# Chapter 6: Bus Out (Group Outputs)

## Digital Output Connections

The eight Bus signals are output simultaneously to the following outputs.

| Connection | Connector | Format |
|---|---|---|
| BUS OUT 1-8 | 25-pin D-sub | Y1, Y2, SDIF2, or M |
| BUS OUT AES/EBU | XLR-3-32 type | AES/EBU |
| INPUT CHANNEL DIGITAL I/O | 25-pin D-sub | Y1, Y2, SDIF2, or M |
| MONITOR CHANNEL DIGITAL I/O | 25-pin D-sub | Y1, Y2, SDIF2, or M |

Data from each output can be bit shifted independently. See "Bit Shifting Digital Output Signals" on page 123.

For details about the AES/EBU BUS OUT's channel status and user bits, see "AES/EBU Channel Status & User Bits" on page 121.

## Setting the Bus Output Format

On the [O.Format] LCD function the data format for the 25-pin D-sub connections that output the Bus signals can be set to Yamaha Y1, Yamaha Y2, SDIF2, or M.

Use the PARAMETER SELECT keys to select a Bus output format, then press the [+1/ON] key. The selected format will flash on the LCD.

```
              **** Initial Data ****
     ---- Output Format Select-----
     BUS           >Y1      >Y2     >SDIF2      >M
     INPUT Direct  >Y1      >Y2     >SDIF2      >M
     MONITOR Direct >Y1     >Y2     >SDIF2      >M
     ST Input Direct >Y1    >Y2     >SDIF2      >M


     [ WCKL Sel ]  [ I.Format ]  [ O.Format ]  [ DIO Sel. ]
         F1            F2            F3            F4
```
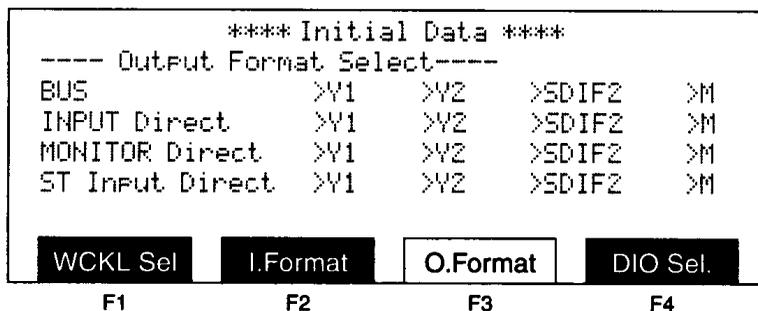
## Metering

The Bus output signal levels can be monitored on meter bank II. Use the METER SELECT [II] key to select BUS.

## Setting the Bus Output Levels

To set the Bus output levels, press the FADER STATUS [BUS MSTR] key. The BUS LED located at the top of channel 8 fader will light up, and the channel faders will control the Bus output levels. Refer to the red print legend on right-hand side of the faders. The Bus fader positions can be monitored on the [Master] LCD function shown below.

```
                **** Initial Data ****
     ---- Master Level ----(dB)  * = unity
  BUS    1/5      2/6      3/7      4/8      STEREO
          *        *        *        *          *
          *        *        *        *
  AUX     1        2        3       DIM        AFL
          *        *        *        .          .
    ┌─────────┬─────────┬─────────┬─────────┐
    │  Input  │   Aux   │ Master  │ Grouping│
    └─────────┴─────────┴─────────┴─────────┘
       F1        F2        F3        F4
```

## Controlling Bus Levels as Stereo Pairs

The Bus output levels can be controlled as stereo pairs: 1/2, 3/4, 5/6, 7/8.

On the [Config.] LCD function, set the "Bus Stereo Link" parameter to "on", as shown below.

```
                **** Initial Data ****
     ---- System configuration ----
  > Bus Stereo Link           on
  > Time Code Frame Erase      off
  > CD/DAT Copy Prohibit       off
  > Remote Parity              Even
  > Noise Shaping              off
    ┌─────────┬─────────┬─────────┬─────────┐
    │ Config. │Function │ ST Pair │ BitShift│
    └─────────┴─────────┴─────────┴─────────┘
       F1        F2        F3        F4
```

Bus output faders in each pair will be set to the same position, and adjusting either fader in a pair will control both output levels.

## Monitoring the Bus Outputs

Bus output signals can be monitored as follows.

1. Press the MONITOR [BUS] key on the Monitor channel that corresponds with the Bus output, for example, channel 1 for Bus 1. The [BUS] key will light up.

2. Make sure that the MONITOR [ON] key is on.

3. Set the monitor level using the MONITOR LEVEL control.

   In Mix mode, a Bus output cannot be monitored if the corresponding Monitor channel is routed to that particular Bus output. This prevents a signal loop situation.

   Bus outputs can be soloed by pressing the corresponding MONITOR [SOLO] key while the MONITOR [BUS] key is on.

   > **Note:** If the Output Emphasis parameter, [Emphasis] LCD function, is set to "on" the Bus output signal will be monitored with emphasis, a high frequency boost.

# Chapter 7: Stereo Output

## Digital Output Connections

The Stereo signal is sent to the following outputs simultaneously.

| Connection | Connector | Format |
|---|---|---|
| STEREO OUT Y2 | 8-pin DIN | Yamaha Y2 |
| STEREO OUT SDIF2 (XLR) | XLR-3-32 type | SDIF2 |
| STEREO OUT SDIF2 (BNC) | BNC | TTL |
| STEREO OUT AES/EBU | XLR-3-32 type | AES/EBU |
| STEREO OUT CD/DAT | RCA/phono | CD/DAT |

Data from each output can be bit shifted independently. See "Bit Shifting Digital Output Signals" on page 123.

For details about the AES/EBU and CD/DAT output's channel status and user bits, see "AES/EBU Channel Status & User Bits" on page 121.

## CD/DAT Copy Prohibit

If the "CD/DAT Copy Prohibit" parameter on the [Config.] LCD function is set to "on", the CD/DAT output signal will be set to copy prohibit. This copy prohibit is the same as SCMS.

## Stereo Insert

An external processor can be patched into the Stereo output via the STEREO INSERT IN/OUT Y2 8-pin DIN connections. Before the insert can be used it must be switched on. Make sure you switch the insert off after use, otherwise, the Stereo signal will not be output.

The [Ins. On] LCD function is used to turn on the stereo insert (ST MASTER).

```
            **** Initial Data ****
   ---- Insert on/off ----
          1     2     3     4     5     6     7     8
   INP  off   off   off   off   off   off   off   off
   MON  off   off   off   off   off   off   off   off
   ST.A off         ST.B off          ST.C off
   ST MASTER              off
```

| Emphasis | Emp. mon | Ins. On | Ins. Pre |
|---|---|---|---|
| F1 | F2 | F3 | F4 |

## Stereo On/Off

The Stereo outputs can be muted by pressing the STEREO [ON] key that is located above the STEREO fader.

## Fader

The STEREO fader adjusts the Stereo output level. The STEREO fader position can be monitored on the [Master] LCD function shown below (STEREO).

```
            **** Initial Data ****
     ---- Master Level ----(dB)  * = unity
 BUS   1/5     2/6     3/7     4/8     STEREO
        *       *       *       *        *
        *       *       *       *
 AUX    1       2       3      DIM      AFL
        *       *       *       .        .
    ┌──────────┬──────────┬─────────┬──────────┐
    │  Input   │   Aux    │ Master  │ Grouping │
    └──────────┴──────────┴─────────┴──────────┘
        F1         F2         F3         F4
```
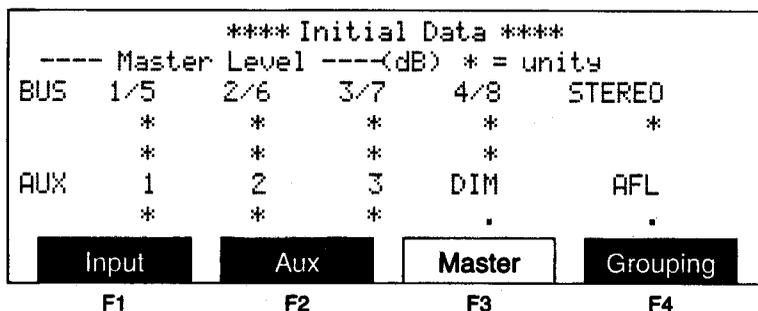
It can also be monitored on the [Input] LCD function. A bar type display of all faders can be seen on the Fader Edit LCD function.

## Balance

The balance between the left and right Stereo signals can be set on the [Balance] LCD function shown below (Stereo Master).

0 = left (+3 dB), 16 = center, 32 = right (+3 dB).

```
            **** Initial Data ****
     ----- Balance -----
 >ST.A 16      >ST.B 16     >ST.C 16
 >Stereo Master      16
 >Monitor Master     16


    ┌──────────┬──────────┬─────────┬──────────┐
    │  Delay   │ Balance  │ Ch Link │   SOLO   │
    └──────────┴──────────┴─────────┴──────────┘
        F1         F2         F3         F4
```
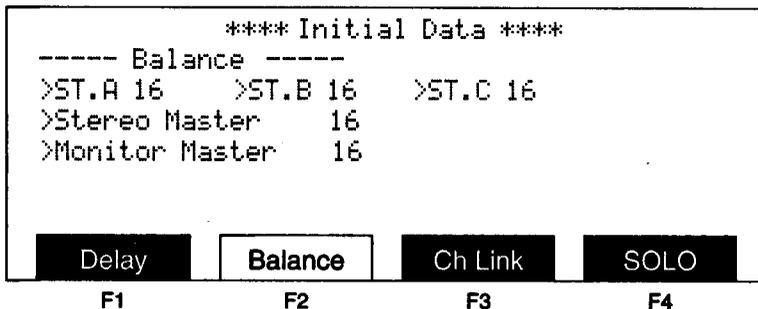
## Metering

The Stereo output levels are displayed on the 32-segment L STEREO R bargraphs.

> **Note:** The CLIP LEDs indicate a maximum output of +18 dBm. The –14 LEDs indicate output levels of +4 dBm – 0VU.

# Noise Shaping

The DMC1000 internally processes digital audio at a 28-bit resolution. If the Stereo output signal is sent as it is to a 16- or 20-bit DAT or DTR, the extra bits will just be chopped off, greatly reducing the audio quality. Therefore, the DMC1000 uses a technique known as noise shaping to produce 16- and 20-bit data from 28-bit data.

There are two noise shaping parameters on the [Config.] LCD function: "Noise Shaping" (on/off) and "Noise Shaping bit No." (16~26).

Use the PARAMETER SELECT keys to select a noise shaping parameter and the PARAMETER ADJUST keys or data entry wheel to set a value.

```
            **** Initial Data ****
     ---- System configuration ----
    > Noise Shaping            off
    > Noise Shaping bit No.    off
    > Grouping Memory          on
    > Link Parameter Memory    off
    > Mem Store Confirmation   on
   ┌──────────┬──────────┬──────────┬──────────┐
   │  Config. │ Function │ ST Pair  │ BitShift │
   └──────────┴──────────┴──────────┴──────────┘
       F1         F2         F3         F4
```
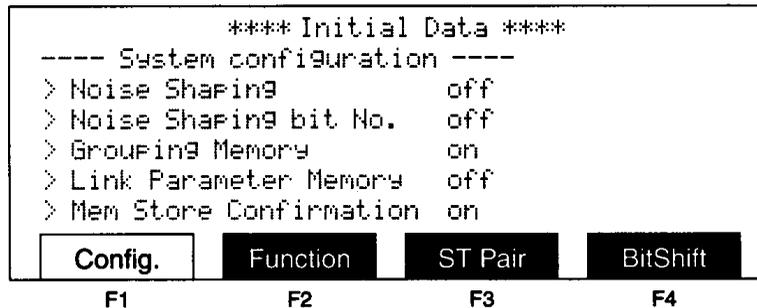
If Noise Shaping is set to off, no noise shaping is applied.

If you are recording the Stereo output to a 16-bit DAT, set the "Noise Shaping bit No." to 16. If you are recording the Stereo output onto a 20-bit DTR, set the "Noise Shaping bit No." to 20.

# Chapter 8: C-R, Small/Large Monitors & Phones

Apart from independent level controls, the following monitor outputs are controlled by the same monitor functions and all are fed from the same selectable monitor source.

## Output Connections

| MONITOR OUT (ANALOG) | Connector | Format |
|---|---|---|
| SMALL L/R | XLR-3-32 type | ANALOG |
| LARGE L/R | XLR-3-32 type | ANALOG |
| C-R MONITOR OUT | AES/EBU | AES/EBU |
| | Y2 | Yamaha Y2 |
| PHONES | 1/4" phone jack | ANALOG |

## C-R Monitor [EXT, [CUE], & [ST] keys

These keys are used to select the monitor source. Once a key has been pressed to select the monitor source, pressing it again will mute the LARGE and SMALL monitor outputs. While muted, the respective key will flash.

### [EXT] key

This key selects the 2TR monitor inputs. The 2TR monitor source is set using the [I.Format] or [EXT Mon] LCD function. See "2TR Monitor Inputs" on page 68 for full details.

If the "Auto C-R Monitor Screen" parameter on the [Config.] LCD function is set to "on", the [EXT Mon] LCD function will appear automatically when the C-R MONITOR [EXT] key is pressed.

### [CUE] key

This key selects the Aux buses. The [CUE Sel] LCD function shown below is used to select which Aux bus.
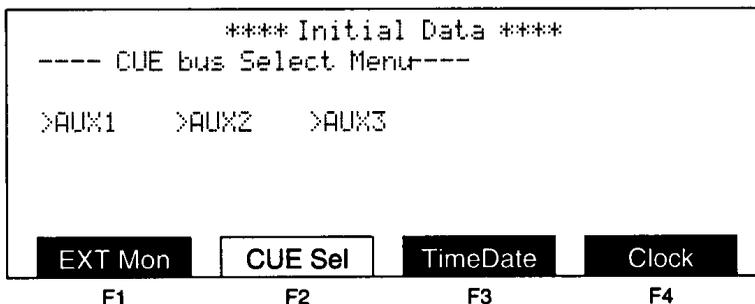
```
            **** Initial Data ****
     ---- CUE bus Select Menu----

  >AUX1     >AUX2     >AUX3




   [ EXT Mon ] [ CUE Sel ] [ TimeDate ] [ Clock ]
       F1          F2          F3          F4
```

If the "Auto C-R Monitor Screen" parameter on the [Config.] LCD function is set to "on", the [CUE Sel] LCD function will appear automatically when the C-R MONITOR [CUE] key is pressed.

## [ST] key

This key selects the Stereo bus. The source can be set to "Pre Fader Listen" (Stereo bus) or "After Fader Listen". This setting is made on the [Routing] LCD function shown below (C-R Monitor [ST]).

```
             **** Initial Data ****
     ---- Signal Routing ----
    >Stereo InputA INT      >Stereo InputB INT
    >C-R Monitor[ST]      After Fader Listen
    >AFL                  After Fader Listen
    >Direct out           After Fader Listen


     ┌─────────┬─────────┬─────────┬─────────┐
     │  Phase  │  Meter  │ Routing │ FadeTime│
     └─────────┴─────────┴─────────┴─────────┘
        F1        F2        F3        F4
```
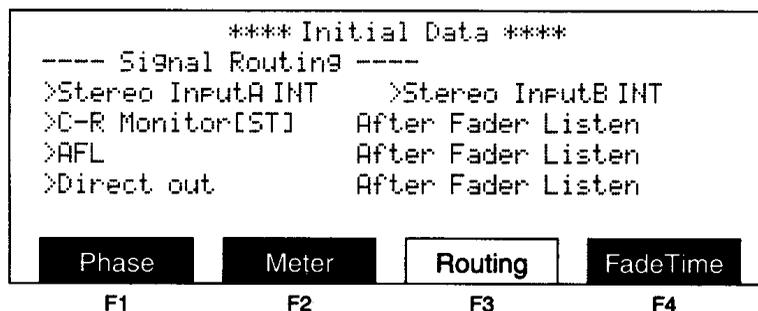
# [MONO] key

Press the [MONO] key to mono the monitor signal.

# AFL LEVEL

This control sets the level of the signal from the Solo bus, used in AFL mode.

The AFL LEVEL control's position can be monitored on the [Master] LCD function (AFL).

# SOLO [AFL] key

The two solo modes, SOLO and AFL, are selected with this key: light off for SOLO mode, light on for AFL mode.

Double clicking the [AFL] key turns off any [SOLO] keys that are on.

## SOLO mode

In SOLO mode, when a channel [SOLO] key is pressed, all other channels are muted, the [ON] keys of the muted channels flash, and the monitor source is switched to the Stereo bus. If, however, a channel is set as a Safe channel, it will not be muted, and its [SOLO] key will flash. Safe channels are set on the [SOLO] LCD function. See "Safe Channels" on page 63.

## AFL mode

In AFL mode, when a channel [SOLO] key is pressed, the monitor source is switched to the Solo bus, and the soloed channel is monitored. The AFL LEVEL control can be used to set the level of the signal coming from the Solo bus.

# SOLO Clear at Recall

The SOLO Clear at Recall parameter on the [Config.] LCD function allows you to select whether or not channels remain soloed when scene memories are recalled.

## Safe Channels

A Safe channel is one that will not be muted when another channel's [SOLO] key is pressed in SOLO mode. Safe channels are set on the [SOLO] LCD function shown below.

✻ safe channel

. will be muted in SOLO mode

```
           ✻✻✻✻ Initial Data ✻✻✻✻
----- SOLO System Menu-----
Console Status : Recording >Mode: AFL
----- SOLO Safe Channels[✻:Safe] ----
           1 2 3 4 5 6 7 8           A B C
Input      ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻  ST.Input  ✻ ✻ ✻
Monitor    . . . . . . . .
┌─────────┬─────────┬─────────┬─────────┐
│  Delay  │ Balance │ Ch Link │  SOLO   │
└─────────┴─────────┴─────────┴─────────┘
    F1         F2        F3        F4
```
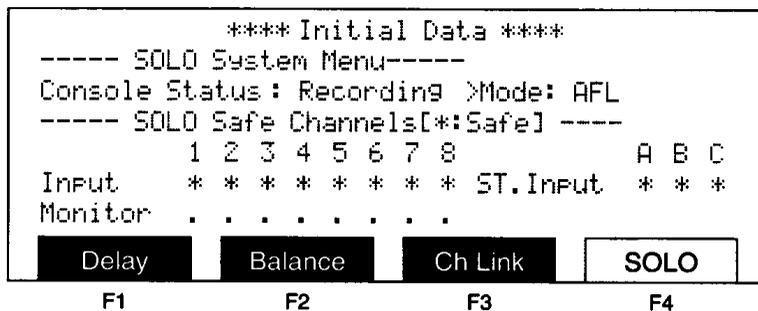
In Rec mode, the Input channels and Stereo channels are set as Safe channels automatically. In Mix mode, no channels are preset as Safe channels.

To set a Safe channel, use the PARAMETER SELECT keys to select the channel and the PARAMETER ADJUST keys or data entry wheel to set it.

The SOLO and AFL modes can also be selected on the [SOLO] LCD function.

## DIM LEVEL control

This control determines the level of the monitors when dimmed.

The DIM LEVEL control's position can be monitored on the [Master] LCD function (DIM).

## DIM [ON]

Press the [DIM] key to dim the monitors to the level set by the DIM LEVEL control.

This function is engaged automatically when the [ON] and [ALL] TALKBACK keys are pressed. See "Talkback & Slate" on page 70.

# Balance

The balance between the left and right monitor signals can be set on the [Balance] LCD function shown below (Monitor Master).

0 = left (+3 dB), 16 = center, 32 = right (+3 dB).

```
               **** Initial Data ****
      ----- Balance -----
    >ST.A 16      >ST.B 16    >ST.C 16
    >Stereo Master      16
    >Monitor Master     16


     ┌─────────┬─────────┬─────────┬─────────┐
     │  Delay  │ Balance │ Ch Link │  SOLO   │
     └─────────┴─────────┴─────────┴─────────┘
        F1        F2        F3        F4
```
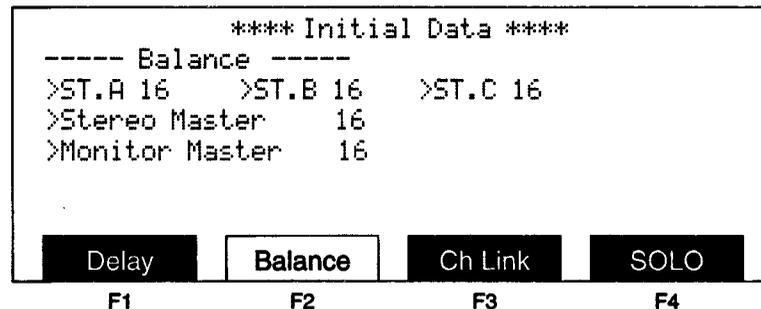
# Metering

The monitor signal level can be monitored on meter bank III (L-CR-R). Use the METER SELECT [III] key to select CUE/CR.

# SMALL LEVEL control

This control sets the level of SMALL MONITOR outputs.

# LARGE LEVEL control

This control sets the level of LARGE MONITOR outputs.

# [SMALL] key

This key switches between the SMALL and LARGE monitor outputs. This allows you to switch between two pairs of monitor speakers. For example, your near field monitors could be connected to the SMALL monitor outputs and your main monitors to the LARGE monitor outputs.

Light off for LARGE MONITOR outputs.

Light on for SMALL MONITOR outputs.

# PHONES LEVEL

This control sets the headphone volume level.

Note: You may find the PHONES jack connection a little bit stiff when plugging and unplugging your headphones. However, this is normal and is intended to prevent accidental disconnection.

# Chapter 9: Studio & Cue Monitors

## Output Connections

| MONITOR OUT (ANALOG) | Connector | Format |
|---|---|---|
| CUE | XLR-3-32 type | ANALOG |
| STUDIO | XLR-3-32 type | ANALOG |

## CUE [MON] key

Selects the cue/studio monitor source.

When the key is unlit, the source is set to the Aux buses. The [CUE Sel] LCD function can be used to select which Aux bus.

If the "Auto C-R Monitor Screen" parameter on the [Config.] LCD function is set to "on", the [CUE Sel] LCD function will appear automatically when the C-R MONITOR [CUE] key is pressed.

When the key is lit, the source is determined by the C-R MONITOR [EXT], [CUE], and [ST] keys. The source is affected by the [MONO] key, but not the solo and dim controls.

## CUE LEVEL Control

This control sets the level of the CUE MONITOR outputs.

## CUE [ON] key

This key turns the CUE MONITOR outputs on and off.

## STUDIO MONITOR LEVEL control

Sets the level of the STUDIO MONITOR outputs.

## STUDIO MONITOR [ON] key

This key turns the STUDIO MONITOR outputs on and off.

## Metering

The cue/studio monitor signal levels can be monitored on meter bank III (L-CUE-R). Use the METER SELECT [III] key to select CUE/CR.

# Chapter 10: Auxiliary Master Sends

## Auxiliary Output Connections

The auxiliary send signals are output via the following connections.

| Connection | Connector | Format |
|---|---|---|
| AUX SEND (ANALOG) 1 | XLR-3-32 type | Analog |
| AUX SEND 1 | 8-pin DIN | Yamaha Y2 (MONO LEFT) |
| AUX SEND (ANALOG) 2 | XLR-3-32 type | Analog |
| AUX SEND 2 | 8-pin DIN | Yamaha Y2 (MONO LEFT) |
| AUX SEND (ANALOG) 3 L/R | XLR-3-32 type | Analog |
| AUX SEND 3 L/R | 8-pin DIN | Yamaha Y2 |

## AUX SEND [ON] keys

These keys turn the corresponding auxiliary send on and off.

## AUX SEND LEVEL control

To set an auxiliary send level, use the AUX SEND [1], [2], and [3] keys to select an auxiliary, then use the AUX SEND LEVEL control.

With the GLOBAL [ENABLE] key on, pressing the AUX SEND [1], [2], and [3] keys will also select Input channels and Monitor channel's AUX [1], [2], and [3] keys.

The AUX SEND LEVEL control's positions can be monitored on the [Master] LCD function shown below.

```
             **** Initial Data ****
       ---- Master Level ----(dB)  * = unity
   BUS   1/5      2/6      3/7      4/8      STEREO
          *        *        *        *          *

          *        *        *        *
   AUX    1        2        3       DIM       AFL
          *        *        *        .          .
```

| Input | Aux | Master | Grouping |
|---|---|---|---|
| F1 | F2 | F3 | F4 |

## Monitoring Aux Sends

To monitor an auxiliary send via the following monitor outputs.

| SMALL MONITOR OUT |
| --- |
| LARGE MONITOR OUT |
| C-R MONITOR OUT |
| PHONES |

1. Press the C-R MONITOR [CUE] key.
2. Use the [CUE Sel] LCD function shown below to select an aux send. The selected aux send flashes on the LCD.
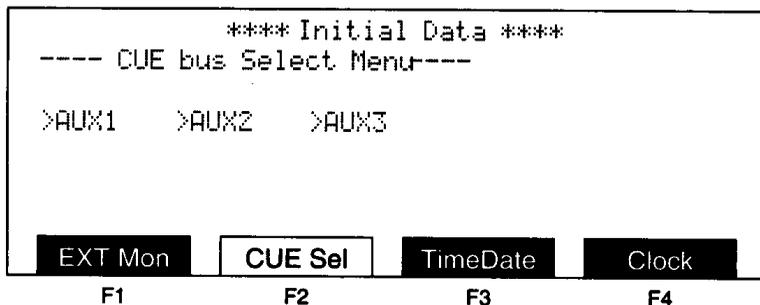
```
                **** Initial Data ****
      ---- CUE bus Select Menu----

      >AUX1     >AUX2     >AUX3




   ┌─────────┬─────────┬──────────┬─────────┐
   │ EXT Mon │ CUE Sel │ TimeDate │  Clock  │
   └─────────┴─────────┴──────────┴─────────┘
       F1         F2        F3         F4
```

To monitor an auxiliary send via the following monitor outputs.

| CUE MONITOR OUT |
| --- |
| STUDIO MONITOR OUT |

1. Press the CUE [MON] key (light off).
2. Use the [CUE Sel] LCD function to select an aux send. The selected aux send flashes on the LCD.

   If the "Auto C-R Monitor Screen" parameter on the [Config.] LCD function is set to "on", the [CUE Sel] LCD function will appear automatically when the C-R MONITOR [CUE] key is pressed.

## Metering

The auxiliary send signal levels can be monitored on meter bank III. Use the METER SELECT [III] key to select AUX.

## Aux Sends & the Internal Effects

As well as their output connections, auxiliary sends 1 and 2 also feed the internal effects: Effect 1 and Effect 2. See "Effects" on page 75 for a full explanation of the relationship between auxiliary sends and internal and external effects.

# Chapter 11: 2TR Monitor Inputs

The following inputs are provided for connecting a 2-track master recorder.

| 2TR MONITOR INPUT (CH7-8) | Connector | Format |
|---|---|---|
| Y2 | 8-pin DIN | Yamaha Y2 |
| SDIF2 | BNC | TTL |
| AES/EBU | XLR-3-31 type | AES/EBU |
| CD/DAT1 | RCA/phono | CD/DAT |
| CD/DAT2 | RCA/phono | CD/DAT |

For details about the AES/EBU and CD/DAT input's channel status and user bits, see "AES/EBU Channel Status & User Bits" on page 121.

## Yamaha 8-pin DIN Input & Emphasis

Emphasis cannot be detected automatically for the Y2 2TR MONITOR INPUT, you must set the emphasis input status yourself. See "Yamaha 8-pin DIN Format Emphasis" on page 120.

## 2TR Monitor Source Selection

To monitor a 2TR monitor input via the following monitor outputs.

| |
|---|
| SMALL MONITOR OUT |
| LARGE MONITOR OUT |
| C-R MONITOR OUT |
| PHONES |

1. Press the C-R MONITOR [EXT] key.
2. Use the [I.Format] or [EXT Mon] LCD function to select a 2TR monitor input. Both LCD functions are shown below. Use the PARAMETER SELECT keys to select a 2-Track input, then press the [+1/ON] key. The currently selected input flashes on the LCD.

```
             **** Initial Data ****
     ---- Input Channel Format Select----
     >Y1  Y2  >SDIF2   >M  >AES/EBU  >DIO
     ---- Monitor Channel Format Select----
     >Y1  Y2  >SDIF2   >M  >DIO
     ---- 2Track In Format Select----
     >AES  >CD/DAT1  >CD/DAT2  >SDIF2  >Y2
```

| WCKL Sel | I.Format | O.Format | DIO Sel. |
|---|---|---|---|
| F1 | F2 | F3 | F4 |
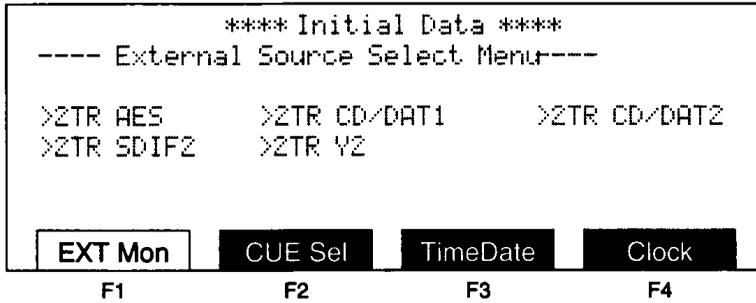
```
             **** Initial Data ****
      ---- External Source Select Menu----

   >2TR AES       >2TR CD/DAT1      >2TR CD/DAT2
   >2TR SDIF2     >2TR Y2


   ┌─────────┐
   │ EXT Mon │   CUE Sel     TimeDate      Clock
   └─────────┘
      F1          F2           F3          F4
```

To monitor a 2TR monitor input via the following monitor outputs.

| CUE MONITOR OUT |
| --- |
| STUDIO MONITOR OUT |

1. Press the C-R MONITOR [EXT] key.

2. Use the [I.Format] or [EXT Mon] LCD function to select a 2TR monitor input. Both LCD functions are shown below. Use the PARAMETER SELECT keys to select a 2-Track input, then press the [+1/ON] key. The currently selected input flashes on the LCD.

3. Press the CUE [MON] key (light on).

   If the "Auto C-R Monitor Screen" parameter on the [Config.] LCD function is set to "on", the [EXT Mon] LCD function will appear automatically when the C-R MONITOR [EXT] key is pressed.

## 2TR Monitor Signal into Input Channels 7 & 8

The selected 2TR monitor input signals can be fed into Input channels 7 and 8. This allows you to apply EQ and other Input channel functions to the 2TR monitor input signals. This could also be used to input CD/DAT, SDIF2, or Yamaha Y2 8-pin DIN format digital into Input channels 7 and 8.

On the [DIO Sel.] LCD function, set the "INP7/8 in" parameter to "2TRK".

```
             **** Initial Data ****
      ---- DIO Select ----
   >  INP7/8 in    2TRK
   >  ST Input A   Digital        >  INT
   >  ST Input B   Digital        >  INT
   >  ST Input C   Digital


                                        ┌──────────┐
    WCKL Sel     I.Format     O.Format  │ DIO Sel. │
                                        └──────────┘
      F1           F2           F3          F4
```
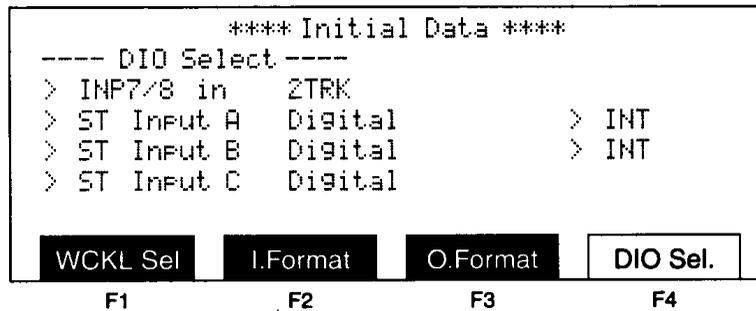
# Chapter 12: Talkback & Slate

The DMC1000 is fitted with an internal condenser microphone (MIC) for talkback operation. The talkback microphone level can be set using the TALKBACK LEVEL control.

There are three talkback modes: [ON], [ALL], and [SLATE]. The following table shows how each output is affected in each of the three modes.

| Output | TALKBACK KEYS | | |
|---|---|---|---|
| | [ON] | [ALL] | [SLATE] |
| AUX 1 SEND | AUX 1 + TB selected on the [CUE Sel] LCD function | | N/C |
| AUX 2 SEND | AUX 2 + TB selected on the [CUE Sel] LCD function | | N/C |
| AUX 3 SEND | AUX 3 + TB selected on the [CUE Sel] LCD function | | N/C |
| | | | |
| CUE OUT | TB + the AUX selected on the [CUE Sel] LCD function | | OFF |
| STUDIO OUT | | | OFF |
| | | | |
| SMALL OUT | DIM | DIM | OFF |
| LARGE OUT | DIM | DIM | OFF |
| C-R MONITOR OUT | DIM | DIM | OFF |
| PHONES | DIM | DIM | OFF |

| | | BUS ASSIGN | | BUS ASSIGN | |
|---|---|---|---|---|---|
| | | ✳ | ▪ | ✳ | ▪ |
| STEREO OUT | N/C | TB + Stereo bus | N/C | SLATE | SLATE |
| | | | | | |
| BUS OUT | N/C | TB + BUS | N/C | SLATE | N/C |

N/C: no change

TB: talkback from internal microphone.

DIM: output level dimmed. Dimmed level set by DIM LEVEL control.

OFF: output switched off.

SLATE: oscillator signal controlled by the [OSC] LCD function.

**Note: When a talkback mode is engaged, Stereo channel C is muted. This is because the talkback system uses some of the circuitry from Stereo channel C.**

When a talkback mode is engaged, the C-R MONITOR [EXT], [CUE], and [ST] keys flash, the [DIM] key lights up, and the CUE [MON] key is switched off.

## Talkback & Slate Bus Assign

The BUS ASSIGN parameters for the Stereo output and Bus outputs are set using the [Talkback] LCD function shown below.

```
              **** Initial Data ****
----- Talkback Control-----
MODE:off

BUS ASSIGN 1 2 3 4 5 6 7 8 ST
            . . . . . . . . .

 ┌──────────┬──────────┬──────────┬──────────┐
 │ Talkback │   OSC    │ Cascade  │   Disk   │
 └──────────┴──────────┴──────────┴──────────┘
     F1          F2         F3         F4
```
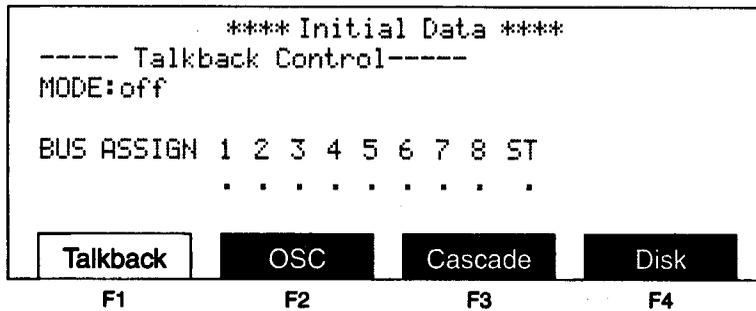
Use the PARAMETER SELECT keys to select a Bus and the PARAMETER ADJUST keys or data entry wheel to make a setting.

.   talkback and slate will not be sent to a Bus (see note below).

*   talkback and slate will be sent to a Bus.

> **Note:** The slate signal is sent to the Stereo output regardless of the "ST" BUS ASSIGN setting. However, it is sent to Bus 1~8 only when a Bus is set to *.

The "MODE" parameter on the [Talkback] LCD function indicates the currently selected talkback mode.

# Slate Oscillator Setup

The SLATE oscillator is set up using the [OSC] LCD function.

```
              **** Initial Data ****
     ----- OSCILLATOR -----
     >  Oscillator              off
     >  Frequency             1.0kHz
     >  Attenuator             -20dB

     >  A/D Offset Calibration
```

| [1.0kHz] | [10kHz] | [100Hz] | [EXIT] |
|:---:|:---:|:---:|:---:|
| F1 | F2 | F3 | F4 |

**Oscillator:** when the "Oscillator" parameter is set to on, the oscillator is sent to all outputs except the Bus outputs. When the [SLATE] key is pressed, this parameter indicates that the oscillator is on.

> **Note:** Make sure you've got your master output level controls turned down before switching the oscillator on – you don't want to give someone a tone burst surprise.

**Frequency:** the oscillator frequency range is from DC, 20 Hz to 20 kHz. Use the PARAMETER ADJUST keys or data entry wheel to set the frequency.

> **Note:** The DC setting does not output DC to the analog outputs.

**Attenuator:** the oscillator output can be attenuated from 0 dB to –96 dB. Use the PARAMETER ADJUST keys or data entry wheel to set the attenuation.

## [F1], [F2], & [F3]

The [F1], [F2], and [F3] keys can be used to set the oscillator frequency to 1.0 kHz, 10 KHz and 100 Hz respectively.

## [F4] – EXIT

Press to exit the [OSC] LCD function.

The oscillator can be left on while you use another LCD function. Rather than going back to the [OSC] LCD function to switch off the oscillator, you can just press the [SLATE] key.

The "A/D Offset Calibration" parameter is explained on page 127.

# Chapter 13: Metering

## L STEREO R Meters

These 32-segment LED bargraphs indicate the Stereo output levels.

> **Note:** The CLIP LEDs indicate a maximum output of +18 dBm. The –14 LEDs indicate output levels of +4 dBm – 0VU.

## Meter Banks I, II, & III

Meter banks I, II, and III can be set to monitor various signals within the DMC1000. The meter sources can be set using the METER SELECT [I], [II], and [III] keys or the [Meter] LCD function. The [Meter] LCD function can also be used to select pre EQ, post EQ, or post fader metering for the Input channels, Monitor channels, and Stereo inputs. The meter's hold and fall times can also be set.

```
             **** Initial Data ****
----- Meter setting MENU -----
  Meter1          Meter2          Meter3
 >Input          >Monitor        >Aux Send
  Input           Monitor        ST Input
 >Pre EQ         >Pre EQ         >Pre EQ   >INT
 >Hold 48500 Sample              >Fall  679 Sample
```

| Phase. | Meter | Routing | FadeTime |
|--------|-------|---------|----------|
| F1 | F2 | F3 | F4 |

Use the PARAMETER SELECT keys to select parameters and the PARAMETER ADJUST keys or data entry wheel to set them.

### Meter Bank I

| Meter 1 | Source | Source Options | Notes |
|---------|--------|----------------|-------|
| Input (INP) | Input channels 1~8 | Pre EQ | – |
| | | Post EQ | |
| | | Post Fader | |
| Monitor (MON) | Monitor channels 1~8 | Pre EQ | Cannot be selected when meter II is set to Monitor |
| | | Post EQ | |
| | | Post Fader | |
| ST Input (ST IN), "INT" parameter set to INT | Stereo channels A~C | Pre EQ | – |
| | | Post EQ | |
| | | Post Fader | |
| ST Input (ST IN) "INT" parameter set to EXT | Effect 1 & Effect 2 returns, Stereo channel C | The Pre EQ, Post EQ, and Post Fader options can still be set for Stereo channel C | L-A-R and L-B-R indicate Effect 1 and Effect 2 return levels respectively. The INT/EXT parameter does not affect the A & B Stereo channel's input source, it is just the metering. |

**Note: Be aware that with the source option set to Post fader, in Mix mode or when a ROUTING [MON] key is pressed, the Input and Monitor channels are swapped, so the input channel signals will appear on the MON meters and the Monitor channel signals on the INP meters.**

## Meter Bank II

| Meter 2 | Source | Source Options | Notes |
|---|---|---|---|
| Monitor (MON) | Monitor channels 1~8 | Pre EQ | Cannot be selected when meter bank I is set to Monitor. |
| | | Post EQ | |
| | | Post Fader | |
| Bus (BUS) | Bus outputs 1~8 | – | – |

## Meter Bank III

| Meter 3 | Source | Source Options | Notes |
|---|---|---|---|
| Aux Send (AUX) | Aux sends 1, 2, 3 | – | – |
| Cue/C-R Monitor (CUE CR) | CUE, CR | – | – |

# Peak Hold

Press the METER SELECT [HOLD] key to turn on the peak hold function. The peak hold function affects all the bargraph meters. The peak hold time can be set on the [Meter] LCD function.

# Meter Peak Hold & Fall Times

On the [Meter] LCD function, the meter hold and fall times are specified in samples. The length of a sample is dependent on the sampling frequency. The following tables show approximate hold and fall times in the sampling frequency range 32 kHz ~ 48 kHz.

| Hold | |
|---|---|
| Samples | Time |
| 0 | 0 |
| 48500 | 1~1.5 sec |
| 97000 | 2~3 sec |

| Fall | |
|---|---|
| Samples | Time |
| 1 | 20~31 µs |
| 679 | 14~21 ms |
| 1358 | 28~42 ms |
| 2716 | 56~84 ms |

If you want to calculate the time exactly, use the formula below.

$$time = (\frac{1}{\text{sampling frequency}}) \times samples$$

# Chapter 14: Effects

## Internal Effects

The DMC1000 contains two digital stereo effects processors that utilize the same technology as the Yamaha SPX1000 digital multi-effect processor. Both internal processors have the same range of effects available, although, each can be set up independently. Effect 1 is always fed from the Aux 1 bus, after the AUX SEND 1 level control. Effect 2 is always fed from the Aux 2 bus, after the AUX SEND 2 level control. Effect 1 is returned into Stereo channel A, and Effect 2 is returned into Stereo channel B. From there, the affected signals can be mixed on to any bus just like an Input or Monitor channel signal.

## Internal Effects List

| Effect Name | Effect Description |
|---|---|
| REV 1 HALL A | Hall type A reverb simulation |
| REV 1 HALL B | Hall type B reverb simulation |
| REV 2 ROOM | Room type reverb simulation |
| REV 3 VOCAL | A reverb simulation intended for vocals |
| REV 4 PLATE | Plate type reverb simulation |
| FLANGE | Flanger |
| CHORUS | Chorus |
| PHASING | Phaser |
| SYMPHONIC | Similar to a chorus effect |
| EARLY REF. 1 | Early reflections that precede the main reverb |
| EARLY REF. 2 | Early reflections that precede the main reverb (with density parameter) |
| GATE REVERB | Gated reverb |
| REVERSE REVERB | Reverse reverb |
| DELAY L/R | A delay with 2 feedback loops |
| STEREO ECHO | A delay with independent L & R feedback loops |
| PITCH CHANGE 1 | Two pitch shifters |
| PITCH CHANGE 2 | Independent pitch shifters for the left & right channels |
| EXCITER | Psychoacoustic enhancer |
| PANPOT | Autopanner |
| COMPRESSOR | Compressor/expander |

## External Effects

External effects processors, analog and digital, can be used. All three aux sends are output via analog XLRs and Yamaha Y2 8-pin DIN digital outputs. External effects can be returned into Stereo channels A, B, and C using analog XLRs or Yamaha Y2 8-pin DIN digital inputs.

**Note: Stereo channels A and B cannot be used as internal effect returns and external effect returns simultaneously.**

External effects can also be patched into individual Input channels, Monitor channels, and Stereo channels using the 25-pin D-sub INSERT I/O connections. The Stereo output also has a Yamaha Y2 8-pin DIN insert facility. These inserts are explained in the relevant sections.

Fig 14-1 shows how the aux 1 and 2 signals are routed to the internal effects, and how Stereo channels A and B can be used as internal effect returns or external effects returns. Note that the stereo Aux 3 send is not shown, since it is not connected with the internal effects. However, Aux 3 send can be used as a stereo external effects send.
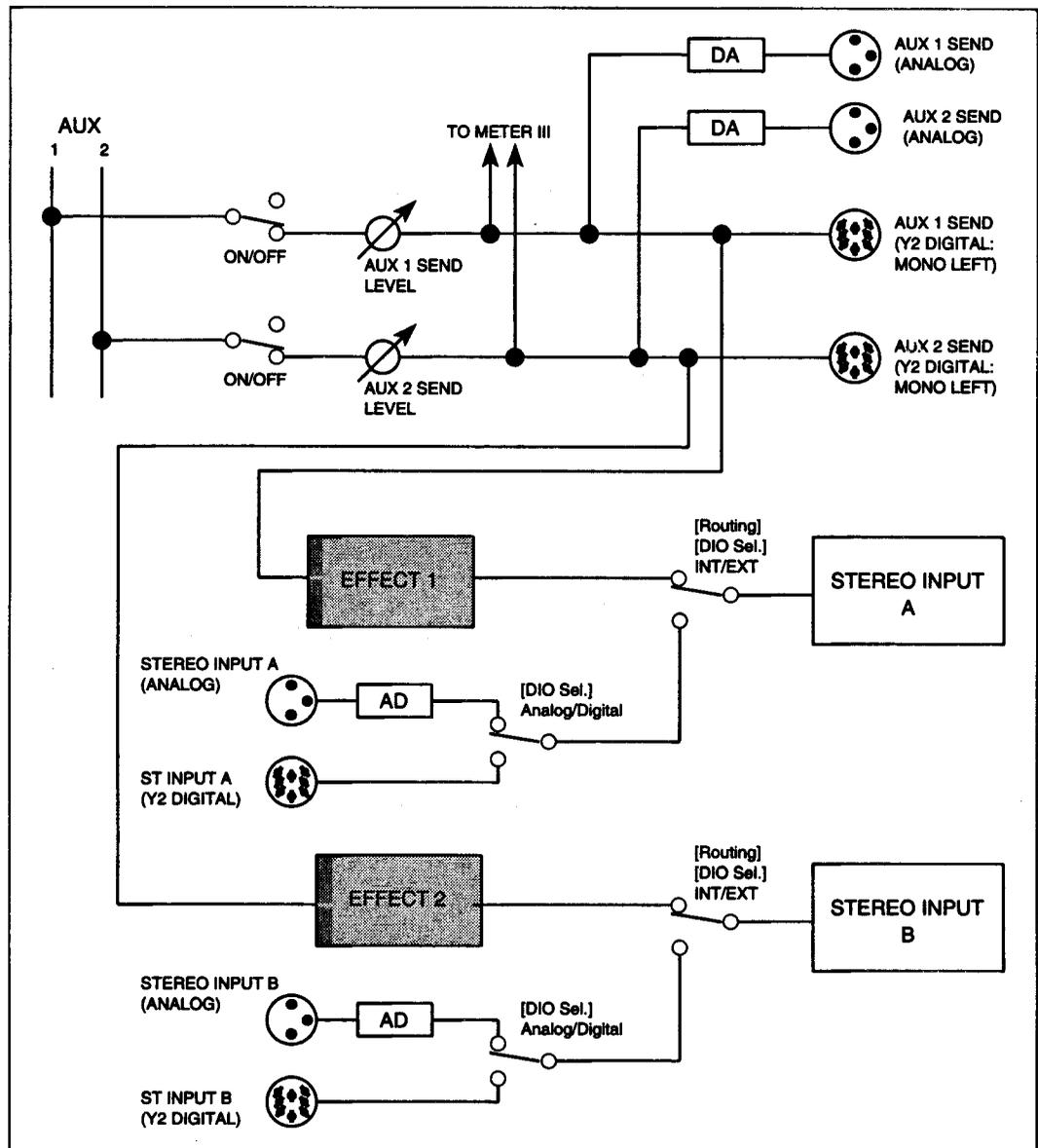


*Figure 14-1    Internal and external effect routing*

## Using the Internal Effects

1. Send a signal from an Input, Monitor, or Stereo channel onto the Aux 1 or Aux 2 bus: Aux 1 bus for Effect 1 and Aux 2 bus for Effect 2.

2. Switch on the AUX 1 or 2 AUX SEND [ON] key, and use the AUX SEND LEVEL control to set the level. With meter III set to AUX, the aux send levels can be monitored.

3. On the [DIO Sel.] LCD function, shown below, set the "ST Input A" or "ST Input B" to

INT. This setting can also be made on the [Routing] LCD function.

```
            **** Initial Data ****
   ---- DIO Select ----
   > INP7/8 in    INPUT
   > ST Input A   Digital        > INT
   > ST Input B   Digital        > INT
   > ST Input C   Digital


    WCKL Sel    I.Format    O.Format    DIO Sel.
      F1          F2          F3          F4
```
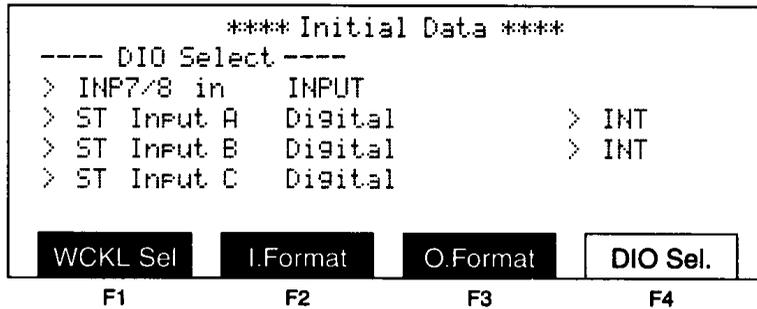
4. Set up Stereo channel A or B so that you can monitor the effect return signal.

5. Locate the [Effect 1] or [Effect 2] LCD function as required. [Effect 1] is shown below.

```
            **** Initial Data ****
   ---- Effect 1 Setting ----
   > REV 1 HALL A      >Effect Recall
   1 Rev Time          2.6 [SEC]
   2 High              0.6
   3 Low               1.2
   4 Diffusion          5

    Effect 1    Effect 2    RAM Card    Title.ed
      F1          F2          F3          F4
```
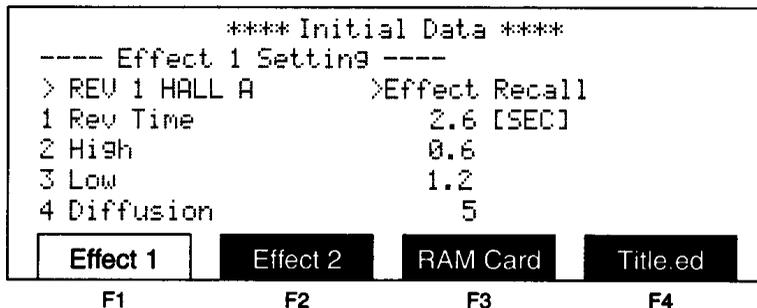
6. With the cursor positioned next to the effect name, use the PARAMETER ADJUST keys or data entry wheel to select an effect. Then position the cursor next to "Effect Recall", and press the [+/YES] key to recall the effect.

7. Use the PARAMETER SELECT and PARAMETER ADJUST keys or data entry wheel to select and adjust the effect parameters as required.

Internal effect parameters are listed on pages 78 to 83.

Effect parameter settings are saved in scene memories.

If the "Auto Effect Screen" parameter on the [Config.] LCD function is set to "on", the [Effect 1] LCD function will appear automatically when the AUX SEND [1] key is pressed, and the [Effect 2] LCD function will appear automatically when the AUX SEND [2] key is pressed. However, the A and B Stereo channels must be set to INT (internal effects).

## Using External Effects

1. Connect the external effects device to the analog AUX SENDS, or, if the device has Yamaha Y2 digital inputs, connect to a Yamaha Y2 digital AUX SEND.

2. Connect the effect returns to one of the Stereo channels: A, B, or C. Use the analog ST INPUTS or a Yamaha Y2 digital ST INPUT.

3. Set up the Stereo channel so that you can monitor the effect return signal.

4. Send a signal from an Input or Monitor channel onto the Aux 1, 2, or 3 bus.

5. Switch on the AUX 1, 2, or 3 AUX SEND [ON] key, and use the AUX SEND LEVEL control to set the send level. With meter III set to AUX, the aux levels can be monitored.

6. On the [DIO Sel.] LCD function, and depending on which Stereo channel you are using, set

the "ST Input A" or "ST Input B" to EXT. Also set the "ST Input" to either "Analog" or "Digital", depending on the type of input connection you are using.

```
              **** Initial Data ****
---- DIO Select ----
>  INP7/8 in    INPUT
>  ST Input A   Digital        >  INT
>  ST Input B   Digital        >  INT
>  ST Input C   Digital

  [ WCKL Sel ]  [ I.Format ]  [ O.Format ]  [ DIO Sel. ]
      F1           F2            F3            F4
```
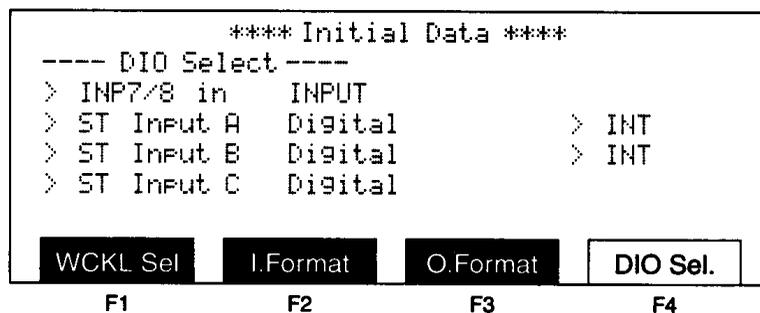
7. The input signal level can be monitored on meter bank I. Use the METER SELECT [I] key to select ST IN.

## Internal Effects Parameters

### REV 1 HALL A

| Parameter | Range | Description |
|---|---|---|
| Rev Time | 0.3 ~ 480.0 sec | Reverb time: the time it takes a 1 kHz signal to decay by 60 dB |
| High | 0.1 ~ 1.0 | High frequency decay ratio |
| Low | 0.1 ~ 2.4 | Low frequency decay ratio |
| Diffusion | 0 ~ 10 | Reverb complexity: 0 = basic room, 10 = complex room shapes |
| Initial Dly | 0.1 ~ 200.0 ms | Initial delay between the direct sound and the early reverb reflections |
| HPF Frq | off ~ 1.0 kHz | Reverb high pass filter |
| LPF Frq | 1.0 kHz ~ off | Reverb low pass filter |
| ER/Rev Balance | 0% ~ 100% | Balance between the early reflections and the denser reverb |
| Rev Delay | 0.1 ~ 100.0 ms | Delay before reverb starts |
| Density | 0 ~ 4 | Reverb density: the average time between reflections |

### REV 1 HALL B, REV 2 ROOM, REV 4 PLATE, REV 3 VOCAL

| Parameter | Range | Description |
|---|---|---|
| Rev Time | 0.3 ~ 480.0 sec | Reverb time: the time it takes a 1 kHz signal to decay by 60 dB |
| High | 0.1 ~ 1.0 | High frequency decay ratio |
| Diffusion | 0 ~ 10 | Reverb complexity: 0 = basic room, 10 = complex room shapes |
| Initial Dly | 0.1 ~ 200.0 ms | Initial delay between the direct sound and the early reverb reflections |
| HPF Frq | off ~ 1.0 kHz | Reverb high pass filter |
| LPF Frq | 1.0 kHz ~ off | Reverb low pass filter |
| ER/Rev Balance | 0% ~ 100% | Balance between the early reflections and the denser reverb |
| Rev Delay | 0.1 ~ 100.0 ms | Delay before reverb starts |
| Density | 0 ~ 4 | Reverb density: the average time between reflections |

## FLANGE

| Parameter | Range | Description |
|---|---|---|
| Mod Frq | 0.05 ~ 40.00 Hz | Modulation frequency |
| Mod Depth 1 | 0 ~ 100% | Modulator 1 depth |
| Mod Delay 1 | 0.1 ~ 100.0 ms | Modulator 1 delay |
| Mod Depth 2 | 0 ~ 100% | Modulator 2 depth |
| Mod Delay 2 | 0.1 ~ 100.0 ms | Modulator 2 delay |
| Phase | –180 ~ 180 degrees | Phase difference between modulators 1 & 2 |
| FB Gain | 0 ~ 100% | Feedback gain: the amount of flanged signal fed back into the flanger |
| HPF Frq | off ~ 1.0 kHz | Flanger high pass filter |
| LPF Frq | 1.0 kHz ~ off | Flanger low pass filter |

## CHORUS

| Parameter | Range | Description |
|---|---|---|
| Mod Frq | 0.05 ~ 40.00 Hz | Modulation frequency |
| DM Depth | 0 ~ 100% | Delay modulation depth |
| AM Depth | 0 ~ 100% | Amplitude modulation depth |
| HPF Frq | off ~ 1.0 kHz | Chorus high pass filter |
| LPF Frq | 1.0 kHz ~ off | Chorus low pass filter |

## PHASING

| Parameter | Range | Description |
|---|---|---|
| Mod Frq | 0.05 ~ 40.00 Hz | Modulation frequency |
| Mod Depth | 0 ~ 100% | Modulation depth |
| Mod Delay | 0.1 ~ 50.0 ms | Modulation delay |
| HPF Frq | off ~ 1.0 kHz | Phaser high pass filter |
| LPF Frq | 1.0 kHz ~ off | Phaser low pass filter |

## SYMPHONIC

| Parameter | Range | Description |
|---|---|---|
| Mod Frq | 0.05 ~ 40.00 Hz | Modulation frequency |
| Mod Depth | 0 ~ 100% | Modulation depth |
| HPF Frq | off ~ 1.0 kHz | Symphonic high pass filter |
| LPF Frq | 1.0 kHz ~ off | Symphonic low pass filter |

## EARLY REF. 1

| Parameter | Range | Description |
|---|---|---|
| Type | S-HALL | Small hall |
| | L-HALL | Large hall |
| | RANDOM | Randomly generated reflection pattern |
| | REVERSE | Reverse reverb |
| | PLATE | Plate reverb |
| | SPRING | Spring line reverb |
| Room Size | 0.1 ~ 25.0 | Room size affects the time intervals between the early reflections |
| Liveness | 0 ~ 10 | Liveliness: 0 = dead room, 10 = very reflective room surfaces |
| Diffusion | 0 ~ 10 | Reverb complexity: 0 = basic room, 10 = complex room shapes |
| Initial Dly | 0.1 ~ 400.0 ms | Initial delay between the direct sound and the early reverb reflections |
| LPF Frq | 1.0 kHz ~ off | Reverb low pass filter |
| FB Delay | 0.1 ~ 900.0 ms | Delay before feedback is applied |
| FB Gain | –99 ~ 99% | Feedback gain: the amount of early reflections fed back into the effect |
| FB High | 0.1 ~ 1.0 | Feedback high frequency filter |

## EARLY REF. 2

| Parameter | Range | Description |
|---|---|---|
| Type | S-HALL | Small hall |
| | L-HALL | Large hall |
| | RANDOM | Randomly generated reflection pattern |
| | REVERSE | Reverse reverb |
| | PLATE | Plate reverb |
| | SPRING | Spring line reverb |
| Room Size | 0.1 ~ 25.0 | Room size affects the time intervals between the early reflections |
| Liveness | 0 ~ 10 | Liveliness: 0 = dead room, 10 = very reflective room surfaces |
| Diffusion | 0 ~ 10 | Reverb complexity: 0 = basic room, 10 = complex room shapes |
| Initial Dly | 0.1 ~ 400.0 ms | Initial delay between the direct sound and the early reverb reflections |
| LPF Frq | 1.0 kHz ~ off | Reverb low pass filter |
| FB Delay | 0.1 ~ 900.0 ms | Delay before feedback is applied |
| FB Gain | –99 ~ 99% | Feedback gain: the amount of early reflections fed back into the effect |
| FB High | 0.1 ~ 1.0 | Feedback high frequency filter |
| Density | 0 ~ 3 | Reverb density: the average time between reflections |

## GATE REVERB, REVERSE GATE

| Parameter | Range | Description |
|---|---|---|
| Type | TYPE-A | Algorithm A |
|  | TYPE-B | Algorithm B |
| Room Size | 0.1 ~ 25.0 | Room size affects the time intervals between the early reflections |
| Liveness | 0 ~ 10 | Liveliness: 0 = dead room, 10 = very reflective room surfaces |
| Diffusion | 0 ~ 10 | Reverb complexity: 0 = basic room, 10 = complex room shapes |
| Initial Dly | 0.1 ~ 400.0 ms | Initial delay between the direct sound and the early reverb reflections |
| LPF Frq | 1.0 kHz ~ off | Reverb low pass filter |
| FB Delay | 0.1 ~ 900.0 ms | Delay before feedback is applied |
| FB Gain | –99 ~ 99% | Feedback gain: the amount of early reflections fed back into the effect |
| FB High | 0.1 ~ 1.0 | Feedback high frequency filter |
| Density | 0 ~ 3 | Reverb density: the average time between reflections |

## DELAY L/R

| Parameter | Range | Description |
|---|---|---|
| Lch Delay | 0.1 ~ 1360.0 ms | Left channel delay |
| Rch Delay | 0.1 ~ 1360.0 ms | Right channel delay |
| FB1 Delay | 0.1 ~ 1360.0 ms | Feedback loop 1 delay |
| FB1 Gain | –99 ~ 99% | Feedback loop 1 gain |
| FB2 Delay | 0.1 ~ 1360.0 ms | Feedback loop 2 delay |
| FB2 Gain | –99 ~ 99% | Feedback loop 2 gain |
| High | 0.1 ~ 1.0 | Feedback high frequency filter |
| HPF Frq | off ~ 1.0 kHz | Delay high pass filter |
| LPF Frq | 1.0 kHz ~ off | Delay low pass filter |

## STEREO ECHO

| Parameter | Range | Description |
|---|---|---|
| LFB Delay | 0.1 ~ 680.0 ms | Left channel feedback loop delay |
| Lch F.B. | –99 ~ 99% | Left channel feedback gain |
| RFB Delay | 0.1 ~ 680.0 ms | Right channel feedback loop delay |
| Rch F.B. | –99 ~ 99% | Right channel feedback gain |
| High | 0.1 ~ 1.0 | Feedback high frequency filter |
| L Ini Delay | 0.1 ~ 1360.0 ms | Left channel initial delay |
| R Ini Delay | 0.1 ~ 1360.0 ms | Right channel initial delay |
| HPF Frq | off ~ 1.0 kHz | Echo high pass filter |
| LPF Frq | 1.0 kHz ~ off | Echo low pass filter |

## PITCH CHANGE 1

| Parameter | Range | Description |
|-----------|-------|-------------|
| Pitch 1 | –24 ~ +24 | Pitch shifter 1: pitch shift in semitones |
| Fine 1 | –100 ~ 100 | Pitch shifter 1: fine tune in cents |
| Delay 1 | 0.1 ~ 650.0 ms | Pitch shifter 1: delay before the pitch shifted sound is output |
| F.B. 1 | –99 ~ 99% | Pitch shifter 1: amount of pitch shifted signal fed back into the effect |
| Level 1 | 0 ~ 100% | Pitch shifter 1: level |
| Pitch 2 | –24 ~ +24 | Pitch shifter 2: pitch shift in semitones |
| Fine 2 | –100 ~ 100 | Pitch shifter 2: fine tune in cents |
| Delay 2 | 0.1 ~ 650.0 ms | Pitch shifter 2: delay before the pitch shifted sound is output |
| F.B. 2 | –99 ~ 99% | Pitch shifter 2: amount of pitch shifted signal fed back into the effect |
| Level 2 | 0 ~ 100% | Pitch shifter 2: level |

## PITCH CHANGE 2

| Parameter | Range | Description |
|-----------|-------|-------------|
| Pitch L | –24 ~ +24 | Left channel: pitch shift in semitones |
| Fine L | –100 ~ 100 | Left channel: fine tune in cents |
| Delay L | 0.1 ~ 650.0 ms | Left channel: delay before the pitch shifted sound is output |
| F.B. L | –99 ~ 99% | Left channel: amount of pitch shifted signal fed back into the effect |
| Pitch R | –24 ~ +24 | Right channel: pitch shift in semitones |
| Fine R | –100 ~ 100 | Right channel: fine tune in cents |
| Delay R | 0.1 ~ 650.0 ms | Right channel: delay before the pitch shifted sound is output |
| F.B. R | –99 ~ 99% | Right channel: amount of pitch shifted signal fed back into the effect |

## EXCITER

| Parameter | Range | Description |
|-----------|-------|-------------|
| HPF Frq | 500 Hz ~ 16 kHz | Only sounds above the HPF frequency are excited (tune) |
| Enhance | 0 ~ 100% | Amount of harmonics produced (drive) |
| Mix Level | 0 ~ 100% | Mix between dry and excited: 0 = dry, 50 = half-and-half, 100 = excited |
| Delay | 0.1 ~ 1360.0 ms | Delay before the excited sound is output |

## PANPOT

| Parameter | Range | Description |
|---|---|---|
| Type | L → R | Auto pan from left to right |
|  | L ← R | Auto pan from right to left |
|  | L ↔ R | Auto pan from left to right to left, etc. |
|  | L-TURN | An auto pan with a degree of front and rear depth that appears to rotate the sound in an anticlockwise circular motion (3D for sound) |
|  | R-TURN | As L-TURN, but in a clockwise circular motion |
| Speed | 0.05 ~40.00 Hz | Auto pan speed |
| F/R Depth | 0 ~ 100% | Front & rear auto pan depth (effective with L-TURN & R-TURN modes) |
| L/R Depth | 0 ~ 100% | Left & right auto pan depth |
| HPF Frq | off ~ 1.0 kHz | Auto pan high pass filter |
| LPF Frq | 1.0 kHz ~ off | Auto pan low pass filter |

## COMPRESSOR

| Parameter | Range | Description |
|---|---|---|
| Attack Time | 1 ~ 40 ms | Attack time: starts when the threshold level is exceeded |
| Release Time | 10 ~ 2000 ms | Release Time |
| Threshold | −48 ~ −6 dB | Trigger threshold level |
| Ratio | 1 ~ 20 | Compression ratio: 1 = no compression, 2~5 = gentle compression, 20 = hard limiting |
| Ex. Threshold | −72 ~ −30 dB | Expander (noise gate) threshold level |
| Ex. Ratio | 1.0 ~ 5.0 | Expander ratio: 1 = no expansion, 5 = 5:1 expansion |
| Delay | 0.1 ~ 1300.0 ms | Delay before the compressed sound is output |
| Detect Delay | −50.0 ~ 50.0 ms | Once the threshold level has been exceeded, the compressor detect (trigger) signal can be delayed, so that the initial attack of a sound can pass through uncompressed. A minus value delays the output (just like the Delay parameter). If Delay + Detect Delay = a negative value, the actual delay time will be the Detect Delay value. |
| Detect HPF | off ~8.0 kHz | A high pass filter in the compressor detect (trigger) circuit, allowing frequency sensitive compression triggering. |

# Chapter 15: Grouping, Linking, & the [GLOBAL] key

## Grouping Faders

Channel faders 1~8 and the ST INPUT A-C fader can be grouped together so that a number of faders can be controlled by moving just one fader. Two fader groups are available: G1 and G2. There are two ways in which you can add and remove faders to and from a fader group: using the CH SELECT keys or the [Grouping] LCD function.

The G1 and G2 fader groups are common to Input channels and Monitor channels. So, for example, if you flip one channel, that fader will be controlling a Monitor channel while other faders in the group are controlling Input channels.

The Bus output faders cannot be grouped. However, they can be set up as stereo pairs. See "Controlling Bus Levels as Stereo Pairs" on page 56.

> **Note:** It is possible to add a fader to both fader groups. However, that fader will then jump between its positions in each group as each group is adjusted.

### Selecting Faders with the CH SELECT keys

1. Select fader group 1 or 2 by pressing the GROUP [G1] or [G2] key.
2. Use the CH SELECT keys to add and remove faders to and from the group.
3. Press the GROUP [ENABLE] key. The selected faders can now be controlled by moving any fader within the group.
4. Press the [G1] or [G2] key that was pressed in step 1 again so that the CH SELECT keys can be used to select channels.
5. To adjust one fader within a group, touch another fader that's in the same group, then adjust the fader.
6. To disable the Group function, turn off the GROUP [ENABLE] key.

The fader group setup can be stored in a scene memory or with the setup data. See "Storing Fader Group Setups" below.

### Selecting Faders with the [Grouping] LCD function

On the [Grouping] LCD function shown below, use the PARAMETER SELECT keys to select a group and fader and the PARAMETER ADJUST keys or data entry wheel to add or remove a fader to or from the group.

- not in group
* in group

The Disable/Enable parameter works in parallel with the GROUP [ENABLE] key.

```
                **** Initial Data ****
        ---- Grouping Information ----
              1 2 3 4 5 6 7 8  A B C
      Group1   . . . . . . . .  . . .
      Group2   . . . . . . . .  . . .
      > Disable
      > Fader Calibration
    ┌────────┬────────┬────────┬──────────┐
    │  Input │   Aux  │ Master │ Grouping │
    └────────┴────────┴────────┴──────────┘
        F1       F2       F3        F4
```
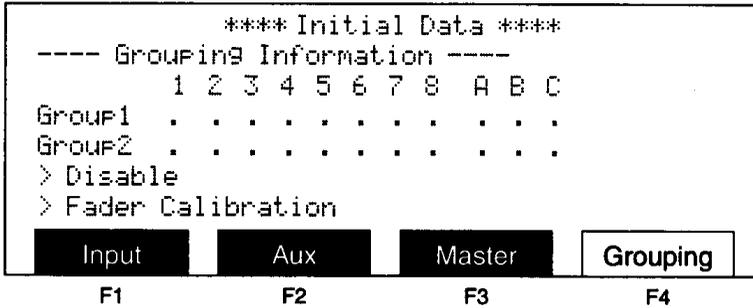
The [Grouping] LCD function can also be used to monitor fader group settings made using the CH SELECT keys.

## Adjusting One Fader in a Group

If you want to adjust the position of just one fader while a group is enabled, touch another fader in the group, then adjust the desired fader. When two faders in a group are touched simultaneously, the grouping function is temporarily disabled.

## Storing Fader Group Setups

Fader group setup data can be stored in scene memories or with the setup data.

Use the "Grouping Memory" parameter on the [Config.] LCD function to select either "Scene" or "Setup".

```
                **** Initial Data ****
        ---- System configuration ----
      > Grouping Memory        Setup
      > Link Parameter Memory  Setup
      > Mem Store Confirmation  off
      > Mem Recall Confirmation off
      > Title Store Prohibit    off
    ┌────────┬──────────┬─────────┬──────────┐
    │ Config.│ Function │ ST Pair │ BitShift │
    └────────┴──────────┴─────────┴──────────┘
        F1       F2         F3        F4
```
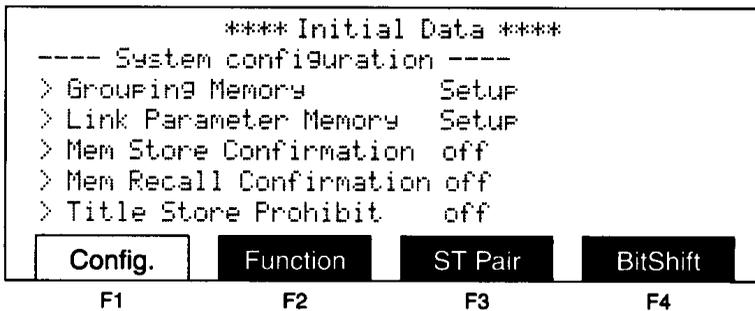
# Linking Channels

A combination of Input channels and Monitor channels can be linked so that channel parameters can controlled from one channel. Two link groups are available: LINK 1 and LINK 2.

The first channel selected for a link group becomes the master, and subsequent selected channels are slaves. As slaves are added to a link group, their channel parameters are set to match those of the master channel. On the [Ch Link] LCD function, the master is indicated by an asterisk (*), and slaves by a plus symbol (+). On the CH SELECT keys, the master channel select key will flash.

Although channels are assigned master and slave status, this only refers to the way in which channel parameters are set when a link group is set up. Once a link group has been set up, parameters can be adjusted on the master channel or the slave channels.

You can choose which channel parameters are linked on the [Ch Link] LCD function shown below. Use the PARAMETER SELECT keys to select a parameter and the PARAMETER ADJUST keys or data entry wheel to set the parameter for linking (on/off).

```
                **** Initial Data ****
     ----- Channel Link [*:master, +:sel] -----
    )******   )Disable          )On/Off     on
    )      1 2 3 4 5 6 7 8  )Aux         on
    Input                    )Equalizer   on
    Monitor                  )PanPot      off
                             )Pad         on
    [  Delay  ]  [ Balance ]  [ Ch Link ]  [  SOLO  ]
       F1           F2           F3           F4
```
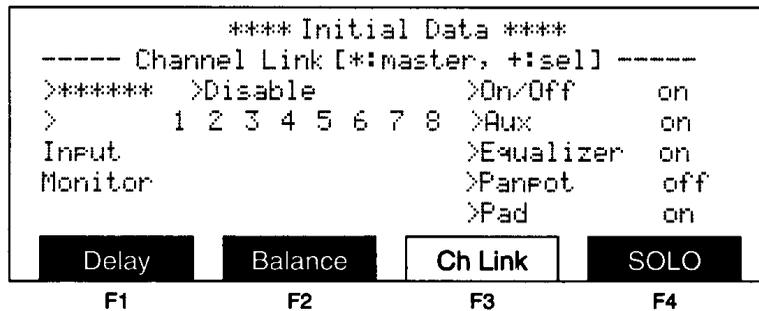
The following table shows which channel parameters can be linked.

| Parameter | Initial Setting | Notes |
|-----------|----------------|-------|
| On/Off | on | Channel on/off switches |
| Aux | on | Auxiliary send on/off, pre/post, and level |
| Equalizer | on | On/off, Q, frequency, gain, and type (shelf/peak) |
| PanPot | off | BUS, MON, and AUX 3 if the Aux parameter is set to on |
| Pad | on | Pad level |
| Phase | on | Phase reverse on/off |
| LPF/HPF | on | LPF/HPF roll off frequency, on/off |
| Delay | on | Delay time, on/off |
| F.B.G. | on | Delay feedback gain |
| Solo | on | Solo switches |
| Fade Time | on | Fade time setting |

## Setting Up a Link Group Using the CH SELECT keys

1. Select link group 1 or 2 by pressing the LINK [LINK 1] or [LINK 2] key.

2. When the EQUALIZER [MON] key is off, the CH SELECT keys select Input channels. When it is on, they select Monitor channels. Set as required.

3. Use the CH SELECT keys to select the master channel. The key pressed will flash to indicate the master channel.

4. Use the CH SELECT keys to add slave channels to the link group. As each slave channel is selected, its parameters will set to match those of the master channel.

5. Press the LINK [ENABLE] key. Parameter adjustments carried out on the master channel or a slave channel will now affect all channels in the link group.

6. To remove a slave channel from a link group, press that channel's CH SELECT key.

7. To cancel a link group, press the master channel's CH SELECT key.

8. Press the [LINK 1] or [LINK 2] key that was pressed in step 1 again so that the CH SELECT keys can be used to select channels.

9. To disable both link groups, press the LINK [ENABLE] key.

> **Note:** A channel cannot be selected for both link groups. If you select a channel that is already used in the other link group, the message "Warning! Can't make Multiple Link!" will appear.

The link group setup can be stored in scene memories or with the setup data. See "Storing Fader Group Setups" on page 85.

## Setting Up a Link Group Using the [Ch Link] LCD function

The [Ch Link] LCD function shown below can be used to set up LINK 1 and LINK 2.

Use the PARAMETER SELECT keys to select channels, and the PARAMETER ADJUST keys or data entry wheel to add and remove them to and from the link groups.

\* master channel

+ slave channels

```
            **** Initial Data ****
      ----- Channel Link [*:master, +:sel] -----
  >******     >Disable           >On/Off        on
  >       1 2 3 4 5 6 7 8  >Aux            on
  Input                        >Equalizer     on
  Monitor                      >Panpot        off
                               >Pad           on
    ┌─────────┬─────────┬─────────┬─────────┐
    │  Delay  │ Balance │ Ch Link │  SOLO   │
    └─────────┴─────────┴─────────┴─────────┘
       F1         F2        F3        F4
```
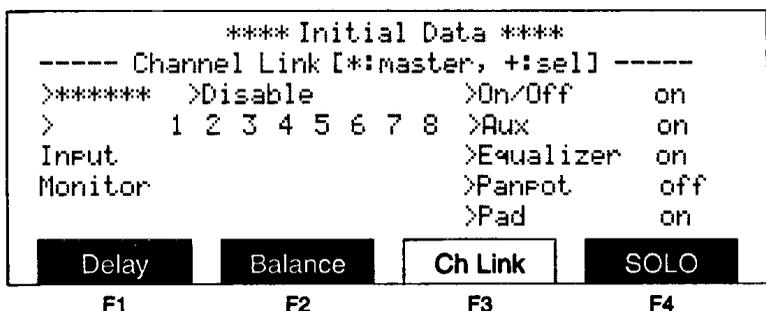
The [Ch Link] LCD function also works as a link group setup monitor, so link group settings made using the CH SELECT keys can be monitored.

### Storing Link Group Setups

Link group setup data can be stored in scene memories or with the setup data.

Use the Link "Parameter Memory" parameter on the [Config.] LCD function to select either "Scene" or "Setup".

```
              **** Initial Data ****
   ---- System configuration ----
  > Link Parameter Memory   Setup
  > Mem Store Confirmation   off
  > Mem Recall Confirmation  off
  > Title Store Prohibit     off
  > Store Req. IN Prohibit   off
```

| Config. | Function | ST Pair | BitShift |
|---------|----------|---------|----------|
| F1      | F2       | F3      | F4       |
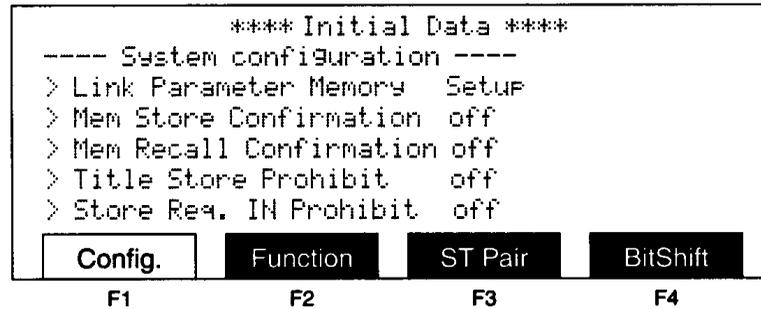
# The [GLOBAL] key

When the [GLOBAL] key is enabled (light on), the following keys can be globally selected for all channels.

- AUX [1], [2], [3], [MON] keys (including the AUX SEND master keys)
- PAN [BUS], [MON], [AUX3] keys
- [FLIP] key

For example, pressing the AUX SEND [1] key (master send) will switch the AUX [1] keys on all channels on.

In addition, when a Stereo channel is selected using the ST INPUT SEL keys the corresponding auxiliary controls are also selected.

# Chapter 16: Floppy Disk Operations

## Disk Handling Precautions

*   Do not touch the surface of a disk.

*   Do not expose disks to extremes of temperature or humidity. The working temperature range for floppy disks is between 4°C and 52°C (40°F~125°F).

*   Do not store or place disks near to a television, radio, loudspeaker, or any other device that generates a magnetic field.

*   Do not attempt to eject a disk while the disk drive light is on.

## Erasure Protection Tabs

Data stored on a disk can be protected against accidental overwriting and erasure by using the erasure protect tabs.

*   With the tab window open, data **cannot** be saved to disk (protected).

*   With the tab window closed, data **can** be saved to disk (unprotected).

Use a pen or similar object to set the erasure protect tab.

## File Types & the [Disk] LCD function

The following DMC1000 data can be saved using 3.5 inch 2DD floppy disks.

| File Type | Description | File Extension |
|---|---|---|
| Internal Memory | Internal scene memories (1~32) | .MEM |
| Card (bank A) | RAM card bank A scene memories (33~64) | |
| Card (bank B) | RAM card bank B scene memories (65~96) | |
| Set-up Memory | Setup data | .SET |
| Automation Data | Automation data (tracks 1, 2, 3, 4, the first scene memory, etc) | .SEQ |
| Control Assign | MIDI Controller assignment table | .CNT |
| Program Assign | MIDI Program Change assignment table | .PRG |

Disk functions can be accessed via the [Disk] LCD function, which can be accessed using the [PREV] and [NEXT] keys, the [Function] menu, or by pressing the AUTOMATION [AUTO] key repeatedly.

```
              **** Initial Data ****
 ---- Disk Load/Save --- Free = 273.6 k
   > File name        [_____]
   > File Type        Internal Memory
   > Load
   > Save
   > Delete   > Format
   [ Talkback ][   OSC   ][ Cascade ][  Disk  ]
        F1          F2         F3        F4
```

The amount of free disk space is indicated next to "Free". The size of each file is indicated next to the file name box "[_____]".

### Disk Compatibility

DMC1000 formatted disks can be read in MS-DOS based PC computers. So disks can be formatted, copied, etc., and files can be examined, copied, and deleted. However, DMC1000 files cannot be edited. Any attempt at editing will damage the file, making it unusable.

## Disk Formatting

Before a new disk can be used to store DMC1000 data it **must** be formatted.

1. Insert the disk into the disk drive – label side up, shutter first. Push it in until it clicks into place.
2. Locate the [Disk] LCD function, and select "Format".
3. Press the [+1/ON] key. The message "Are You Sure ?" will appear.
4. Press the [+1/ON] key to format the disk, or the [–1/OFF] key to cancel the operation.

## Saving Data

1. Position the cursor next to "File Type" and use the PARAMETER ADJUST keys or data entry wheel to select the type of file that you want to save.
2. Move the cursor to the "File Name" name box "[_____]".
3. Use the PARAMETER SELECT keys to position the cursor within the name and the PARAMETER ADJUST keys or data entry wheel to enter characters (0~9, A~Z).
4. Position the cursor next to "Save", then press the [+1/ON] key. The message "Are You Sure ?" will appear.
5. Press the [+1/ON] key to save the data, or the [–1/OFF] key to cancel the operation.

> **Note:** If a file already exists with the name that you have entered, that file will be overwritten when you press the [+1/ON] key.
>
> **Note:** Because some files share the same file extension, always name files before saving to prevent overwriting existing files of the same type.

## Listing All Files on a Disk

1. Position the cursor next to "File Name".
2. Press and hold down the [–1/OFF] key, then press the [+1/ON] key to see a complete directory listing of all files on the disk.

   The [Disk] LCD function will reappear after about 5 seconds.

   Press the [+1/ON] key to list only files of the type specified using the File Type parameter.

## Loading Data

If you want to load automation data, see "Loading Automation Data" on page 91.

If you want to load setup data, make sure that the "Set-up Memory Protect" parameter on the [Config.] LCD function is set to "off".

1. Position the cursor next to "File Type" and use the PARAMETER ADJUST keys or data entry wheel to select the type of file that you want to Load.
2. Position the cursor next to "File Name", and use the [–1/OFF] and [+1/ON] keys to select

the file. The names of files of the selected type will be shown in the name box.

3. Position the cursor next to "Load", then press the [+1/ON] key. The message "Are You Sure ?" will appear.

4. Press the [+1/ON] key to load the file, or the [–1/OFF] key to cancel the operation.

## Loading Automation Data

1. Position the cursor next to "File Type" and use the PARAMETER ADJUST keys or data entry wheel to select "Automation Data".

2. Position the cursor next to "File Name", and use the [–1/OFF] and [+1/ON] keys to select the file. The names of automation data files will be shown in the name box.

3. Use the AUTOMATION [TRK] keys to select the tracks that you want to load. Only tracks whose [TRK] key is on will be loaded. Data in tracks that are off will not be affected. To load all the automation data, turn on all the [TRK] keys.

> Note: If all tracks are loaded together, and the "Internal Mem. Protect" parameter on the [Config.] LCD function is set to "off", the contents of the first scene memory will also be loaded. See "The First Scene Memory" on page 104.

4. Position the cursor next to "Load", then press the [+1/ON] key. The message "Are You Sure ?" will appear.

5. Press the [+1/ON] key to load the selected automation data, or the [–1/OFF] key to cancel the operation.

## Deleting Files

1. Position the cursor next to "File Type" and use the PARAMETER ADJUST keys or data entry wheel to select the type of file that you want to delete.

2. Position the cursor next to "File Name", and use the [–1/OFF] and [+1/ON] keys to select the file. The names of files of the selected type will be shown in the name box.

3. Position the cursor next to "Delete", then press the [+1/ON] key. The message "Are You Sure ?" will appear.

4. Press the [+1/ON] key to delete the file, or the [–1/OFF] key to cancel the operation.

# Chapter 17: Scene Memories

## What Are Scene Memories?

At any time during a mix session, the current console settings can be stored in a scene memory, sometimes called a *mix scene*, or *mix snapshot*. Scene memories can then be recalled in one of three ways:

- Manually using the MEMORY [RECALL] key. See "Recalling Scene Memories" on page 95.

- Automatically from the [At.MemEd] Memory Sequence Edit list, which is like an EDL (Edit Decision List) of mix scenes that can be synchronized to timecode, MTC, or MIDI Clock. See "Recording Scene Memories On-the-Fly" on page 109.

- Using MIDI Program Change messages. See "Program Change" on page 130.

The parameters that are stored within a scene memory are listed on page 170.

## Internal & RAM Card Scene Memories

Scene memories are organized into two types: internal scene memories and RAM card scene memories. There are 32 internal scene memories and 64 RAM card scene memories, 32 in bank A and 32 in bank B.

## Scene Memory 0

Internal scene memory 0 is different to other scene memories, as it is a ROM scene memory that cannot be changed. When scene memory 0 is recalled, all controls are set for unity gain, for example, EQ flat, faders unity gain (0), etc. (input pads are set to –6 dB). Scene memory 0 is useful for resetting all controls before starting a new session. Scene memory 0 can be recalled just like any other scene memory.

## Scene Memory Number Display

On the MEMORY number display, internal scene memories are 1~32 and RAM card memories are 33~64. When a scene memory is stored or recalled, its number stops flashing and the red dot in the bottom right-hand corner of the number display disappears. If a console control is adjusted, the red dot will reappear to indicate that the current console settings do not match those of the scene memory that was recalled last.

| Note: With no RAM card installed, only memory numbers 0~32 are displayed. |

## Working with RAM Cards

### Write Protect

Data saved on the RAM card can be protected by setting the WRITE PROTECT switch to ON, just like a floppy disk. In this case, new data cannot be saved, existing data cannot be deleted, and the card cannot accidentally be formatted. To save data to the RAM card, set the WRITE PROTECT switch to OFF.

### RAM Card Battery

Because RAM type memory requires a small electrical charge to store data, a small battery is installed inside the RAM card. The battery voltage is displayed on the [RAM Card] LCD function as, for example, "EXT 3.1 Volt". If the voltage falls below 2.5 Volt, the battery should be replaced. Please contact your Yamaha dealer. Do not attempt to replace the battery yourself.

> **Note:** All RAM card data will be lost when the old battery is removed, so save the scene memories to floppy disk first. See "Floppy Disk Operations" on page 89.

### Installing the RAM Card

The RAM card can be inserted into the MEMORY CARD slot, or removed while the DMC1000 is powered up. Although, don't remove it while saving or loading data.

### Formatting the RAM Card

A new RAM card must be formatted before it can be used to save scene memories. See "RAM Card Scene Memories" on page 93.

## RAM Card Scene Memories

The [RAM Card] LCD function shown below is used to select which RAM card scene memory bank (A or B) will be used for the Load, Save, Swap, and Format functions.

```
              **** Initial Data ****
       ---- Memory Card Utility ----
   >  Bank = A 0/32 Free Protect off
   >  Load
   >  Save
   >  Swap                          EXT 3.1Volt
   >  Format                        INT 3.1Volt

   [ Effect 1 ][ Effect 2 ][ RAM Card ][ Title.ed ]
       F1          F2          F3          F4
```

**Bank:** selects the bank (A or B) that will be used for the Load, Save, and Swap functions. The "32/32" parameter indicates the number of unused scene memories in the selected bank. For example, 15/32 indicates that 15 out of 32 scene memories are unused, that is, no data stored in them. Use the PARAMETER ADJUST keys or data entry wheel to select either bank A or bank B.

For the following RAM card functions, use the PARAMETER SELECT keys to select a function and the [+1/ON] key to execute it. The message "Are You Sure" will appear, press the [+1/ON] key again to continue or the [–1/OFF] key to cancel the function.

**Load:** loads the 32 RAM card scene memories of the currently selected bank into the 32 internal scene memories. Any data in the 32 internal scene memories will be overwritten.

**Save:** saves the 32 internal scene memories into the currently selected RAM card bank. Any data in the currently selected RAM card bank will be overwritten.

**Swap:** swaps the 32 internal scene memories with the 32 RAM card scene memories of the currently selected bank.

**Format:** prepares the RAM card for saving scene memories. When a card is formatted, card memories 33~96 are initialized. After formatting, the scene memories free parameter will show "0/32".

The following parameters display information only.

**Protect:** displays the RAM card WRITE PROTECT switch setting, if the RAM card is installed. See "Write Protect" on page 93

**EXT:** displays the voltage of the RAM card battery, if the RAM card is installed. See "RAM Card Battery" on page 93.

**INT:** displays the voltage of the DMC1000's internal RAM backup battery. See "Memory Backup Battery" on page ii.

## Storing Scene Memories

1. Use the MEMORY [∧] and [∨] keys to select a scene memory.
2. Press the [STORE] key to store the current console settings.

### Internal Scene Memory Protect

If the "Internal Mem. Protect" parameter on the [Config.] LCD function is set to "on", internal scene memories cannot be overwritten by:

Pressing the [STORE] key.

Using the RAM card Load and Swap functions.

Receiving internal scene memory data via MIDI Bulk Dump.

> **Note:** Even with this protect parameter set to "on", the internal scene memories can be overwritten by loading internal scene memories from floppy disk.

### Store Confirmation

If the "Mem Store Confirmation" parameter on the [Config.] LCD function is set to "on", the message "Memory Store ! Are you sure?(push STORE)" will appear, and the [STORE] key will flash when you try to store a scene memory. In this case, press the [STORE] key again to store the scene memory, or the [∨] key to cancel the store operation.

## Recalling Scene Memories

### Manually

1. Use the MEMORY [∧] and [∨] keys to select a scene memory.

2. Press the [RECALL] key to recall the selected scene memory.

### With Automation

Scene memories can be recalled automatically during an automated mix down from the [At. MemEd] Memory Sequence Edit list, which is like an EDL (Edit Decision List) of mix scenes that can be synchronized to timecode, MTC, or MIDI Clock. See "Recording Scene Memories On-the-Fly" on page 109.

### MIDI Program Change Messages

To recall scene memories using MIDI Program Change messages, see "Program Change" on page 130.

### Recall Confirmation

If the "Mem Recall Confirmation" parameter on the [Config.] LCD function is set to "on", the message "Memory Recall ! Are you sure?(push RECALL)" will appear, and the [RECALL] key will flash when you try to recall a scene memory. In this case, press the [RECALL] key again to recall the scene memory or the [∨] key to cancel the recall operation.

## Undoing Scene Memory Stores and Recalls

This function allows you to undo the last scene memory store or recall. This is useful when a scene memory is stored or recalled by mistake.

To undo the last store or recall, double-click the [UNDO] key.

Then, within 10 seconds, press the [+1/ON] key to undo or the [-1/OFF] key to cancel.

If the 10 seconds expires before you make a choice, double-click the [UNDO] key again and try again.

When a store operation is undone, the scene memory that was overwritten is restored. When a recall operation is undone, the previous edit buffer data is restored.

## Titling Scene Memories

Although scene memories can be identified by number, you may want to title them, for example, "Chorus" or "Door Opening", etc.

The [Title.ed] LCD function shown below can be used to title scene memories.

```
                    **** Initial Data ****
           ----------- Memory Title Edit ---------------
               ****  Memory No. 1   ****
           ------------------------------------------------
        >  GET       >  PUT      >  UPPER    >  LOWER


         [INSERT]      [DELETE]      [FILL]      [EXIT]
           F1            F2            F3           F4
```
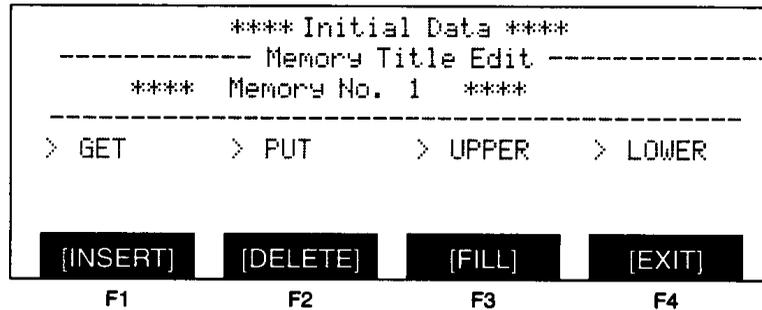
Titles can be up to 40 characters in length, and all scene memories have the initial title "**** Memory No. xx ****".

You don't have to recall a scene memory to title it. Use the MEMORY [∧] and [∨] keys to select a scene memory, use "GET" to copy the existing title on to the title editing line, then "PUT" to store the edited title in the scene memory.

The PARAMETER SELECT keys are used to position the cursor within the title, and the PARAMETER ADJUST keys or data entry wheel to enter characters.

The following functions can be used when titling.

**GET:** copy the title of the selected scene memory (displayed on top line of LCD) on to the editing line.

**PUT:** store the title on the editing line to the selected scene memory.

**UPPER:** change all characters to uppercase.

**LOWER:** change all characters to lowercase.

**[INSERT]:** insert a space at the cursor position.

**[DELETE]:** delete the character at the cursor position.

**[FILL]:** set all characters to the right of the cursor to the character at the cursor position. By setting the character at the cursor position to a blank space, this can be used to delete all characters to the right of the cursor.

**[EXIT]:** exit the [Title.ed] LCD function.

## Title Store Prohibit

If the "Title Store Prohibit" parameter on the [Config.] LCD function is set to "on", when you store a scene memory, the scene memory data will be stored, but the existing title will be kept.

So, for example, you could recall a scene memory, store the console settings in a number of other scene memories while keeping their original titles. This is useful when you want to update some similar scene memories.

## Store & Recall of Only Certain Parameters

The [S/R Prm.] LCD function shown below allows you select which parameters are stored and recalled with scene memories. When the DMC1000 is powered on, this function is set to disable so that all parameters are stored and recalled. When editing scene memories, this function allows you to selectively update certain scene memory parameters, and to selectively copy data from one scene memory to another. It is also useful when scene memories are being recalled automatically using timecode or MIDI Program Change messages in conjunction with automation. For example, if you want to on-line edit some EQ settings, you can disable the EQ recall parameter in General mode, so that your EQ adjustments are not lost each time a scene memory is recalled.

* parameters will be stored and recalled.

. parameters will not be stored and recalled.

```
                 **** Initial Data ****
     ---- Memory Store/Recall Parameters----
   > General   S > Disable     R > Disable
   1. Fader       *               *
   2. Cut         *               *
   3. Panpot      *               *
   4. Aux         *               *
    ┌─────────┬───────────┬──────────┬──────────┐
    │ S/R Prm.│ MSdecode  │   [62]   │   [63]   │
    └─────────┴───────────┴──────────┴──────────┘
       F1          F2          F3         F4
```

**General or Scene:** in Scene mode, you can store and recall certain parameters in each scene memory. For example, scene memory No. 1 for faders only, scene memory No. 2 for cut data, etc. The [S/R Prm.] parameter settings must be stored in the scene memory.

In General mode, the [S/R Prm.] settings affect all scene memories. That is, the settings will not be changed after a scene memory has been recalled and all subsequent scene memory recalls will be affected by the settings. The individual [S/R Prm.] settings stored within each scene memory are ignored unless Scene mode is selected.

> **Note:** When Scene mode is selected, the "Automation Locate" parameter on the [Config.] LCD function is set to "FULL" automatically. See "Automation Locate – Modes" on page 109.

**S > Disable or Enable:** disable will ignore any settings made in the "S >" (store) column. Enable makes settings in the "S >" (store) column active.

**R > Disable or Enable:** disable will ignore any settings made in the "R >" (recall) column. Enable makes settings in the "R >" (recall) column active.

Use the PARAMETER SELECT keys to select a parameter and the PARAMETER ADJUST keys or data entry wheel to set it. The following parameter groups can be enabled or disabled.

|    | Parameter | Parameter No. |
|----|-----------|---------------|
| 1. | Fader     | 0~27          |
| 2. | Cut       | 96~114, 151   |
| 3. | Panpot    | 28~59, 990~997 |
| 4. | Aux       | 60~95, 115~150, 251~307, 998~1069 |
| 5. | EQ        | 343~741       |
| 6  | Pad       | 742~863       |
| 7  | Others    | All other scene memory parameters. |

Note: For the first scene memory recalled in an automated mix, all parameters must be set to enable. See "The First Scene Memory" on page 104.

## Storing [S/R Prm.] in Scene Memories

If the "S/R Prm. to Scene Mem." parameter on the [Config.] LCD function is set to "on" (Scene mode), settings made on the [S/R Prm.] LCD function can be stored within a scene memory.

Note: The [S/R Prm.] LCD function's General/Scene parameter is the same as the "S/R Prm. to Scene Mem." parameter on the [Config.] LCD function. Off = General, and On = Scene.

Note: If General mode is selected, the individual [S/R Prm.] settings stored within each scene memory are ignored.

## Setting the Fade Time

A Fade Time parameter can be set for each fader allowing a gradual fader change when a scene memory is recalled. The fade time settings **must** be set, then stored in the scene memory that you want to be affected. The [FadeTime] LCD function is used to set the fade time for each fader.

```
                 **** Initial Data ****
      ---- Fade Time [0-51] ----
           1   2   3   4   5   6   7   8     A   B   C
     INP  16  16  16  16  16  16  16  16    16  16  16
     MON  16  16  16  16  16  16  16  16
     >    46.8mSEC     [INP. 1]

        ┌──────────┬──────────┬──────────┬──────────┐
        │  Phase.  │  Meter   │ Routing  │ FadeTime │
        └──────────┴──────────┴──────────┴──────────┘
           F1         F2         F3         F4
```

A fade time value can be specified for each Input channel fader, Monitor channel fader, and Stereo channel fader.

There are 52 fade times available (0~51), and the actual time value is displayed on the bottom line of the LCD. The fade time is initially set to 46.8 ms (16).

By positioning the cursor on the ">" symbol, the same fade time value can be set for all faders.

Use the PARAMETER SELECT keys to select a fader and the PARAMETER ADJUST keys or data entry wheel to set a fade time.

## Long-Term Scene Memory Storage & Backup

Internal scene memories and RAM card scene memories can be saved to the following.

* Floppy Disk. See "Saving Data" on page 90.
* A MIDI data recorder, librarian, etc., using MIDI Bulk Dump. See "Bulk Dump (System Exclusive)" on page 132.

We recommend that you save all scene memories, internal and RAM card, to floppy disk.

# Chapter 18: Automation

## What is Automation?

The DMC1000 has two types of mix automation: *scene memories* for mix snapshots and *automation* for continuous (dynamic) control. Both types can be used together or independently. All DMC1000 parameter adjustments can be recorded as automation data.

Automation data is recorded using a 4-track data recorder, and you can decide which DMC1000 parameters are recorded into each track. Recording and playback can be synchronized internally, or to MIDI clk, MTC, or SMPTE.

Automation data can be edited on-line or off-line. On-line editing allows you to buildup a complex mix by repeatedly recording in Insert mode. Replace mode replaces all existing data in the recording track and Insert mode merges the new data with the existing data. On-line editing can also be performed using the Auto Punch IN/OUT function. Fader positions can be trimmed by recording in Relative mode. Off-line editing consists of individual editing of every recorded parameter, track copy, clear, merge, parameter extract, and swap.

Scene memory recalls can be entered "on-the-fly" into the Memory Sequence list, which is similar to an EDL (Edit Decision List). MIDI Program Change messages that are assigned to scene memories can be used to select effects programs, etc., on external MIDI devices.

Automation data can be saved to and loaded from floppy disk for backup and future use. Individual tracks can be loaded from disk, giving you more tracks for mix experiments. MIDI Controllers and Program Change messages from external MIDI devices can be recorded into the automation data. For playback, automation data can be output as MIDI data.

## The [AUTO] key

The following automation related LCD functions can be selected by pressing the [AUTO] key repeatedly. Automation → [REC Prm] → Fader Edit → [Edit Sw] → [At.MemEd] → [At.CntEd] → [AutoCopy] → [S/R Prm.] → [TimeCode] → [Disk].

If you double click the [AUTO] key, the Automation LCD function will appear.

> **Note:** The Automation LCD function can only be accessed using the [AUTO] key.

## Automation Recording Procedure

1. Set the synchronization source. See "Automation & Synchronization" on page 101.
2. Clear all tracks. See "Clearing All Tracks" on page 103.
3. Set the first scene memory. See "The First Scene Memory" on page 104.
4. Set up the four tracks. See "Track Setup" on page 105.
5. Select the recording track. See "Selecting the Recording Track" on page 106.
6. Start recording. See "Record Ready Mode" on page 107.
7. Playback. See "Playback" on page 109.
8. Edit. See the editing functions starting on page 110.
9. Save your data. See "Saving Automation Data" on page 117.

# Automation & Synchronization

Automation can be synchronized to any one of the five sources shown in Fig 18-1.
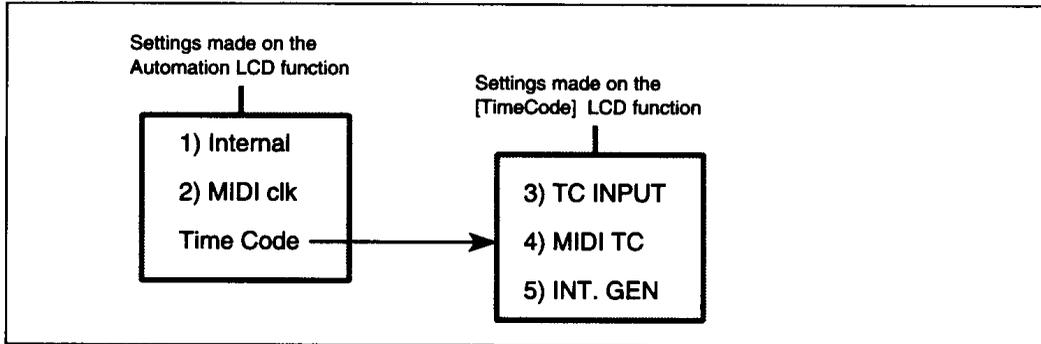


*Figure 18-1    Automation synchronization sources*

The Internal, MIDI clk, and Time Code source settings are made on the Automation LCD function shown below (Sync).

```
             **** Initial Data ****
       ---- Automation ----
        #### STOP ####
    Address = 0000    0000    0000    0000    000000
    Counter = 0000    0000    0000    0000    (100%)
    > PLAY Repeat     off >   Sync =    Time Code
    > MIDI Remote     off >   Rec  =    Tr1 (100%)
```

| Trk.Edit | Relative | Replace | Motor On |
|----------|----------|---------|----------|
| F1 | F2 | F3 | F4 |

Position the cursor next to "Sync", and select one of the following.

**Internal:** a clock source derived from the CPU clock (this is not internal timecode). This may prove to be useful when you are learning the automation functions. When Internal is selected, and the **PLAY Repeat** parameter is set to "on", automation playback will repeat continuously until stopped. I'm not sure about practical applications, but it's good for demonstrations.

**MIDI clk:** MIDI Clock (F8H).

MIDI System Real-Time messages are received via the MIDI IN connection. The DMC1000 sends Start, Stop, messages when the [PLAY] and [STOP] keys are pressed respectively via the MIDI OUT connection. When a Reset message is received, the Running Status is cleared. MIDI System Real Time messages are unaffected by other MIDI settings such as those on the [MIDI] LCD function.

When MIDI clk is selected, and the **MIDI Remote** parameter is set to "off", automation will synchronize to MIDI Clock, but you will have to start and stop it using the AUTOMATION keys. Set to "on", automation will start, stop, etc., automatically when the relevant System Real-Time message is received. Useful when using a MIDI sequencer with MIDI Clock.

**Time Code:** there are three timecode sources available. The timecode source setting is made on the [TimeCode] LCD function shown below.

```
                    **** Initial Data ****
        ---- Time Code ----
    > Start Time            00:00:00.00
    > Frame Type            30 non drop
    > Source               TC INPUT



     ┌──────────┐┌──────────┐┌──────────┐┌──────────┐
     │ At.MemEd ││ At.CntEd ││ TimeCode ││  Edit Sw │
     └──────────┘└──────────┘└──────────┘└──────────┘
         F1          F2          F3          F4
```
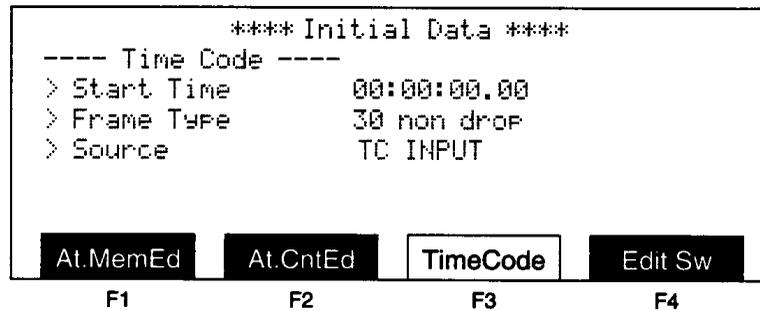
**Start Time:** specify the time at which automation recording/playback starts. Recorded automation data can be shifted in time by editing this value. This value can also be set on the [At.MemEd] and [At.CntEd] LCD functions.

**Frame Type:** specify the frame type of the internal timecode generation. If external timecode is used, the frame type must be set to match that of the incoming timecode. If "30 drop" is selected as the frame type, the DF (Drop Frame) indicator will light up.

**Source:** specify the timecode source TC INPUT, MIDI TC, INT. GEN. These options are explained below.

## TC INPUT:

SMPTE timecode received via the TIMECODE IN connection. Timecode received via the TIMECODE IN connection is output directly to the TIMECODE THRU connection.

## MIDI TC:

MTC received via the MTC IN connection. MTC received via the MTC IN connection is output directly to the MTC THRU connection. MTC is unaffected by other MIDI settings such as those on the [MIDI] LCD function.

## INT. GEN:

Internally generated SMPTE timecode. This timecode cannot be output from the DMC1000.

## Other Timecode Functions

### Timecode Frame Erase

If the two frame counting digits of the TIME CODE display are too distracting, or you just want to turn them off, set the "Time Code Frame Erase" parameter on the [Config.] LCD function to "on". The display will then show just hours, minutes, and seconds.

### Drop Out Warning

When the "TC Drop Warning Prohibit" parameter on the [Config.] LCD function is set to "on", the message, "Frame Drop Out", will not appear on the LCD when the external timecode drops out. The DMC1000 can compensate for up to 8 seconds of external timecode drop out, after that, automation will stop.

## Clearing All Tracks

Before recording new automation data you must clear any existing data from the four tracks. This is done on the [Trk.Edit] LCD function shown below. The [Trk.Edit] LCD function does not appear in the [Function] menu, however, when the Automation or Fader Edit LCD function is displayed, it can be accessed by pressing the [F1] key.

```
              **** Initial Data ****
     ---- Track Edit ----
     >  IN  00:00:00.00    >  OUT  00:00:00.00
     >  EXTRACT    Tr1    Input 6 Level
     >  SWAP       Tr1    and    Tr1
     >  MERGE      Tr1    and    Tr1  to  Tr1
     >  CLEAR      Tr1       >  ALL CLEAR
    +-----------+-----------+-----------+-----------+
    |  Trk.Edit |  Relative |  Replace  |  Motor On |
    +-----------+-----------+-----------+-----------+
         F1          F2          F3          F4
```

Position the cursor next to "ALL CLEAR", and press the [+1/ON] key. The message "Sure ?" will appear. Press the [+1/ON] key to clear, or the [-1/OFF] key to cancel the operation. The following items are set during an ALL CLEAR.

- Data in all four tracks is deleted.

- All tracks are set to off.

- Track No. 1 is selected as the recording track.

- Absolute mode is selected.

- Replace mode is selected.

- All entries on the [At.MemEd], Memory Sequence Edit, LCD function are cleared, and scene memory No. 1 is entered on track 1 at the time specified on the [TimeCode] LCD function. See "The First Scene Memory" on page 104.

# The First Scene Memory

You **must** start an automated mix by recalling a scene memory. This scene memory should contain the console settings that you want at the start the automated mix. If you do not start by recalling a scene memory, the automation data will have no reference point to start from during playback. So automation playback will start with the console settings as they were when automation recording or playback was last stopped.

When the automation data is cleared using the ALL CLEAR function, scene memory No. 1 is entered in the [At.MemEd], Memory Sequence Edit, LCD function as shown below. Scene memory No. 1 is intended to recall the console settings that you want at the start the automated mix, that is, the first scene memory. However, you can set any scene memory to be the first scene memory: internal 1~32, RAM card 33~96. Although, make sure that you store the console settings that you want at the start of the automated mix into that scene memory. When you store that scene memory, make sure that the [S/R Prm.] LCD function is disabled.

```
              **** Initial Data ****
   ---- Memory Sequence Edit ----
   T=00:00:00.00          Memory    Trk = 1
   1 00:00:00.00            1         0000




    [INSERT]      [DELETE]       [CNT.]        [EXIT]
      F1            F2             F3             F4
```
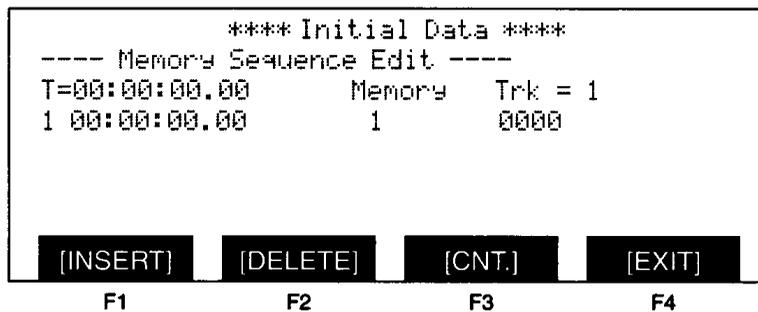
The first scene memory is entered at the time specified on the [TimeCode] LCD function. Although, this can be changed on the [At.MemEd] LCD function shown above.

As you can see from the above display, the first scene memory recall is actually located on track 1 (Trk=1). So long as track 1 is going to be on at the specified recall time during playback, this setting will usually be OK. If, however, track 1 will not be on at the specified time, the first scene memory recall must be located on a track that will be on.

To do this, position the cursor under the "Trk=" parameter, and use the PARAMETER ADJUST keys or data entry wheel to select another track. The message "This track has no Memory recall" will appear. Press [F1] to insert a memory recall into the list, then set the recall time and the scene memory number as required.

### Saving & Loading Automation Data

The console settings stored in the first memory are saved to floppy disk with the other automation data. So when you load all automation data from disk, that is, all tracks, the first scene memory will also be loaded, so long as the "Internal Mem. Protect" parameter on the [Config.] LCD function is set to "off".

The contents of the scene memory with the corresponding number to the first scene memory stored in the automation data will be deleted when the automation data is loaded. For this reason, it is a good idea to always use the same scene memory number as the first scene memory, and do not use that scene memory for anything else. If the console settings that you want to use at the start of the mix are stored in another scene memory, recall that scene memory, then store the contents into the first scene memory.

If you use a RAM card scene memory (33~96), or many scene memories to set the console settings at the beginning of an automated mix, you **must** save those scene memories yourself. Only one internal scene memory can be saved with the automation data.

# Track Setup

Four tracks are available for automation recording, and you can decide which parameters are recorded in each. Parameters are divided into the following groups.

| | Parameter | Parameter No. |
|---|---|---|
| 1. | Fader | 0~27 |
| 2. | Cut | 96~114, 151 |
| 3. | Panpot | 28~59, 990~997 |
| 4. | Aux | 60~95, 115~150, 251~307, 998~1069 |
| 5. | EQ | 343~741 |
| 6 | Flip | 785~792 |
| 7 | Others | All other scene memory parameters. |

Parameters are assigned to tracks using the [REC Prm] LCD function shown below.

\* assigned to track

. not assigned

```
           **** Initial Data ****
  ---- Automation REC Parameter----
                  Tr1    Tr2    Tr3    Tr4
  1. Fader         *      *      *      *
  2. Cut           *      *      *      *
  3. Panpot        *      *      *      *
  4. Aux           *      *      *      *

  REC Prm    At.MemEd     Edit Sw    Fader Ed
    F1          F2          F3          F4
```

Use the PARAMETER SELECT keys to select parameters, and the PARAMETER ADJUST keys or data entry wheel to set them. Two recommended track setups are given below.

## Setup 1

| | Parameter | Tr1 | Tr2 | Tr3 | Tr4 |
|---|---|---|---|---|---|
| 1. | Fader | * | | | |
| 2. | Cut | | * | | |
| 3. | Panpot | | | | * |
| 4. | Aux | | | | |
| 5. | EQ | | | * | |
| 6. | Flip | | | | * |
| 7. | Others | | | | * |

In setup 1, the Fader, Cut, and EQ are assigned to separate tracks, because these parameters are to going to be adjusted a lot during the automated mix. Having only one parameter type on each track will simplify editing. The remaining parameter types, except Aux, are assigned to track 4. Aux parameters are not going to be adjusted in this particular mix, so we haven't assigned them to a track.

**Setup 2**

| | Parameter | Tr1 | Tr2 | Tr3 | Tr4 |
|---|---|---|---|---|---|
| 1. | Fader | * | * | * | * |
| 2. | Cut | * | * | * | * |
| 3. | Panpot | * | * | * | * |
| 4. | Aux | * | * | * | * |
| 5. | EQ | * | * | * | * |
| 6. | Flip | * | * | * | * |
| 7. | Others | * | * | * | * |

In setup 2, all parameters are assigned to each track. Tracks will be recorded one at a time, each with a different mix. During playback we can listen to each mix individually, by pressing the corresponding [TRK] key, and decide which one to use. This is useful for trying out different mixes.

# What is Recorded?

While recording, all parameter adjustments are recorded. That is, adjustments made using the physical console controls and adjustments made on LCD functions using the PARAMETER ADJUST keys and data entry wheel. [SOLO] key presses (parameters 793~811) are not recorded. Also, adjustments to the master controls (parameters 983~987), that is, any of the larger black control knobs and their associated keys are not recorded.

# Selecting the Recording Track

When the automation data is cleared using the ALL CLEAR function, track 1 is selected as the recording track. A different recording track can be selected on the Automation LCD function shown below (REC =). The "(%)" value next to the track number indicates the amount of free memory available for the selected track (100% = 128KB).

```
             **** Initial Data ****
    ---- Automation ----
    #### STOP ####
    Address = 0000   0000    0000    0000    000000
    Counter = 0000   0000    0000    0000    (100%)
    > PLAY Repeat     off >  Sync =   Time Code
    > MIDI Remote     off >  Rec  =   Tr1  (100%)
    ┌──────────┬──────────┬──────────┬──────────┐
    │ Trk.Edit │ Relative │ Replace  │ Motor On │
    └──────────┴──────────┴──────────┴──────────┘
        F1          F2          F3          F4
```

Use the PARAMETER SELECT keys to position the cursor next to "REC =" and the PARAMETER ADJUST keys to select a track. The recording track can also be selected using the [TRK] keys in Record Ready mode.

**Address:** indicates the position within a track – not important for users.

**Counter:** indicates the next automation step – not important for users.

**(100%):** this value indicates the record buffer' free memory. Each time recording starts, this value will be 100%. During recording this value will gradually decrease as the record buffer fills up. When recording stops, the record buffer data is merged into the recording track.

## Record Ready Mode

Before engaging Record Ready mode, use the [TRK] keys to select which tracks you want to playback while recording. Normally, all recorded tracks will playback, however, you can turn off recorded tracks. This is useful when you want to re-record a mix, but don't want to overwrite the previous track data, just in case you decide to use it.

Press the [REC] key. The [REC] key will flash and the selected recording track key will light up to indicate Record Ready mode. To cancel, press the [STOP] or [REC] key.

> **Note:** Once in Record Ready mode, if you are using external timecode, recording will start automatically when the correct timecode is received, and with Replace mode selected, existing data in the recording track will be deleted.

In Record Ready mode you can select the recording track using the [TRK] keys.

When recording starts using one of the methods explained below, the [TRK] key of the recording track will flash quickly. The [TRK] keys of other tracks that are playing back automation data will flash slowly. If a track is selected for playback, but it doesn't contain any data, its [TRK] key will light up, but it will not flash.

## Auto Record Mode

Auto Record mode saves you having to press the [REC] key to start automation recording in Insert mode. Once in Auto Record mode, recording starts automatically each time the automation is started.

To engage Auto Record mode, double-click the [REC] key.

The DMC1000 is in Record Ready mode and the [REC] key flashes. When the automation starts, recording starts automatically.

> **Note:** You cannot enter Auto Record mode while Replace mode is selected.

To cancel Auto Record mode, press the [REC] key again.

## Record Start for Internal Sync

Press the [PLAY] key. Automation recording will start, the [REC] key will light continuously, and the recording track key will flash.

## Record Start for MIDI Clock Sync

Set the "MIDI Remote" parameter on the Automation LCD function to "on", then send a Start (FAH) message from a MIDI sequencer, etc. to start automation recording.

If recording is started using the AUTOMATION keys, a Start (FAH) message will be sent from the DMC1000 when the [PLAY] key is pressed.

## Record Start for Internal Timecode Sync

Press the [PLAY] key. The internal timecode generator will restart 4 seconds before the start time specified on the [TimeCode] LCD function. Then, automation recording will start.

# Record Start for TC IN & MIDI TC Sync

Automation recording will start when the correct timecode is received for more than 1 second.

If the external timecode is already running, pressing the [PLAY] key will start automation recording. If, however, the external timecode is not running, the message "#### No Time Code ! ####" will appear.

# Aborting a Recording

If you make a mistake during automation recording, or decide that you do not want to keep the recording:

1. Press the [TRK] key of the recording track. It will stop flashing.
2. Press the [STOP] key. The message "#### ABORTED without Up-date ! ####" will appear, and the data will be erased.

# Stopping Recording

If you are happy with the recording:

1. Press the [STOP] key to stop recording. The message #### Automation Data Up-Date ####" will appear to show that the recording track has been updated with the new data.

# Undoing the Last Recording

If you decide that don't want the new data, you can undo back to the previous data.

1. Locate the [Trk.Edit] LCD function shown below.

```
               **** Initial Data ****
    ---- Track Edit ----
    >  IN  00:00:00.00    >  OUT  00:00:00.00
    >  EXTRACT    Tr1    Input 6 Level
    >  SWAP       Tr1    and    Tr1
    >  MERGE      Tr1    and    Tr1  to  Tr1
    >  CLEAR      Tr1       >  ALL CLEAR

    | Trk.Edit |  Relative  |  Replace  |  Motor On  |
         F1          F2          F3          F4
```

2. Set the "Tr and Tr" parameters on the "SWAP" line to track that you want to undo.
3. Position the cursor next to "SWAP".
4. Press the [+1/ON] key. The previous track data will be restored.

Note: Track undo can be done only when the track's free space is more than 50%.

## Recording Scene Memories On-the-Fly

During automation recording, if you recall a scene memory using the [RECALL] key, that recall will be entered automatically into the [At.MemEd], Memory Sequence Edit, LCD function shown below.

```
            **** Initial Data ****
  ---- Memory Sequence Edit ----
T=00:00:00.00        Memory   Trk = 1
1 00:00:00.00          1        0000
2 00:00:20.15          3        0001
3 00:00:37.06          5        0002


  [INSERT]    [DELETE]     [CNT.]      [EXIT]
     F1          F2          F3          F4
```

## Playback

If you are using internal sync, press the [PLAY] key to start automation playback and the [STOP] key to stop it.

If you are using MIDI Clock with the "MIDI Remote" parameter turned "on", automation playback will start when a Start (FAH) message is received.

If you are using external timecode, playback will start automatically when a correct timecode is received, and stop automatically when the timecode stops.

During playback, the [TRK] keys of recorded tracks will flash slowly. When the automation data in a track ends, its [TRK] key will stop flashing. If a track is selected for playback, but it doesn't contain any data, its [TRK] key will light up, but it will not flash.

## Automation Locate Modes

The "Automation Locate" parameter on the [Config.] LCD function has two locate modes: Full and Quick. These affect how the automation data is calculated when external timecode is, for example, stopped half way through a mix then restarted.

**Full:** when playback restarts, the current console settings will be calculated by examining all data starting from the automation start time, that is, the first scene memory.

**Quick:** when playback restarts, the current console settings will be calculated from the last scene memory recall, so automation playback will start quicker.

> Note: If some of the scene memory recalls recall parameters selectively, you must use the Full mode. See "Store & Recall of Only Certain Parameters" on page 97.

## Motor On/Off

After recording and editing, you can turn off the fader drive motors so that you are not distracted by the moving faders as you check the final automated mixdown. The level of the signal controlled by each fader will still be adjusted. The motors can be toggled on and off by pressing the [F4] key when either the Automation or Fader Edit LCD function is displayed and the automation is neither playing nor recording.

The fader motors are set to on when the DMC1000 is powered on.

When playback is started with the motors turned off, the Fader Edit LCD function will appear automatically, indicating the current fader positions.

> **Note:** If you on-line edit fader moves with the motors turned off, make sure that the Relative mode is selected, because the current fader position will not correspond with the recorded fader position, so the signal level may jump when you touch the fader.

## On-Line Editing

To edit existing automation data on-line, you must enter Record mode. Parameter adjustments made during automation playback will not be kept. If you are using Input channels and Monitor channels in your automated mix, make sure that the channel fader (linear fader) is actually set to the required channel type while editing on-line.

## Absolute Update Mode (Faders Only)

On the [Config.] LCD function, the "Absolute Up-date Mode" parameter can be set to either "REC Trk" or "ALL Trk".

**REC Trk:** existing fader data that corresponds to the fader being edited in the recording track only will be updated with new data from the time at which the fader is touched to when it is released. Use this mode when you want to edit the data in the recording track only.

**ALL Trk:** existing fader data that corresponds to the fader being edited in the recording track and any other tracks that are **turned on** will be updated with new data from the time at which the fader is touched to when it is released. Use this mode when, for example, the fader data exists in two or more tracks, and you want to update the fader data in all those tracks.

## Absolute & Relative Modes (Faders Only)

On the Automation and Fader Edit LCD functions the recording mode can be toggled between Absolute and Relative when the automation is neither playing nor recording by pressing the [F2] key. Initially, when all tracks are cleared, the recording mode is set to Absolute, however, for editing, the Relative mode is useful for *trimming* fader levels.

**Absolute mode:** existing fader data that corresponds to the fader being edited in the recording track (or all tracks if Absolute Update mode is set to ALL Trk) will be deleted from the time at which the fader is touched to when it is released, and the new fader moves recorded.

**Relative mode:** the new fader moves will be added or subtracted relatively to the existing fader data in the recording track. As you can see from Fig 18-2, the new fader moves appear to modulate about the existing fader data.



| Fader touched | Fader released | – – – Existing data |
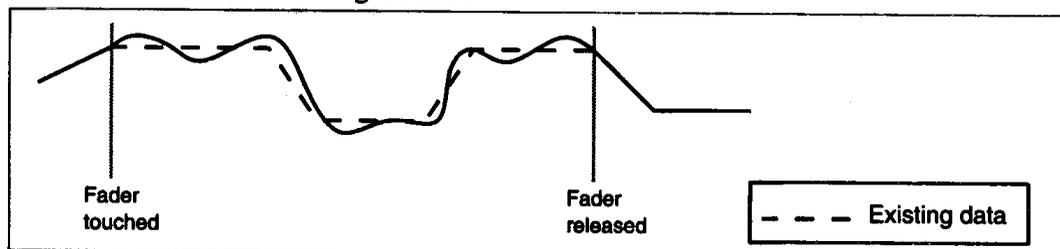
*Figure 18-2    Trimming fader levels in Relative mode*

The Absolute and Relative modes can also be set using the "Fader Edit Mode" parameter on the [Config.] LCD function.

## Replace & Insert Modes

On the Automation and Fader Edit LCD functions the recording mode can be toggled between Replace and Insert when the automation is neither playing nor recording by pressing the [F3] key. Initially, when all tracks are cleared, the recording mode is set to Replace, however, for editing, the Insert mode is useful for recording new data onto an the existing track.

**Replace mode:** data existing after the recording start time in the selected recording track is deleted before recording starts. This mode should be used when you make your first automation recordings.

**Insert mode:** existing data will playback, and the existing data in the selected recording track is merged with the new data. This mode should be used for on-line editing.

The Replace and Insert modes can also be set using the "Automation REC Mode" parameter on the [Config.] LCD function.

## Insert Mode, Faders, & Take Over Time

Start recording on the track that contains the fader data, then at the point where you want to edit the fader position, move the fader. When you release the fader, it will return to the position specified in the existing fader data at the rate (take over time) set on the Fader Edit LCD function (2.9 msec ~ 21.0 sec). If the existing fader data specifies a fader movement, the take over time will be ignored and the fader will respond immediately.

If you don't want the fader to return to the position specified in the existing fader data, press the [STOP] key before releasing the fader.

The fader position will remain the same until the existing fader data specifies a fader movement. This can also be achieved by setting the "RETURN/NO RET" parameter on the Fader Edit LCD function to "NO RET". In this case, the fader will remain at the position that you left it until any existing data specifies a move. See Fig 18-3. If you stop recording before the end of the mix, the fader will return to its previous position, as specified by the existing data, at a rate set by the take over time parameter.

The take over time parameter is effective for the Input channel faders, Monitor channel faders, and the Stereo channel faders, not the Bus faders or STEREO fader.

The Fader Edit LCD function is shown below.
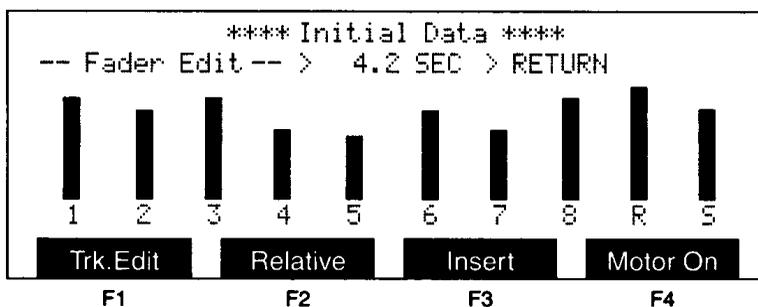


The Fader Edit LCD function also shows the position of each fader during automation playback. When editing fader moves in Insert mode, the existing fader position and the new fader movements are indicated by a solid bar and hollow rectangle. A plus (+) or minus (–) character next to the fader number indicates whether the new fader position is above (+, hollow rectangle) or below (–, solid bar) the fader position specified in the existing fader data.

If the "Auto Fader Edit Screen" parameter on the [Config.] LCD function is set to "on", the Fader Edit LCD function shown above appears automatically when automation playback or recording is started.
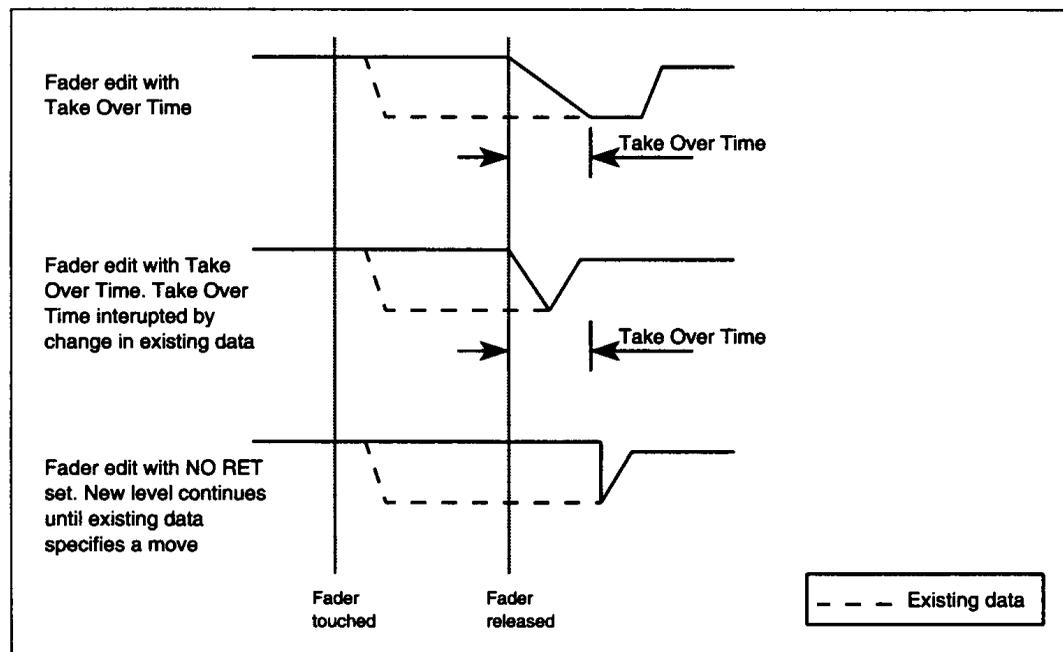


*Figure 18-3    Insert mode & fader edit take over*

## Keep Touch Mode

With the Keep Touch parameter set to ON, during automation insert editing you can release a fader (stop touching it) and it will not return to the position specified by the previously recorded data until you stop automation recording. In Return mode, the fader will return to the position specified by the previously recorded data when you stop. In No Return mode, the fader will not return when you stop, and the new data will be connected relatively to the previously recorded data.

The Keep Touch parameter is set on the [Config.] LCD function.

## Fader Out of Range

Under certain circumstances, fader edits may produce data that exceeds the physical limits of a fader's travel. For example, if you edit in Relative mode with the motors turned off.

In this case, the message "Fader Out of Range" will appear on the LCD. On the Fader Edit LCD function, a "<" symbol indicates that the fader data exceeds the maximum fader position, and a ">" symbol indicates that the fader data exceeds the minimum fader position.

## Insert Mode for Other Parameters

Before Insert mode can be used to edit other parameters, the existing parameter data **must** be extracted. See "Track Edit Functions" on page 116. The Extract function allows you to specify the parameter to be extracted and the extract start and end times. Once the data has been extracted, start recording, then adjust the parameter as required at the appropriate point in the mix.

Alternatively, use the "Auto Punch IN/OUT" function on the [AutoCopy] LCD function. This function allows you to set punch-in and punch-out times, and there is also an option for extracting the existing data between the punch-in and punch-out times. See "Punch In/Out" on page 114.

## Insert Mode & Cut Switch Data

Cut switch data (mutes) can be edited using the [Edit Sw] LCD function shown below. With this LCD function you can edit cut switch data "on-the-fly", it's like a manual punch-in/punch-out function just for cut switch data.

```
            **** Initial Data ****
    ---- Edit on/off SW ----[.]:off   [*]:on
        1  2  3  4  5  6  7  8     A  B  C  ST
   INP  .  .  .  .  .  .  .  .     .  .  .  .
   MON  .  .  .  .  .  .  .  .

      At.MemEd      At.CntEd     TimeCode     Edit Sw
        F1            F2           F3           F4
```

1. Position the cursor under the switch that you want to edit.
2. With Insert mode selected, start recording.
3. Just before the point at which you want to edit, press the [+1/ON] key. The . will change to an * character, and the existing data for the selected cut switch will be deleted. Any new [ON] key presses will be recorded.
4. Press the [–1/OFF] key when you have finished. The * will change to an . character.

> **Note:** While the * character is shown, all existing data for the selected cut switch will be deleted. So remember to press the [–1/OFF] key before reaching some cut switch data that you want to keep.

# Punch In/Out

The "Auto Punch IN/OUT" parameter on the [AutoCopy] LCD function shown below allows you to set automation record punch-in and punch-out times, and to select a parameter to be extracted between the punch-in and punch-out times. This function should be used for editing parameters other than the faders.

```
              **** Initial Data ****
-- Automation Data Copy ( Insert) --
From:  Tr1 00:00:00.00 -00:00:00.00
To:    Tr1 00:00:00.00 -00:00:00.00
---- Auto Punch IN/OUT----
> Manual    00:00:00.00 -00:00:00.00
> EXTRACT   off > Input 1 Level
```

| M Emph | DelayMon | Cas.Iso. | AutoCopy |
|--------|----------|----------|----------|
| F1     | F2       | F3       | F4       |
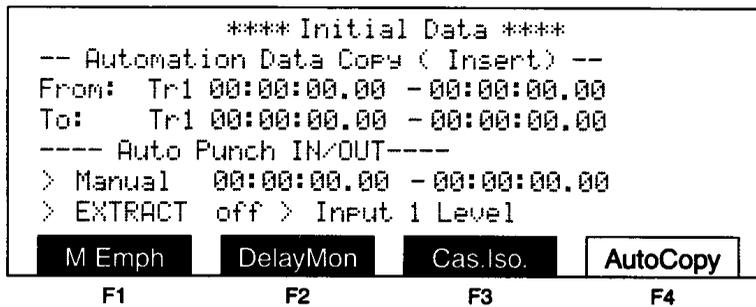
1. Position the cursor next to "Manual", and press the [+1/ON] key to select "Auto". This parameter effectively turns the Auto Punch IN/OUT function on and off.

2. Set the punch-in time and the punch-out time.

3. Position the cursor next to "EXTRACT", and press the [+1/ON] key to turn on the EXTRACT function. This EXTRACT cannot be used when the Auto Punch IN/OUT is set to "Manual".

4. Position the cursor next to "Input 1 Level", and use the PARAMETER ADJUST keys or data entry wheel to select the parameter to be extracted, that is, the parameter that you are going to re-record.

5. Press the [REC] key to enter Record Ready mode. When the external timecode reaches the punch-in time, recording will start automatically. Recording will stop when the punch-out point is reached.

## Editing Scene Memory Recall Times

Scene memories that were recalled during automation recording are entered automatically into the [At.MemEd], Memory Sequence Edit, LCD function shown below. After recording, they can be edited. New scene memory recalls can also be entered into the list. The [At. MemEd] data is recorded onto the track that was selected for recording.
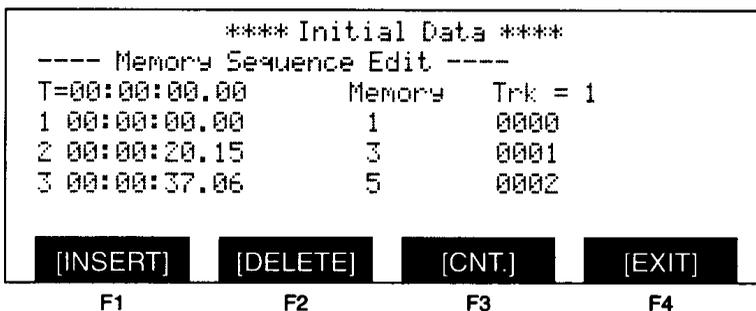
```
              **** Initial Data ****
---- Memory Sequence Edit ----
T=00:00:00.00        Memory   Trk = 1
1 00:00:00.00          1       0000
2 00:00:20.15          3       0001
3 00:00:37.06          5       0002
```

| [INSERT] | [DELETE] | [CNT.] | [EXIT] |
|----------|----------|--------|--------|
| F1       | F2       | F3     | F4     |

Use the PARAMETER SELECT keys to select parameters and the PARAMETER ADJUST keys or data entry wheel to edit them.

**Trk:** select the track that contains the [At.MemEd] data. The 4-digit numbers under the "Trk" parameter are not important.

**T:** specify the automation recording/playback start time. Recorded automation data can be shifted in time by editing this value. This parameter can also be set on the [TimeCode] and [At.CntEd] LCD functions.

**Memory:** specify the scene memory to be recalled.

**[INSERT]:** insert a new scene memory entry with the same settings as the one at the cursor position.

**[DELETE]:** delete the scene memory entry at the cursor position.

**[CNT.]:** switches to the [At.CntEd] LCD function.

**[EXIT]:** exits the [At.MemEd] LCD function and returns to the previous LCD function.

The [PREV] and [NEXT] keys can be used to scroll quickly through the scene memory entries.

> **Note:** The Track Swap function cannot be used to go back to the previous data, so save it to disk just in case.

## Editing Data Off-Line

Automation data can be edited using the [At.CntEd] LCD function shown below. This LCD function lists all the parameter adjustments that have been recorded in the selected track. It is useful for cut data (mute) timing correction.

```
            **** Initial Data ****
      ---- Control Sequence Edit ----
T=00:00:00.00 Parameter              Trk  = 1
1 10:12:34.02 Input 1 Level                -5
2 10:12:34.03 Input 1 Level                -5
3 10:12:34.04 Input 1 Level                -6
4 10:12:34.05 Input 1 Level                -6

   [INSERT]      [DELETE]      [MEM.]       [EXIT]
     F1            F2            F3            F4
```

Use the PARAMETER SELECT keys to select parameters and the PARAMETER ADJUST keys or data entry wheel to edit them.

**Trk:** select the track.

**T:** specify the automation recording/playback start time. Recorded automation data can be shifted in time by editing this value. This parameter can also be set on the [TimeCode] and [At.MemEd] LCD functions.

**Parameter:** indicates the recorded parameter. The timecode value in the left-hand column indicates the time at which the parameter adjustment was made, and the value in the right-hand column indicates the parameter's value at that time.

**[INSERT]:** insert a new entry with the same settings as the one at the cursor position.

**[DELETE]:** delete the parameter entry at the cursor position.

**[MEM]:** switches to the [At.MemEd] LCD function.

**[EXIT]:** exits the [At.CntEd] LCD function and returns to the previous LCD function.

The [PREV] and [NEXT] keys can be used to scroll quickly through the entries.

# Track Edit Functions

The [Trk.Edit] LCD function shown below can be used to edit track data.

```
                    **** Initial Data ****
    ---- Track Edit ----
 >  IN  00:00:00.00    >  OUT  00:00:00.00
 >  EXTRACT    Tr1    Input 6 Level
 >  SWAP       Tr1    and   Tr1
 >  MERGE      Tr1    and   Tr1 to  Tr1
 >  CLEAR      Tr1         >  ALL CLEAR
```

| Trk.Edit | Relative | Insert | Motor On |
|----------|----------|--------|----------|
| F1 | F2 | F3 | F4 |

**IN / OUT:** specify the in and out times for the EXTRACT function.

**EXTRACT:** specify the track, the parameter (adjust or switch the corresponding console control), and set the in and out times. Then position the cursor next to "EXTRACT", and press the [+1/ON] key. All the data for the specified parameter, on the specified track, between the in and out times will be extracted (deleted). The total number of events extracted will flash on the top line of the LCD.

**SWAP:** specify two tracks. Then position the cursor next to "SWAP", and press the [+1/ON] key. The data will be swaped between tracks.

This function can also be used to undo back one step to the previous track data after performing an extract, merge, clear, or track data load from floppy disk.

To undo back to the previous track data, set both "Tr" parameters on the "SWAP" line to the same track number, position the cursor next to "SWAP", then press the [+1/ON] key.

> **Note:** Track undo can be done only when the track's free space is more than 50%.
>
> **Note:** Track undo will not restore data cleared using the ALL CLEAR function.

**MERGE:** specify two tracks to be merged and the destination track. Then position the cursor next to "MERGE", and press the [+1/ON] key. Data from "Tr and Tr" will be merged and the result put on the destination track. All existing data on the destination track will be deleted.

This function can also be used to copy data between tracks. Set the "Tr and Tr" parameters to the same track, and set the destination track. Then position the cursor next to "MERGE", and press the [+1/ON] key.

> **Note:** Be careful that you don't accidentally execute the Merge function twice, because data will be duplicated and automation playback will become very erratic.

**CLEAR:** specify the track to be deleted. Then position the cursor next to "CLEAR", and press the [+1/ON] key. All data in the specified track will be deleted.

**ALL CLEAR:** clear all tracks ready for a new automation recording session.

## Copying Track Data

The [AutoCopy] LCD function shown below allows you to copy data within a specified time range from one track to another.

```
                  **** Initial Data ****
       -- Automation Data Copy ( Insert) --
       From:  Tr1 00:00:00.00 - 00:00:00.00
       To:     Tr1 00:00:00.00 > EXEC    > UNDO
       ---- Auto Punch IN/OUT----
       >  Manual   00:00:00.00 - 00:00:00.00
       >  EXTRACT  off  >  Input 1 Level

        M Emph     DelayMon     Cas.Iso.    AutoCopy
          F1          F2          F3          F4
```

**(Insert):** indicates the currently selected recording mode: Replace or Insert. These modes affect the AutoCopy function. In Replace mode, data on the destination track (To:) will be replaced by the data from the source track (From:). In Insert mode, data on the destination track (To:) will be merged with the data from the source track (From:).

The Replace and Insert modes must be set on the Automation LCD function.

**From:** specify the source track and the time range.

**To:** specify the destination track and the start time.

**EXEC:** execute the AutoCopy function.

**UNDO:** undo the last AutoCopy, that is, restore the destination track.

> **Note:** AutoCopy undo can be done only when the destination track's free space is more than 50%.

> **Note:** Data copied onto a track using the AutoCopy function may not join very well with the existing data before and after the copied range, and you may have to edit some parameters to smooth out the transitions. It is a good idea to set the source (From:) data range's start time to correspond with a scene memory recall.

## Saving Automation Data

All automation data can be saved to floppy disk. See "Saving Data" on page 90. The [Disk] LCD function can be located by pressing the [AUTO] key repeatedly.

Save your automation data at regular intervals during a session, just in case you accidentally delete or overwrite some data. Even better, save all data such as scene memories, setup data, MIDI Controller assign, etc. If, for example, you do a remix in the future, you could spend a long time trying to find just one setup parameter that has been changed.

## Loading Automation Data

Automation data can be loaded from floppy disk altogether or track by track. See "Loading Automation Data" on page 91.

If you do load individual tracks, remember that the [At.MemEd], Memory Sequence Edit, data that is stored with the individual tracks will also be loaded. So you may have to reorganize some scene memory recalls.

# Automation & MIDI

## MIDI Controllers

### Recording

If the "MIDI In →Auto.REC" parameter on the [Config.] LCD function is set to "on", MIDI Controller messages received at the MIDI IN connection can be recorded as part of the automation. See "Basic Setup" on page 129 and "Assigning MIDI Controllers" on page 131.

### Playback

If the "Auto.PLAY→MIDI Out" parameter on the [Config.] LCD function is set to "on", the automation data will be output as MIDI data to the MIDI OUT connection. See "Basic Setup" on page 129 and "Assigning MIDI Controllers" on page 131.

Automation data could then be recorded to an MDR (MIDI Data Recorder) or MIDI sequencer. If the data is sent to another DMC1000, that DMC1000 could be controlled using the same automation data.

## MIDI Program Change

### Recording

If the "MIDI In →Auto.REC" parameter on the [Config.] LCD function is set to "on", MIDI Program Change messages received at the MIDI IN connection can be recorded as part of the automation. See "Basic Setup" on page 129 and "Assigning Scene Mems to Program Change" on page 130.

This could be used to record Program Change messages from an effects unit, etc. While recording, the Program Change messages will recall scene memories and these recalls will be entered automatically into the [At.MemEd] Memory Sequence Edit list.

### Playback

If the "Auto.PLAY→MIDI Out" parameter on the [Config.] LCD function is set to "on", a Program Change message will be output to the MIDI OUT connection each time a scene memory is recalled from [At.MemEd] Memory Sequence Edit list.

These MIDI functions are also used when DMC1000s are cascaded together. See "Cascade, Scene Memories, & MIDI" on page 136.