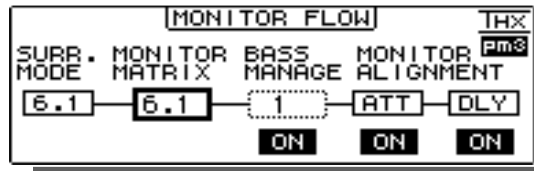


Yamaha Digital Production Console DM2000 DM1000 O2R96 Version 2 Surround-Monitoring Functions' Quick Reference

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [March '05, r343]
 ©2005 Yamaha Corp. & SONA Corp.



DM 2000
DIGITAL PRODUCTION CONSOLE

DM1000
Digital Production Console

O2R96
Digital Mixing Console



Ver.2

©2005 Yamaha Corporation

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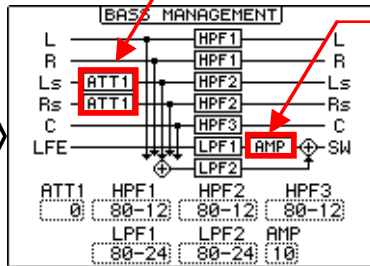
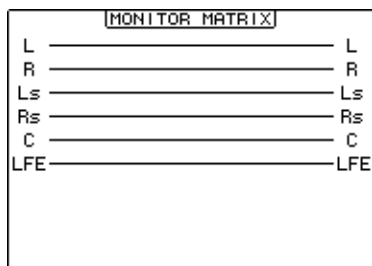
rev. 343



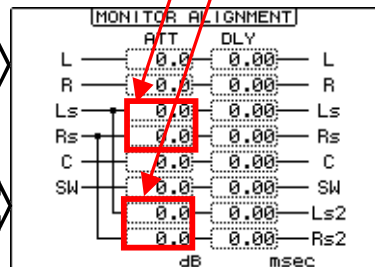
Outline 1

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [March '05, r343]
 ©2005 Yamaha Corp. & SONA Corp.

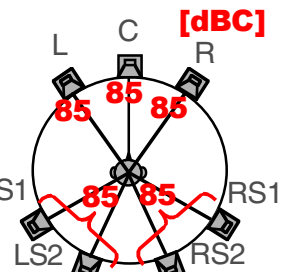
5.1



DVD: 0dB, Movie: -3dB
 DVD-V, Movie: +10dB
 DVD-A, SACD: 0dB

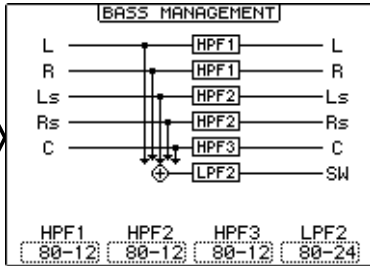
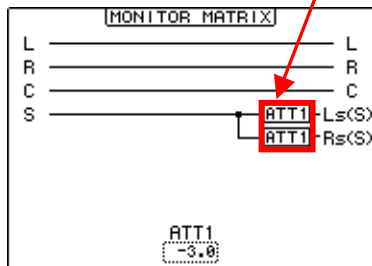


Values for 5.1

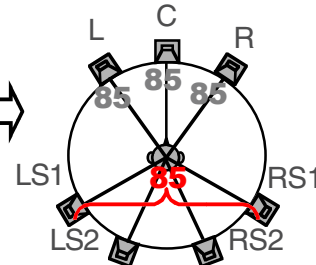


3-1

Surround attenuation

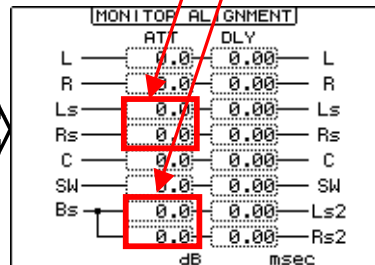
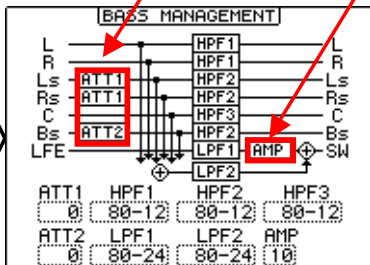
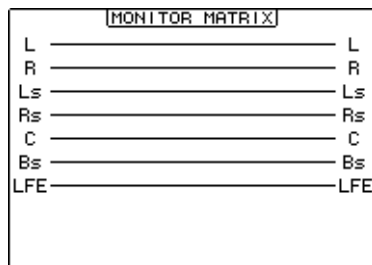


different scenes

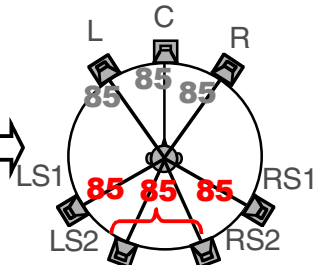


6.1

DVD: 0dB, Movie: -3dB
 DVD-V, Movie: +10dB
 DVD-A, SACD: 0dB



Values for 6.1



Outline 2

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [March '05, r343]
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Setup

- Step 1 for 5.1** Calibrate the 5.1 monitoring environment (5.1=>5.1) using ATTs and DLYs in the "Monitor Alignment" window, and store these values as "**Scene A**"
- Step 2 for 3-1** Calibrate the 3-1 monitoring environment (3-1=>3-1) using **ATT1 of "Monitor Matrix"**, and copy the value to **ATT4** of 5.1=>3-1 Monitor Matrix and **ATT5** of 6.1=>3-1 Monitor Matrix.
- Step 3 for 6.1** Calibrate the 6.1 monitoring environment (6.1=>6.1) using ATTs and DLYs in the "Monitor Alignment" window, and store these values as "**Scene B**".

Bus conditions and alignment scenes

Monitor Matrix			Monitor Alignment
Main BUS	to	Monitor BUS	
2	=>	2	Scene A (or B)
3-1	=>	3-1	Scene A
		2	Scene A (or B)
5.1	=>	5.1	Scene A
		3-1	Scene A
6.1	=>	2	Scene A (or B)
		6.1	Scene B
		5.1	Scene A
		3-1	Scene A
		2	Scene A (or B)

Presets of bass management

Preset number	target project	LFE		Surround Att.**	Note
		fc	AMP		
1	DVD	80Hz	+10dB	0dB	Parameters can be changed.
2		120Hz			
3	Theatrical movie	80Hz	+10dB	-3dB	
4		120Hz			
5	Completely bypass	THRU	0dB	0dB	
THXD*	DVD	120Hz	+10dB	0dB	Parameters cannot be changed.
THXF*	Theatrical movie			-3dB	
THXM*	Music (DVD-A, SACD)		+10dB/0dB	0dB	

* THX™ pm3™ Approved.

** not effective on the 3-1 mode.

CONTENTS

p.5 - 8

Monitoring functions

Monitor Matrix

Bass Management

Monitor Alignment

p.9 - 12

Monitoring flow

2ch Monitoring

3-1ch Monitoring

5.1ch Monitoring

6.1ch Monitoring

p.13 - 17

Monitor Adjustment

FAST WAY TO REACH THE TARGET ENVIRONMENT

APPENDIX 1:

Playback level balance

APPENDIX 2:

5.1 playback response

APPENDIX 3:

Time alignment and Comb filtering effect

Monitoring functions

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
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Monitor Matrix



! Down-mix
! Surround level adjustment (3-1)

Bass Management



! Bass redirection (DVD-V)
! DVD or Movie (Surr -3dB)
! LFE+10dB or 0dB

Monitor Alignment

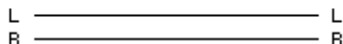


! Delay
! Attenuator
! Surround routing

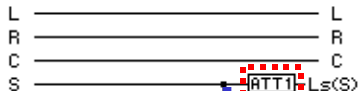
Featuring...

2ch, 3-1ch, 5.1ch, 6.1ch

MONITOR MATRIX



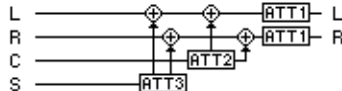
MONITOR MATRIX



ATT1
 -3.0

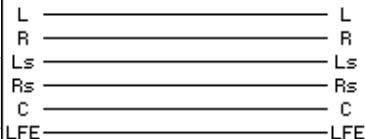
Down-mix

MONITOR MATRIX

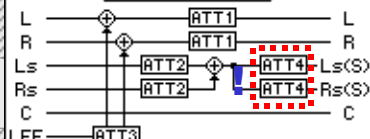


ATT1 ATT2 ATT3
 0.0 -3.0 -3.0

MONITOR MATRIX

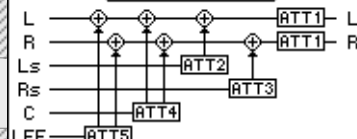


MONITOR MATRIX



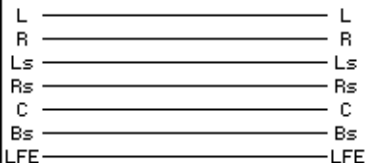
ATT1 ATT2 ATT3 ATT4
 0.0 -3.0 -∞ -3.0

MONITOR MATRIX

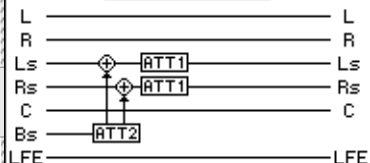


ATT1 ATT2 ATT3 ATT4 ATT5
 0.0 -3.0 -3.0 -3.0 -∞

MONITOR MATRIX

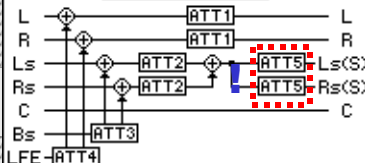


MONITOR MATRIX



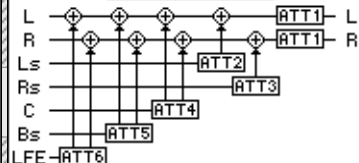
ATT1 ATT2
 0.0 -3.0

MONITOR MATRIX



ATT1 ATT2 ATT3 ATT4 ATT5
 0.0 -3.0 -3.0 -∞ -3.0

MONITOR MATRIX



ATT1 ATT2 ATT3 ATT4 ATT5 ATT6
 0.0 -3.0 -3.0 -3.0 -3.0 -∞

Monitor Matrix

PARAM	RANGE	STEP
ATT	0~-12.0dB, -inf, (0.1dB step)	142

PARAM	RANGE	STEP
ATT	+12.0~-12.0dB, -inf, (0.1dB step)	242

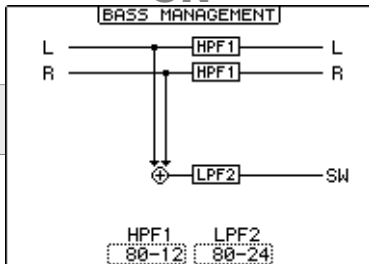
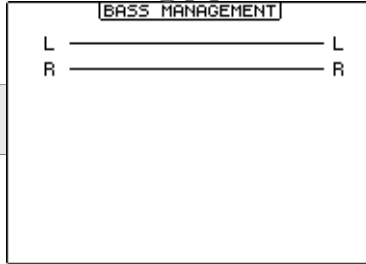
Same value should be used

2

3-1

5.1

6.1

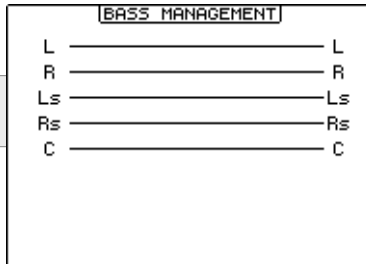
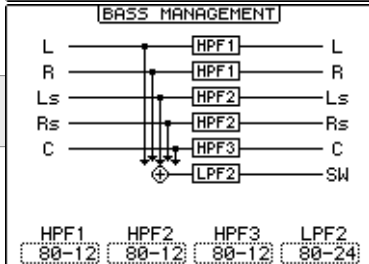
ON**OFF**

2

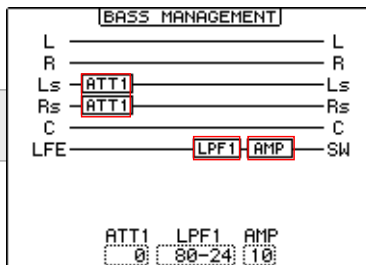
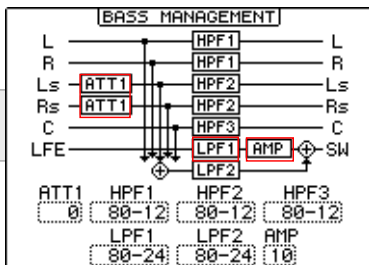
Bass Management

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [March '05, r343]
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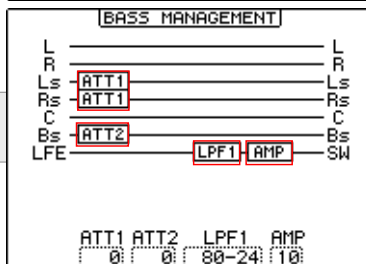
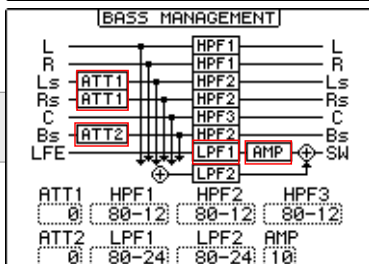
3-1



5.1



6.1



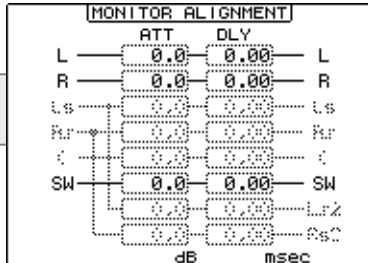
	1	2	3	4	5
	DVD : LFE80Hz	DVD : LFE120Hz	Movie : LFE80Hz	Movie : LFE120Hz	Bypass
HPF1	80-12	80-12	80-12	80-12	THRU
HPF2	80-12	80-12	80-12	80-12	THRU
HPF3	80-12	80-12	80-12	80-12	THRU
LPF1	80-24	120-42	80-24	120-42	THRU
LPF2	80-24	80-24	80-24	80-24	MUTE
ATT1	0dB	0dB	-3dB	-3dB	0dB
ATT2	0dB	0dB	-3dB	-3dB	0dB
AMP	10dB	10dB	10dB	10dB	0dB

	THXD	THXF	THXM
	THXpm3 : DVD	THXpm3 : Film	THXpm3 : Music
HPF1	80-12 (Fixed)	80-12 (Fixed)	80-12 (Fixed)
HPF2	80-12 (Fixed)	80-12 (Fixed)	80-12 (Fixed)
HPF3	80-12 (Fixed)	80-12 (Fixed)	80-12 (Fixed)
LPF1	120-42 (Fixed)	120-42 (Fixed)	120-42 (Fixed)
LPF2	80-24L (Fixed)	80-24L (Fixed)	80-24L (Fixed)
ATT1	0dB (Fixed)	-3dB (Fixed)	0dB (Fixed)
ATT2	0dB (Fixed)	-3dB (Fixed)	0dB (Fixed)
AMP	10dB (Fixed)	10dB (Fixed)	10dB (default) / 0dB (option)

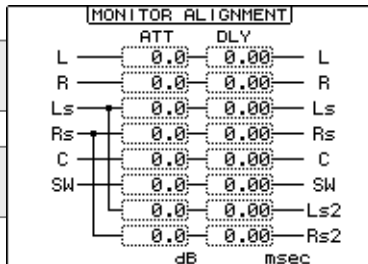
	OFF	PARAM	RANGE
	HPF1	THRU	HPF1
HPF2	THRU	HPF2	THRU, 80-12, 80-12L, 80-24, 80-24L
HPF3	THRU	HPF3	THRU, 80-12, 80-12L, 80-24, 80-24L
LPF1	No action (Variable)	LPF1	THRU, 80-24, 80-24L, 120-42
LPF2	MUTE	LPF2	THRU, 80-24, 80-24L, MUTE
ATT1	No action (Variable)	ATT1	0~-12dB(1dB step)
ATT2	No action (Variable)	ATT2	0~-12dB(1dB step)
AMP	No action (Variable)	AMP	0~-12dB(1dB step)

e.g., 80-12 ; Butterworth $f_c=80\text{Hz}$, 12dB/oct.
 80-12L ; Linkwitz-Riley $f_c=80\text{Hz}$, 12dB/oct.

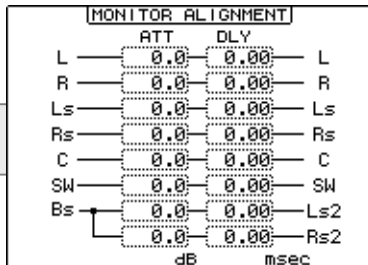
2



3-1



5.1



6.1

Monitor Alignment

	ATT	DLY
DEFAULT	0dB	0.00msec
RANGE	-12.0~+12.0	0.00~30.00msec
STEP	242(0.1dB step)	1501(0.02msec step)

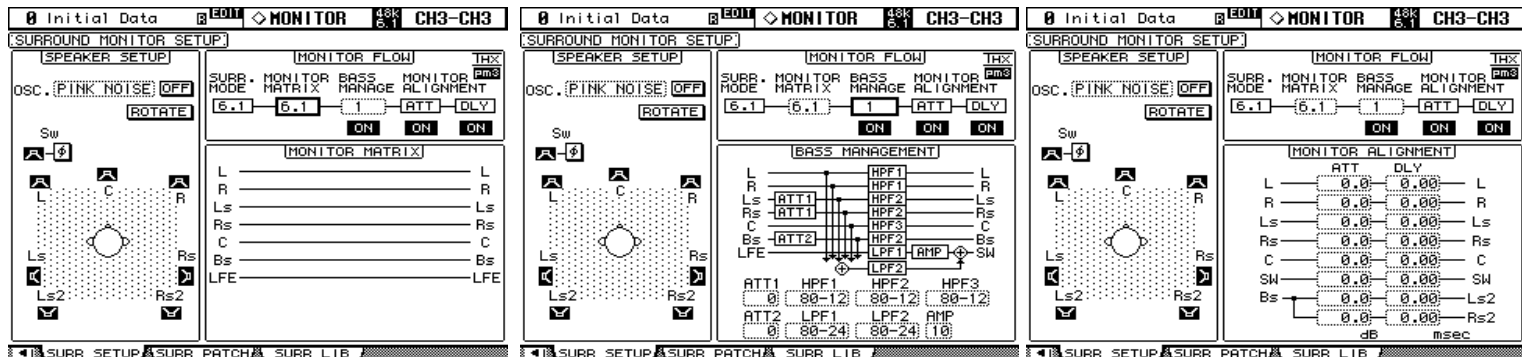
Monitoring flow

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
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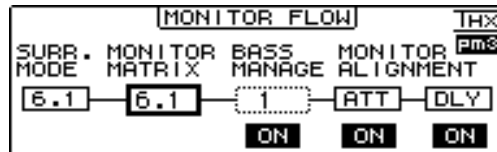
Monitor Matrix

Bass Management

Monitor Alignment



2ch
3-1ch
5.1ch
6.1ch

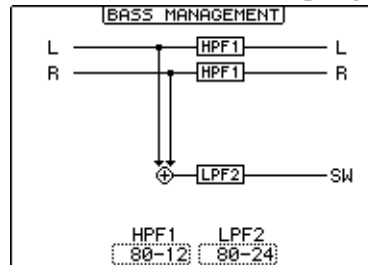
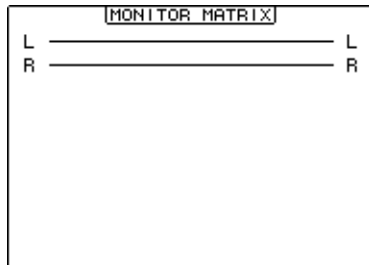


2.0ch
2.1ch
3-1ch
5.1ch
6.1ch

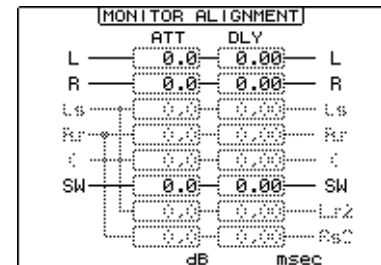
2ch Monitoring

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
 quick reference [March '05, r343]
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2

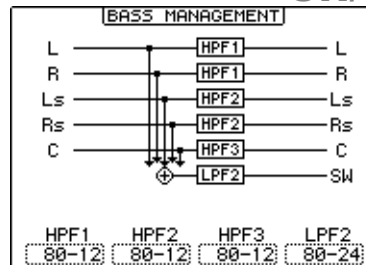
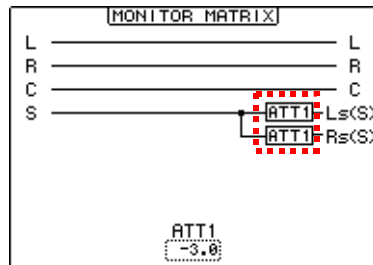


ON/OFF

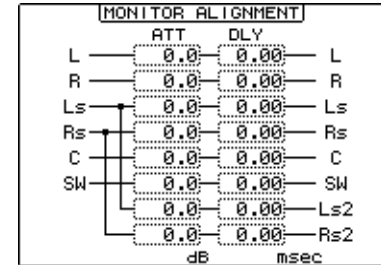


3-1ch Monitoring

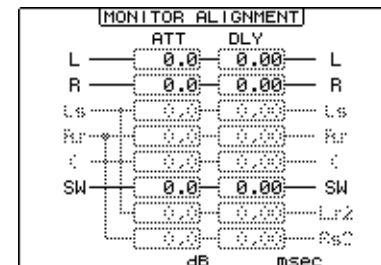
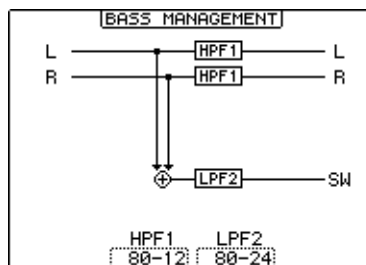
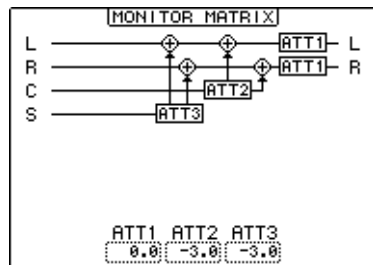
3-1



ON/OFF

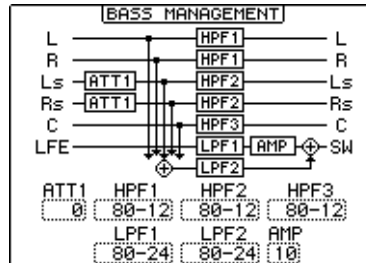
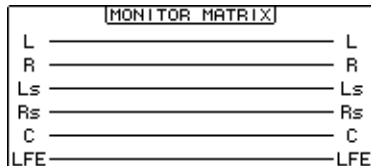


3-1 > 2



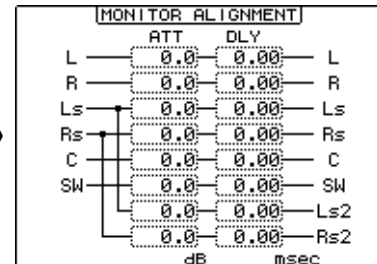
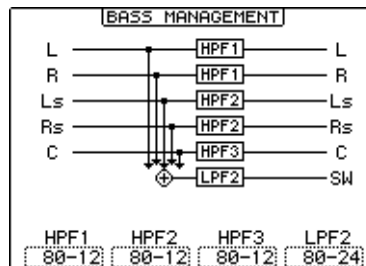
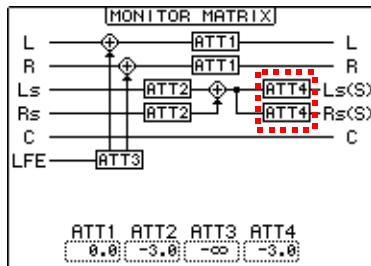
5.1ch Monitoring

5.1



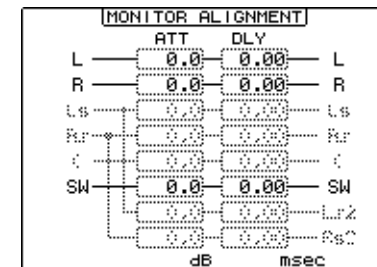
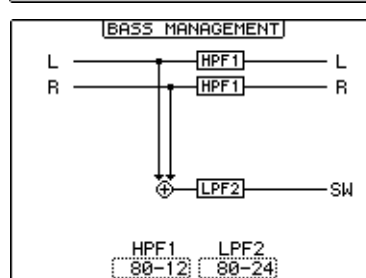
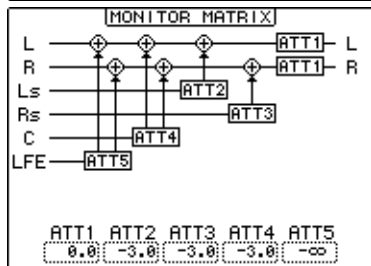
ON/OFF

5.1 > 3-1

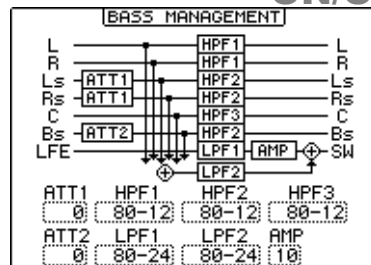
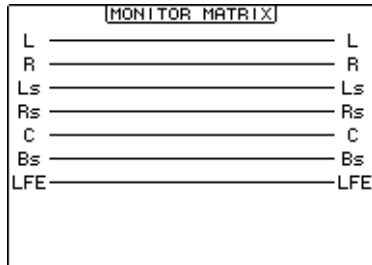


Same value

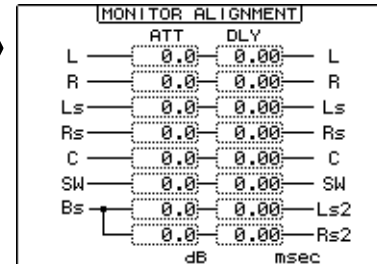
5.1 > 2



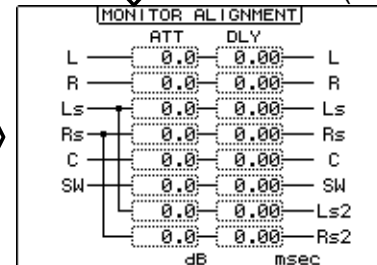
6.1



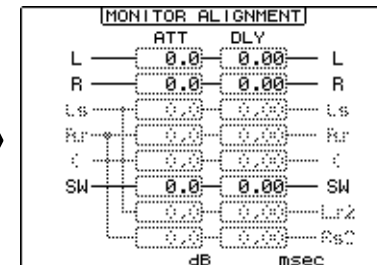
6.1ch Monitoring



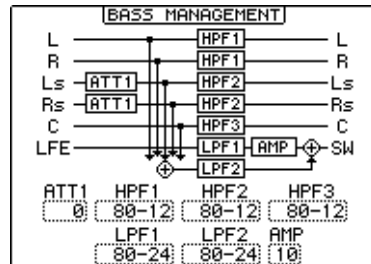
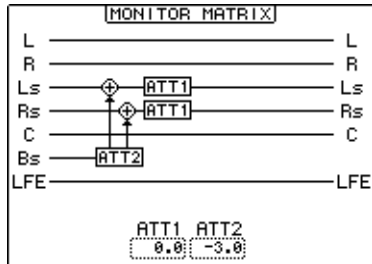
↕ Different value (LS, RS)



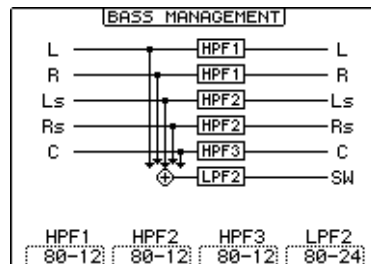
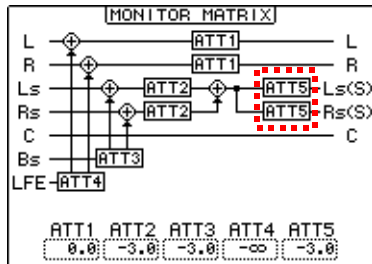
↕ Same value



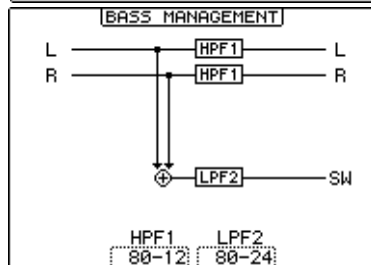
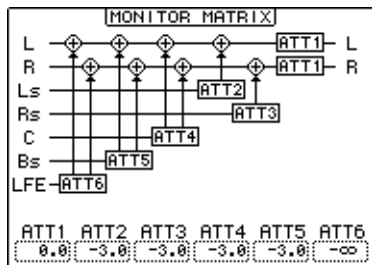
6.1 > 5.1



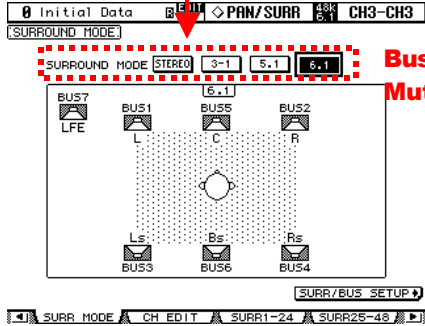
6.1 > 3-1



6.1 > 2



Surround mode (Main Bus)

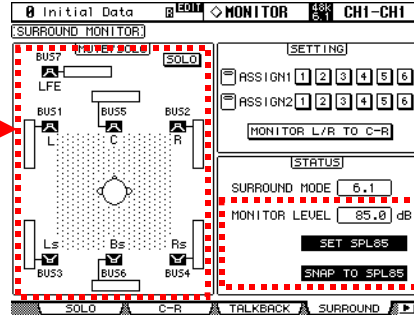


Monitor Adjustment

Noise Generator

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
 quick reference [March '05, r343]
 ©2005 Yamaha Corp. & SONA Corp.

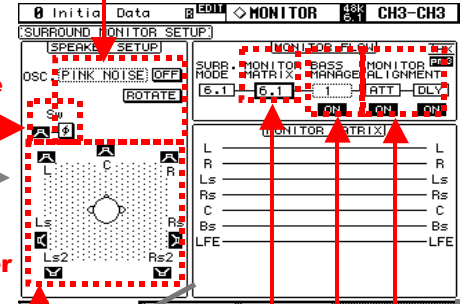
Bus Mute/Solo



SUB phase

Master Vol.

SP Mute



Monitor Bass Att. Bus Mng. Dly.

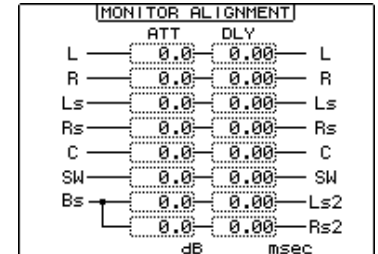
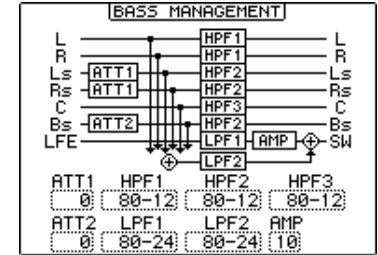
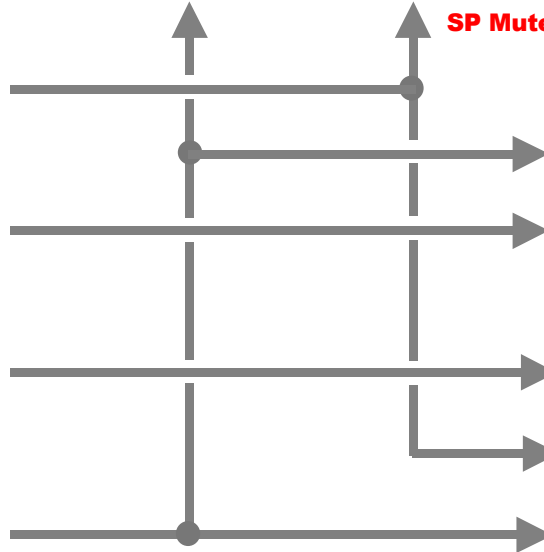
Level Balance

LFE gain

Time alignment

SUB phase

X-over [Main, SUB]



FAST WAY TO REACH THE TARGET ENVIRONMENT

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [March '05, r343]
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1) First of all, “5.1ch DVD-V” environment should be adjusted using bass management .

1. X-over [SUB, Main], SUB Phase
2. Master Vol., Level Balance
3. Time Alignment

2) If necessary, turn the bass management OFF.

Check the SUB phase again.

3) For Movie program, reduce the Surround level -3dB.

Use the Bass Management function ; ATT1, ATT2 -> -3dB

4) For DVD-A / SACD, change the LFE level from +10dB to 0dB.

Bass management function ; AMP -> 0dB

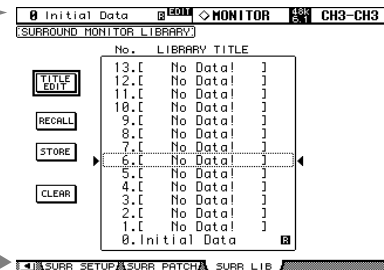
5) For 3-1, adjust the surround level again.

1. Switch the surround mode to 3-1.
2. Play the pink noise from the S channel.
3. Adjust the playback level to 85dBC using ATT1 of “3-1=>3-1” monitor matrix.
ATT1 will be adjusted to -3dB ~ -6dB.
4. Copy the value of ATT1 to ATT4 of “5.1=>3-1” and ATT5 of “6.1=>3.1” monitor matrix.

6) Finally, store adjustment data into “SURR LIB”.

7) For 6.1, adjust the LS, RS, BS level again.

1. Switch the surround mode to 6.1.
2. Play the pink noise from the LS, RS, BS channel.
3. Adjust the each playback level to 85dBC
using ATTs of LS1, LS2, RS1 and RS2 on the “monitor alignment”.
4. Store the adjustment data into “SURR LIB” as another scene.



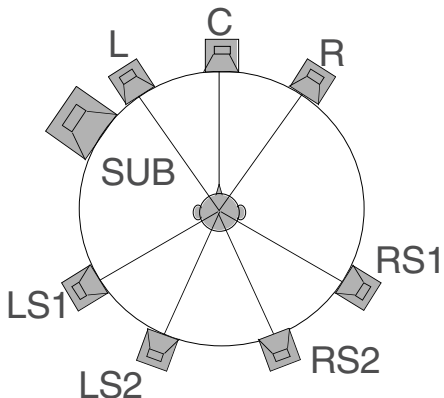
APPENDIX 1:

Playback level balance

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [March '05, r343]
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Monitor Assign

	L	R	C	SUB	LS1	RS1	LS2
2	L	R	-	(SUB)	-	-	-
3-1	L	R	C	(SUB)	S	S	(S)
5.1	L	R	C	LFE (SUB)	LS	RS	(LS)
6.1	L	R	C	LFE (SUB)	LS	RS	BS



Playback levels

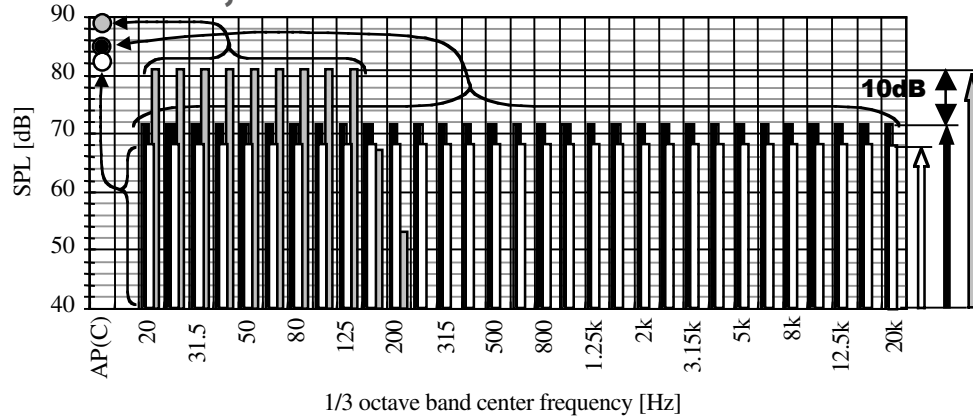
CH	Target	L	C	R	LS	RS	BS	LFE
3-1	DVD-V	85dBC	85dBC	85dBC	S=LS+RS=85dBC		-	-
	Movie				(LS=RS=82dBC)			
5.1	DVD-V	85dBC	85dBC	85dBC	85dBC	85dBC	-	+10dB* (89dBC**)
	Movie				82dBC	82dBC		
	DVD-A				85dBC	85dBC		
	SACD				85dBC	85dBC		
6.1	DVD-V	85dBC	85dBC	85dBC	85dBC	85dBC	85dBC	+10dB* (89dBC**)
	Movie				82dBC	82dBC	82dBC	

*in-band gain, **All-pass level

APPENDIX 2:

5.1 playback response

DVD-V, Movie



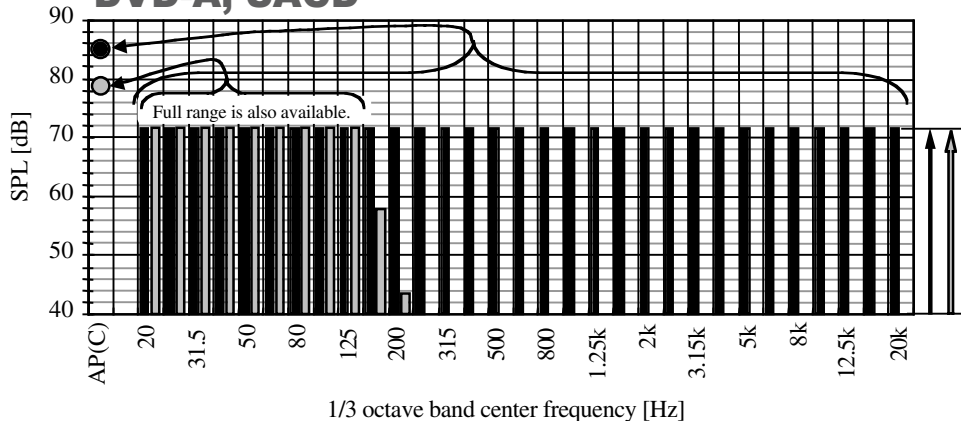
Main channels

- All pass level : 85dBC
 - ↑ 1/3 octave band level : approx.71dB
- LS / RS for 3-1 and Movie program
- All pass level : 82dBC
 - ↑ 1/3 octave band level : approx.68dB

LFE channel

- All pass level : approx.89dBC
- ↑ 1/3 octave band level : approx.81dB

DVD-A, SACD



Main channels

- All pass level : 85dBC
- ↑ 1/3 octave band level : approx.71dB

LFE channel

- All pass level : approx.79dBC
- ↑ 1/3 octave band level : approx.71dB

APPENDIX 3:

Time alignment and Comb filtering effect

DM2000 DM1000 O2R96 Ver2
 Surround-monitoring functions
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