・Rの各出力レベルを+10dBsとしたとき、CUE L・RのVUメーターの指示が $0 \pm 1$ VUであることを確認します。また内蔵のPEAK LEDが点灯するのは、GROUP OUT 1~8、9/L、10/Rの各出力が $+21 \pm 2$ dBs、AUX 1~2の出力が $+17 \pm 2$ dBsの範囲内にあることを確認します。

### 12. ノイズレベル

1項の状態、各CHのLO-Z INのHOT、COLD間を $150 \Omega$ の抵抗で短絡したとき、GROUP OUT 1で得られるノイズレベルが、 $-44$ dBs以下であることを確認します。

\*ノイズレベルが $-44$ dBs以上の場合は、入力換算でのノイズレベルを求めて、それが $-128$ dBs以下であれば可とします。

### 13. 残留ノイズ

1項の状態、全てのCHのGROUP VR、AUX VR、ST LEVELをMINにします。このときMASTER FADER、MASTER VRを最大または最小にしたときのノイズレベルが、表13のレベル以下であることを確認します。

表13 残留ノイズ

単位[dBs]

FADER&VR	GROUP 1~8	G/L,G10/R	AUX1~2	CUE L・R	TB OUT
MAX	-68	-65	-73	-	-
MIN	-97	-97	-99	-99	-95

### 14. 位相

各入力端子に加えた信号と各出力端子で得られる信号が同相であることを確認します。またINPUT CHのPHASE SWをONすると、各入力端子に加えた信号と各出力端子で得られる信号が逆相になることを確認します。

\*バランス型入出力端子のピン極性

PIN1 - GND

PIN2 - HOT (+)

PIN3 - COLD (-)

### 15. PHANTOM

測定するINPUTモジュールのPHANTOM SWをONとし、各CHの入力コネクタピン①-②間に負荷抵抗( $10k\Omega$ 、1W以上)を接続し、②-③間を短絡します。このとき、負荷抵抗の両端に $+35 \pm 3$ Vの電圧が得られることを確認します。

### 16. CUE CONTROL

CUE CONTROL端子をGNDに接続したとき、INPUT CUE LEDが点灯することを確認します。

## 17. 安定度

### 17-1. 電源電圧変動

電源電圧を規定の±10%変化させても、動作に異常のないことを確認します。

## 18. 測定器

- ・発振器は、出力インピーダンスは100Ω以下のものを使用して下さい。
- ・オシロスコープ、レベル計などは、入力インピーダンスが100kΩ以上のものを使用して下さい。
- ・ノイズレベルを測定するときには、12.7kHz、-6dB/oct L.P.Fを使用して下さい。
- ・測定器は、バランス入力型を用いることが望ましいのですが、やむをえずアンバランス入力型の測定器を使用する場合は、バランス出力端子の最大出力レベルが低下するので注意して下さい。

**■ CIRCUIT DIAGRAM (回路図)**

**■ BLOCK & LEVEL DIAGRAM**

**■ HA, INC CIRCUIT DIAGRAM**

**■ IN CIRCUIT DIAGRAM**

**■ MA1/3-1/3 CIRCUIT DIAGRAM**

**■ MA1/3-2/3, MA3/3 CIRCUIT DIAGRAM**

**■ MA1/3-3/3, MA2/3 CIRCUIT DIAGRAM**

**■ LA, OUTC CIRCUIT DIAGRAM**

**■ JK CIRCUIT DIAGRAM**

**■ MTA2 CIRCUIT DIAGRAM**

**■ MTA3 CIRCUIT DIAGRAM**

**■ POWER SUPPLY CIRCUIT DIAGRAM**

**■ GROUND DIAGRAM**

Notes)

Circuit Board: HA (VN721500) XL000A0

1. IC  
IC 1, 7: NJM2068D-D (XA987A00) OP AMP
2. Transistor  
Q\*01, \*02: 2SA970 GR, BL (IA097030)
3. Diode Array  
DA\*01: DAN215 TL2 0.1A (VM977000)  
DA\*02: DAP215 TL2 0.1A (VM976900)
4. Ceramic Cap.  
C\*03, \*04: B 470P 50V K (FG612470)  
C\*05, \*06: B 220P 50V K (FG612220)  
C\*08: B 330P 50V K (FG612330)  
C\*09, \*10, \*11: SL 100P 50V J (FG652100)  
C\*12: F 0.0100 50V Z (FG644100)
5. Electrolytic Cap.  
C 1: 47.00 100.0V (UJ797470)  
C\*01, \*02: 10.00 63.0 (UL477100)  
C\*07: 470.00 6.3V (UJ818470)  
C\*13: 22.00 25.0V (UJ847220)
6. Flame Proof C. Resistor  
R 4: 390.0 1/4 J (HV355390)
7. Metal Film Resistor  
R\*01, \*03: 4.7K 1/4 F (VA074100)  
R\*02: 1.1K 1/4 F (VB065600)  
R\*04: 100.0K 1/4 F (VB069600)  
R\*07, \*08: 47.0K 1/4 F (VB068800)  
R\*09, \*10: 8.2K 1/4 F (VB067400)  
R\*11, \*12: 2.2K 1/4 F (VB066300)  
R\*13: 13.0 1/4 F (VB060400)  
R\*16, \*17: 27.0K 1/4 F (VB068300)
8. Variable Resistor  
VR\*01: W20K (VL818700) GAIN
9. Push Switch  
SW 1: SPEC12 NON-SHORT BE (VL891900) PHANTOM  
SW\*01, \*02: SPEC12 SHORT WH (VM967100) φ. PAD
10. Base Post Connector  
CN 6: PH-4P TE (VB390000) to INC(CH1)-CN1  
CN 7: PH-5P TE (VB390100) to IN-CN1  
CN 8: PH-8P TE (VB390400) to INC(CH2)-CN1, INC(CH3)-CN1  
CN 9: PH-4P TE (VB390000) to IN-CN1  
CN10: PH-4P TE (VB390000) to INC(CH1)-CN1  
CN11: PH-4P TE (VB390000) to IN-CN5

Notes)

Circuit Board: INC (VM676500) XK041B0

1. Carbon Resistor  
R 3: 560.0 1/4 J (HF755560)
2. Metal Film Resistor  
R 1, 2: 6.8K 1/4 F (VB067300)
3. Phone Jack  
JK 2, 3: HLJ2305 STEREO (LB202700) INPUT H, INS I/O
4. XLM Connector  
JK 1: XLM-3-31PCH-L (VM651800) INPUT LO-Z
5. Base Post Connector  
CN 1: PH-7P SE (VB858600) CH1: to HA-CN3  
CH2: to HA-CN8  
CH3: to HA-CN8  
CH4: to HA-CN10
6. Jumper Wire  
J 6: 0.55 (VA078900)

Notes)

Circuit Board: IN (VN721300) XK000C0

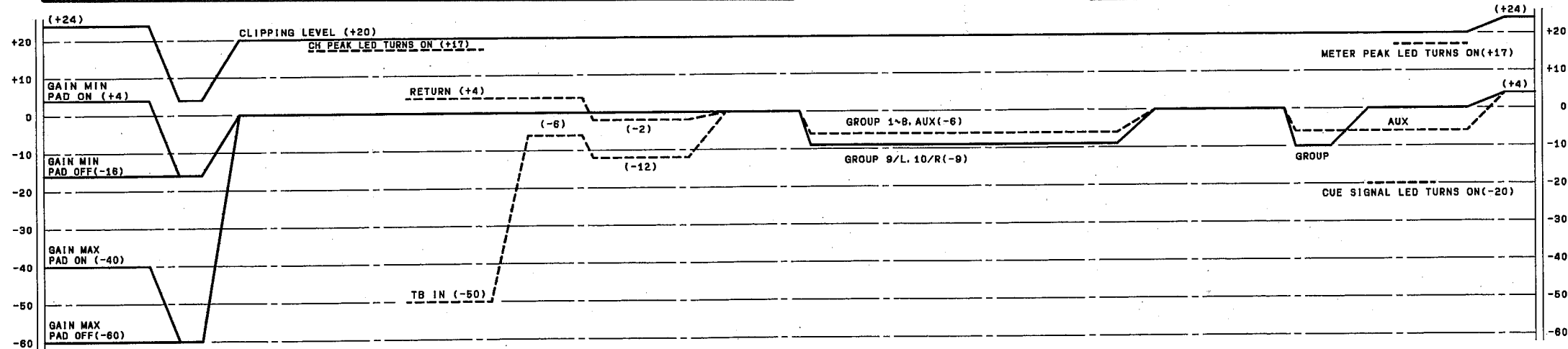
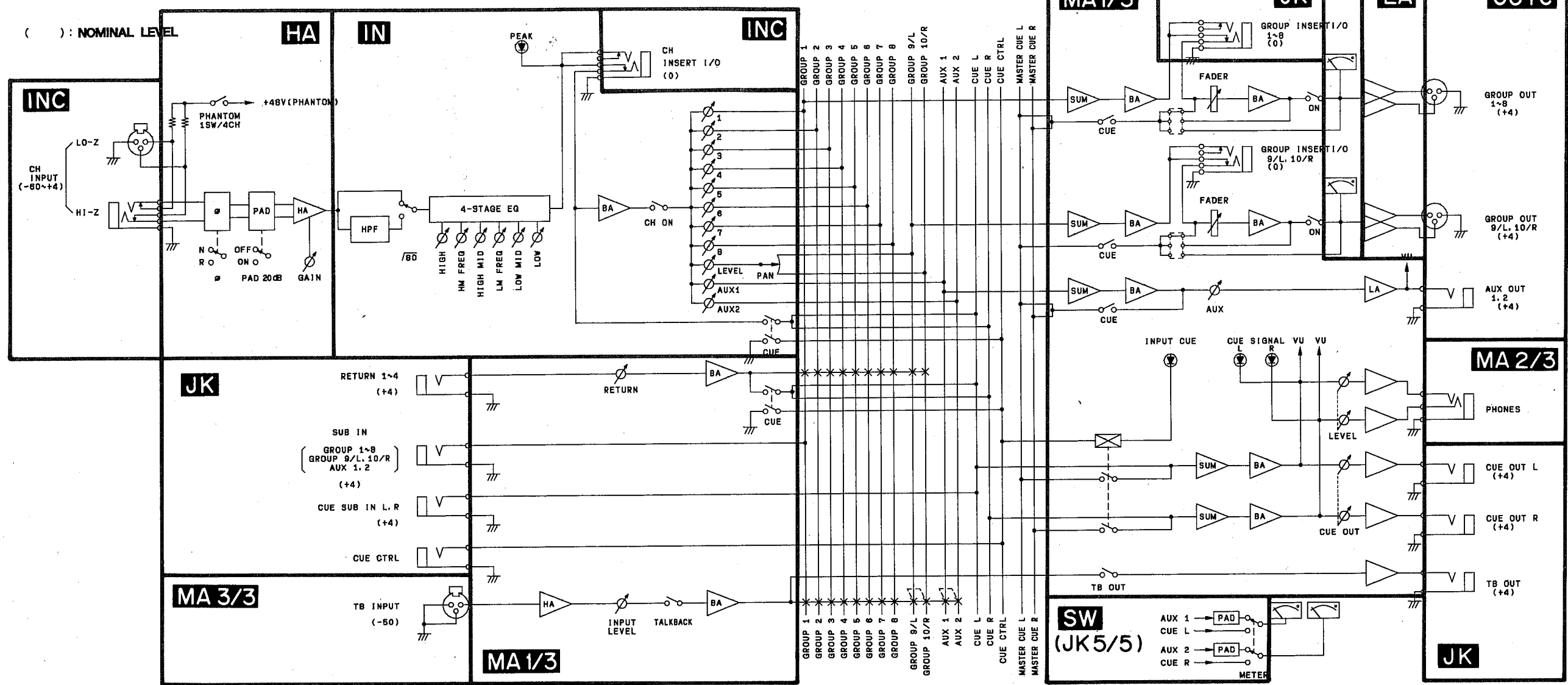
1. IC  
IC 2-5, 8-11: NJM4556DD (XE803A00) OP AMP  
IC 6, 12: BA4558-NK (XF128A00) OP AMP
2. Transistor  
Q\*03: 2SA1015 O, Y (IA101590)  
Q\*04: 2SC1815 Y, GR (IC1815M0)
3. LED  
LED\*01: GL2PR6 RE (VH325200) PEAK
4. Mylar Cap.  
C\*14, 15: 0.0910 50V J (UA354910)  
C\*22, \*23: 0.0330 50V J (UA354330)  
C\*24: 1200P 50V J (UA353120)  
C\*28: 2400P 50V J (UA353240)  
C\*29: 6200P 50V J (UA353620)  
C\*32: 0.0120 50V J (UA354120)  
C\*33: 0.0300 50V J (UA354300)
5. Ceramic Cap.  
C 4, \*17, \*19, \*27, \*31, \*35, \*43: F 0.0100 50V Z (FG644100)  
C\*16, \*25, \*40-42, \*45, \*46: SL 100P 50V J (FG652100)  
C\*26: SL 47P 50V J (FG651470)  
C\*30, \*34: SL 22P 50V J (FG651220)
6. Electrolytic Cap.  
C 2, 3, \*44: 100.00 25.0V (UJ848100)  
C\*18, \*20, \*39: 22.00 25.0V (UJ847220)  
C\*21, \*37, \*38: 1.00 50.0V (UJ866100)  
C\*36: 47.00 25.0V (UJ847470)
7. Resistor Array  
RA 1, 2: RGLD04X183J (VM946100)
8. Variable Resistor  
VR\*02, \*03: B50K (VP032200) HIGH, LOW  
VR\*04, \*06: C100K x 2 (VL818900) LM FREQ, HM FREQ  
VR\*05, \*07: W20K (CLICK) (VP032300) H MID, LOW MID  
VR\*08: K20K (VP034600) 9-10 LEVEL  
VR\*09-18: A20K (VL819100) GROUP1-8, AUX1, 2  
VR\*19: AC20Kx2 (CLICK) (VP032400) 9-10 PAN
9. Push Switch  
SW\*02-04: SPEC12 (VL891900) 80, CH ON, CUE
10. Base Post Connector  
CN 1: PH-9P TE (VB390500) to HA-CN9, CN7  
CN 2: PH-5P TE (VB390100) to INC(CH1)-CN1, INC(CH2)-CN1  
CN 3: PH-4P TE (VB390000) to INC(CH4)-CN1, INC(CH3)-CN1  
CN 5: PH-4P TE (VB390000) to HA-CN11
11. Straight Header  
CN 4: HIF3FC30PA-2.54DSA to MA-CN501(Bus connector)

Notes)

Circuit Board: MA (VN721400) XL001D0

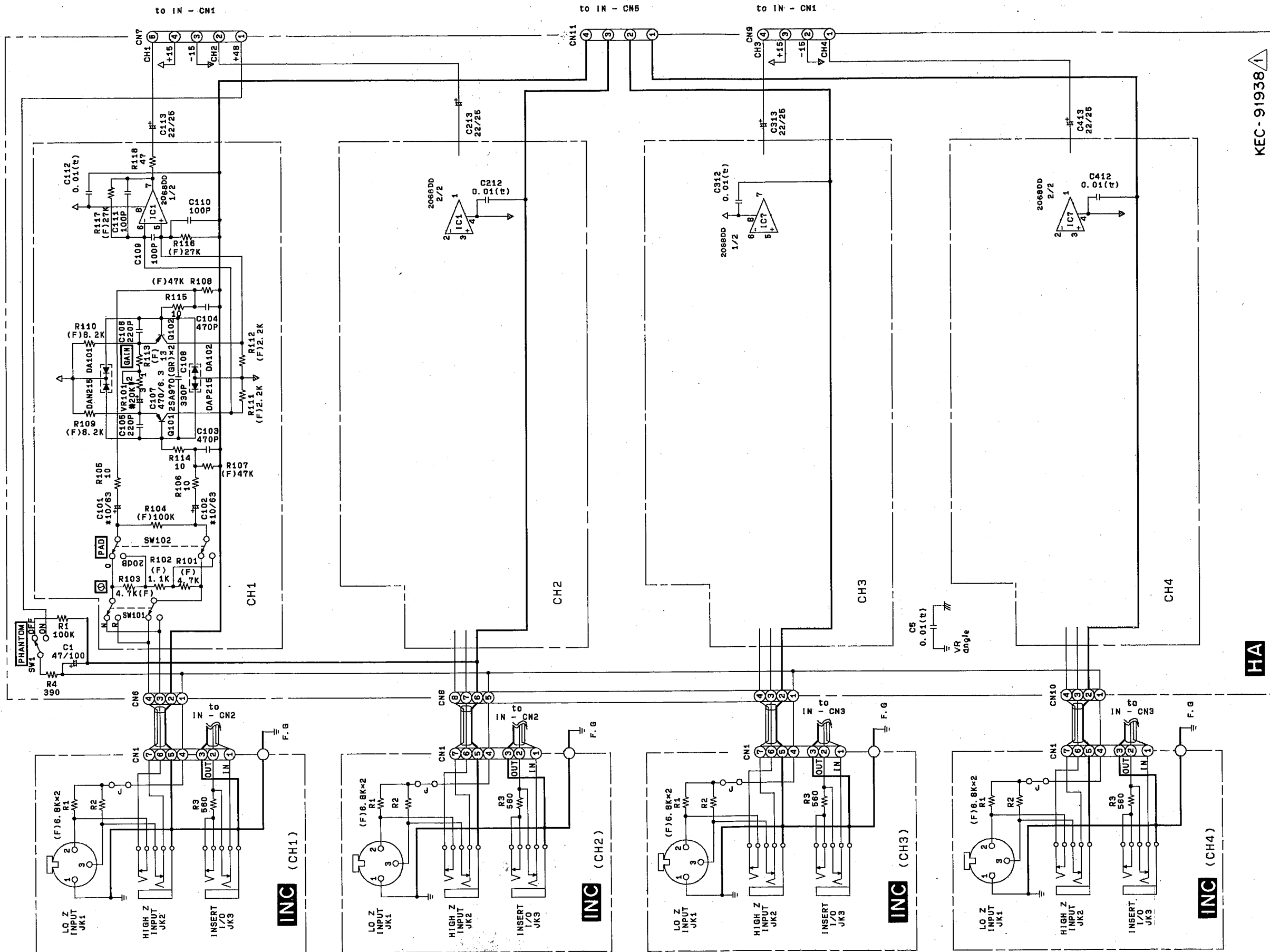
1. IC  
IC501, 502, 505, 508, 514, 517, 524: UPC4570HA (XB247A00) OP AMP  
IC503, 504, 506, 507, 509, 510, 512, 513, 515, 518-521, 525, 527: NJM4558S (IG076800) OP AMP  
IC516, 523, 526, 528: NJM4556DD (XE803A00) OP AMP  
IC522: NJM2041D-D (IG069200) OP AMP
2. Transistor  
Q501, 502, 504: 2SA1015 O, Y (IA101590)  
Q503, 505: 2SC1815 Y, GR (IC1815M0)
3. Zener Diode  
ZD501, 502, 503: MTZ10B 10V (VA095900)  
D501: MTZ10B 10V (VA095900)
4. LED  
LED501, 502: GL2EG6 GR (VH325300) CUE SIGNAL L, R  
LED503: GL2HY6 YE (VJ471200) INPUT CUE

■ BLOCK & LEVEL DIAGRAM



# HA, INC CIRCUIT DIAGRAM

MC2410M/MC3210M



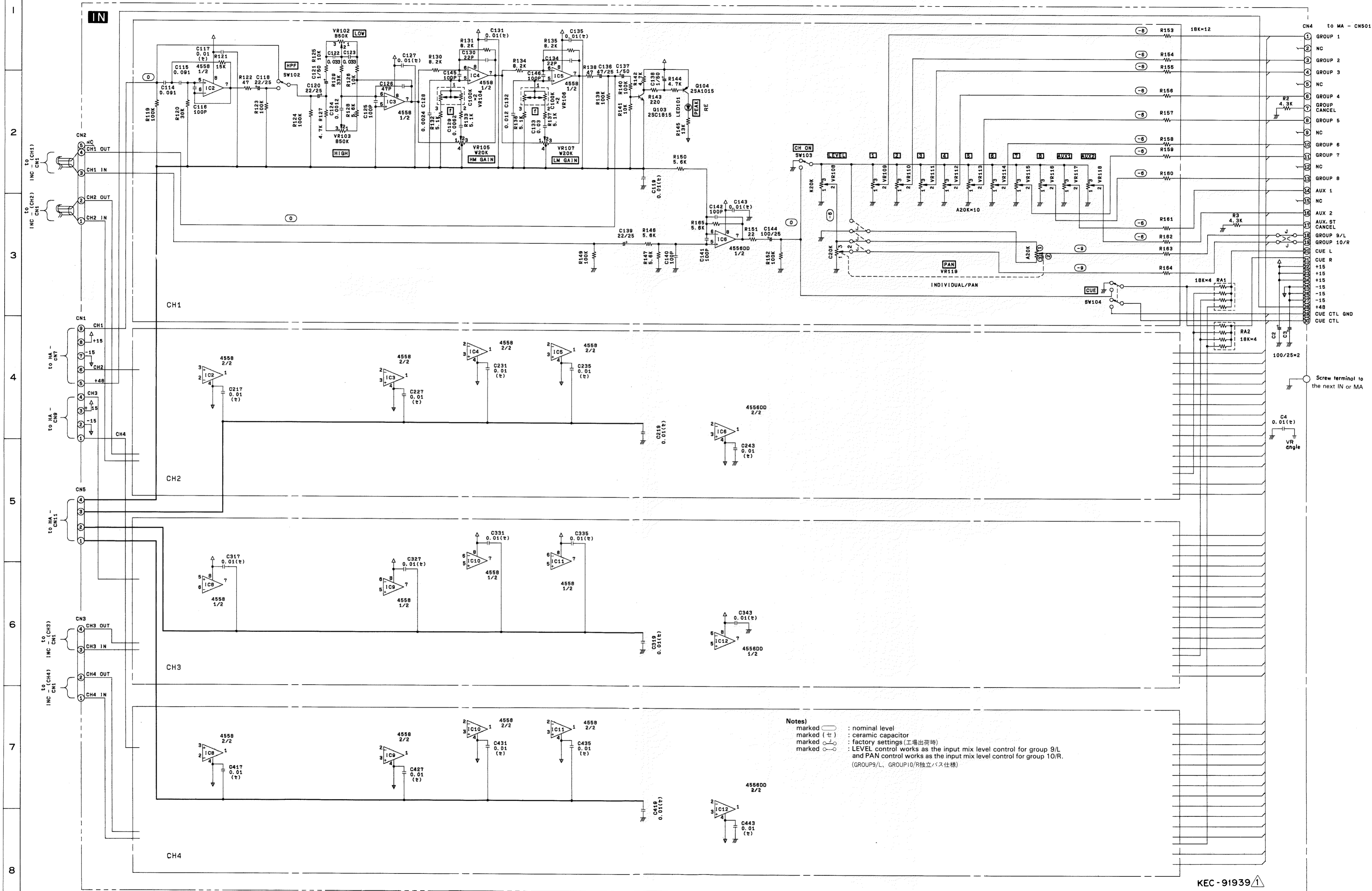
KEC-91938/1

HA

- Notes
- \* : low noise electrolytic capacitor
  - marked (±) : ceramic capacitor
  - marked (F) : metal film resistor
  - marked R4 : flame proof carbon resistor

# HA, INC CIRCUIT DIAGRAM

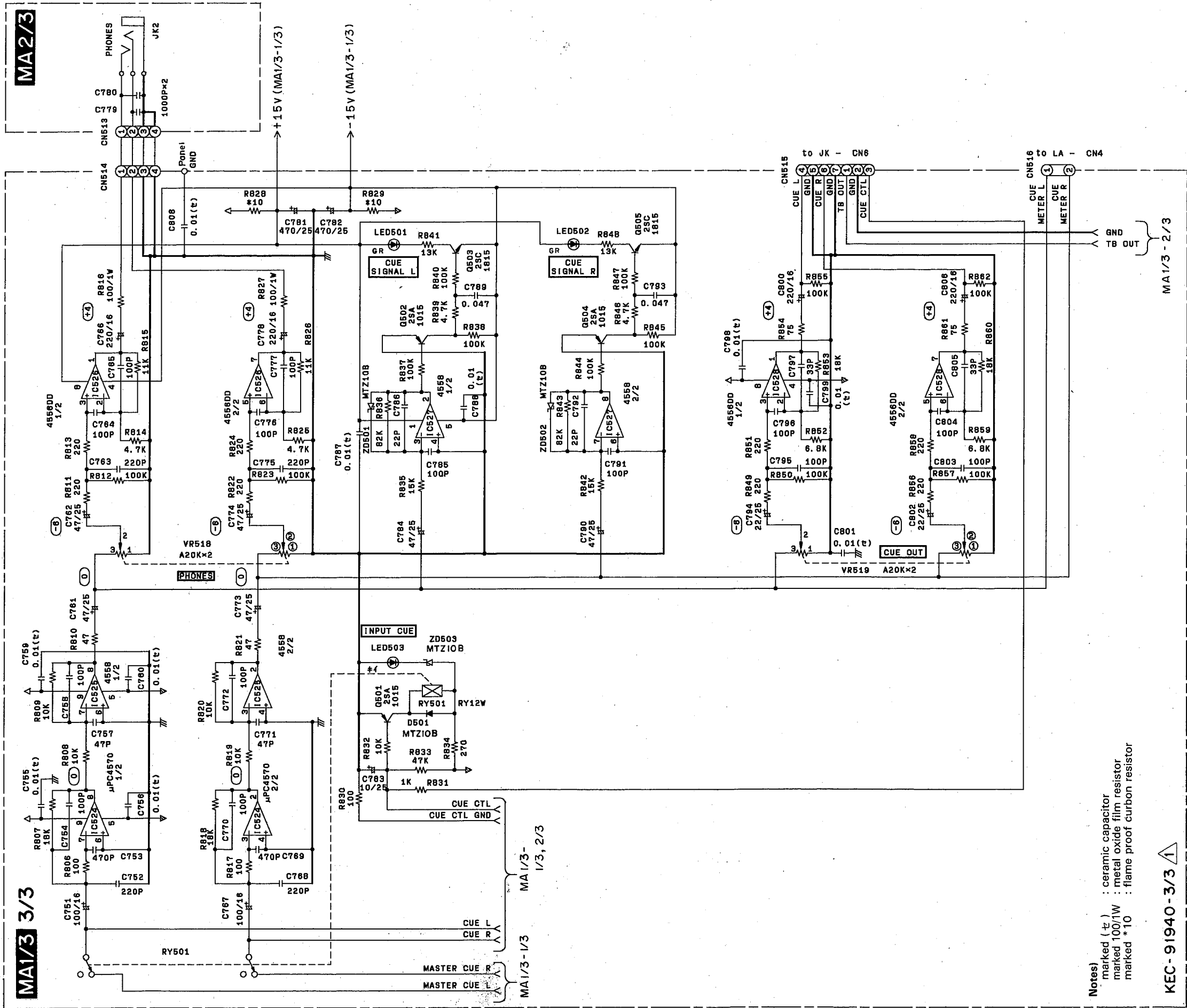
MC2410M/MC3210M



Notes

- marked : nominal level
- marked (セ) : ceramic capacitor
- marked : factory settings (工場出荷時)
- marked : LEVEL control works as the input mix level control for group 9/L and PAN control works as the input mix level control for group 10/R. (GROUP9/L、GROUP10/R独立バス仕様)

# MA1/3-3/3, MA2/3 CIRCUIT DIAGRAM

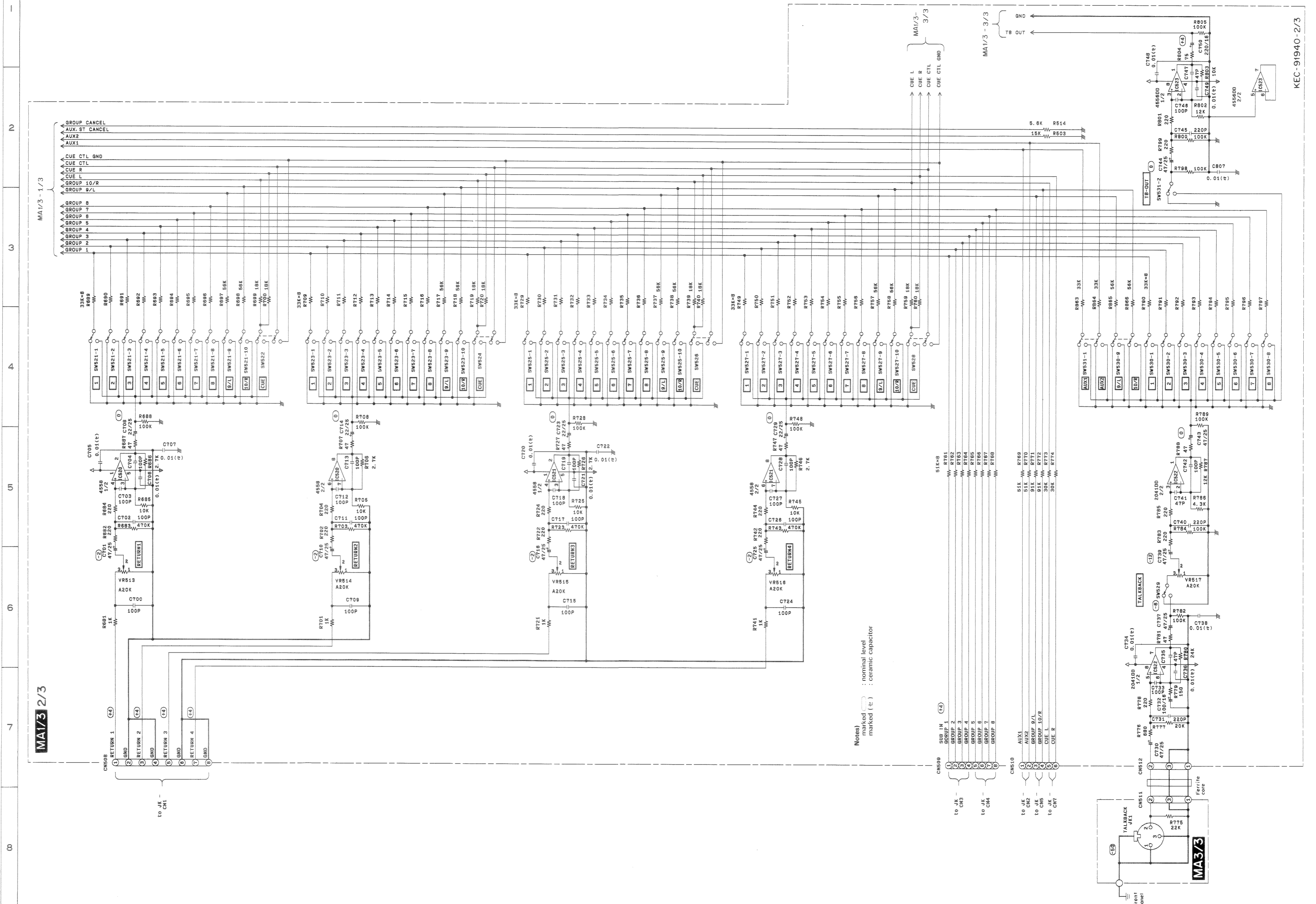


Notes)  
 marked (-t) : ceramic capacitor  
 marked 100/1W : metal oxide film resistor  
 marked \*10 : flame proof carbon resistor

KEC-91940-3/3 1

## MA1/3-3/3, MA2/3 CIRCUIT DIAGRAM



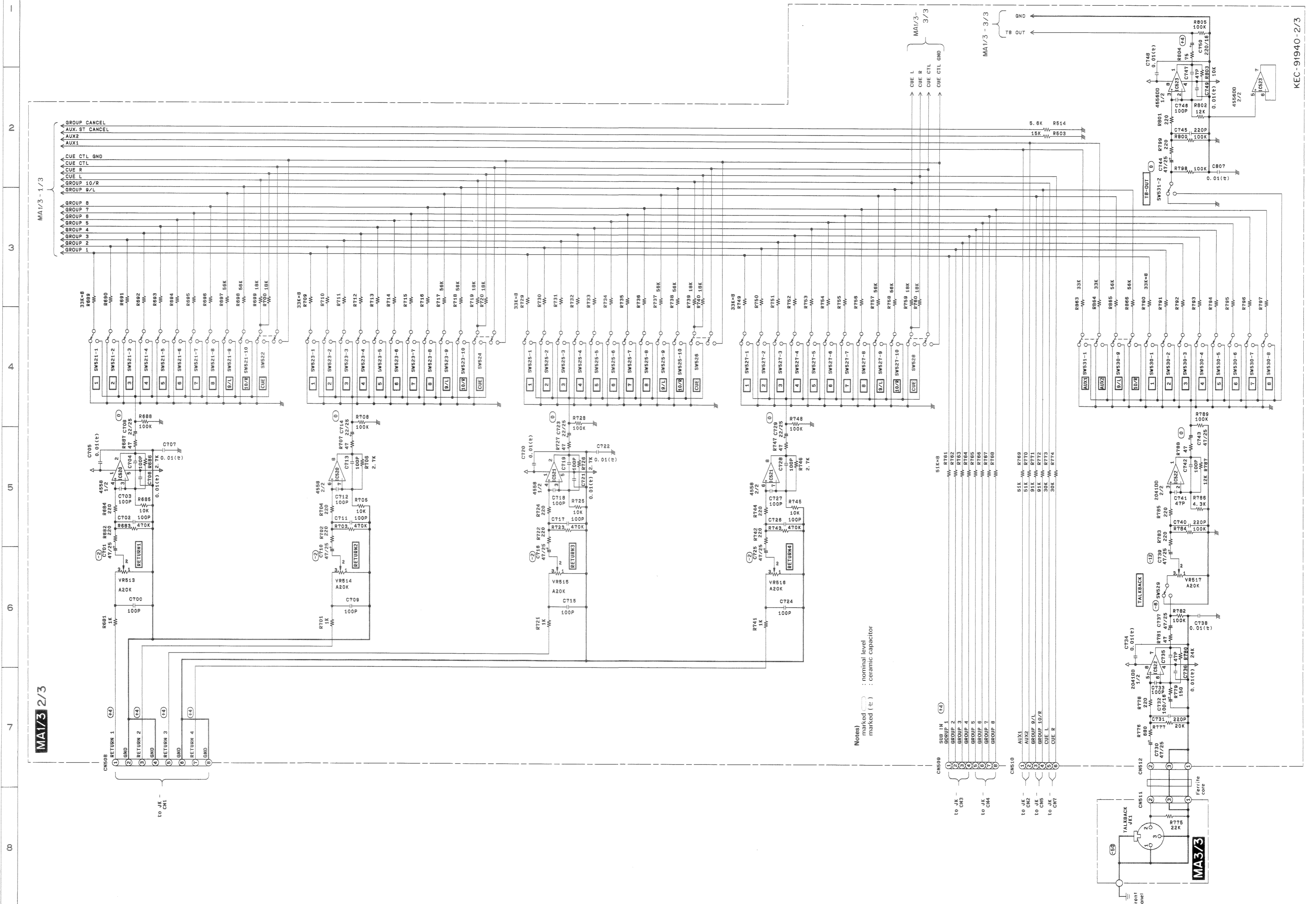


Notes)  
 marked (t) : nominal level  
 marked (t) : ceramic capacitor

MA1/3 2/3

MA3/3

KEC-91940-2/3



Notes)  
 marked (t) : nominal level  
 marked (t) : ceramic capacitor

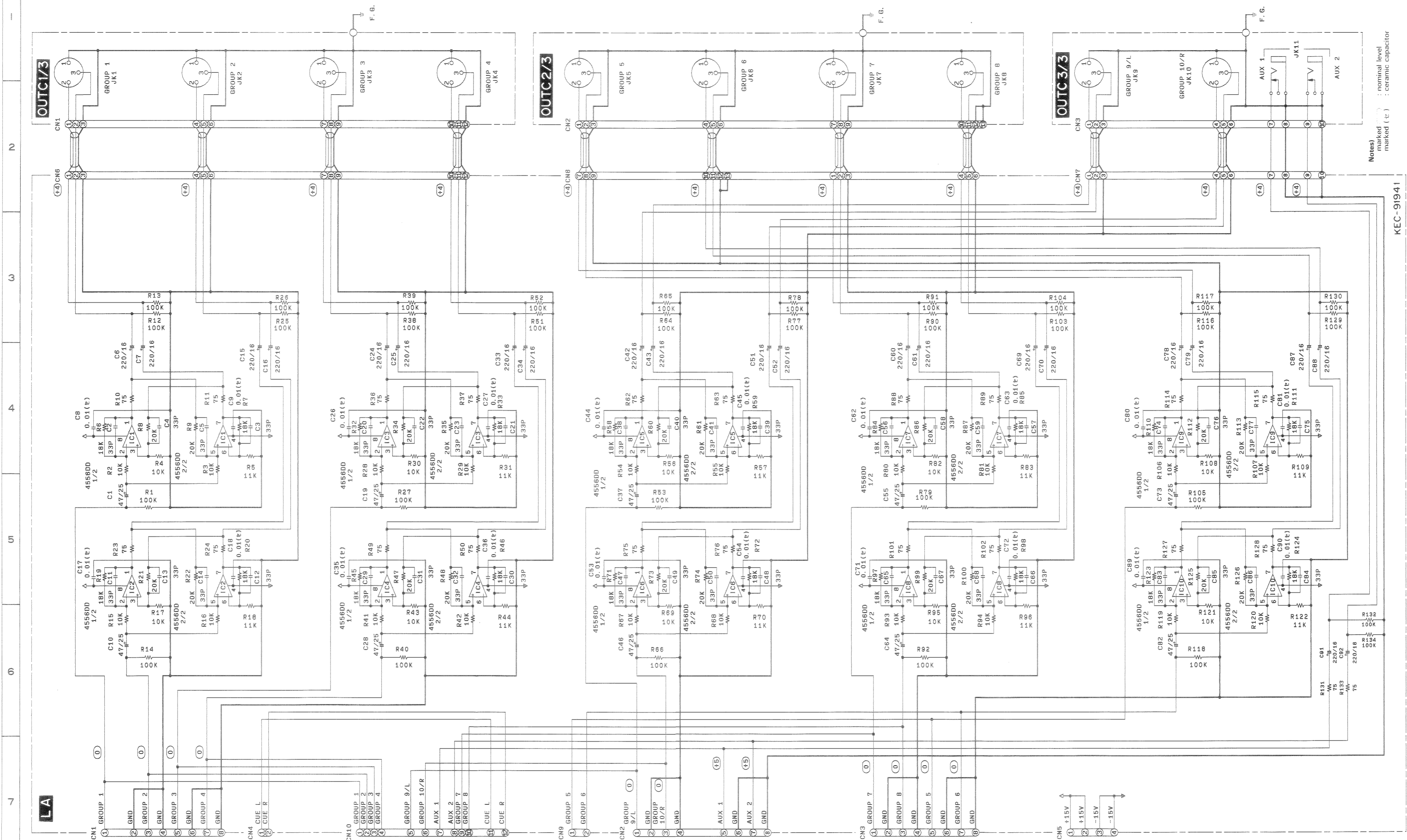
MA1/3 2/3

MA3/3

KEC-91940-2/3

LA, OUTC CIRCUIT DIAGRAM

MC2410M/MC3210M

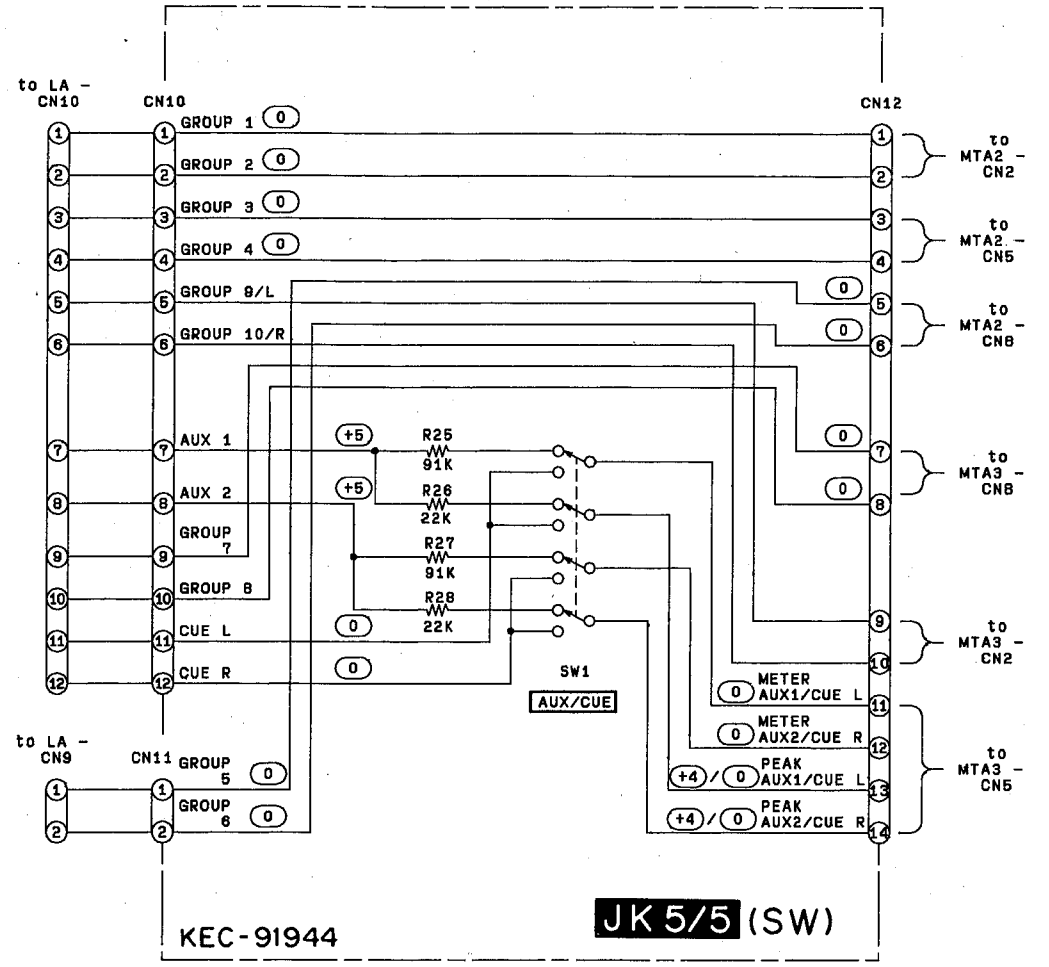
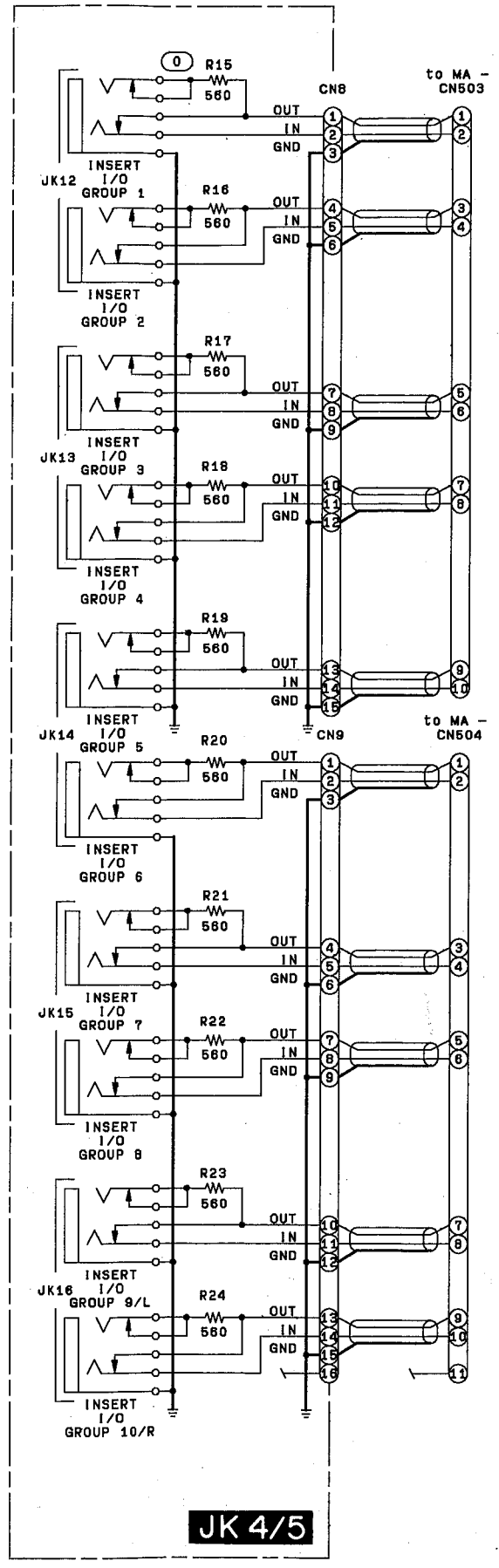
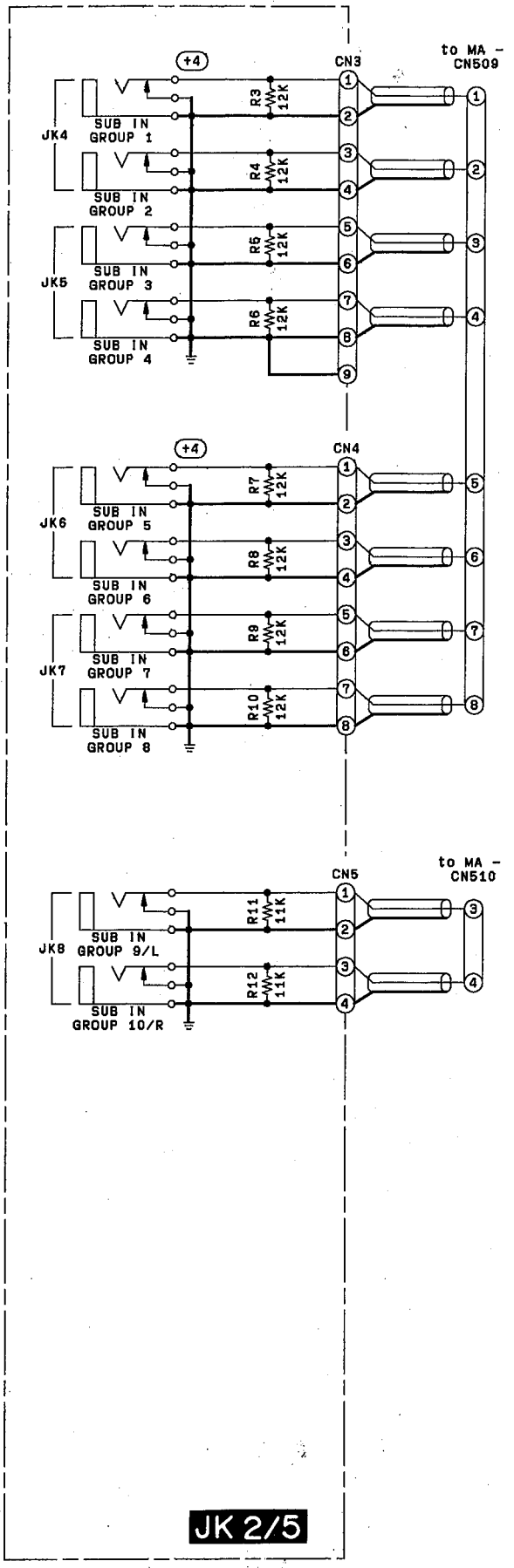
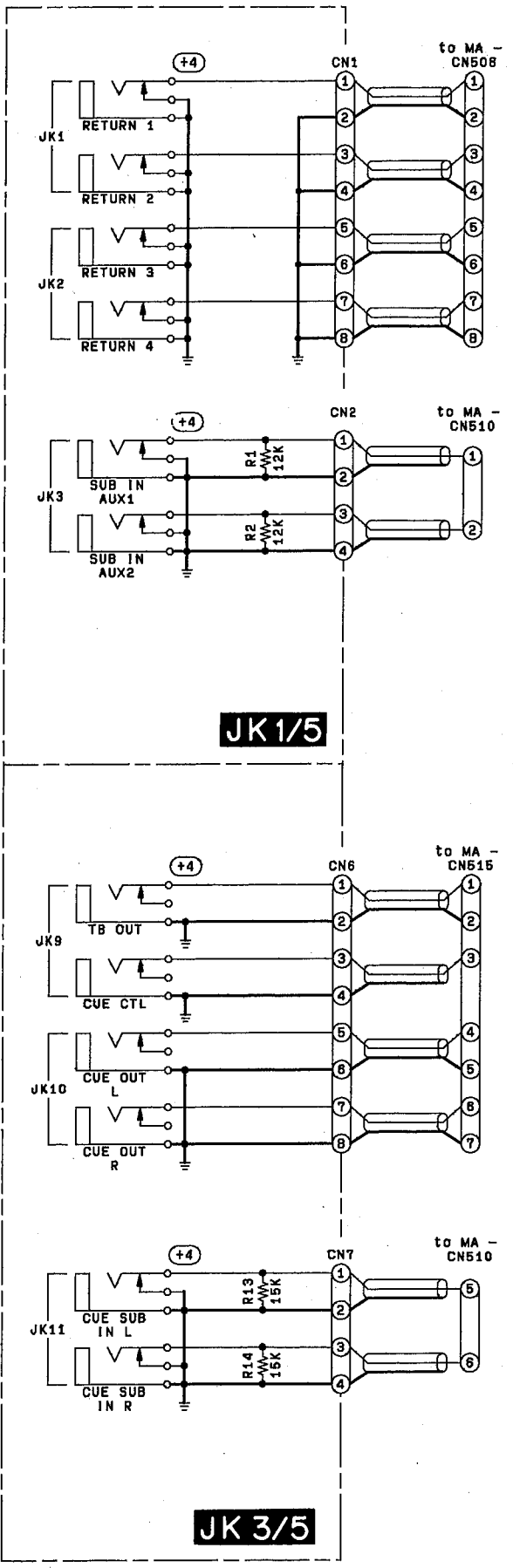


Notes:  
 marked ( ) : nominal level  
 marked (t) : ceramic capacitor

KEC-91941

# JK CIRCUIT DIAGRAM

1  
2  
3  
4  
5  
6

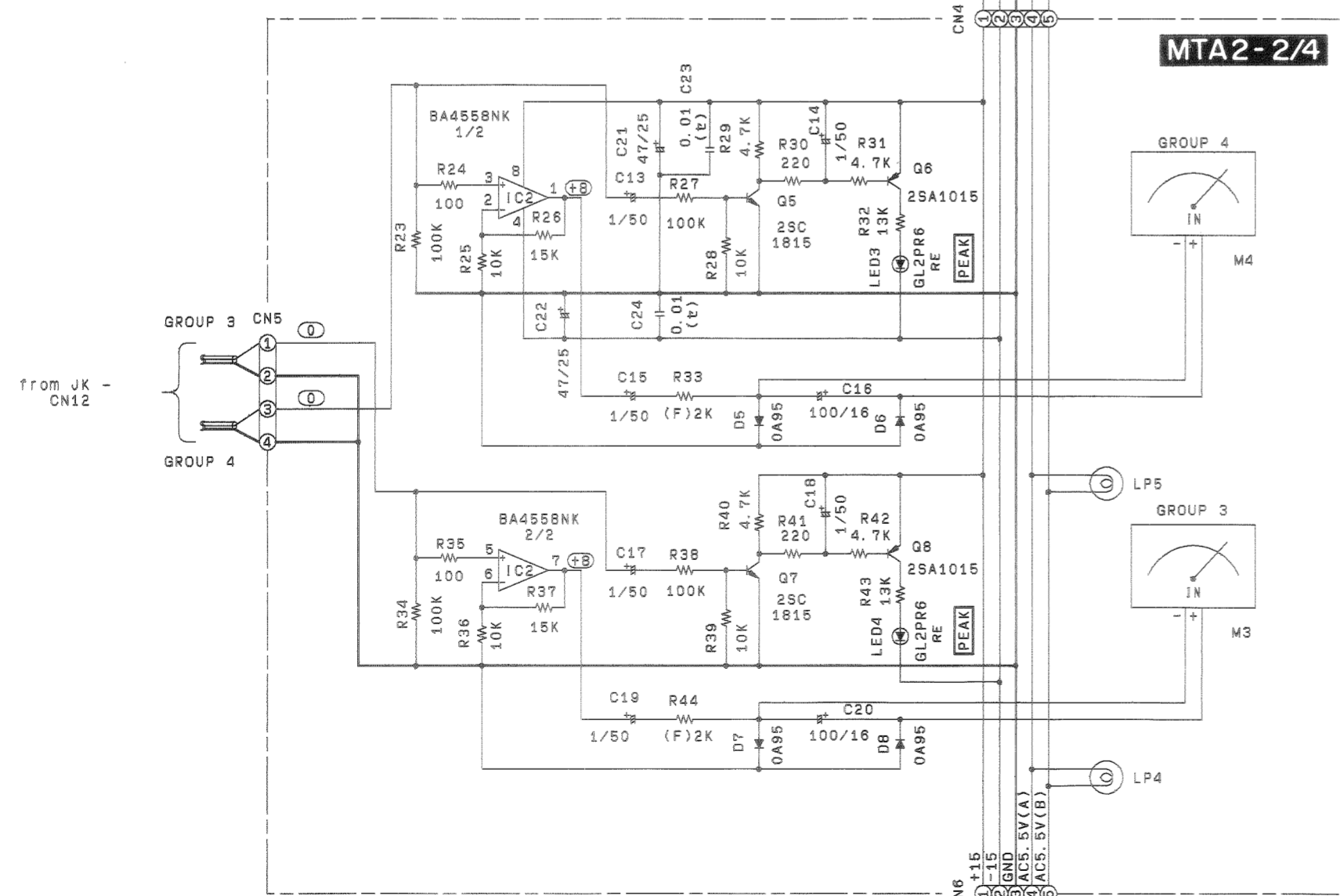
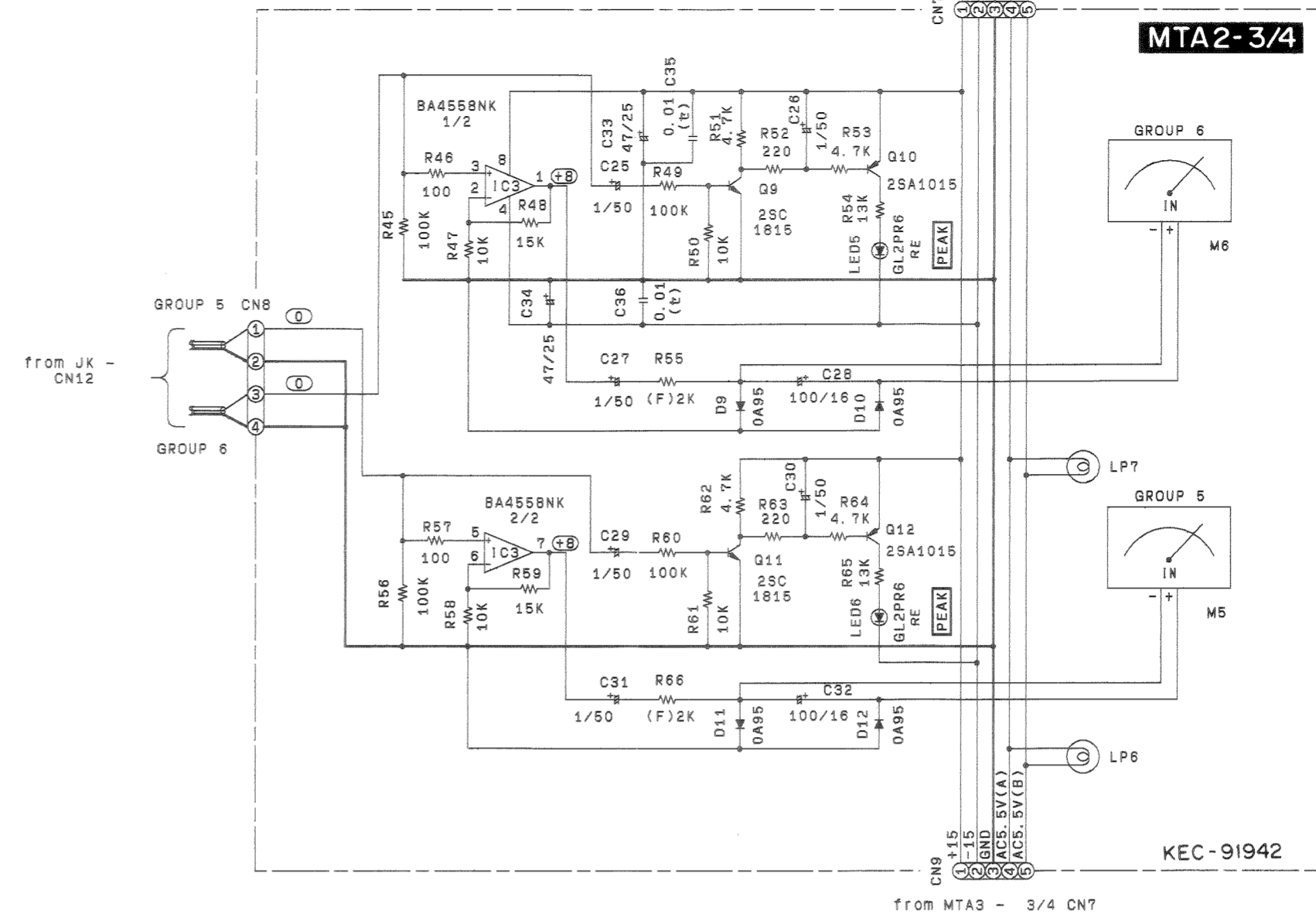
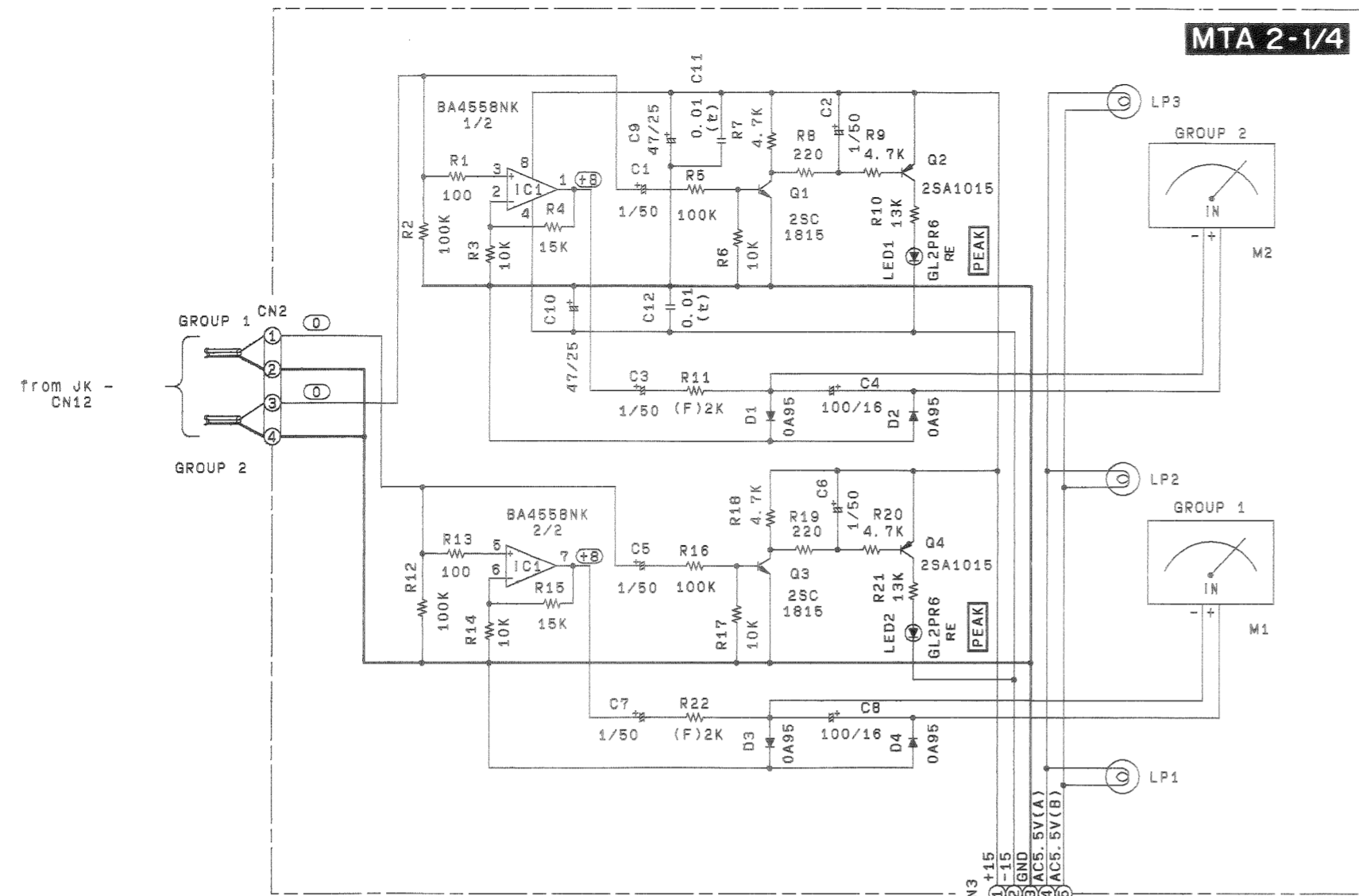


Notes)  
 marked : nominal level

# JK CIRCUIT DIAGRAM

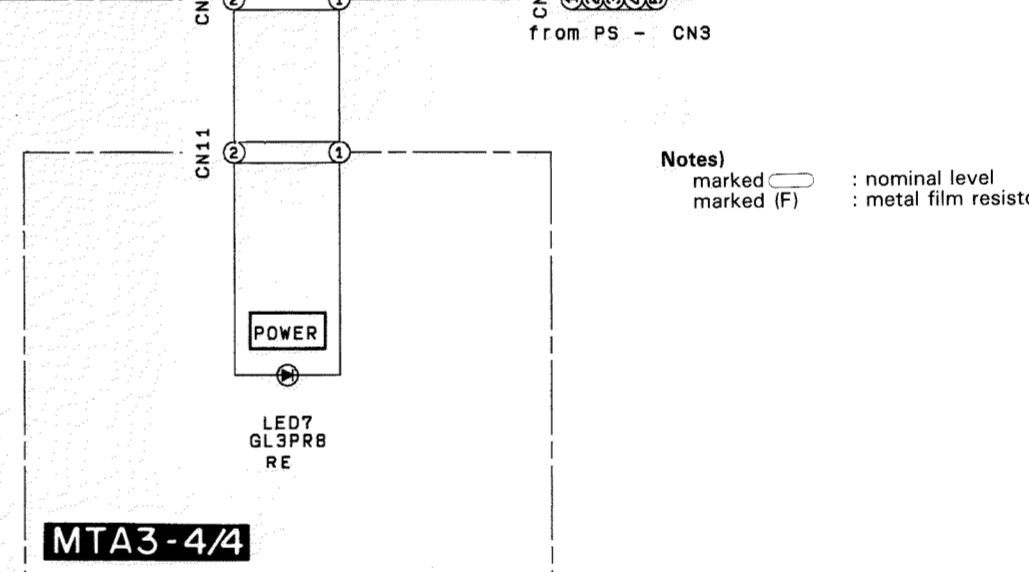
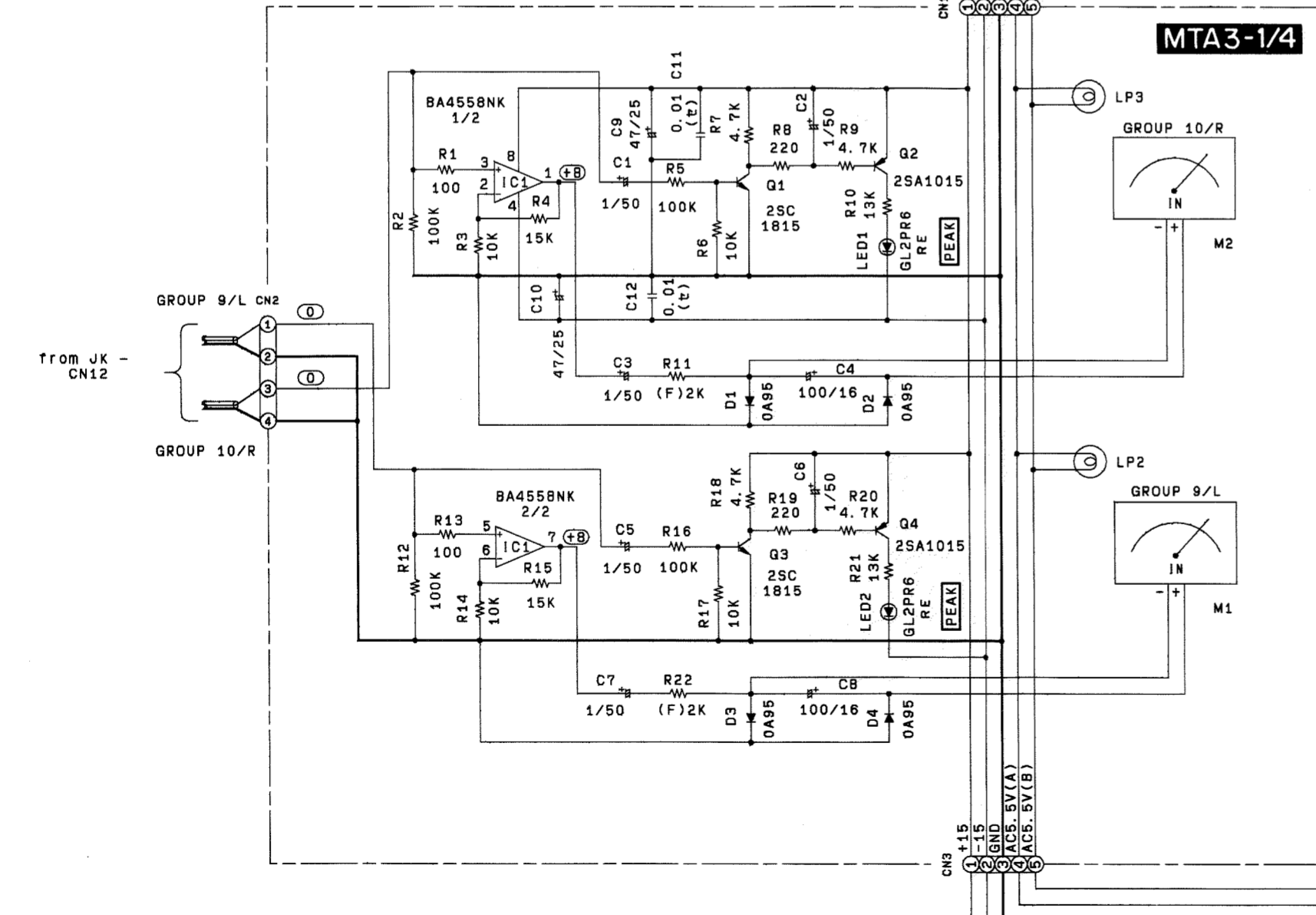
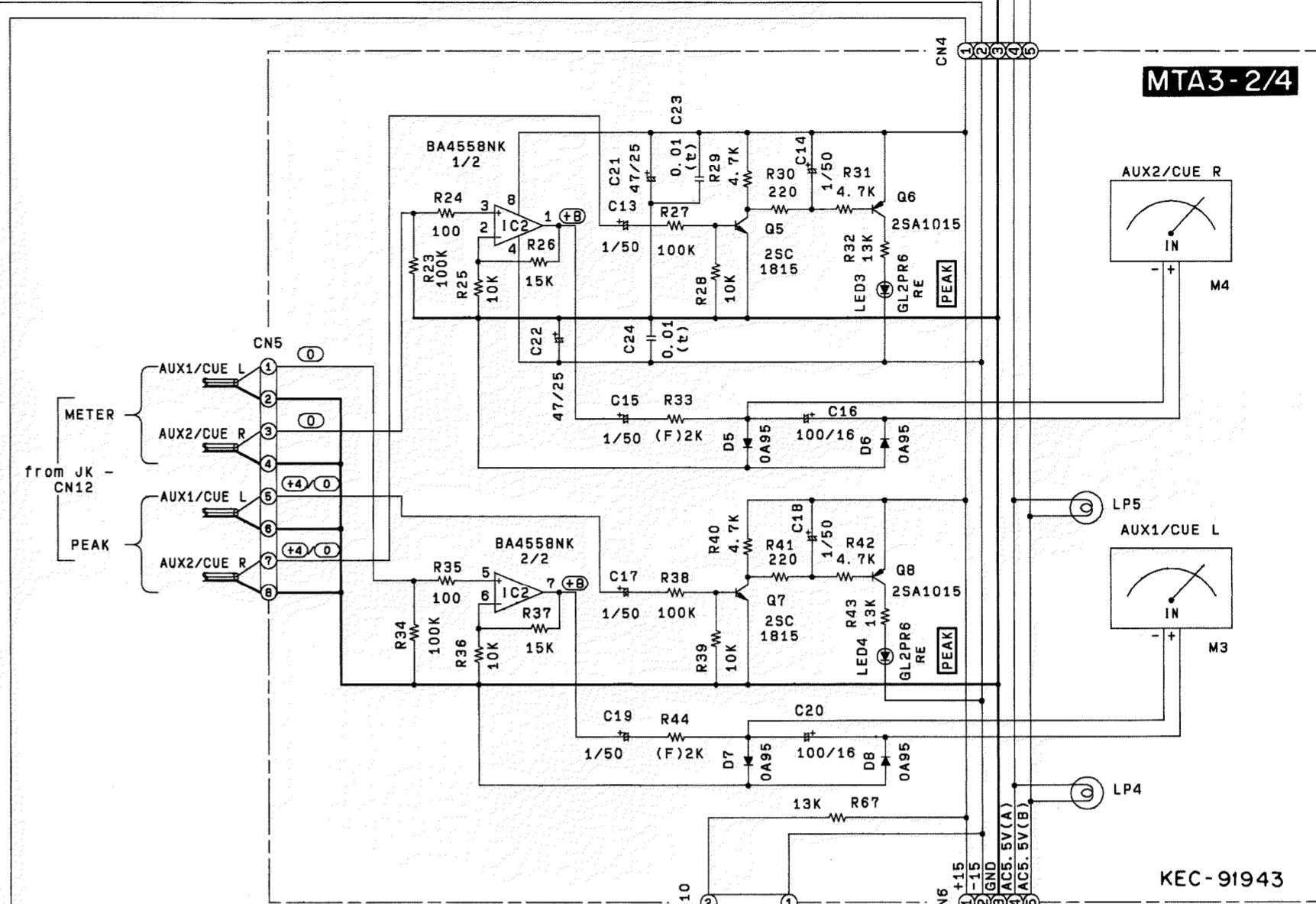
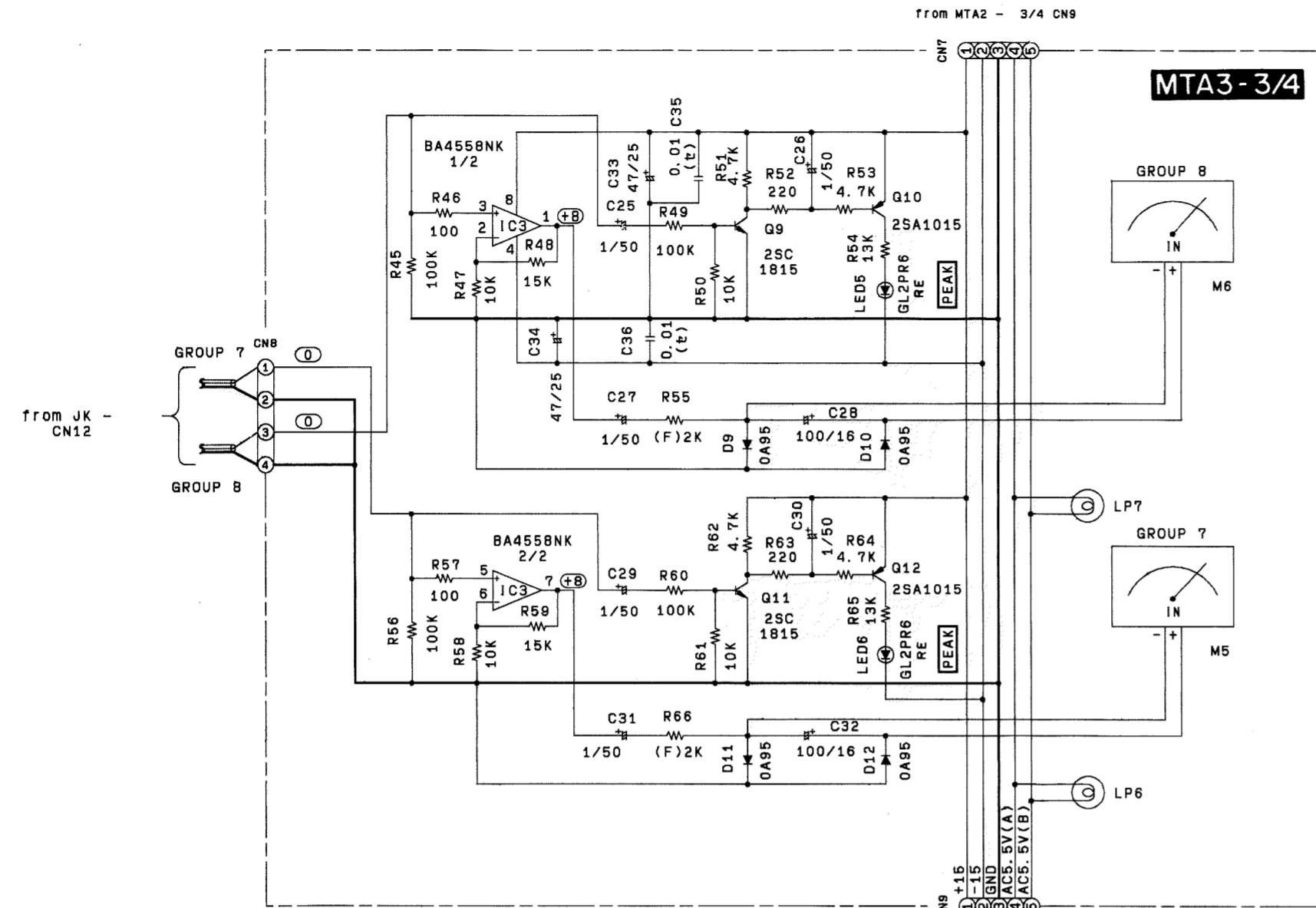
MC2410M/MC3210M





Notes  
 ◯ : nominal level  
 (F) : metal film resistor  
 MTA2-4/4 circuit board is not used in this unit.  
 (MTA2-4/4シートは本機に使用されていません)

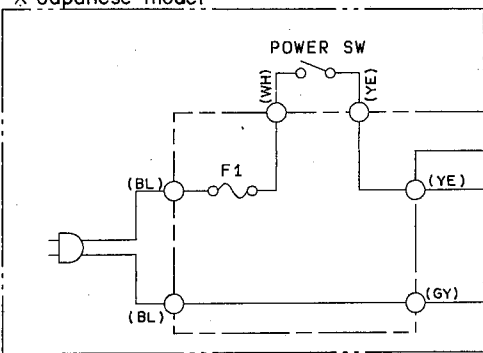
MTA3 CIRCUIT DIAGRAM



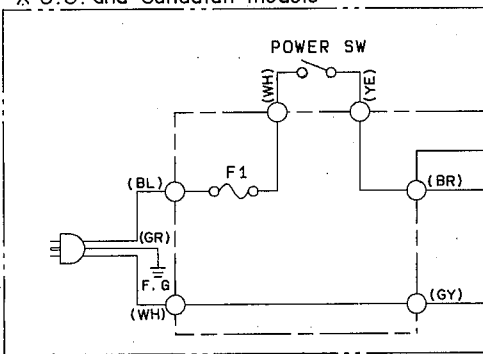
Notes)  
 marked ( ) : nominal level  
 marked (F) : metal film resistor

**POWER SUPPLY CIRCUIT DIAGRAM**

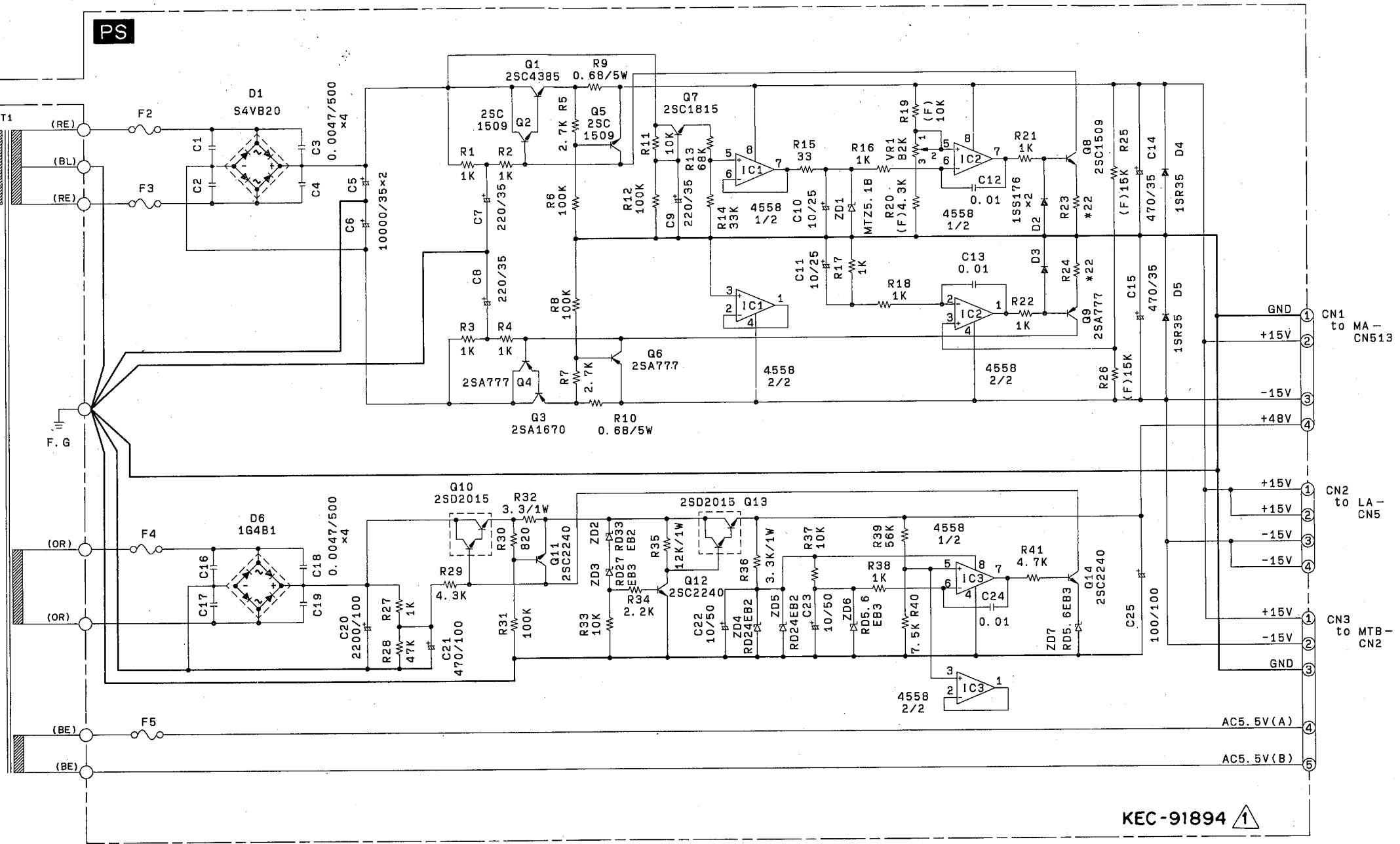
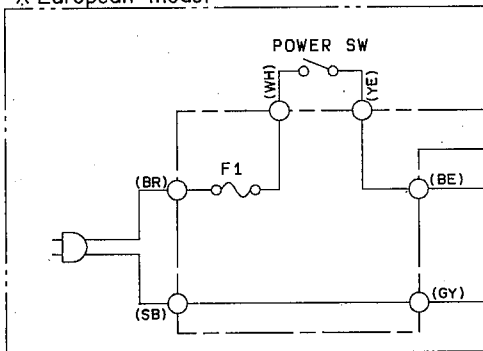
\* Japanese model



\* U.S. and Canadian models



\* European model



KEC-91894 ⚠

	Japanese model	U.S. and Canadian models	European model
F1	▽ 3A 250V	① 3A 250V	⑤ T1.6A 250V
label	x	x	VC03960
F2	▽ 4A 250V	① 4A 250V	⑤ T3.15A 250V
label	x	x	CA80886
F3	▽ 4A 250V	① 4A 250V	⑤ T3.15A 250V
label	x	x	CA80886
F4	▽ 1A 250V	① 1A 250V	⑤ T1.0A 250V
label	x	x	CA80888
F5	▽ 3A 250V	① 3A 250V	⑤ T3.15A 250V
label	x	x	CA80886
T1	XJ782A0	XJ783A0	XJ784A0
PS	VM67720	VM67730	VM67740

marked X : flame proof carbon resistor  
 marked (F) : metal film resistor  
 marked /5W : wire wound resistor  
 marked /1W : metal oxide film resistor

**POWER SUPPLY CIRCUIT DIAGRAM**





- 5. Mylar Cap.  
C508, 513: 0.0150 50V J (UA354150)  
C789, 793: 0.0470 50V J (UA354470)
- 6. Ceramic Cap.  
C506, 512, 516, 533, 547, 564, 578, 595, 610, 627, 641, 659, 670, 687, 731, 740, 745, 752, 763, 768, 775:  
B 220P 50V K (FG612220)  
C509, 510, 519, 520, 523, 524, 526, 538, 539, 550, 551, 554, 555, 557, 569, 570, 581, 582, 585, 586, 588, 600, 601, 603, 613, 614, 617, 618, 620, 632, 633, 644, 645, 648, 649, 651, 656, 657, 673, 674, 677, 678, 680, 692, 693, 705, 706, 707, 720, 721, 722, 734, 736, 738, 748, 749, 755, 756, 759, 760, 787, 788, 798, 799:  
F 0.0100 50V Z (FG644100)  
C517, 535, 549, 566, 580, 597, 612, 629, 643, 661, 672, 689, 753, 769:  
B 470P 50V K (FG612470)  
C518, 522, 528 ~ 530, 534, 537, 542, 543, 548, 553, 559, 560, 561, 565, 568, 573, 574, 575, 579, 584, 590, 591, 592, 596, 599, 605, 606, 607, 611, 616, 622, 623, 624, 628, 631, 636, 637, 638, 642, 647, 653, 654, 660, 663, 666, 667, 676, 682, 683, 684, 691, 696, 697, 698, 700, 702, 703, 704, 709, 711, 712, 713, 715, 717, 718, 719, 724, 726, 727, 728, 733, 742, 746, 754, 758, 764, 765, 770, 772, 776, 777, 785, 791, 795, 796:  
SL 100P 50V J (FG652100)  
C521, 536, 552, 567, 583, 598, 615, 630, 546, 662, 675, 690, 735, 741, 747, 757, 771:  
SL 47P 50V J (FG651470)  
C655, 668, 671, 688, 797:  
SL 33P 50V J (FG651330)  
C779, 780:  
B 1000P 50V K (FG613100)  
C786, 792:  
SL 22P 50V J (FG651220)
- 7. Electrolytic Cap.  
C501 ~ 504: 220.00 25.0V (UJ848220)  
C505, 511, 515, 532, 546, 563, 577, 594, 609, 626, 640, 658, 669, 686, 732, 751, 767:  
100.00 16.0V (UJ838100)  
C525, 531, 540, 545, 556, 562, 571, 576, 587, 593, 602, 608, 619, 625, 634, 639, 650, 664, 679, 694, 701, 710, 716, 725, 730, 736, 739, 743, 744, 761, 762, 773, 774, 784, 790:  
47.00 25.0V (UI547470)  
C527, 541, 558, 572, 589, 604, 621, 635, 652, 665, 708, 714, 723, 729, 794:  
22.00 25.0V (UI547220)  
C681, 695:  
22.00 25.0V (UJ847220)  
C685, 699:  
47.00 25.0V (UJ847470)  
C750, 766, 778, 800:  
220.00 16.0V (UJ838220)  
C781, 782:  
470.00 25.0V (UJ748470)  
C783:  
10.00 25.0V (UJ847100)
- 8. Flame Proof C. Resistor  
R828, 829: 10.0 1/4 J (HV354100)
- 9. Metal Oxide Film Resistor  
R816, 827: 100.0 1W J (VC731200)
- 10. Resistor Array  
RA501, 502: RGLD12X183J (VP007600)
- 11. Slide Pot.  
VR501 ~ 508, 511, 512: A10K (VL819600) GROUP FADER1-10
- 12. Variable Resistor  
VR509, 510, 513 ~ 517: A20K (VL819100) RTN1-4, AUX OUT, TB INPUT LEVEL  
VR518, 519: A20K x 2 (VL899200) CUE OUT, HP LEVEL
- 13. Slide Switch  
SW532, 533: SSS212 (KA401270) CANCEL
- 14. Push Switch  
SW501 ~ 520, 522, 524, 526, 528, 529, 534, 535:  
SPEC12 NON-SHORT BE (VL891900) ON, CUE, TB  
SW521, 523, 525, 527: SPEC101 10 (VN720800) RTN assign  
SW530: SPEC91 9 (VN720900) TB assign1-10  
SW531: SPEC21 2 (VP034700) TB assign AUX, TB OUT

- 15. Phone Jack  
JK 2: HLJ1520 (LB202300) PHONES
- 16. Cannon Connector  
JK 1: XLM-3-31PCV (VL958600) TB INPUT
- 17. Relay  
RY501: DC RY12W 12V (KC001900)
- 18. Base Post Connector  
CN503: PH-10P TE (VB390600) to JK-CN8  
CN504: PH-11P TE (VB390700) to JK-CN9  
CN508: PH-8P TE (VB390400) to JK-CN1  
CN509: PH-8P TE (VB390400) to JK-CN3, CN4  
CN510: PH-6P TE (VB390200) to JK-CN2, CN5, CN7  
CN511: PH-3P TE (VB389900) to MA-CN512  
CN513: PH-4P TE (VB390000) to MA-CN514  
CN515: PH-7P TE (VB390300) to JK-CN6
- 19. Straight Header  
CN501: HIF3FC30PA-2.54DSA to IN-CN4 (Bus connector)
- 20. Connector Assembly  
CN502: PS to PS-CN1  
CN505: SAN & PH 8P 100L to LA-CN1  
CN506: SAN & PH 8P 100L to LA-CN3  
CN507: SAN & PH 8P 200L to LA-CN2  
CN508: SAN & PH 3P 80L to MA-CN511  
CN512: SAN & PH 4P 60L to MA-CN513  
CN514: SAN & PH 2P 80L to LA-CN4  
CN516: SAN & SAN 2P 60L to MA-CN518  
CN517: SAN & SAN 2P 60L to MA-CN517  
CN518:

Notes)

Circuit Board: LA (VM676400) XK038B0

- 1. IC  
IC 1 ~ 10: NJM4556DD (XE803A00) OP AMP
- 2. Ceramic Cap.  
C 2 ~ 5, 11 ~ 14, 20 ~ 23, 29 ~ 32, 38 ~ 41, 47 ~ 50, 56 ~ 59, 65 ~ 68, 74 ~ 77, 83 ~ 86:  
SL 33P 50V J (FG651330)  
C 8, 9, 17, 18, 26, 27, 35, 36, 44, 45, 53, 54, 62, 63, 71, 72, 80, 81, 89, 90:  
F 0.0100 50V Z (FG644100)
- 3. Electrolytic Cap.  
C 1, 10, 19, 28, 37, 46, 55, 64, 73, 82:  
47.00 25.0V (UJ847470)  
C 6, 7, 15, 16, 24, 25, 33, 34, 42, 43, 51, 52, 60, 61, 69, 70, 78, 79, 79, 87, 88, 91, 92:  
220.00 16.0V (UJ838220)
- 4. Base Post Connector  
CN 1: PH-8P TE (VB390400) to MA-CN505  
CN 2: PH-8P TE (VB390400) to MA-CN507  
CN 3: PH-8P TE (VB390400) to MA-CN506  
CN 4: PH-2P TE (VB389800) to MA-CN516  
CN 6: PH12P TE (VB390800) to OUTC-CN1  
CN 7: PH10P TE (VB390600) to OUTC-CN3  
CN 8: PH13P TE (VF283100) to OUTC-CN2  
CN 9: PH-2P TE (VB389800) to JK-CN11  
CN10: PH12P TE (VB390800) to JK-CN10
- 5. Connector Assembly  
CN 5: SAN & PH 4P to PS-CN2

Notes)

Circuit Board: OUTC (VM676600) XK042B0

- 1. Phone Jack  
JK11: HLJ2335 STEREO (VM673600) AUX OUT1,2
- 2. XLM Connector  
JK 1 ~ 10: XLM-3-32PCV (VL958700) GROUP OUT1-10
- 3. Base Post Connector  
CN 1: PH-12P TE (VB390800) to LA-CN6  
CN 2: PH-13P TE (VF283100) to LA-CN8  
CN 3: PH-10P SE (VB858900) to LA-CN7

MC2410M/MC3210M

# MC2410M/MC3210M

## Notes)

Circuit Board: JK (VN835000) XL002D0  
 Circuit Board: SW (VN834900) XL002D0

1. Push Switch  
SW 1: SPEC12 (VL943200) AUX/CUE(METER)
2. Phone Jack  
JK 1-11: HLJ2335 STEREO (VM673600) GRP SUB IN1-10,  
AUX SUB IN1/2, RTN1-4, CUE-CTL, CUE SUB IN,  
TB OUT  
JK 12-16: HLJ2335 STEREO (LB606940) GROUP INS I/O
3. Base Post Connector  
CN 1: PH-8P TE (VB390400) to MA-CN508  
CN 2: PH-4P TE (VB390000) to MA-CN510  
CN 3: PH-9P TE (VB390500) to MA-CN509  
CN 4: PH-8P TE (VB390400) to MA-CN509  
CN 5: PH-4P TE (VB390000) to MA-CN510  
CN 6: PH-8P SE (VB858700) to MA-CN515  
CN 7: PH-4P SE (VB858300) to MA-CN510  
CN 8: PH-15P SE to MA-CN503  
CN 9: PH-16P SE to MA-CN504  
CN12: PH-14P SE (VH904200) to MTA2-CN2, CN5, CN8  
& MTA3-CN8, CN2, CN5
4. Connector Assembly  
CN10: SAN & PH 12P 60L to LA-CN10  
CN11: SAN & PH 2P 60L to LA-CN9

## Notes)

Circuit Board: MTA2 (VN721600) XK039B0

1. IC  
IC 1, 2, 3: BA4558-NK (XF128A00) OP AMP
2. Transistor  
Q 1, 3, 5, 7, 9, 11: 2SA1015 O, Y (IA101590)  
Q 2, 4, 6, 8, 10, 12: 2SC1815 Y, GR (IC1815M0)
3. Diode  
D 1-12: OA95 (IF005640)
4. LED  
LED 1-6: GL2PR6 RE (VH325200) PEAK
5. Ceramic Cap.-F  
C11, 12, 23, 24, 35, 36: 0.0100 50V Z (FG644100)
6. Electrolytic Cap.  
C 1-3, 5-7, 13-15, 17-19, 25-27, 29-31: 1.00 50.0V (UI566100)  
C 4, 8, 16, 20, 28, 32: 100.00 16.0V (UI538100)  
C 9, 10, 21, 22, 33, 34: 47.00 25.0V (UI547470)
7. Metal Film Resistor  
R11, 22, 33, 44, 55, 66: 2.0K 1/4 F (VB066200)  
2.0K 1/4 F (VB066200)
8. Lamp  
LP 1-7: 8V 100mA (VM672900)
9. Base Post Connector  
CN 2: PH-4P SE (VB858300) to JK-CN12  
CN 3: PH-5P SE (VB858400) to MTA2-CN4  
CN 5: PH-4P SE (VB858300) to JK-CN12  
CN 6: PH-5P SE (VB858400) to MTA2-CN7  
CN 8: PH-4P SE (VB858300) to JK-CN12  
CN 9: PH-5P SE (VB858400) to MTA3-CN7
10. Connector Assembly  
CN 4: SAN & PH 5P 120L to MTA2-CN3  
CN 7: SAN&PH 5P 120L to MTA2-CN6

## Notes)

Circuit Board: MTA3 (VN721700) XK039B0

1. IC  
IC 1, 2, 3: BA4558-NK (XF128A00) OP AMP
2. Transistor  
Q 1, 3, 5, 7, 9, 11: 2SA1015 O, Y (IA101590)  
Q 2, 4, 6, 8, 10, 12: 2SC1815 Y, GR (IC1815M0)
3. Diode  
D 1-12: OA95 (IF005640)
4. LED  
LED 7: GL3PR8 RE (VG261500) POWER indicator  
LED 1-6: GL2PR6 RE (VH325200) PEAK indicator
5. Ceramic Cap.-F  
C11, 12, 23, 24, 35, 36: 0.0100 50V Z (FG644100)  
0.0100 50V Z (FG644100)
6. Electrolytic Cap.  
C 1-3, 5-7, 13-15, 17-19, 25-27, 29-31: 1.00 50.0V (UI566100)  
C 4, 8, 16, 20, 28, 32: 100.00 16.0V (UI538100)  
C 9, 10, 21, 22, 33, 34: 47.00 25.0V (UI547470)
7. Metal Film Resistor  
R11, 22, 33, 44, 55, 66: 2.0K 1/4 F (VB066200)

8. Lamp  
LP 2-7: 8V 100MA (VM672900)
9. Base Post Connector  
CN 2: PH-4P SE (VB858300) to JK-CN12  
CN 3: PH-5P SE (VB858400) to MTA3-CN4  
CN 5: PH-8P SE (VB858700) to JK-CN12  
CN 6: PH-5P SE (VB858400) to PS-CN3  
CN 8: PH-4P SE (VB858300) to JK-CN12  
CN 9: PH-5P SE (VB858400) to MTA3-CN1
10. Connector Assembly  
CN 1: SAN & PH 5P 120L to MTA3-CN9  
CN 4: SAN & PH 5P 120L to MTA3-CN3  
CN 7: SAN & PH 5P 120L to MTA2-CN9  
CN10: SAN & SAN 2P 80L to MTA3-CN11  
CN11: SAN & SAN 2P 80L to MTA3-CN10

## Notes)

Circuit Board: PS (VM677200) XK044B0 (J)  
 PS (VM677300) XK044B0 (U, C, V)  
 PS (VM677400) XK044B0 (H, B)

1. IC  
IC 1-3: BA4558-NK (XF128A00) OP AMP
2. Transistor  
Q 1/3: 2SC4385/2SA1670 Y (VM977100)  
Q 2, 5, 8: 2SC1509 O, R (IC150930)  
Q 4, 6, 9: 2SA777 Q, R (IA077730)  
Q 7: 2SC1815 Y, GR (IC1815M0)  
Q10, 13: 2SD2015 (VM923000)  
Q11, 12, 14: 2SC2240 GR, BL (IC224030)
3. Diode  
D 2, 3: 1SS133, 1SS176 (VB941200)  
D 4, 5: 1SR35-100A (VE170000)
4. Diode Stack  
D 1: S4VB20 2.6A (IH001090)  
D 6: 1G4B1 1.5A (IH001400)
5. Zener Diode  
ZD 1: MTZ5.1B 5.1V (VA780300)  
ZD 2: RD33EB2 33.0V (IF005650)  
ZD 3: RD27EB3 27.0V (IF005660)  
ZD 4, 5: RD24EB2 24.0V (IF005670)  
ZD 6, 7: RD5.6EB3 5.6V (IF001690)
6. Mylar Cap.  
C12, 13, 24: 0.0100 50V K (UA314100)
7. Ceramic Cap.  
C 1-4, 16-19: E 0.0047 500V M (FH223470) U, C, V
8. Electrolytic Cap.  
C 5, 6: 10000.0 35V (VM678700)  
C 7-9: 220.00 35.0V (UJ858220)  
C10, 11: 10.00 25.0V (UJ847100)  
C14, 15: 470.00 35.0V (UJ858470)  
C20: 2200. 100V (VM681400)  
C21: 470.00 100.0V (UJ798470)  
C22, 23: 10.00 50.0V (UJ867100)  
C25: 100.00 100.0V (UJ798100)
9. Carbon Resistor  
R 1-4, 16-18, 21, 22, 38: 1.0K 1/4 J (HF756100)  
R 5, 7: 2.7K 1/4 J (HF756270)  
R 6, 8, 12, 31: 100.0K 1/4 J (HF758100)  
R11, 33, 37: 10.0K 1/4 J (HF757100)  
R13: 68.0K 1/4 J  
R14: 33.0K 1/4 J (HF757330)  
R15: 33.0 1/4 J  
R28: 47.0K 1/4 J (HF757470)  
R29: 4.3K 1/4 J  
R30: 820.0 1/4 J (HF755820)  
R34: 2.2K 1/4 J (HF756220)  
R39: 56.0K 1/4 J (HF757560)  
R40: 7.5K 1/4 J  
R41: 4.7K 1/4 J (HF756470)
10. Flame Proof C. Resistor  
R23, 24: 22.0 1/4 J (HV354220)  
R27: 1.0K 1/4 J (HV356100)
11. Metal Film Resistor  
R19: 10.0K 1/4 F (VA074400)  
R20: 4.3K 1/4 F (VB067000)  
R25, 26: 15.0K 1/4 F (VA074600)
12. Metal Oxide Film Resistor  
R32: 3.3 1W J (VC726800)  
R35: 12.0K 1W J (VC736900)  
R36: 3.3K 1W J (VC735400)
13. Wire Wound Resistor  
R 9, 10: 0.68 5W K (HM752680)
14. Trimmer Potentiometer  
VR 1: B2.0K (VI444400) +15V adj.
15. Fuse  
F 1, 5: T 3.00A 250V (KB000360) J  
F 2, 3: T 4.00A 250V (KB000380) J  
F 4: T 1.00A 250V (KB000330) J  
F 1, 5: T 3.00A 250V (KB002650) U, C, V  
F 2, 3: T 4.00A 250V (KB002640) U, C, V  
F 4: T 1.00A 250V (KB001060) U, C, V  
F 1: T 1.60A 250V (KB000740) H, B  
F 2, 3, 5: T 3.15A/250V (KB000760) H, B  
F 4: T 1.00A 250V (KB000730) H, B
16. Base Post Connector  
CN 1: VH-4P TE (LB932040) to MA-CN502  
CN 2: PH-4P TE (VB390000) to LA-CN5  
CN 3: PH-5P TE (VB390100) to MTA3-CN6

MC2410M/MC3210M