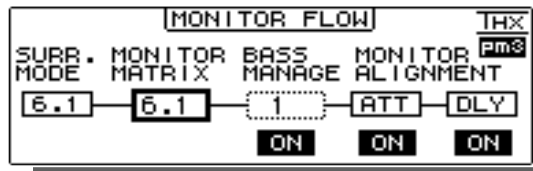


Yamaha Digital Production Console DM2000 DM1000 O2R96 Version 2 Surround-Monitoring Functions' Quick Reference

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [May '05, r351]
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DM 2000
 DIGITAL PRODUCTION CONSOLE

DM1000
 Digital Production Console

O2R96
 Digital Mixing Console



Ver.2

©2005 Yamaha Corporation

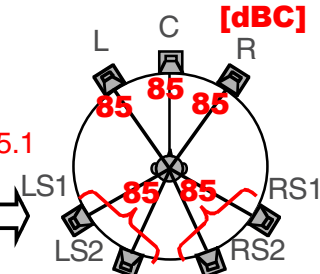
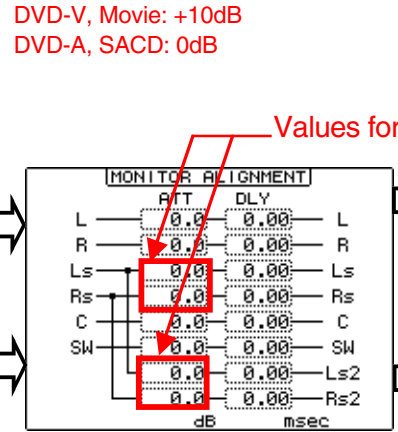
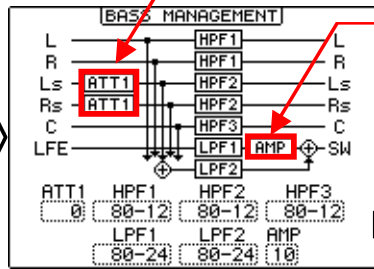
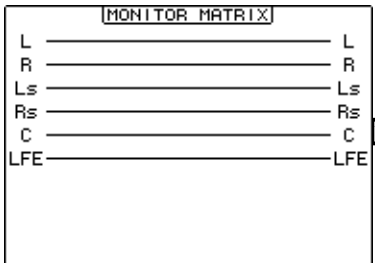
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rev. 351



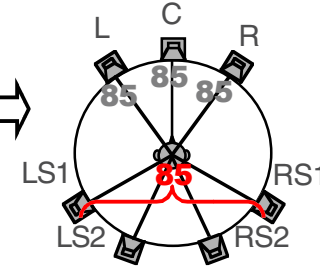
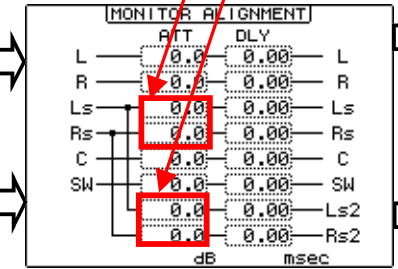
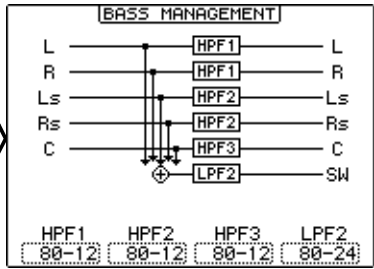
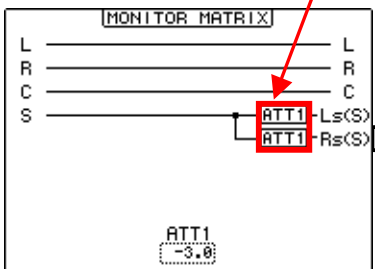
Outline 1

5.1



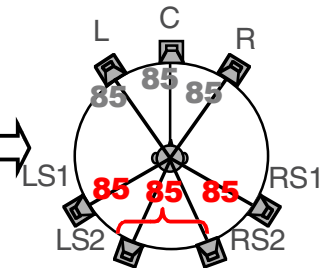
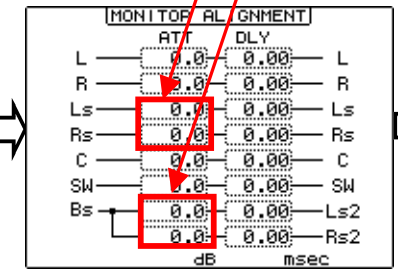
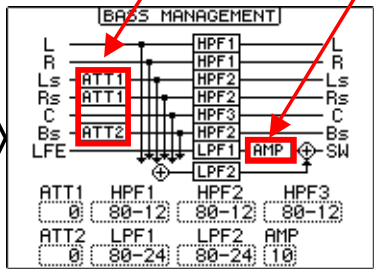
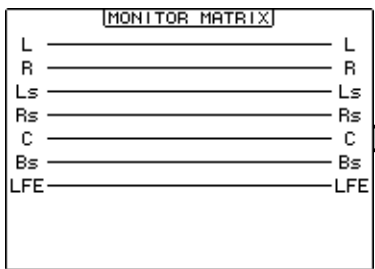
3-1

Surround attenuation



6.1

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



different scenes

Values for 6.1

Outline 2

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
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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 |
| 6.1 | => | 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
quick reference [May '05, r351]
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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

L _____ L
 R _____ R

MONITOR MATRIX

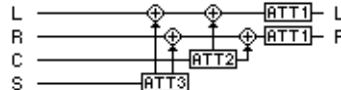
L _____ L
 R _____ R
 C _____ C
 S _____ S



ATT1
 -3.0

Down-mix

MONITOR MATRIX

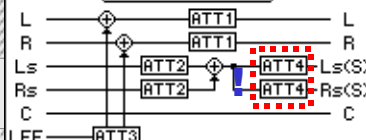


ATT1 ATT2 ATT3
 0.0 -3.0 -3.0

MONITOR MATRIX

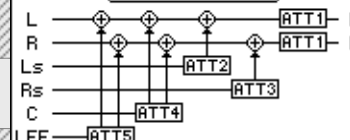
L _____ L
 R _____ R
 Ls _____ Ls
 Rs _____ Rs
 C _____ C
 LFE _____ LFE

MONITOR MATRIX



ATT1 ATT2 ATT3 ATT4
 0.0 -3.0 -∞ -3.0

MONITOR MATRIX

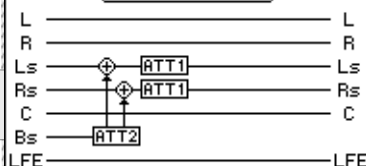


ATT1 ATT2 ATT3 ATT4 ATT5
 0.0 -3.0 -3.0 -3.0 -∞

MONITOR MATRIX

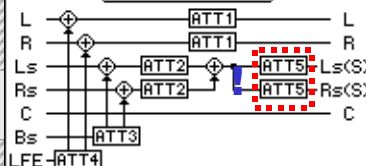
L _____ L
 R _____ R
 Ls _____ Ls
 Rs _____ Rs
 C _____ C
 Bs _____ Bs
 LFE _____ LFE

MONITOR MATRIX



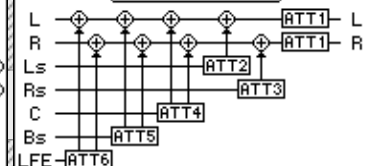
ATT1 ATT2
 0.0 -3.0

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 |

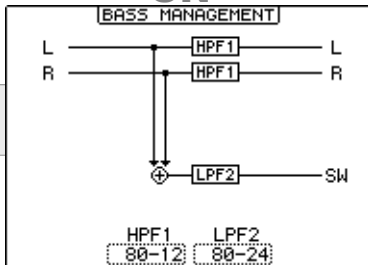
! Same value should be used

2

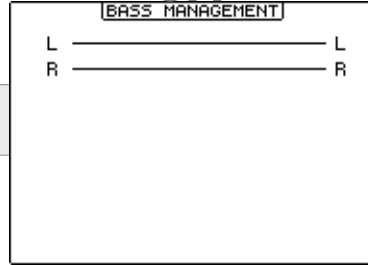
3-1

5.1

6.1

ON

2

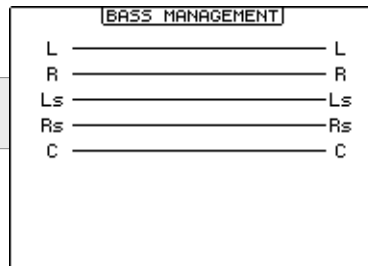
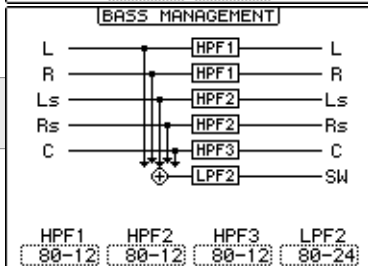
OFF

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [May '05, r351]
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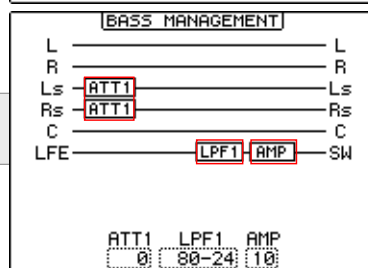
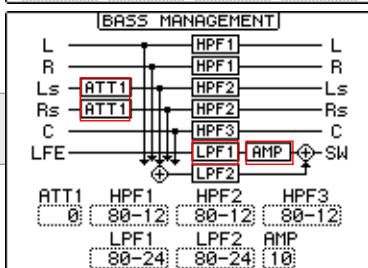
Bass Management

| | 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 |

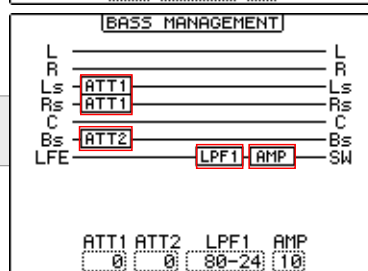
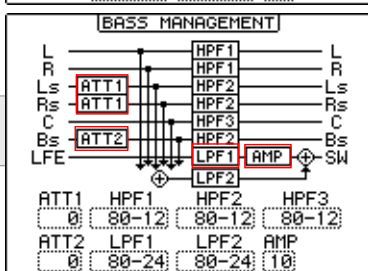
3-1



5.1



6.1

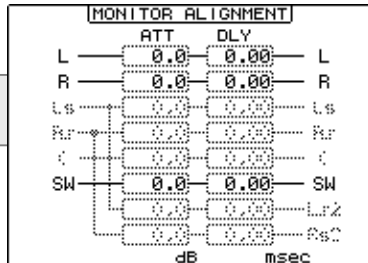


| | THXD | THXF | THXM |
|------|----------------|----------------|-------------------------------|
| | THXpm3 : DVD | THXpm3 : Film | THXpm3 : Music |
| HPF1 | 80-12 (Fixed) | 80-12 (Fixed) | 80-12 (Fixed) |
| HPF2 | 80-12 (Fixed) | 80-12 (Fixed) | 80-12 (Fixed) |
| HPF3 | 80-12 (Fixed) | 80-12 (Fixed) | 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) |

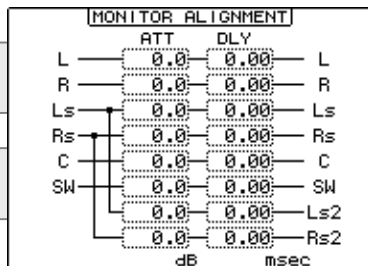
| | OFF | PARAM | RANGE |
|------|----------------------|-------|------------------------------------|
| HPF1 | THRU | HPF1 | THRU, 80-12, 80-12L, 80-24, 80-24L |
| HPF2 | THRU | HPF2 | THRU, 80-12, 80-12L, 80-24, 80-24L |
| HPF3 | THRU | HPF3 | THRU, 80-12, 80-12L, 80-24, 80-24L |
| LPF1 | No action (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.

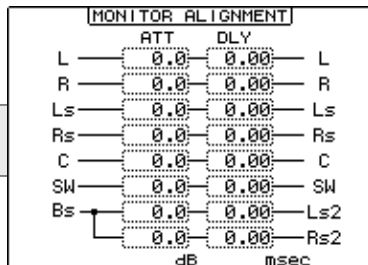
2



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) |

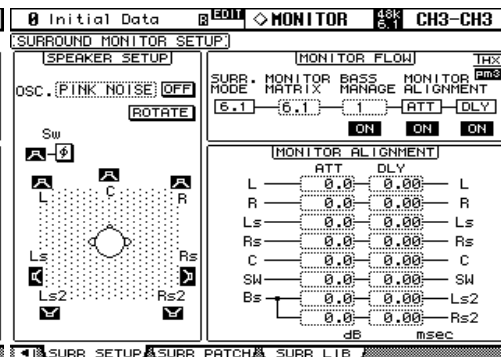
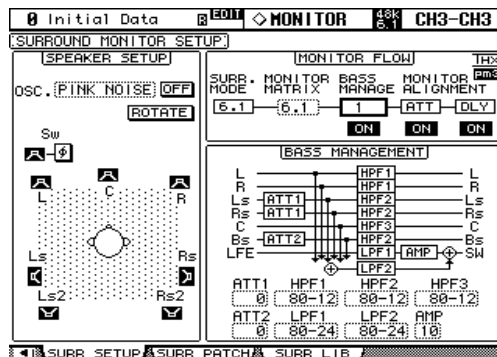
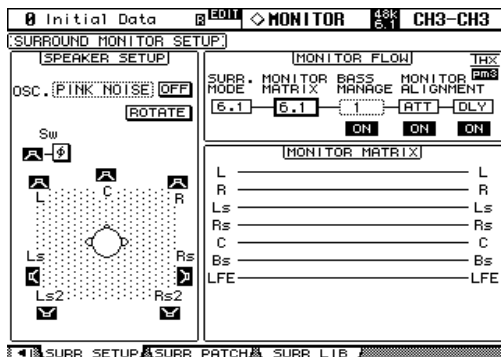
Monitoring flow

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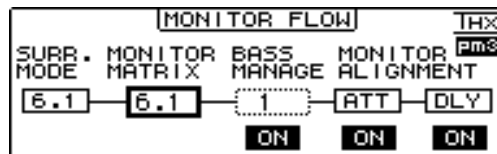
Monitor Matrix

Bass Management

Monitor Alignment



2ch
3-1ch
5.1ch
6.1ch



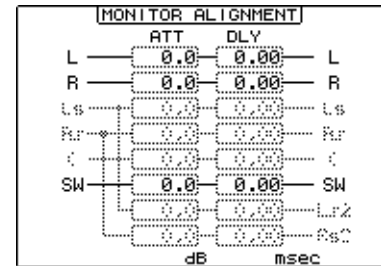
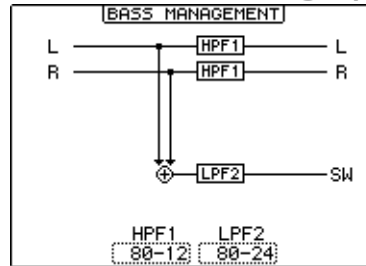
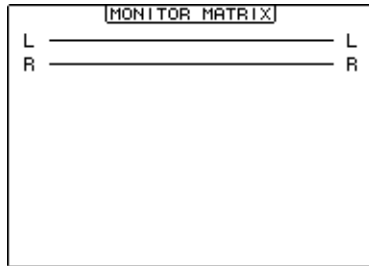
2.0ch
2.1ch
3-1ch
5.1ch
6.1ch

2ch Monitoring

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ON/OFF

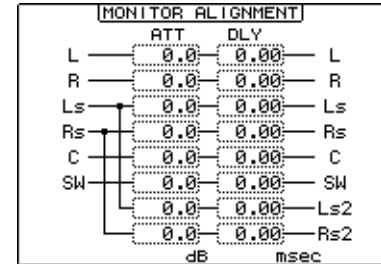
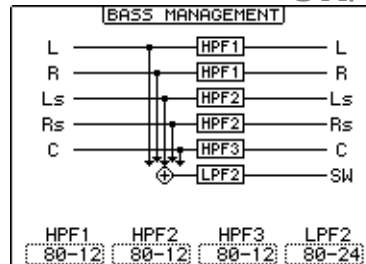
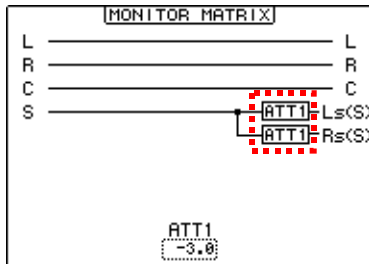
2



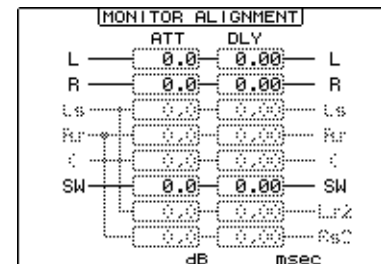
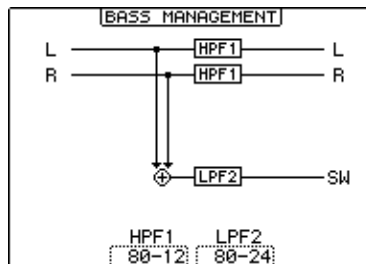
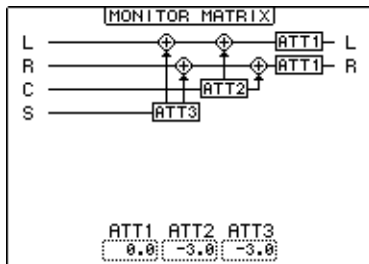
3-1ch Monitoring

ON/OFF

3-1

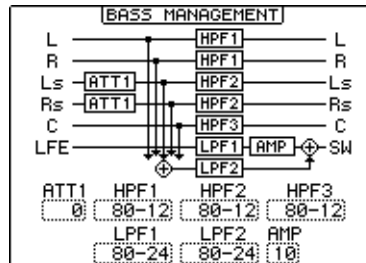
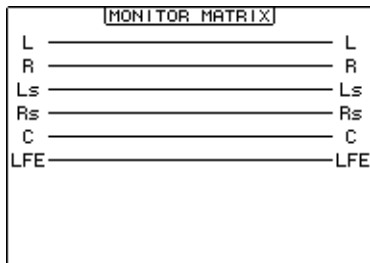


3-1 > 2



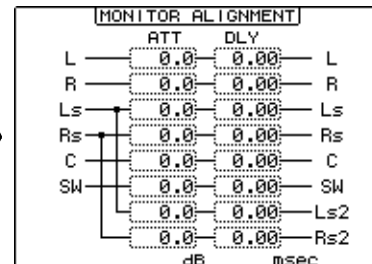
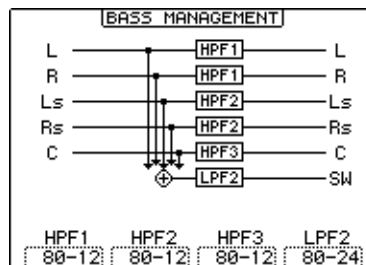
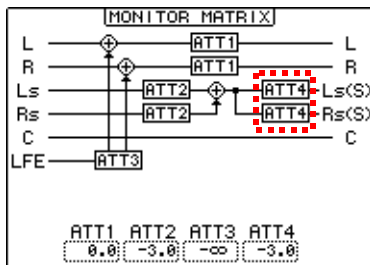
5.1ch Monitoring

5.1



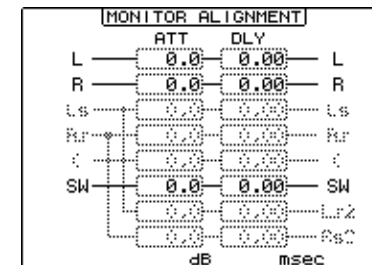
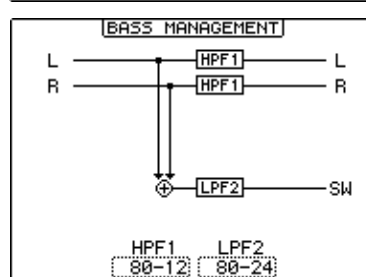
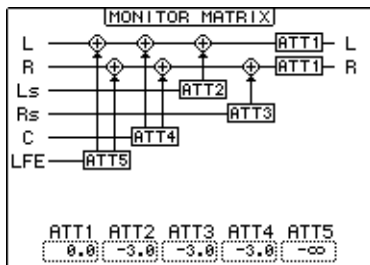
ON/OFF

5.1 > 3-1

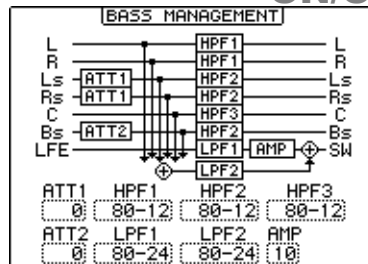
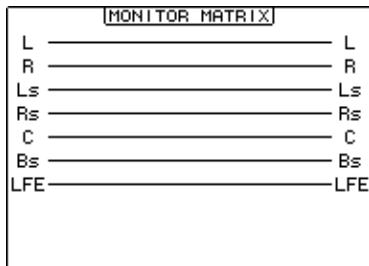


Same value

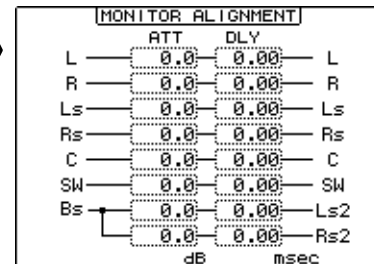
5.1 > 2



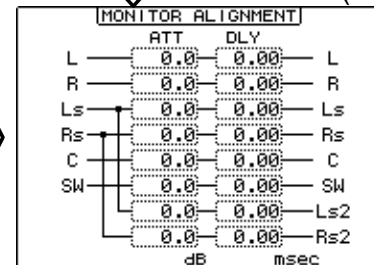
6.1



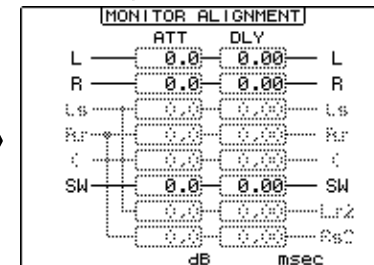
6.1ch Monitoring



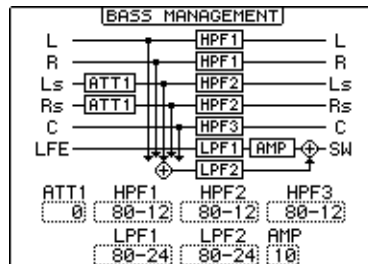
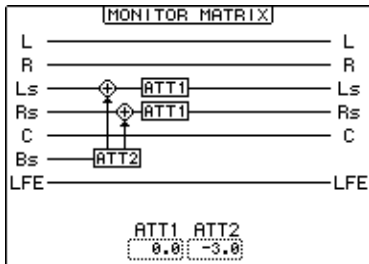
↕ Different value (LS, RS)



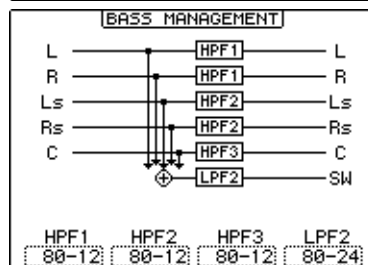
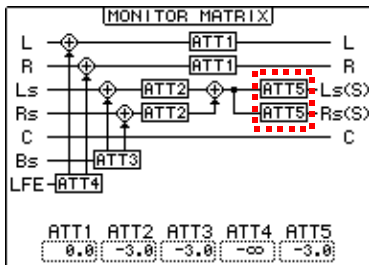
↕ Same value



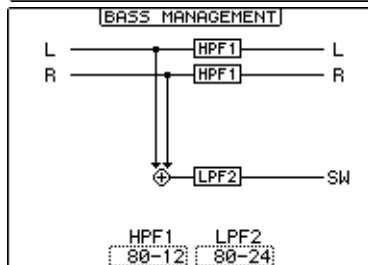
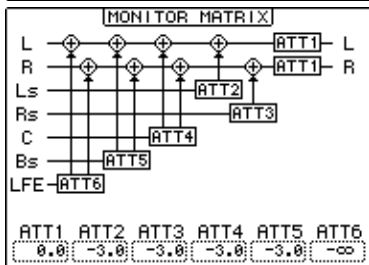
6.1 > 5.1



6.1 > 3-1

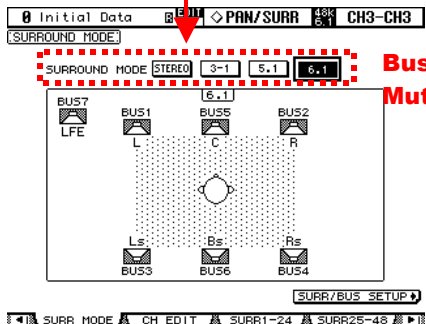


6.1 > 2

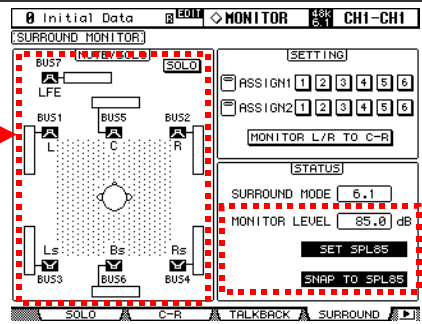


Monitor Adjustment

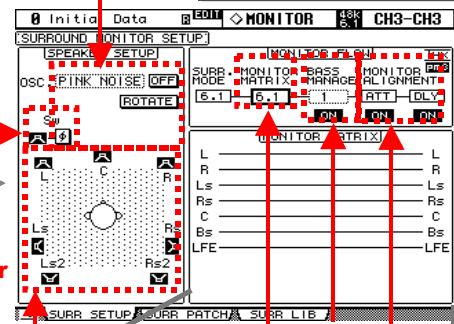
Surround mode (Main Bus)



Bus Mute/Solo



Noise Generator



SUB phase

Master Vol.

SP Mute

Monitor Bass Att. Bus Mng. Dly.

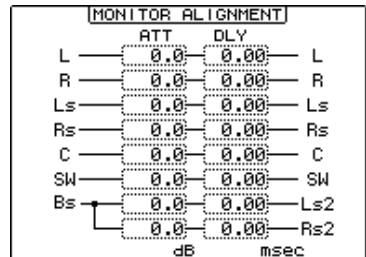
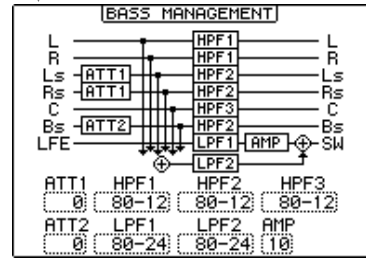
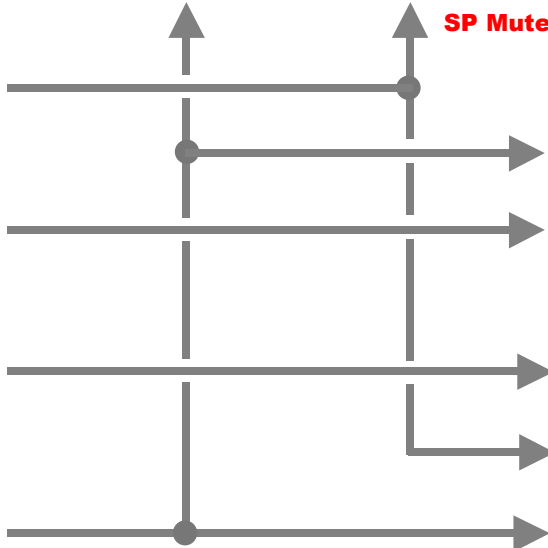
Level Balance

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 [May '05, r351]
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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

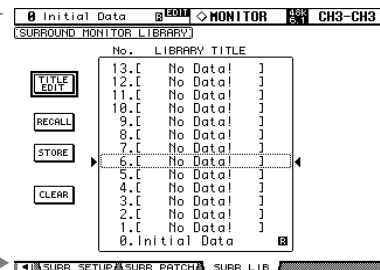
5) For 3-1, adjust the surround level again.

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”.

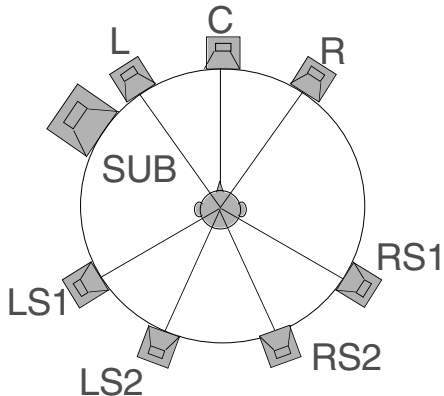
7) For 6.1, adjust the LS, RS, BS level again.

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



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

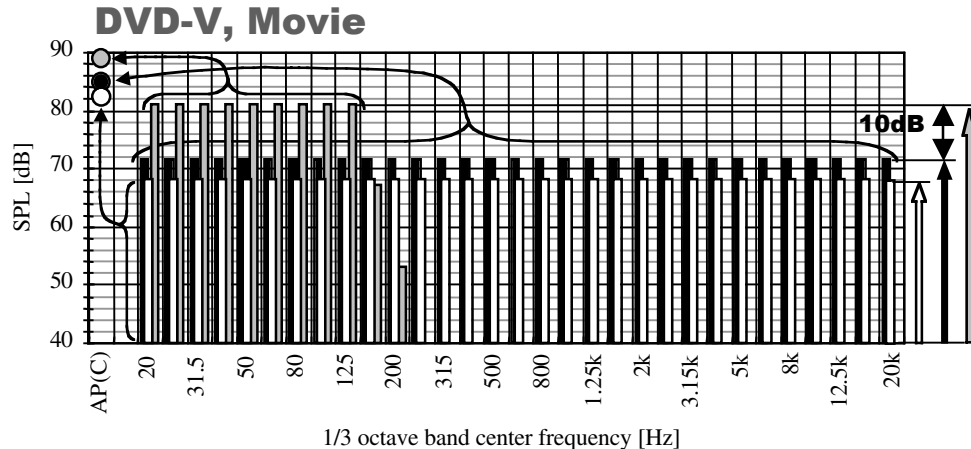
| CH | Target | L | C | R | LS | RS | BS | LFE |
|-----|--------|-------|-------|-------|---------------|-------|-------|------------------|
| 3-1 | DVD-V | 85dBC | 85dBC | 85dBC | S=LS+RS=85dBC | | - | - |
| | Movie | | | | (LS=RS=82dBC) | | | |
| 5.1 | DVD-V | 85dBC | 85dBC | 85dBC | 85dBC | 85dBC | - | +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

DM2000 DM1000 O2R96 Ver2
Surround-monitoring functions
quick reference [May '05, r351]
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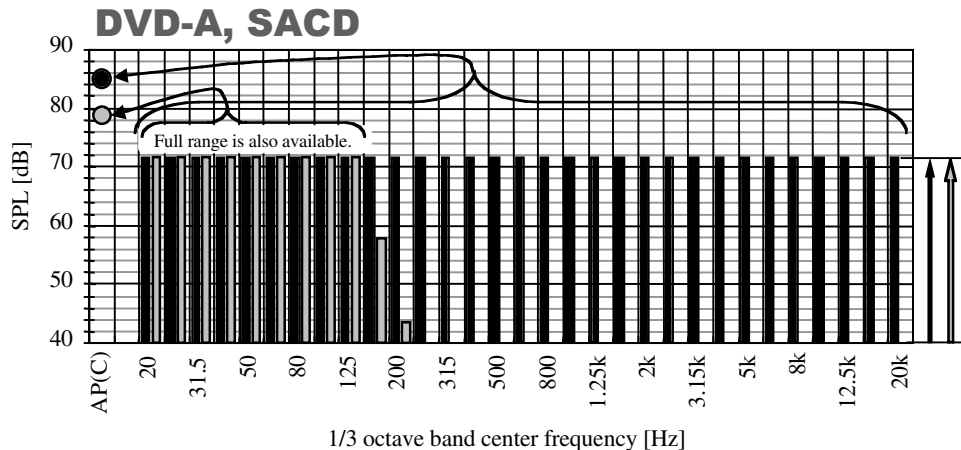


Main channels

- 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



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
 quick reference [May '05, r351]
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