YAMAHA
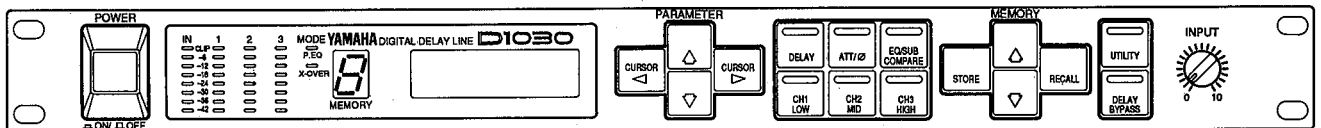
DIGITAL DELAY LINE
LIGNE A RETARD NUMERIQUE

D1030

OPERATION MANUAL
MANUEL D'INSTRUCTIONS
BEDIENUNGSANLEITUNG

Introduction

The D1030 Digital Delay Line is a high-performance delay line with on-board EQ designed for commercial sound applications — especially those requiring excellent sound quality and extended dynamic range. It features a 1-in/3-out configuration with independently programmable delays of up to 1300 milliseconds (20-microsecond increments) for each output. 15 memory locations are provided so preset programs including delay and EQ settings can be prepared and easily recalled when needed. Programs may be recalled via the front-panel controls, by using a contact-closure system, or via MIDI.

The D1030 offers sound quality, programmability and functional versatility that make it ideal for a broad range of critical applications including time alignment, distance delay compensation, electronically-assisted acoustics, special effects, and more.

Main Features

● *New technological 18-bit A/D conversion and 18-bit D/A conversion.*
● *Dynamic range over 100 dB.*
● *THD less than 0.03%.*
● *Full 20 kHz bandwidth.*
● *Delays to 1300 milliseconds in 20-microsecond increments.*
● *2 main operational modes:*
  • *DELAY & PARAMETRIC EQUALIZER: Independent 3-band parametric EQ for each delay output.*
  • *DELAY & CROSSOVER: 3-way crossover with delay for each output and 2-way crossover plus sub-woofer with delay for each output.*
● *Delay time may be set in milliseconds, meters or feet.*
● *Independently programmable attenuation (up to 50 dB or ∞) for each delay channel.*
● *Balanced +4 dB analog input and outputs.*
● *Front panel disable and internal memory protect functions.*
● *EQ/crossover mode change lockout for system protection.*
● *MIDI interface for real-time parameter control, memory select, parameter adjust, and memory up/down loading.*

CONTENTS

PRECAUTIONS

1. Avoid Excessive Heat, Humidity, Dust and Vibration

Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity — such as near radiators, stoves, etc. Also avoid locations which are subject to excessive dust accumulation or vibration which could cause mechanical damage.

If the D1030 is to be rack mounted, make sure that sufficient ventilation is provided.

2. Avoid Physical Shocks

Strong physical shocks to the unit can cause damage. Handle it with care.

3. Do Not Open The Case Or Attempt Repairs Or Modifications Yourself

This product contains no user-serviceable parts. Refer all maintenance to qualified YAMAHA service personnel. Opening the case and/or tampering with the internal circuitry will void the warranty.

4. Make Sure Power Is Off Before Making Or Removing Connections

Always turn the power OFF prior to connecting or disconnecting cables.

5. Handle Cables Carefully

Always plug and unplug cables — including the AC cord — by gripping the connector, not the cord.

6. Clean With a Soft Dry Cloth

Never use solvents such as benzine or thinner to clean the unit. Wipe clean with a soft, dry cloth.

7. Always Use the Correct Power Supply

The power requirements for the D1030 are clearly marked on the rear panel. Make sure the specified mains voltage matches the voltage in your area before using the unit!

8. Electrical Interference

Since the D1030 contains digital circuitry, it may cause interference and noise if placed too close to TV sets, radios or similar equipment. If such a problem does occur, move the D1030 further away from the affected equipment.

9. Memory Backup

The D1030 contains a special long-life battery that retains the contents of its internal RAM memory even when the power is turned OFF. The backup battery should last for approximately 5 years. When the battery voltage drops to a level that is too low to maintain the memory contents, the following message will appear on the D1030 display when the power is turned ON:

```
** WARNING **
LOW BATTERY
```

If this display appears, have the backup battery replaced by qualified YAMAHA service personnel. DO NOT ATTEMPT TO REPLACE THE BACKUP BATTERY YOURSELF!

!! PLEASE READ THIS BEFORE PROCEEDING !!

FRONT PANEL
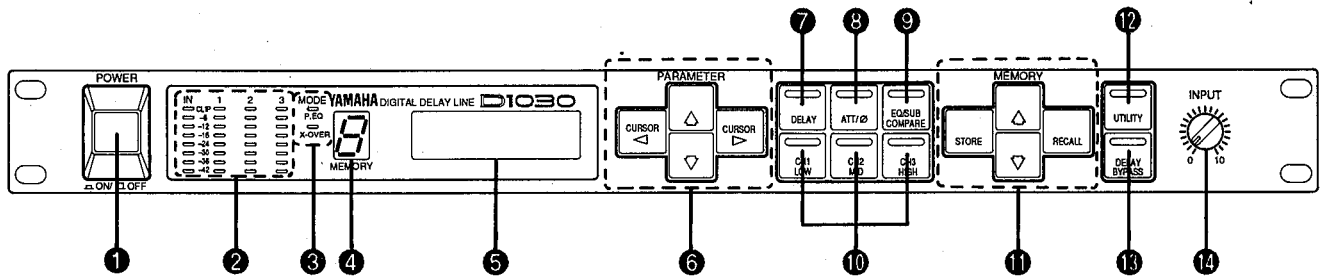
❶ Power Switch

Press to turn the power ON or OFF.

❷ Input & Output Level Indicators

These 8-element LED level meters provide accurate peak-level readings for the input signal and the output signals at each of the D1030's three outputs. The lower 7 segments correspond to –42, –36, –30, –24, –18, –12 and –6 dB. The highest segment is a CLIP indicator that warns of circuit overload.

See the block diagram on page 27 for the level indicator take-off points.

❸ Mode Indicators

Indicate whether the D1030 is in the "DELAY & PARAMETRIC EQ (P.EQ)" or "DELAY & CROSSOVER (X-OVER)" mode, selected by the rear-panel MODE switch (❿ MODE switch, below).

❹ MEMORY Display

This 7-segment LED display shows which of the D1030's available memory locations is selected — 1 through F (hexadecimal). Memory locations 1 through 9 are used for storing DELAY & PARAMETRIC EQUALIZER programs, locations A through C store 3-way DELAY & CROSSOVER programs, and locations D through F hold 2-way DELAY & CROSSOVER programs.

See page 7 for further details.

❺ LCD Display

Two 16-character display lines show program names, parameters and values for easy operation and programming. The display is backlit for optimum visibility.

❻ Cursor & Parameter Edit Keys

The horizontal arrow keys move the cursor to the desired parameter within the display screen, while the vertical arrow keys adjust the value of the selected parameter.

❼ Delay Key

Accesses the individual delay 1, delay 2 and delay 3 parameters, as well as an overall delay offset parameter.

See page 17 for further details.

❽ Attenuation/Phase Key

Allows individual adjustment of the attenuation (up to 50 dB or ∞) and phase (normal or reverse) of each delay channel.

See page 17 for further details.

❾ EQ/Subsonic/Compare Key

Allows the equalizer and subsonic filter for each channel to be independently turned on or off in the DELAY & PARAMETRIC EQUALIZER mode. Also activates the COMPARE function during DELAY & CROSSOVER mode editing, allowing A/B comparison between previously stored and new data.

See pages 9 and 10 for further details.

❿ CH1/LOW, CH2/MID, CH3/HIGH Keys

These keys access the EQ parameters for the corresponding channel when the DELAY AND PARAMETRIC EQUALIZER mode is selected (i.e. when a memory location between 1 and 9 is selected), or the crossover filter parameters when the

4

DELAY & CROSSOVER mode is selected (memory locations A through F).

See pages 8, 11 and 13 for further details.

⓫ MEMORY Select, STORE and RECALL Keys

Select and recall or store data in any of the D1030 memory locations.

See page 7 for further details.

⓬ UTILITY Key

The UTILITY key accesses a range of utility functions including program title edit, delay display mode (milliseconds, feet or meters), level meter peakhold ON/OFF, MIDI channel selection, MIDI program change table assignments, MIDI controller assignments, and bulk dump operations.

See page 21 for further details.

⓭ DELAY BYPASS Key

One-touch delay bypass. When this key is pressed its indicator will light and all delays are completely bypassed. EQ and crossover parameters are unaffected. Pressing the key a second time causes its indicator to go out and restores normal delay operation.

⓮ INPUT Level Control

Matches the sensitivity of the D1030 input to the source signal. Use in conjunction with the "IN" level indicator to set up the optimum input level for various signals.
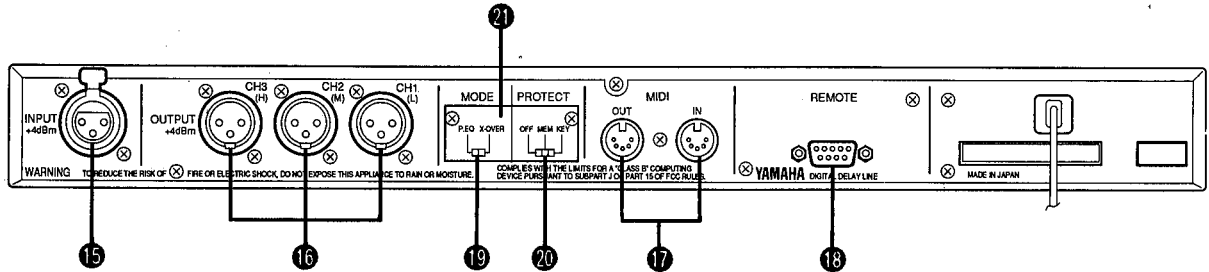
⑮ INPUT Connector

Electronically balanced main input to the D1030. Nominal input level/impedance is +4 dB/10 kΩ.

The pin connections are:

Pin 1: GROUND
Pin 2: HOT (+)
Pin 3: COLD (–)

⑯ CH1, CH2 and CH3 OUTPUT Connectors

Electronically balanced outputs from each of the D1030 delay/EQ channels. Nominal output level/impedance is +4 dB/150 Ω. The pin connections are the same as for the input connector.

⑰ MIDI IN and OUT Connectors

MIDI IN accepts MIDI program change, control change messages to select specific memory locations or control assigned EQ parameters or parameter change, respectively. MIDI OUT allows program data to be "bulk dumped" to a second D1030 or MIDI data storage device, parameter change data to be "link" to a second D1030, and also program change.

See pages 19 and 20 for more information.

⑱ REMOTE Connector

Accepts a custom-built contact-closure system for remote memory location selection.

See page 20 for further details.

⑲ MODE Switch

Locks the D1030 in the P.EQ or CROSSOVER mode to prevent speaker or system damage.

See pages 7 and 10 for further details.

⑳ PROTECT Switch

Has settings to either lock out the front panel keys or prevent memory write operations.

• In the "OFF" position no protect function is active.

• In the "MEM" position the internal memory is protected and can not be overwritten by either a front-panel STORE operation or MIDI bulk data reception.

• In the "KEY" position all front-panel keys are locked out and have no effect on the D1030's operation, except receiving MIDI bulk dump request.

㉑ MODE/PROTECT Switch Cover

Prevents unwanted changes to the MODE and PROTECT switch settings. The plastic cover is attached with two screws — the cover can be removed or installed by removing one screw and loosening the other.

The DELAY & PARAMETRIC EQUALIZER mode is selected by setting the rear-panel MODE switch to the "P.EQ" position. This should normally be done while the power is OFF.

To prevent speaker and/or system damage, the D1030 is equipped with a muting function that is automatically activated if the MODE switch setting is changed while the power is ON. If this occurs and the protection function is activated, the following display will appear:

```
MUTE & KEY LOCK
POWER → OFF → ON
```

Turn the [POWER] switch OFF and then ON again to reset the muting function and activate the selected mode.

PROGRAMS AND PROGRAM SELECTION

In the DELAY & PARAMETRIC EQUALIZER mode, only programs (memory locations) 1 through 9 are available. The various programs are selected as follows:

1. Use the memory △ and ▽ keys to select the desired program — the selected program number will flash on the LED display to indicate that the program has been selected but not recalled (the previously selected program is still active.

2. Press the [RECALL] key to actually recall and activate the selected program — the recalled program number will light continuously.

Note: When the D1030 is initially shipped, all memory locations contain "INITIAL" programs in which all parameters are set to their "normal" values. Original DELAY & PARAMETRIC EQUALIZER programs you create by editing the various delay and EQ parameters can be stored in any memory location between 1 and 9 by using the STORE procedure described on page 18.

● FUNCTIONAL BLOCK DIAGRAM
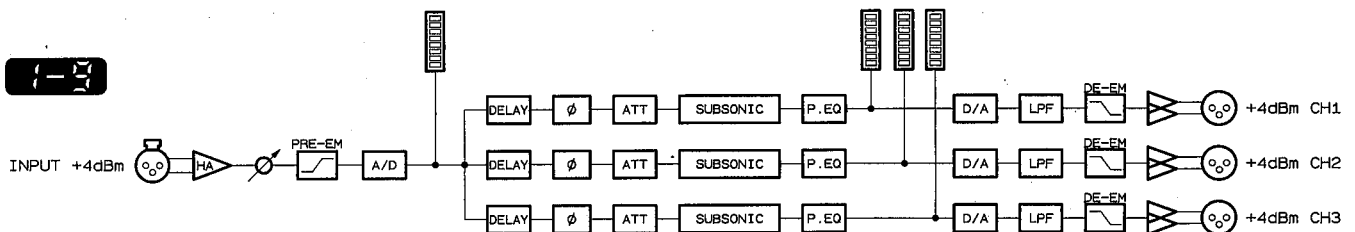
PARAMETRIC EQ
PARAMETERS & PROCEDURE

The [CH1], [CH2] and [CH3] keys each select four display screens in sequence, as shown below:

CH1 LOW	CH2 MID	CH3 HIGH
⇩	⇩	⇩
`LOW ▣` `F= 100   G= 0`	`LOW ▣` `F= 100   G= 0`	`LOW ▣` `F= 100   G= 0`
⇩	⇩	⇩
`MID ▣ Q=0.70` `F= 1.0k   G= 0`	`MID ▣ Q=0.70` `F= 1.0k   G= 0`	`MID ▣ Q=0.70` `F= 1.0k   G= 0`
⇩	⇩	⇩
`HIGH ▣` `F= 10k   G= 0`	`HIGH ▣` `F= 10k   G= 0`	`HIGH ▣` `F= 10k   G= 0`
⇩	⇩	⇩
`CTRL ▣  DLY` `0.0 → 100.0`	`CTRL ▣  DLY` `0.0 → 100.0`	`CTRL ▣  DLY` `0.0 → 100.0`

Use the ◁ and ▷ CURSOR keys to move the underline cursor to the required parameter. Use the △ and ▽ parameter editing keys to set the value of the selected parameter.

The △ or ▽ key can be held for continuous incrementing or decrementing. Faster incrementing or decrementing can be achieved by pressing the opposite key while holding the △ or ▽ key.

The ranges of the equalizer parameters (not including the "CTRL" screen parameters — see "REALTIME MIDI PARAMETER CONTROL" on page 19) are as follows:

EQ Parameter	Range
LOW F (Frequency)	40 Hz — 1.6 kHz
MID F (Frequency)	200 Hz —8 kHz
HIGH F (Frequency)	400 Hz — 16 kHz
G (Gain)	±15 dB
Q (Bandwidth, MID only)	0.1 — 10

DELAY, ATTENUATION & PHASE PARAMETERS & PROCEDURE

These parameters operate the same in all D1030 modes. See page 17 for details.

EQ & SUBSONIC FILTER SWITCHING

In the DELAY & PARAMETRIC EQUALIZER mode, the [EQ/SUB] key alternately selects the following two display screens:

```
 ┌─────────┐
 │  ⊂═══⊃  │
 │  EQ/SUB │
 │ COMPARE │
 └─────────┘
```

⇩

```
┌─────────────────────┐
│    P.EQ  ▦   ON     │
│  ▦   ON  ▦   ON     │
└─────────────────────┘
```

⇩

```
┌─────────────────────┐
│    SUB.  ▦   OFF    │
│  ▦   OFF ▦   OFF    │
└─────────────────────┘
```

▦ indicates the channel-1 (CH1) parameter.
▦ indicates the channel-2 (CH2) parameter.
▦ indicates the channel-3 (CH3) parameter.

The "P.EQ" screen allows switching the parametric equalizer ON or OFF for each channel, and the "SUB." allows switching the internal subsonic filter (20 Hz, −12 dB/oct.) ON or OFF for each channel.

Select the desired channel using the ◁ and ▷ CURSOR keys, then switch ON or OFF using the parameter editing △ and ▽ keys.

The DELAY & CROSSOVER mode is selected by setting the rear-panel MODE switch to the "X-OVER" position. This should normally be done while the power is OFF.

To prevent speaker and/or system damage, the D1030 is equipped with a muting function that is automatically activated if the MODE switch setting is changed while the power is ON. If this occurs and the protection function is activated, the following display will appear:

```
MUTE & KEY LOCK
POWER → OFF → ON
```

Turn the [POWER] switch OFF and then ON again to reset the muting function and activate the selected mode.

PROGRAMS AND PROGRAM SELECTION

In the DELAY & CROSSOVER mode, only programs (memory locations) A through F are available. The various programs are selected as follows:

1. Use the memory △ and ▽ keys to select the desired program — the selected program number will flash on the LED display to indicate that the program has been selected but not recalled (the previously selected program is still active).

2. Press the [RECALL] key to actually recall and activate the selected program — the recalled program number will light continuously. When switching from a 3-way crossover to a 2-way crossover program, however, a "RECALL OK?" display will appear when the [RECALL] key is first pressed. This is a precautionary measure intended to preventing speaker and/or system damage caused by switching to an inappropriate crossover configuration. When the "RECALL OK?" display appears, press the [RECALL] key a second time to recall the selected program.
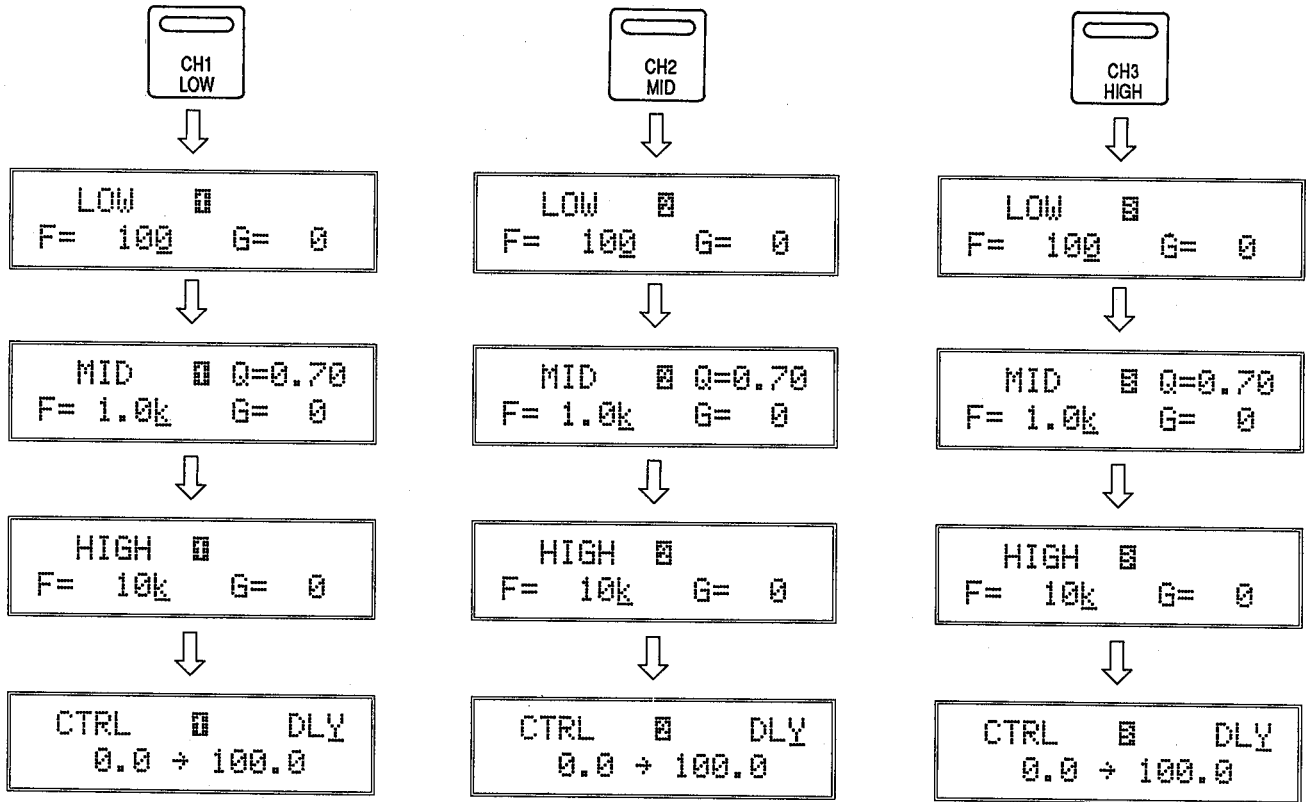
Note: When the D1030 is initially shipped, all memory locations contain "INITIAL" programs in which all parameters are set to their "normal" values. Original DELAY & CROSSOVER programs you create by editing the various delay and EQ parameters can be stored in any memory location between A and F (3-way types to programs A, B or C; 2-way types to programs D, E or F) by using the STORE procedure described on page 18.

THE COMPARE FUNCTION

In the DELAY & CROSSOVER mode, the [COMPARE/EQ/SUB] key activates the D1030 COMPARE function (the EQ ON/OFF and SUBSONIC FILTER parameters are not available in this mode).

When the [COMPARE/EQ/SUB] key is pressed while editing in this mode, its indicator will light and the parameters of the program stored in the current memory location are temporarily recalled so the sound can be compared with that of the edited version. Press the [COMPARE/EQ/SUB] key again to return to the edited parameters (the [COMPARE/EQ/SUB] key indicator will go out).

■ A/B/C: 3-CHANNEL DELAY + 3-WAY CROSSOVER

● FUNCTIONAL BLOCK DIAGRAM
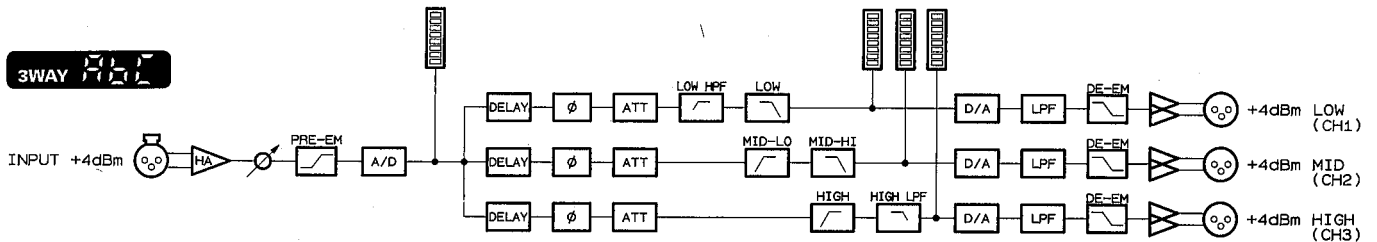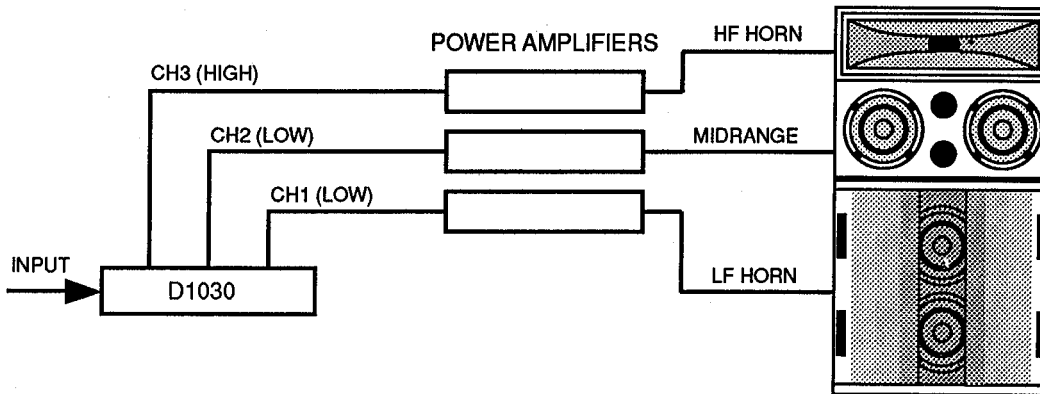
● BASIC SYSTEM CONFIGULATION

DELAY, ATTENUATION &
PHASE PARAMETERS & PROCEDURE

These parameters operate the same in all D1030 modes. See page 17 for details.

3-WAY CROSSOVER
PARAMETERS & PROCEDURE

The [CH1], [CH2] and [CH3] keys each select three display screens in sequence, as shown below:

CH1 LOW	CH2 MID	CH3 HIGH
⬇	⬇	⬇
LOW - HPF F= 40 SL.=THRU	MID-LO SL.=-24Ḏ F= 800 F.F= 0	HIGH SL.=-24Ḏ F= 4.0k F.F= 0
⬇	⬇	⬇
LOW SL.=-24Ḏ F= 800 F.F= 0	MID-HI SL.=-24Ḏ F= 4.0k F.F= 0	HIGH - LPF F= 14k SL.=THRU
⬇	⬇	⬇
CTRL ▮ DLY̲ 0.0 ÷ 100.0	CTRL ▮ DLY̲ 0.0 ÷ 100.0	CTRL ▮ DLY̲ 0.0 ÷ 100.0
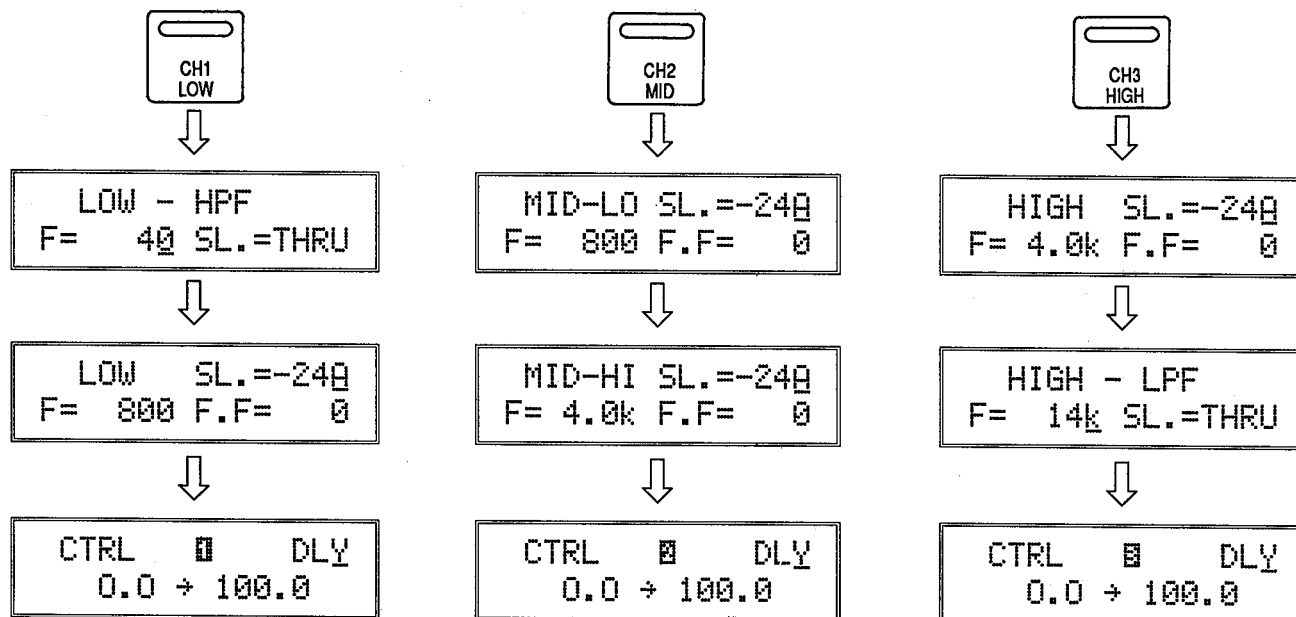
Use the ◁ and ▷ CURSOR keys to move the underline cursor to the required parameter. Use the △ and ▽ parameter editing keys to set the value of the selected parameter.

The △ or ▽ key can be held for continuous incrementing or decrementing. Faster incrementing of decrementing can be achieved by pressing the opposite key while holding the △ or ▽ key.

The ranges of the 3-way crossover parameters (not including the "CTRL" screen parameters — see "REAL-TIME MIDI PARAMETER CONTROL" on page 19) are as follows:
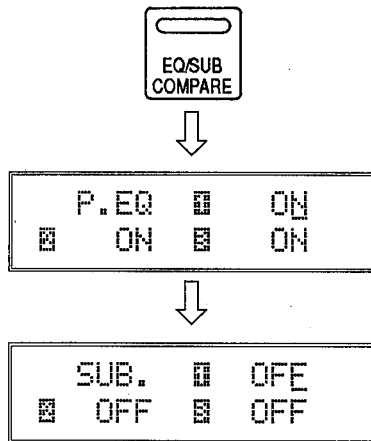
3-way Crossover Parameters	Range
LOW F (Frequency)	200 Hz — 2 kHz
MID-LO F (Frequency)	200 Hz — 2 kHz
MID-HI F (Frequency)	1 kHz — 10 kHz
HIGH F (Frequency)	1 kHz — 10 kHz
LOW - HPF F (Frequency)	20 Hz — 80 Hz
HIGH - LPF F (Frequency)	10 kHz — 18 kHz
F.F (Frequency Fine)	−10 — +10
LOW, MID-LO, MID-HI and HIGH SL. (Slope)	−6 — −24D* dB/oct.
HPF and LPF SL. (Slope)	THRU — −18D dB/oct.

* All slope values except –6 dB/oct. (i.e. –12, –18 and –24 dB/oct.) have four settings — A, B, C and D. These correspond to different degrees of attenuation at the cutoff frequency, as follows:

Display	–**A	–**B	–**C	–**D
Attenuation	–3 dB	–4 dB	–5 dB	–6 dB

–12A, –12B, –12C and –12D, for example, all have –12 dB/octave slopes, but are 3, 4, 5, and 6 dB down at the selected frequency, respectively. In particular, the –12D and –24D (–6 dB) settings produce a Linkwitz-Riley filter response with constant-voltage characteristics and a gain of 1.

The optimum settings for a given sound system will depend on the type of speakers used and other factors, and are best determined by ear. Aim for a smooth, natural crossover between frequency ranges. The only rule is that the LPF and HPF slopes for the same crossover point should be set to the same attenuation value to avoid phase differences that may adversely affect the response at and around the crossover frequency.

■ D/E/F: DELAY + 2-WAY CROSSOVER + SUB-WOOFER

● FUNCTIONAL BLOCK DIAGRAM
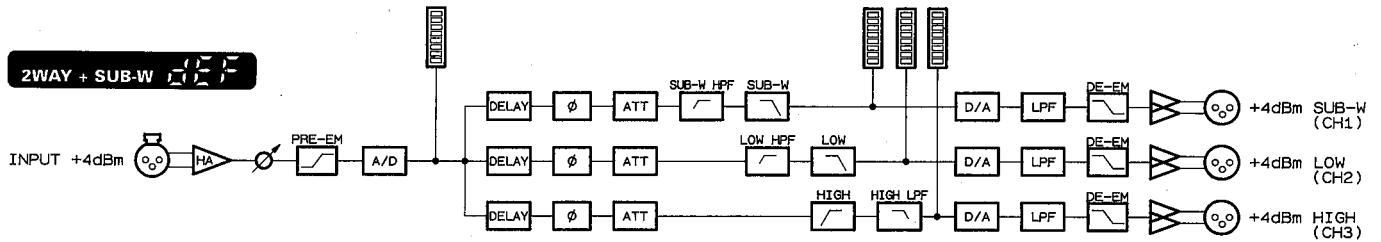
● BASIC SYSTEM CONFIGULATION

A full-range auxilliary speaker can be used in place of a subwoofer if the SUB-W parameter is set ro its maximum frequency of 18 kHz.

DELAY, ATTENUATION & PHASE PARAMETERS & PROCEDURE

These parameters operate the same in all D1030 modes. See page 17 for details.

2-WAY CROSSOVER
PARAMETERS & PROCEDURE

The [CH1], [CH2] and [CH3] keys each select three display screens in sequence, as shown below:

CH1 LOW	CH2 MID	CH3 HIGH
⬇	⬇	⬇
`SUB-W  - HPF` `F=   40 SL.=THRU`	`LOW - HPF` `F=  100 SL.=THRU`	`HIGH  SL.=-24Q` `F= 1.6k F.F=    0`
⬇	⬇	⬇
`SUB-W  SL.=-24Q` `F=  130 F.F=    0`	`LOW   SL.=-24Q` `F= 1.6k F.F=    0`	`HIGH - LPF` `F=   14k SL.=THRU`
⬇	⬇	⬇
`CTRL  ▯    DLY` `   0.0 ÷ 100.0`	`CTRL  ▮    DLY` `   0.0 ÷ 100.0`	`CTRL  ▮    DLY` `   0.0 ÷ 100.0`
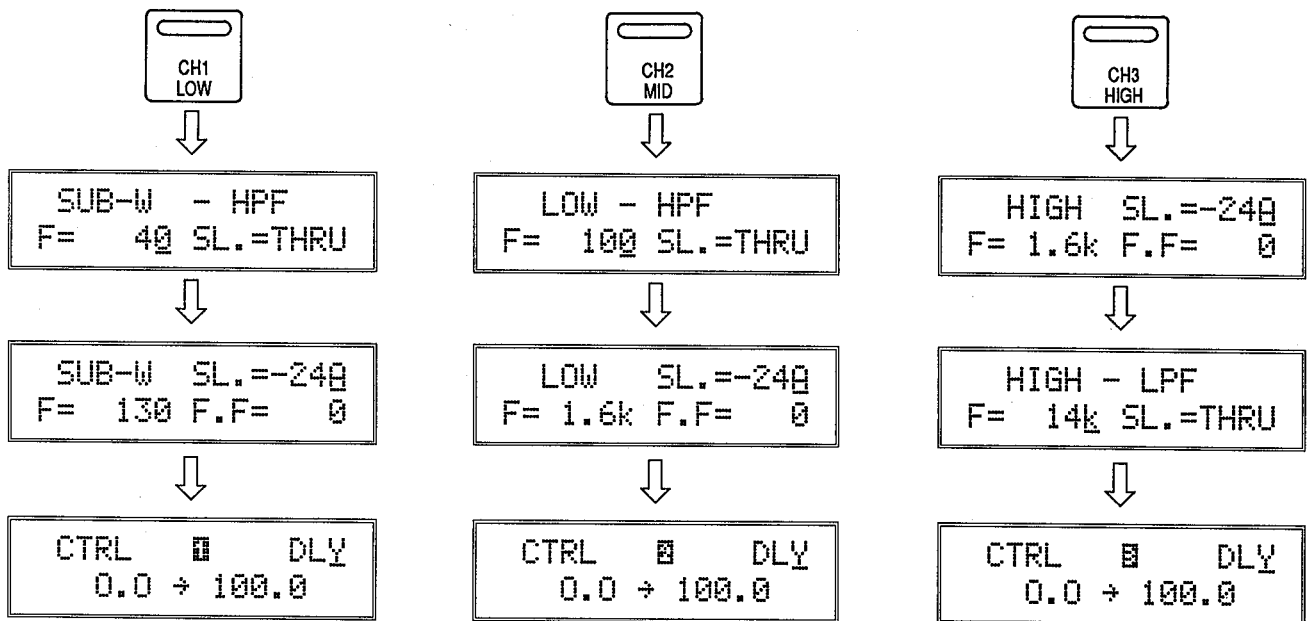
Use the ◁ and ▷ CURSOR keys to move the underline cursor to the required parameter. Use the △ and ▽ parameter editing keys to set the value of the selected parameter.

The △ or ▽ key can be held for continuous incrementing or decrementing. Faster incrementing or decrementing can be achieved by pressing the opposite key while holding the △ or ▽ key.

The ranges of the 2-way crossover parameters (not including the "CTRL" screen parameters — see "REAL-TIME MIDI PARAMETER CONTROL" on page 19) are as follows:

2-way Crossover Parameters	Range
SUB-W F (Frequency)	80 Hz — 18 kHz
LOW F (Frequency)	400 Hz — 6.3 kHz
HIGH F (Frequency)	400 Hz — 6.3 kHz
SUB-W - HPF F (Frequency)	20 Hz — 80 Hz
LOW - HPF F (Frequency)	20 Hz — 400 Hz
HIGH - LPF F (Frequency)	10 kHz — 18 kHz
F.F (Frequency Fine)	−10 — +10
SUB-W, LOW and HIGH SL. (Slope)	−6 — −24D* dB/oct.
HPF and LPF SL. (Slope)	THRU — −18D dB/oct.

* All slope values except –6 dB/oct. (i.e. –12, –18 and –24 dB/oct.) have four settings — A, B, C and D. These correspond to different degrees of attenuation at the cutoff frequency, as follows:

Display	–**A	–**B	–**C	–**D
Attenuation	–3 dB	–4 dB	–5 dB	–6 dB

–12A, –12B, –12C and –12D, for example, all have ±12 dB/octave slopes, but are 3, 4, 5, and 6 dB down at the selected frequency, respectively. In particular, the –12D and –24D (–6 dB) settings produce a Linkwitz-Riley filter response with constant-voltage characteristics and a gain of 1.

The optimum settings for a given sound system will depend on the type of speakers used and other factors, and are best determined by ear. Aim for a smooth, natural crossover between frequency ranges. The only rule is that the LPF and HPF slopes for the same crossover point should be set to the same attenuation value to avoid phase differences that may adversely affect the response at and around the crossover frequency.

Note: The SUB-W F (frequency) parameter can be set as high as 18 kHz to allow the use of a supplemental full-range speaker system rather than a sub-woofer system.

16
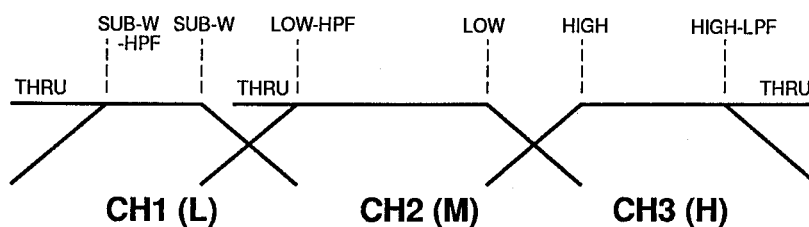
DELAY, ATTENUATION & PHASE PARAMETERS & PROCEDURE

The D1030 delay, attenuation and phase parameters are set in the same way and have the same effect regardless of the currently selected operating mode.

The [DELAY] and [ATT/Ø] keys each alternately access two display screens, as shown below.
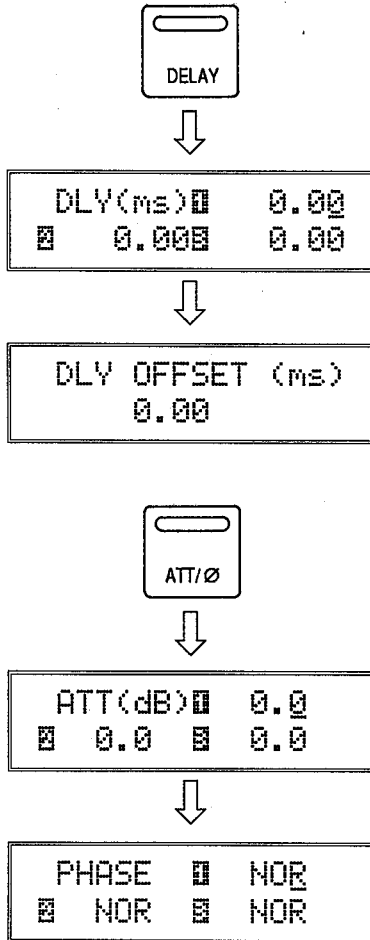
```
   ┌──────────┐
   │   ⊂⊃    │
   │  DELAY   │
   └──────────┘
        ⇩
┌────────────────────┐
│ DLY(ms)█   0.0░    │
│ ░   0.0░   0.00    │
└────────────────────┘
        ⇩
┌────────────────────┐
│  DLY OFFSET  (ms)  │
│       0.00         │
└────────────────────┘


   ┌──────────┐
   │   ⊂⊃    │
   │  ATT/Ø   │
   └──────────┘
        ⇩
┌────────────────────┐
│ ATT(dB)█   0.0     │
│ ░   0.0  ░   0.0   │
└────────────────────┘
        ⇩
┌────────────────────┐
│ PHASE   ░   NOR    │
│ ░  NOR  ░   NOR    │
└────────────────────┘
```

▓ indicates the channel-1 (CH1) parameter.
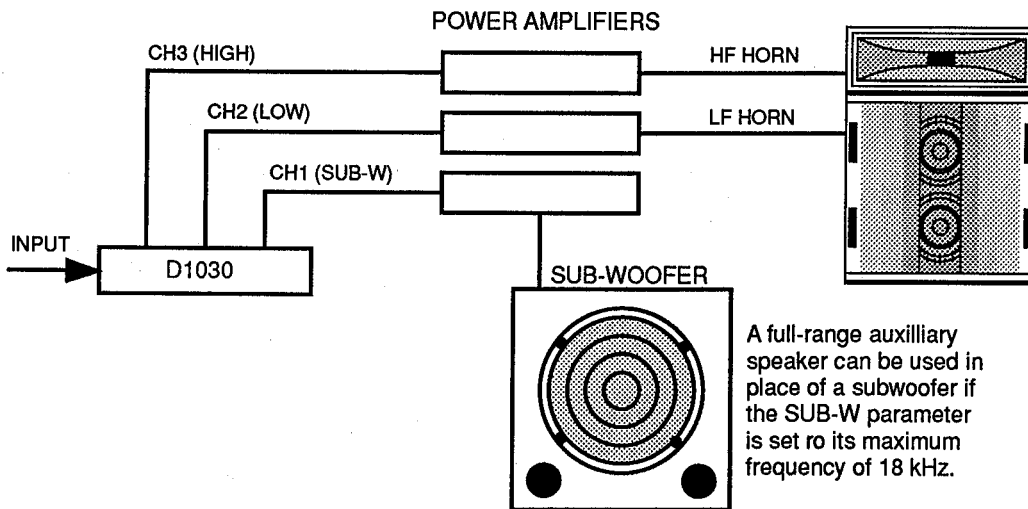▒ indicates the channel-2 (CH2) parameter.
▓ indicates the channel-3 (CH3) parameter.

Use the ◁ and ▷ CURSOR keys to move the underline cursor to the required parameter (except in the "DLY OFFSET" screen, which only has one parameter). Use the △ and ▽ parameter editing keys to set the value of the selected parameter.

The △ or ▽ key can be held for continuous incrementing or decrementing. Faster incrementing or decrementing can be achieved by pressing the opposite key while holding the △ or ▽ key.

THE PARAMETERS

● **DLY (Delay).**
Range: 0 ... 1300 milliseconds.
0 ... 442 meters.
0 ... 1450 feet 1.5 inches.

Sets the delay time of the corresponding channel. The utility mode "DELAY DISPLAY" function (see page 21) selects delay display in milliseconds, meters, or feet.

● **DLY OFFSET (Delay Offset)**
Range: 0 ... 1300 minus maximum DLY setting.

Sets an overall delay offset for all three channels. The maximum offset setting is equal to 1300 minus the highest current delay setting.

The DLY OFFSET display also appears in meters or feet, according to the utility mode "DELAY DISPLAY" setting.

● **PHASE (Phase).**
Settings: NOR (Normal), REV (Reverse).

Selects normal or reverse phasing for the corresponding channel. The phase control block for each channel is located immediately following the delay block, as shown in the block diagrams on pages 27.

● **ATT (Attenuation).**
Range: 0 — 50 dB, ∞.

Sets the input attenuation for the corresponding channel. The attenuator block for each channel is located immediately following the phase control block, as shown in the block diagrams on pages 27.

PROGRAM STORE

Once you have finished editing a program, it can be stored to the current memory location for later recall and use. If you do not store the edited program and a different program number or mode is selected, the edited program will be lost (the previous program in that memory location remains unchanged).

1. When finished editing, press the [STORE] key. A display similar to the folowing will appear, asking you to confirm the fact that you want to store the edited data to the current memory location.

```
   STORE OK ?
 MEM.1 → MEM.1
```

The program number will also flash on the MEMORY LED display.

2. Press the [STORE] key a second time to actually store the data. "MEMORY STORE" will appear while the data is being stored. When the store operation is finished, the MEMORY LED display will stop flashing.

REALTIME MIDI PARAMETER CONTROL

This capability makes it possible to independently control up to three delay, EQ or crossover parameters via MIDI control change messages received at the MIDI IN connector. Any MIDI device that is capable of transmitting control change messages with control numbers 0 through 31, 64 through 95 and 102 through 120 can be used. You could, for example, use a synthesizer modulation wheel or data entry control to adjust any of the variable parameters, or a sustain pedal to switch an "ON/OFF" type parameter.

Control numbers are assigned to the three D1030 channels — channel 1 (Controller 1), channel 2 (Controller 2) and channel 3 (Controller 3) — using the utility mode "CONTROLLER ASSIGNMENT" function described on page 22.

The "CTRL" displays accessed by the [CH1], [CH2] and [CH3] keys are used to select the parameter to be controlled in that program by the corresponding controller, and the maximum available control range.

```
CTRL    ▊    DLY
   0.0 → 100.0
```

```
CTRL    ▊    DLY
   0.0 → 100.0
```

```
CTRL    ▊    DLY
   0.0 → 100.0
```

Different parameters can be controlled in the DELAY & PARAMETRIC EQUALIZER and DELAY & CROSSOVER modes, as follows:

DELAY & PARAMETRIC EQ MODE

DLY	Delay time.
ATT.	Attenuation.
PHASE	Phase NOR/REV.
P.EQ	EQ ON/OFF.
SUB.	Subsonic ON/OFF.
LOW-FRQ	Low Frequency.
LOW-G	Low Gain.
MID-FRQ	Mid Frequency.
MID-G	Mid Gain.
MID-Q	Mid Bandwidth.
HI-FRQ	High Frequency.
HI-G	High Gain.

DELAY & CROSSOVER MODE

DLY	Delay time.
ATT.	Attenuation.
PHASE	Phase NOR/REV.

The parameters on the bottom line of the display are the minimum (to the left of the arrow) and maximum (to the right of the arrow) control range limits, assuming the maximum control range to be from 0 to 100 (%). These parameters make it possible to limit control to a specified position of the total range of the select parameter — for example, you might want the full range of the controller to change delay time only over a central 40 ... 60% portion of its range. In this case you would set the range parameters to: "40 → 60".

Editing procedure is the same as for all other D1030 functions: use the ◁ and ▷ CURSOR keys to select a parameter, then the △ and ▽ parameter editing keys to set the value of the selected parameter.

Note: In addition to controlling parameters using MIDI control change messages, program change message can be used to select programs. Refer to the utility mode "MIDI PROGRAM CHANGE ASSIGNMENT TABLE" function described on page 22.

HARD-WIRED PROGRAM SELECTION

The 9-pin D-SUB REMOTE connector on the D1030 rear panel allows hard-wired remote selection of programs 1, 2, 3, and 4 (DELAY & PARAMETRIC EQUALIZER mode only). The connector should be wired as follows — using shielded cable. Also avoid long cable runs which might pick up noise.
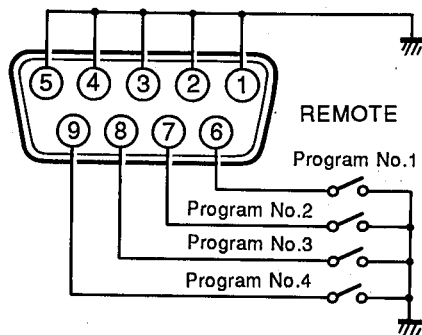
PIN #	SIGNAL
1	GND
2	GND
3	GND
4	GND
5	GND
6	Program No. 1
7	Program No. 2
8	Program No. 3
9	Program No. 4

* REMOTE connector wiring has no effect in the DELAY & CROSSOVER mode.
* If more than one pin (6 ... 9) is grounded at the same time, the lowest-numbered pin takes priority.
* If at least one pin (6 ... 9) is grounded, the front panel keys and MIDI reception are locked out (except receiving MIDI bulk dump request).

MIDI LINK

This function allows two D1030 units connected via a MIDI cable to be programmed simultaneously. This means that in stereo setups in which both channels require the same parameter settings, the editing procedure need only be carried out once.

In practice, one D1030 functions as the "slave". Connect a MIDI cable from the MIDI OUT of the master unit to the MIDI IN of the slave unit. This function is used primarily to match the transmit channel of the master unit with the receive channel of the slave unit. Refer to the utility mode "MIDI CONTROL" function described on page 21. Any parameter changes made on the master unit will then be transmitted directly to the slave unit as well. The MIDI link functions will not operate, however, if the rear-panel [PROTECT] switch is set to the "KEY" position.

UTILITY MODE FUNCTIONS

The D1030 utility functions are accessed in sequence by pressing the [UTILITY] key. The utility mode is exited after the last function in the utility "list." the utility mode can also be exited at any time by holding the [UTILITY] key for longer than about one second.

Once the utility mode has been selected, it is also possible to cycle backward and forward through the utility function list <u>without</u> exiting from the utility mode after the last function by using the memory select △ and ▽ keys.

● TITLE EDIT

```
INITIAL P.EQ
TITLE EDIT
```

The Program Title Edit function allows you to create original titles for your D1030 programs, for easy identification. When the Title Edit function is called the LCD will appear something like the example above — the program title will appear on the upper line. Use the ◁ and ▷ CURSOR keys to move the cursor to the desired character location, then use the △ and ▽ keys to change the character at the cursor location. The STORE key can be used to place a space at the cursor position. Continue until the new title is complete.

The characters accessible via the △ and ▽ keys are shown in the chart below, in their proper order.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
T	U	V	W	X	Y	Z		ə	ä	b	c	d	e	f	g	h	i	j
k	l	m	n	o	ö	p	٩	r	s	t	u	ü	v	w	x	y	z	
ア	ァ	ィ	ィ	ゥ	ゥ	エ	ェ	オ	ォ	カ	キ	ク	ケ	コ	サ	シ	ス	セ
ソ	タ	チ	ッ	ツ	テ	ト	ナ	ニ	ヌ	ネ	ノ	ハ	ヒ	フ	ヘ	ホ	マ	ミ
ム	メ	モ	ヤ	ャ	ユ	ュ	ヨ	ョ	ラ	リ	ル	レ	ロ	ワ	ヲ	ン	゛	゜
゛	゜	ー	[	]	<	>	:	.	*	+	—	=	&	/	,	.	'	
%	!	?	→	←	#		0	1	2	3	4	5	6	7	8	9		

* A SPACE can also be entered by pressing the STORE key.

● DELAY DISPLAY

```
DELAY DISPLAY
UNIT : SECOND
```

Depending on the application, it might be more convenient to have the D1030 display delay parameters in milliseconds, meters or feet.

After selecting the DELAY DISPLAY function, use the △ and ▽ keys to select the desired display mode.

● LEVEL METER

```
LEVEL METER
PEAK HOLD:OFF
```

This function determines whether the D1030 level meters operate in the normal or peak-hold mode. In the peak hold mode peak levels are held briefly to allow for more accurate level readings.

Use the △ and ▽ keys to turn the PEAK HOLD function ON or OFF.

● MIDI CONTROL

```
MIDI CONTROL
CHANNEL:OMNI
```

This function is used to set the D1030 MIDI receive/transmit channel.

Use the △ and ▽ keys to set the MIDI receive/transmit channel (1 — 16), the OMNI mode (all channels can be received, transmit channel 1), or turn MIDI reception OFF.

● MIDI PROGRAM CHANGE TABLE

```
MIDI PGM CHANGE
PGM  1 = MEM 1
```

The D1030 makes it possible to select specific programs via external MIDI control (MIDI program change messages). The D1030 receives a MIDI program change number and selects the program that you have assigned to it using the Program Change Table function described here.

When this function is called the LCD will appear as shown above, and it becomes possible to assign new memory location numbers to each MIDI program change number.

1. When the MIDI PGM CHANGE function is first called, the underline cursor should be under the PGM parameter.

2. Use the △ and ▽ keys to select the program change number to which a different memory location number is to be assigned. The range of available program change numbers is from 1 to 128.

3. Move the underline cursor to the MEM parameter by pressing the CURSOR ▷ key. Use the △ and ▽ keys to select the memory location number containing the program which is to be assigned to the selected program change number, or a dash ("-") if no memory location is to be assigned to that program change number. Only the memory locations available in the current D1030 mode can be selected (i.e. 1 through 9, A through C, or D through F).

4. Move the underline cursor back to the PGM parameter by pressing the CURSOR ◁ key and repeat the above steps to assign as many program change numbers as necessary.

● CONTROLLER ASSIGNMENT

```
CONTROLLER 1
1 MOD. WHEEL
```

The D1030 allows three MIDI "controllers" to be assigned for remote real-time control of delay, attenuation, phase, EQ and crossover parameters. "MIDI controller" actually refers to a MIDI CONTROL CHANGE number between 0 and 127. Some of these numbers are assigned to specific controllers — modulation wheel, data entry, etc — and a MIDI device such as a keyboard that has any of these controllers will transmit the corresponding MIDI control change data when the controllers are operated. You could, for example, assign a keyboard modulation wheel to control delay time.

In order to use this kind of setup, the three "controllers" that the D1030 allows — Controller 1, Controller 2 , and Controller 3 — must be set to receive specific MIDI control change data (i.e. receive data from a specific MIDI controller) using Controller Assignment function. Controller 1 applies to output channel 1 (CH1), controller 2 applies to channel 2 (CH2), and controller 3 applies to channel 3 (CH3).

1. When the CONTROLLER function is first called, the underline cursor should be under the CONTROLLER parameter on the upper line of the display.

2. Use the △ and ▽ keys to select the controller number — 1, 2 or 3 — to which a different MIDI control change number is to be assigned. The range of available control change numbers is from 0 to 31, 64 to 95 and 102 to 120, or control change reception can be turned "OFF" for that controller.

3. Move the underline cursor to the control change number parameter by pressing the CURSOR ▷ key. Use the △ and ▽ keys to select the control change number which is to be assigned to the selected controller.

4. Move the underline cursor back to the CONTROLLER parameter by pressing the CURSOR ◁ key and repeat the above steps to assign as many control change numbers as necessary.

The following control change numbers and associated controllers (or none if no controller is specifically assigned) can be selected:

Control Change #	Controller Assignment
OFF	Controller OFF
0	No specific controller assigned.
1	MOD. WHEEL
2	BREATH CTRL
3	No specific controller assigned.
4	FOOT CTRL
5	PORT TIME
6	DATA ENTRY
7	MAIN VOLUME
8 — 31	No specific controller assigned.
64	SUST SWITCH
65	PORT SWITCH
66	SUST PEDAL
67	SOFT PEDAL
68 — 95, 102 — 120	No specific controller assigned.

● **BULK OUT**

```
BULK OUT     ALL
MEM* PGM-TBL SYS
```

This function allows MIDI bulk dump transmission of all D1030 data ("ALL"), the data for a single program ("MEM"), all programs ("MEM*"), the MIDI program change table ("PGM-TBL"), or the system setup data ("SYS"). System setup data corresponds to the current D1030 panel settings.

Use the ◁ and ▷ CURSOR keys to select the type of data to be transmitted. If the "MEM" type is selected, use the △ and ▽ keys to select the particular program from which you want to dump the data or the asterisk ("MEM*") for all programs. Once the data to be transmitted has been selected, press the memory [STORE]' key to initiate transmission. The "** BULK OUT" display will appear during transmission.

TIME ALIGNMENT BASICS

Time alignment is essential to achieving optimum sound quality in critical multi-amped sound reinforcement systems and other commercial sound installations. The D1030's DELAY & CROSSOVER mode makes accurate time alignment quick and easy to achieve, in addition to providing a high-quality programmable electronic crossover system.

Time alignment makes it possible to eliminate phase differences between speaker output at the crossover frequencies which, if left unresolved, can cause severe frequency response aberrations and unstable imaging at and around the crossover points. Refer to the example below.

$$\text{Wavelength} = \frac{\text{Speed of Sound (approx. 343 meters/sec. or 1127 feet/sec.)}}{\text{Frequency in Hertz}}$$

With a crossover frequency of 5,000 Hz (wavelength = 343/5,000 = 0.0686 meters or 68.6 cm), a distance of 10 cm equals almost one and a half wavelengths, putting signals from the midrange driver and high-frequency horn approximately 180° out of phase at and around the crossover frequency.
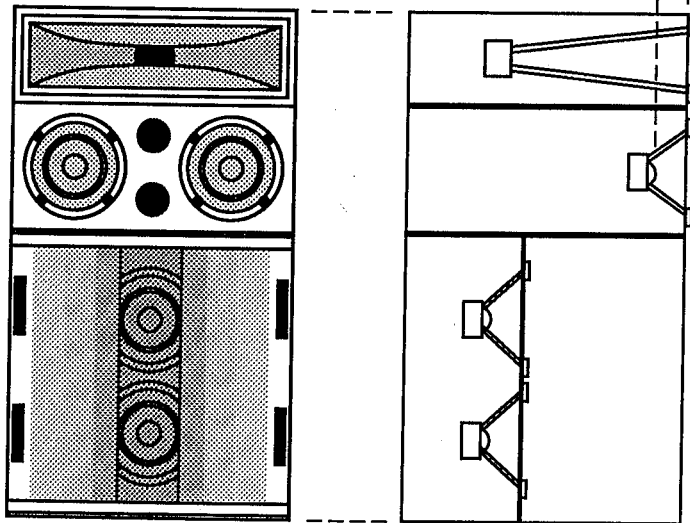
Higher frequencies from cone-type speaker originate primarily at center of cone (dome), while the zero-phase point for a horn is generally at the mouth of the horn.
If the zero-phase points of two drivers are not aligned, their output will most likely be out of phase at the crossover frequency.

In this example, the 10-centimeter distance between the zero-phase points of the midrange drivers and high-frequency horn results in almost 180 degrees phase difference — the worst possible case. This situation can be resolved quite easily with the D1030 in its 3-way DELAY & CROSSOVER mode by setting the midrange (CH2) delay to about 20 milliseconds — or 68 millimeters if the display mode is set to meters. Fine adjustment is best carried out by ear.

DISTANCE COMPENSATION BASICS

In any sound reinforcement setup where rearward-firing auxiliary speakers are used to feed sound to audience members located at some distance from the stage and main house speaker system — but still within earshot of the main system — delay between the sound heard from the auxiliary and main speakers can cause anything from subtle unintelligibility to complete confusion.

```
                        STAGE

        ┌───┐   ◄─── MAIN HOUSE SPEAKERS ───►   ┌───┐
        └───┘                                   └───┘
                                                  ▲
                                                  │
                          The auxiliary speaker is located about
                          35 meters (115 feet) from the house
                          speaker. Listener "L" will hear the
                          sound from the auxiliary speaker
                          approximately 100 milliseconds
                          before that from the house speaker.
                                                  │
                                                  ▼
    ◇◇                                          ┌───┐
   ◇◇◇  ◄─── AUXILIARY REAR SPEAKERS ───   (L) ───►  ◇◇◇
    ◇                                                 ◇
```
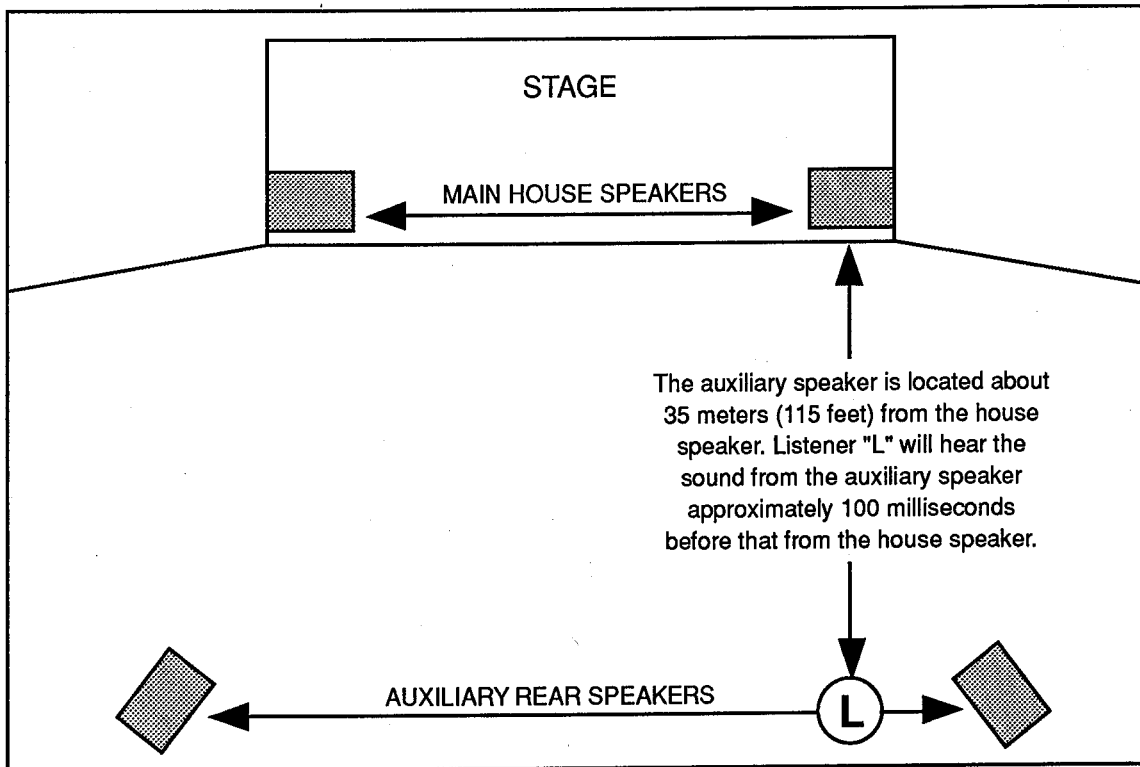
Referring to the diagram above, we can see that even relatively short distances can add up to considerable delays. Since the speed of sound in air is approximately 1127 feet/343 meters per second (at 20°), a mere 35 meters results in a delay of around 100 milliseconds — more than enough to serious degrade the quality of the sound. Delays of less than about 50 milliseconds can be ignored because the "precedence effect" causes listeners to discern only the initial sound, Longer delays, however, should be eliminated. In the example case, the D1030 could be set to delay the auxiliary speaker sound by about 100 milliseconds (35 meters or 115 feet, depending on the display mode), thereby restoring the integrity of the sound for all listeners.

SPECIFICATIONS

Electrical Characteristics
    Frequency Response   20 Hz — 20 kHz
    Dynamic Range   Greater than 100 dB
    Total Harmonic Distortion   Less than 0.03% (1 kHz)

Input
    Number of Inputs   1 (Electronically balanced)
    Nominal Level   +4 dB
    Input Impedance   10 kΩ

Outputs
    Number of Outputs   3 (Electronically Balanced)
    Nominal Level   +4 dB
    Output Impedance   150 Ω

A/D, D/A Conversion
    Quantization   18 bits
    Sampling Rate   50 kHz

Delay Time   0 — 1.3 sec (20 μsec steps)

Memory
    Number of Locations   15: 1 — 9 and A — F
    1 — 9   Delay + 3-band PEQ
    A — F   Delay + crossover

MIDI In/Out   Program change for memory select, control change
                               for parameter adjust, bulk dump for up/down load

External Remote Connector   9-pin D-SUB (contact-closure memory select)

Displays
    Level Meter   INPUT/OUTPUT 1 — 3
    Memory Number   7-segment LED
    Parameter   16-char. x 2-line, backlit

Power Requirements
    U.S. & Canadian models   120 V (105 — 130 V) 50/60 Hz
    General model   220 — 240 V (±10 %) 50/60 Hz

Power Consumption   22 W

Dimensions (W x H x D)   480 x 45 x 323.2 mm (18-7/8" x 1-3/4" x 12-3/4")

Weight   3.8 kg (8 lbs 6 oz)

    * *0 dB = 0.775 Vrms*

    * *Specifications and appearance subject to change without notice.*

    * *Internal circuit delays result in an overall delay of approximately 0.85 msec even when DELAY TIME and DELAY OFFSET are both set to "0", or DELAY BYPASS is engaged.*

BLOCK DIAGRAM

DELAY&PARAMETRIC EQUALIZER MODE
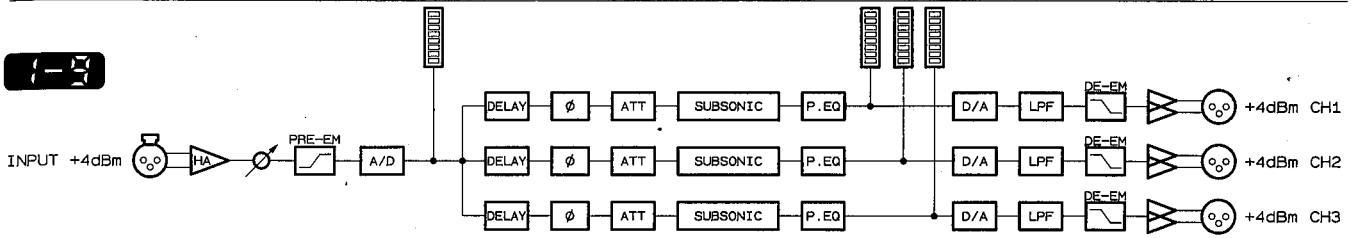
DELAY&CROSSOVER MODE
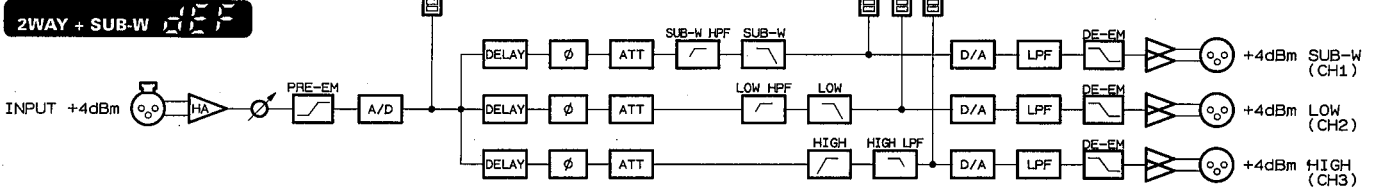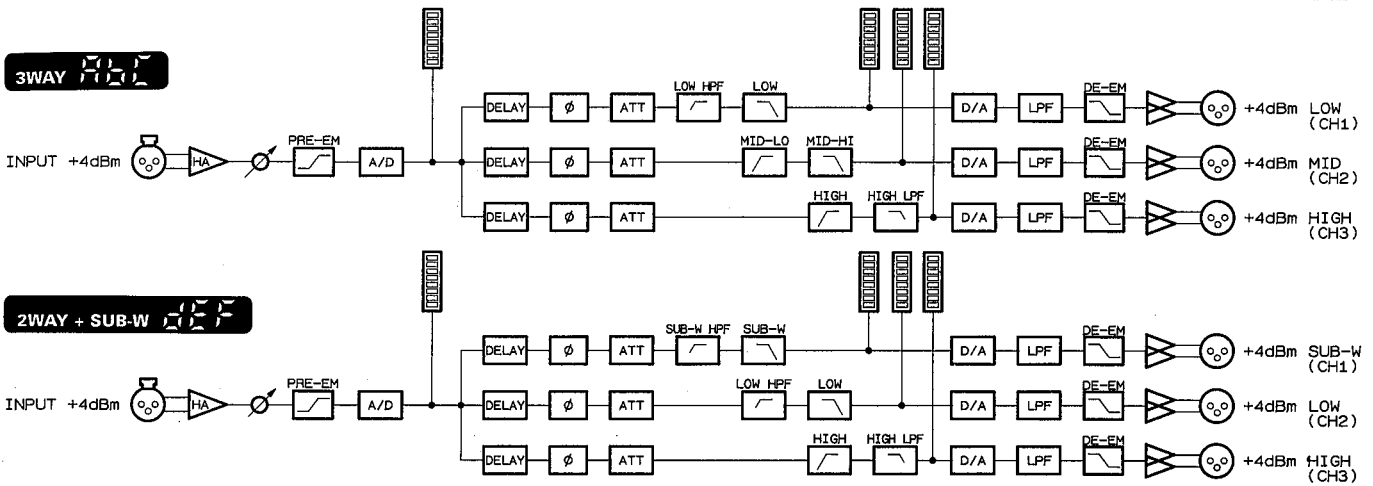
DIMENSIONS

Unit: mm (inch)

27
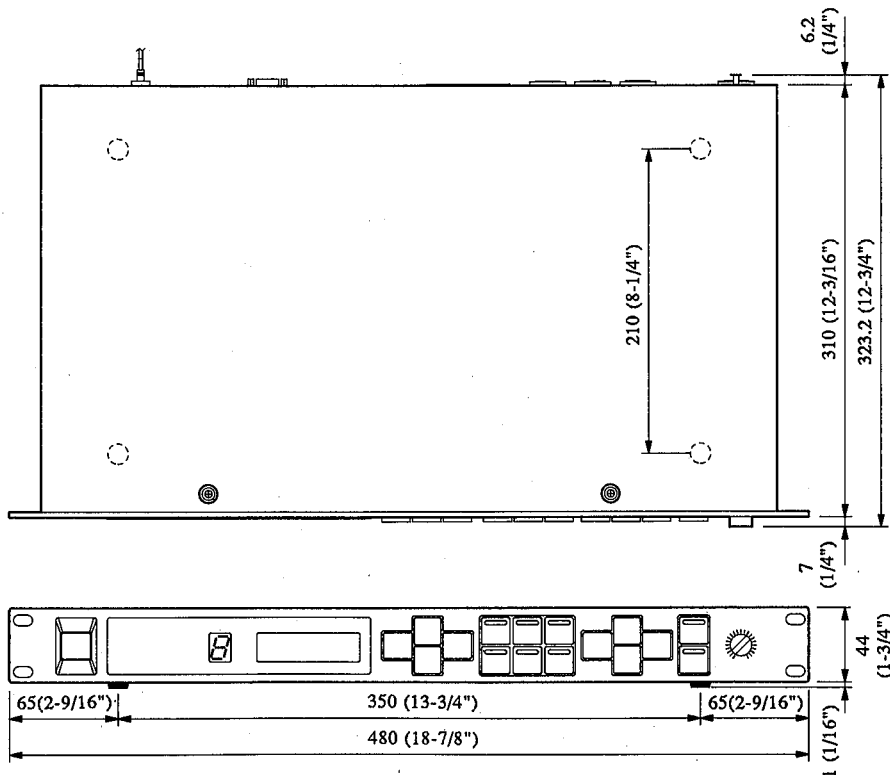
D1030

MIDI DATA FORMAT

1. Transmission Conditions

[CHANNEL MESSAGE]
PROGRAM CHANGE (CnH)

[SYSTEM EXCLUSIVE MESSAGE]
BULK DUMP (F0H, 43H, 0nH)

PARAMETER CHANGE (F0H, 43H, 1nH)

MIDI CH

○ OMNI

○ 1 — 16

CH = ?

○ OFF

→ MIDI OUT

2. Transmission Data
All MIDI data transmitted only when MIDI channel is set to 1 — 16 or omni.

2-1 Channel Information
1) Channel Voice Message
(1) Program Change
Transmitted whenever a program is recalled (within the same mode).

```
1100nnnn (CnH)  STATUS BYTE n=0 (channel No.1) ~
                            15 (channel No.16)
0ppppppp        PROGRAM NUMBER p=0~14
```

2-2 System Information
1) System Exclusive Message
(1) Bulk Dump
The data group to be bulk dumped is selected in the utility mode bulk dump function — MEM(No.), MEM*, PGM-TBL, SYS, ALL.

● **1 Memory Bulk Data [MEM(No.)]**

```
11110000 (F0H)  STATUS BYTE
01000011 (43H)  YAMAHA ID CODE
0000nnnn (0nH)  n=DEVICE NUMBER
01111110 (7EH)  FORMAT NUMBER
00000001 (01H)  BYTE COUNT (MSB)
00100100 (24H)  BYTE COUNT (LSB)
01001100 (4CH)  "L"
01001101 (4DH)  "M"
00100000 (20H)  " "
00100000 (20H)  " "
00111000 (38H)  "8"
00110111 (37H)  "7"
00110000 (30H)  "0"
00110011 (33H)  "3"
01001101 (4DH)  "M"  MEMORY
0mmmmmmm        MEMORY NUMBER (m=1~15*)
0ddddddd ─┐
   │       ├ DATA (154 byte*)
0ddddddd ─┘
0eeeeeee        CHECKSUM
11110111 (F7H)  EOX
```

* The memory number and the mode represented by the data type number must match.

	MEMORY NO.	Type No.
P.EQ	1 — 9	0
3WAY	10 — 12	1
2WAY	13 — 15	2

● **All Memory (15) Bulk Data [MEM*]**

The "1 Memory Bulk Data" described above is transmitted 15 times — once for each memory location.

● **Program Change Table Bulk Data [PGM-TBL]** .

```
11110000 (F0H) STATUS BYTE
01000011 (43H) YAMAHA ID CODE
0000nnnn (0nH) n=DEVICE NUMBER
01111110 (7EH) FORMAT NUMBER
00000011 (03H) BYTE COUNT (MSB)
00001010 (0AH) BYTE COUNT (LSB)
01001100 (4CH) "L"
01001101 (4DH) "M"
00100000 (20H) " "
00100000 (20H) " "
00111000 (38H) "8"
00110111 (37H) "7"
00110000 (30H) "0"
00110011 (33H) "3"
01010100 (54H) "T" TABLE
00000001 (01H) "1" fix TABLE NUMBER
0ddddddd ─┐
         │  DATA (384 byte)
0ddddddd ─┘
0eeeeeee      CHECKSUM
11110111 (F7H) EOX
```

● **System Setup Bulk Data [SYS]**

```
11110000 (F0H) STATUS BYTE
01000011 (43H) YAMAHA ID CODE
0000nnnn (0nH) n=DEVICE NUMBER
01111110 (7EH) FORMAT NUMBER
00000000 (00H) BYTE COUNT (MSB)
00010010 (12H) BYTE COUNT (LSB)
01001100 (4CH) "L"
01001101 (4DH) "M"
00100000 (20H) " "
00100000 (20H) " "
00111000 (38H) "8"
00110111 (37H) "7"
00110000 (30H) "0"
00110011 (33H) "3"
01010011 (53H) "S" SYSTEM SETUP DATA
00100000 (20H) " "
0vvvvvvv      VERSION NUMBER (01)
0rrrrrrr      VERSION NUMBER (00)
0ddddddd ─┐
         │  DATA (6 byte)
0ddddddd ─┘
0eeeeeee      CHECKSUM
11110111 (F7H) EOX
```

● **All Memory, Program Change Table, and System Setup Bulk Data [ALL]**

The "All Memory Bulk Data," "Program Change Table Bulk Data," and "System Setup Bulk Data" transmissions described above are carried out in sequence.

(2) Parameter Change

Transmitted when parameter data is edited.

```
11110000 (F0H) STATUS BYTE
01000011 (43H) YAMAHA ID CODE
0001nnnn (1nH) n=DEVICE NUMBER
00011101 (1DH) GROUP NUMBER
0ppppppp      PARAMETER NUMBER (0~116)
0ddddddd ─┐
         │  DATA (4 byte)*
0ddddddd ─┘
11110111 (F7H) EOX
```

*DATA CONVERSION (1 or 2 byte to 4 byte)

(1 byte)
```
             ┌─00000000
aaaabbbb ──► │ 00000000
             │ 0000aaaa
             └─0000bbbb
```

(2 byte)
```
aaaabbbb ─┐   ┌─0000aaaa
ccccdddd ─┘──►│ 0000bbbb
              │ 0000cccc
              └─0000dddd
```
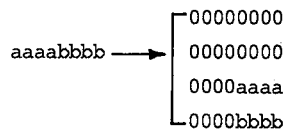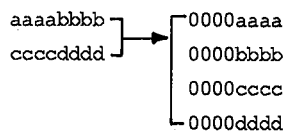
The D1030 can be switched to two modes: PARAMETRIC EQ and CROSSOVER. In the CROSSOVER mode it is further possible to select 3-way or 2-way operation. The number of parameters in each mode and their ID numbers are shown in the chart below.

		No. of Parameters	Parameter Number
EQ Mode		46	0 — 45
CROSSOVER Mode	3WAY	36	46 — 81
	2WAY	35	82 — 116

(117 total)

PARAMETER CHANGE TABLE

PARAMETER GROUP/SUB. GROUP NUMBER = 1DH

1. EQ MODE PARAMETER NUMBER (No.) = 0 — 45

No.	PARAMETER NAME	No.	PARAMETER NAME	No.	PARAMETER NAME
0	CH1 DELAY TIME	16	CH1 LOW FREQUENCY	32	CH3 MID FREQUENCY
1	CH2 DELAY TIME	17	CH1 LOW GAIN	33	CH3 MID GAIN
2	CH3 DELAY TIME	18	CH1 MID FREQUENCY	34	CH3 MID Q
3	DELAY OFFSET	19	CH1 MID GAIN	35	CH3 HIGH FREQUENCY
4	CH1 ATTENUATE	20	CH1 MID Q	36	CH3 HIGH GAIN
5	CH2 ATTENUATE	21	CH1 HIGH FREQUENCY	37	CH1 CTRL PARAMETER
6	CH3 ATTENUATE	22	CH1 HIGH GAIN	38	CH1 CTRL MIN
7	CH1 PHASE	23	CH2 LOW FREQUENCY	39	CH1 CTRL MAX
8	CH2 PHASE	24	CH2 LOW GAIN	40	CH2 CTRL PARAMETER
9	CH3 PHASE	25	CH2 MID FREQUENCY	41	CH2 CTRL MIN
10	CH1 PARAMETRIC EQ	26	CH2 MID GAIN	42	CH2 CTRL MAX
11	CH2 PARAMETRIC EQ	27	CH2 MID Q	43	CH3 CTRL PARAMETER
12	CH3 PARAMETRIC EQ	28	CH2 HIGH FREQUENCY	44	CH3 CTRL MIN
13	CH1 SUBSONIC FILTER	29	CH2 HIGH GAIN	45	CH3 CTRL MAX
14	CH2 SUBSONIC FILTER	30	CH3 LOW FREQUENCY		
15	CH3 SUBSONIC FILTER	31	CH3 LOW GAIN		

2. CROSSOVER MODE

(1) 3WAY TYPE PARAMETER NUMBER (No.) = 46 — 81

No.	PARAMETER NAME	No.	PARAMETER NAME	No.	PARAMETER NAME
46	CH1 DELAY TIME	58	CH1 LOW FREQUENCY	70	CH3 HIGH-LPF FRQ
47	CH2 DELAY TIME	59	CH1 LOW FINE	71	CH3 HIGH-LPF SLOPE
48	CH3 DELAY TIME	60	CH1 LOW SLOPE	72	CH1 CTRL PARAMETER
49	DELAY OFFSET	61	CH2 LOW-MID FREQ	73	CH1 CTRL MIN
50	CH1 ATTENUATE	62	CH2 LOW-MID FINE	74	CH1 CTRL MAX
51	CH2 ATTENUATE	63	CH2 LOW-MID SLOPE	75	CH2 CTRL PARAMETER
52	CH3 ATTENUATE	64	CH2 HIGH-MID FRQ	76	CH2 CTRL MIN
53	CH1 PHASE	65	CH2 HIGH-MID FINE	77	CH2 CTRL MAX
54	CH2 PHASE	66	CH2 HIGH-MID SLOPE	78	CH3 CTRL PARAMETER
55	CH3 PHASE	67	CH3 HIGH FREQUENCY	79	CH3 CTRL MIN
56	CH1 LOW-HPF FRQ	68	CH3 HIGH FINE	80	CH3 CTRL MAX
57	CH1 LOW-HPF SLOPE	69	CH3 HIGH SLOPE	81	COMPARE

(2) 2WAY TYPE PARAMETER NUMBER (No.) = 82 — 116

No.	PARAMETER NAME	No.	PARAMETER NAME	No.	PARAMETER NAME
82	CH1 DELAY TIME	94	CH1 S.WOOF-LOW FRQ	106	CH3 HIGH-LPF SLOPE
83	CH2 DELAY TIME	95	CH1 S.WOOF-LOW FINE	107	CH1 CTRL PARAMETER
84	CH3 DELAY TIME	96	CH1 S.WOOF-LOW SLOPE	108	CH1 CTRL MIN
85	DELAY OFFSET	97	CH2 LOW-HPF FREQ	109	CH1 CTRL MAX
86	CH1 ATTENUATE	98	CH2 LOW-HPF SLOPE	110	CH2 CTRL PARAMETER
87	CH2 ATTENUATE	99	CH2 LOW FREQUENCY	111	CH2 CTRL MIN
88	CH3 ATTENUATE	100	CH2 LOW FINE	112	CH2 CTRL MAX
89	CH1 PHASE	101	CH2 LOW SLOPE	113	CH3 CTRL PARAMETER
90	CH2 PHASE	102	CH3 HIGH FREQUENCY	114	CH3 CTRL MIN
91	CH3 PHASE	103	CH3 HIGH FINE	115	CH3 CTRL MAX
92	CH1 S.WOOF-HPF FRQ	104	CH3 HIGH SLOPE	116	COMPARE
93	CH1 S.WOOF-HPF SLOPE	105	CH3 HIGH-LPF FRQ		

3. Reception Conditions

[CHANNEL MESSAGE]
→ CONTROL CHANGE (BnH)

→ PROGRAM CHANGE (CnH)

[SYSTEM EXCLUSIVE MESSAGE]
→ BULK DUMP (F0H, 43H, 0nH)

→ PARAMETER CHANGE (F0H, 43H, 1nH)

→ BULK DUMP REQUEST (F0H, 43H, 2nH)

MIDI IN — MIDI CH — OMNI / 1—16 / OFF — CH = ?
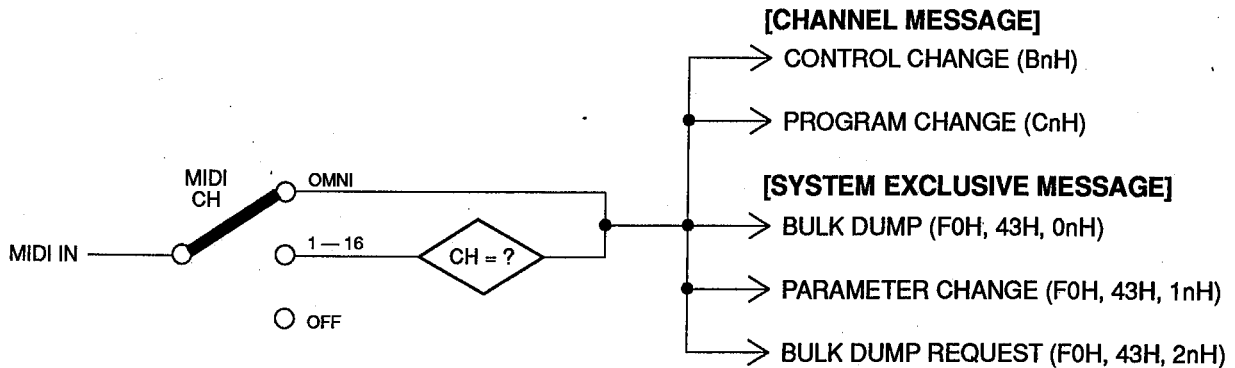
4. Reception Data

All MIDI data transmitted only when MIDI channel is set to 1 — 16 or omni.

4-1 Channel Information

1) Channel Voice Message

(1) Control Change

Controllers can be individually assigned to the D1030 CH1, CH2 and CH3 using the utility mode CONTROLLER function.

```
1011nnnn (BnH)  STATUS BYTE n=0(channel No.1)~
                              15(channel No.16)
0ccccccc        CONTROL NUMBER C=0~31, 64~95, 102~120
0vvvvvvv        VALUE v=0~127
```

(2) Program Change

```
1100nnnn (CnH)  STATUS BYTE n=0(channel No.1)~
                              15(channel No.16)
0ppppppp        PROGRAM NUMBER p=0~127
```

4-2 System Information

1) System Exclusive Message

(1) Bulk Dump

The data group to be bulk dumped is selected in the utility mode bulk dump function — MEM(No.), MEM*, PGM-TBL, SYS, ALL.

● **1 Memory Bulk Data**

The data received is the same as that described in "1 Memory Bulk Data" in the preceding "Transmission Data" section.

● **All Memory (15) Bulk Data**

The data received is the same as that described in "All Memory (15) Bulk Data" in the preceding "Transmission Data" section.

● **Program Change Table Bulk Data**

The data received is the same as that described in "Program Change Table Bulk Data" in the preceding "Transmission Data" section.

● **System Setup Bulk Data**

The data received is the same as that described in "System Setup Bulk Data" in the preceding "Transmission Data" section.

● **All Memory, Program Change Table, and System Setup Bulk Data**

The data received is the same as that described in "All Memory, Program Change Table, and System Setup Bulk Data" in the preceding "Transmission Data" section.

(2) Parameter Change

The data received is the same as that described in "Parameter Change" in the preceding "Transmission Data" section. The parameters of the currently selected program are changed accordingly when this data is received.

(3) Bulk Dump Request

The data group to be bulk dumped is selected in the utility mode bulk dump function — MEM(No.), MEM*, PGM-TBL, SYS, ALL.

● Memory Data Bulk Dump Request

The data for the currently selected program is transmitted when this data is received.

```
11110000  (F0H)  STATUS BYTE
01000011  (43H)  YAMAHA ID CODE
0010nnnn  (2nH)  n=DEVICE NUMBER
01111110  (7EH)  FORMAT NUMBER
01001100  (4CH)  "L"
01001101  (4DH)  "M"
00100000  (20H)  " "
00100000  (20H)  " "
00111000  (38H)  "8"
00110111  (37H)  "7"
00110000  (30H)  "0"
00110011  (33H)  "3"
01001101  (4DH)  "M"  MEMORY
0mmmmmmm         MEMORY NUMBER  (m=1~15)
11110111  (F7H)  EOX
```

● Program Change Table Bulk Dump Request

Bulk transmission of the program change table data occurs when this data is received.

```
11110000  (F0H)  STATUS BYTE
01000011  (43H)  YAMAHA ID CODE
0010nnnn  (2nH)  n=DEVICE NUMBER
01111110  (7EH)  FORMAT NUMBER
01001100  (4CH)  "L"
01001101  (4DH)  "M"
00100000  (20H)  " "
00100000  (20H)  " "
00111000  (38H)  "8"
00110111  (37H)  "7"
00110000  (30H)  "0"
00110011  (33H)  "3"
01010100  (54H)  "T"  TABLE
00000001  (01H)  "1"  fix TABLE NUMBER
11110111  (F7H)  EOX
```

● System Setup Data Bulk Dump Request

Bulk transmission of the system setup data occurs when this data is received.

```
11110000  (F0H)  STATUS BYTE
01000011  (43H)  YAMAHA ID CODE
0010nnnn  (2nH)  n=DEVICE NUMBER
01111110  (7EH)  FORMAT NUMBER
01001100  (4CH)  "L"
01001101  (4DH)  "M"
00100000  (20H)  " "
00100000  (20H)  " "
00111000  (38H)  "8"
00110111  (37H)  "7"
00110000  (30H)  "0"
00110011  (33H)  "3"
01010011  (53H)  "S"  SYSTEM SETUP DATA
00100000  (20H)  " "
11110111  (F7H)  EOX
```

```
YAMAHA   [ Digital Delay Line ]                    Date : 10/07, 1989
          Model  D1030  MIDI Implementation Chart  Version : 1.0
```

Function ...	Transmitted	Recognized	Remarks
:Basic Default	1 - 16, off	1 - 16, off	memorized
:Channel Changed	1 - 16, off	1 - 16, off	
:Mode Default	x	OMNIoff/OMNIon	memorized
Messages	x	x	
Altered	**************	x	
:Note	x	x	
:Number : True voice	**************	x	
:Velocity Note ON	x	x	
Note OFF	x	x	
:After Key's	x	x	
:Touch Ch's	x	x	
:Pitch Bender	x	x	
:Control 0 - 31	x	o	
64 - 95	x	o	
:Change 102 - 120	x	o	
:Prog	o 0 - 14	o 0 - 127	*1
:Change : True #	**************		
:System Exclusive	o	o	
:System : Song Pos	x	x	
: Song Sel	x	x	
:Common : Tune	x	x	
:System :Clock	x	x	
:Real Time :Commands	x	x	
:Aux :Local ON/OFF	x	x	
:All Notes OFF	x	x	
:Mes- :Active Sense	x	x	
:sages :Reset	x	x	

```
:Notes: *1 = For program 1 - 128, memory #1 - #F is selected.
```

```
Mode 1 : OMNI ON,  POLY    Mode 2 : OMNI ON,   MONO           o : Yes
Mode 3 : OMNI OFF, POLY    Mode 4 : OMNI OFF,  MONO           x : No
```

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Explosionsfara vid felaktig hantering.

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ammattimies.

ADVARSEL!
Lithiumbatteri!
Eksplosionsfare. Udskiftning má kun foretages
af en sagkyndig, – og som beskrevet i
servicemanualen.

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