KORG
DRV-2000
DIGITAL REVERB

OWNER'S MANUAL

INTRODUCTION
– About This Manual

Congratulations on your purchase of the KORG DRV-2000 Digital Reverb. You now own one of the most advanced digital reverberators available today, offering you not only studio-quality reverberation, but also a host of other sophisticated effects such as stereo echo and Space Pan. In addition, the DRV-2000 gives you more practical real-time control over the processed sound than any other effect unit on the market. Both in live performance and studio recording applications, you will thus be able to enhance your music with a new kind of expressiveness and excitement.

Despite its large number of features and unprecedented flexibility of control, the DRV-2000 is very easy to use. This manual is designed to help you get acquainted with the many possibilities of effects processing now at your disposal and make full use of the vast potential of this unit. We advise you to read it thoroughly while actually trying out the various adjustments as we explain them, listening to the influence they have on the effect. This way, you will soon be familiar with the DRV-2000 and able to make it do precisely what you want it to.

If you already know a lot about effect processing, you may want to just skim through section II to confirm the key functions and then read about "PROGRAMS AND PARAMETERS" to get to know all DRV-2000 features. Should you have little experience in this field, reading the entire manual will help save time and avoid frustration with ineffective settings.

The manual first introduces the major types of effects provided, telling you "WHAT THE DRV-2000 CAN DO FOR YOUR SOUND". Since you will probably want to hear some actual examples of the beautiful ambience and impressive effects right away, this section also contains "quick" information on connections and operation.

Section II describes all front panel controls and rear panel terminals while showing you how to hook up the DRV- 2000 properly in different systems.

General operations are outlined in section III, the "OPERATION GUIDE", where the 4 operation modes of the DRV-2000 are introduced. You are taught how to perform all steps necessary to call up and edit programs in order to create your own individual effects, and how to store them in one of the 80 internal memory locations.

The contents of the 16 preset effect programs, which form the basis for your own edited versions, are described in detail in part A) of IV, "PROGRAMS AND PARAMETERS". You are recommended to experiment and try out many different settings to get a feeling for effects programming and what it means in terms of actual sound. This will help you create the ideal program for the application at hand, suiting your taste and needs.

Part B) explains the DRV-2000 UTILITY functions (except Title Edit, which is treated in the preceding section III). Here you will learn about settings necessary for external MIDI and foot switch control, and how to save program data to external memories such as the MEX-8000.

A unique set of DRV-2000 features, called "Multi Modulation", allows you to create an amazing variety of highly useful and attractive effects via foot controllers, drum machine triggers or external audio and MIDI signals. Programming is described in part C) of section IV, "MULTI MODULATION".

Finally, "Advanced Application Advice" gives you some concrete setting examples and helpful hints along with explanations of terms used in professional sound processing like "doubling" or "slap echo". We hope that this section will start you off on creating the kind of effects you have always been looking for on your own.

PRECAUTIONS

LOCATION

Avoid exposure to direct sunlight or other sources of heat. Vibration, excessive dust, cold or dampness can also lead to malfunctions.

HANDLING

Handle with care. Do not apply excessive force to the keys, knobs or terminals. Always remove plugs from jacks or MIDI terminals by gripping them directly, not by pulling the cord.

POWER SUPPLY

1. Use only with rated AC voltage. When moving to a country with a different voltage, be sure to connect the unit to a proper transformer.
2. Disconnect the unit from the AC receptacle when not using it for extended periods of time. Electrical storms (lightning) can give rise to power surges which might damage the internal digital circuitry even if the unit is turned off.
3. Avoid connection to the same AC outlet as other devices, particularly ones with large power consumption, since this may cause sound quality to deteriorate.

AUDIO AND MIDI CABLES

Be sure to use standard shielded audio cables with phone plugs for INPUT and OUTPUT connections. Never insert any other kind of plug into these jacks. Keep cables to under 20 feet in length to avoid hum, noise and high frequency losses.
Connect only standard MIDI cables. Avoid bundling them together with power cords as this can lead to MIDI malfunctions.

CLEANING

Wipe the exterior with a soft, dry cloth. Chemical solvents like benzene will damage the finish.

SERVICE AND MODIFICATIONS

The DRV-2000 contains no user servicable parts. Opening it or tampering with it in any way can lead to electrical shock and damage the unit. Besides, it will void the product warranty. Refer all servicing to qualified KORG personnel.

MEMORY BACKUP

The DRV-2000 contains a lithium backup battery which ensures that the user program area and utility data is not lost when power is turned off.
This battery has a lifespan of over 5 years. To be on the safe side, we recommend replacing it every five years or as soon as the battery life warning display *appears on the LCD.
Contact your dealer or the nearest KORG service center for a replacement.

* : When battery voltage drops below a certain minimum, the LCD will warn you and indicate how to load the preset programs to the user area.

KEEP THIS MANUAL FOR FUTURE REFERENCE.

CONTENTS

SECTION I:
WHAT THE DRV-2000 CAN DO FOR YOUR SOUND

Music without effects has been likened to food without spice. Even the best performance will sound flat and lifeless if the vibrant ambience provided by natural or high-quality artificial reverberation, for example, is lacking. That is why in the recording industry, there is practically no such thing as "unprocessed" sound.

The DRV-2000 is a professional-quality digital reverberation unit — but at the same time, it is much more than just that. Written on its front panel is the word "MULTI-EFFECT". It indicates that the DRV-2000 is also a superb two-channel digital delay, a stereo phaser and flanger, a compressor and noise gate — and many other things you want it to be. This single compact unit thus puts the whole range of state-of-the-art effect processing at your fingertips.

Once you start using the DRV-2000, your sound will never be the same again. Virtually any kind of music is enhanced by adding reverb to varying degrees, making it "liver" and giving more "presence". Some instruments will not sound authentic at all if reverberation is missing. A good example is a church organ as simulated by a synthesizer.

Many other effects allow you to create a new kind of sound altogether. Flanging applied to an electric guitar, for instance, gives a tonal quality totally different from the unprocessed timbre.

Chorus, doubling, tripling and so on can turn solo instruments into ensembles. Such effects can also be used to make up for a human voice's weakness, thickening the timbre and increasing intensity. Vocal character can then be further improved with the special VOCAL plate reverb program (using a second DRV-2000 in live situations, or the same one during mix-down of a recording).

Finally, there is limitless world of "special effects" that can help you achieve the most diverse impressions. They run the whole gamut from the gated reverb effects now so popular for drums to breathtaking stereo echoes and Space Pan which can make sound images race and rotate backward and forward, left and right through the entire stereo field.

Merely considering the above examples, you can already roughly distinguish quite a few kinds of very different applications for the incredibly flexible DRV-2000 Multi-Effect Digital Reverberator. Among many other things, it lets you

1. enhance overall sound, producing ambience and "liveness"
2. enhance particular instrument timbres
3. totally change the tonal quality of individual instruments
4. create ensemble (multiple instrument) effects from single sounds
5. correct "shortcomings" of vocalists or other performers, for instance giving thin voices presence and power
6. add an infinite variety of "special effects".

The DRV-2000 can make your music sound even better in so many ways, we can not possibly describe them all in this manual. The following list of main features, which is by no means comprehensive, should at least give you a first idea of its awesome potential. Various applications are introduced in following sections.

In the end though, it will be up to you and your imagination and originality to really find out what the DRV-2000 can do for your sound.

A ⎯⎯⎯ MAIN FEATURES ⎯⎯⎯⎯

KORG Custom Digital Signal Processor (DSP)

Using 16-bit linear analog-digital conversion, this DSP offers all the advantages of the most advanced digital technology. First, sound quality: an extremely wide dynamic range, very low noise and practically no distortion.

The other great bonus: instant control. The DRV-2000 makes full use of this digital advantage for unheard-of control flexibility.

16 Professional Preset Programs

These reverb, stereo echo, flanger and other effects can be altered freely to form the basis for your own programs. Up to 80 edited versions can be stored in the internal user memory area.

Easy Editing of the Numerous Parameters

The preset programs have an abundance of parameters for individual tailoring of each effect to suit your music. Editing is nevertheless very simple thanks to the illuminated LCD with its easy-to-understand messages.

Widest Range of External Control Possibilities

The unique Multi Modulation concept allows you to select from among 72 external sources — foot switches, audio signals, MIDI devices — for real-time control of a large variety of parameters. A simple example: the duration and/or intensity of an effect such as reverb can be regulated according to MIDI key touch, a pitch bend lever or the pressing of a foot switch (which then functions like a piano damper pedal). Multi Modulation control of two parameters can be memorized for each program.

Fast Program Selection Via Foot Switch or MIDI

Two independent foot controls can be assigned to switch UP to the next or DOWN to the preceding program number within a user-definable range, or cancel an effect altogether. MIDI messages such as program change or note on key number may be used to access specific DRV-2000 programs "automatically" during a performance.

Direct program selection is also possible with the KORG MIDI pedal keyboard MPK-130.

Highly Realistic, Natural Reverberation

The reverb programs on the DRV-2000 also simulate the early reflections (E/R) so essential to a natural, authentic ambience.

Unique Space Pan Effect

By synchronizing auto pan with tremolo, the DRV-2000 is capable of producing distinct circular and elliptical motion of the sound within the stereo field, panning the image between the left and right while simultaneously moving it closer or letting it recede into the distance.

Adjustable Gate Shapes

The envelope form used for the gate reverb programs can be varied over a wide range of shapes including reverse gate.

Useful Combination Programs

In the "Reverb & Echo" and "Reverb & Chorus" programs, the DRV-2000 functions like two totally independent effect processors at the same time.

B ⎯ QUICK BASIC SETUP AND OPERATION ⎯

By now, you probably can't wait to actually hear some of the exciting effects the DRV-2000 can add to your music. This paragraph gives the most fundamental information needed to get some sound out of the unit, supposing that you already know a bit about processors. If you do not, please be sure to start with following section instead as soon as you have read about

AC Power Connection

Plug the power cord into a convenient AC receptacle, but do NOT turn on the power yet. Remember that as a rule, all audio and MIDI connections should be made with the equipment turned OFF. This will avoid damage to your speakers, MIDI malfunctions and so on.

Audio Connections

Look at the diagrams on p. 7 - 8 . Choose the one closest to your own application and connect your instrument or mixer to the rear panel INPUT jack of the DRV-2000 as shown. Return the L/MONO and/or R OUTPUT signal(s) to the mixer or send them to an amplifier. If you are not sure about these connection, read section II B).

Power Up and Input Level Adjustment

After having made the necessary connections, push the POWER switch. Play your instrument while adjusting the INPUT LEVEL knob so that the top red LED lights only during signal peaks. (You may have to change the position of the rear panel attenuator switch.)

Regulate the balance between direct and effect sound with the OUTPUT MIX knob.

Program Selection

You can now select any desired preset program (name shown on the LCD, number by the LEDs) with the **UP** and **DOWN** keys.

While playing your instrument, listen to a bit of what the DRV-2000 can do for your sound.

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SECTION II:
FRONT AND REAR PANEL LAYOUT, CONNECTIONS

A /⎺FRONT PANEL⎺ — Controls and Displays /

This section is a short introduction of the front panel to help you become familiar with the controls and displays. The functions and operations using the 7 keys are explained in later sections along with the messages appearing on the LCD.
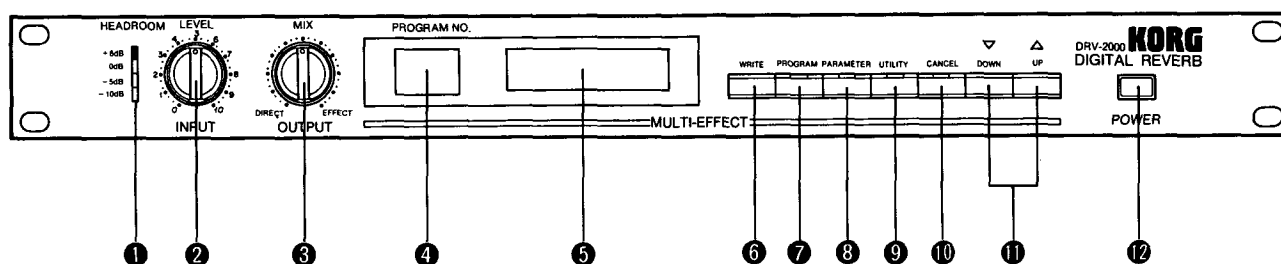
❶ HEADROOM Indicator

This four-segment LED level meter is a practical visual aid to obtaining appropriate input volumes with the INPUT LEVEL knob.

If the top (red) segment is on continuously when a signal is applied, this indicates an overload that will lead to distortion. On the other hand, the green segments should light up whenever there is an input. Otherwise, the S/N (signal to noise) ratio will deteriorate.

❷ INPUT LEVEL Knob

Allows you to regulate the signal level applied to the rear panel INPUT jack for optimum effect sound quality. Raise or lower this volume as necessary while watching the HEADROOM indicator. Turning the knob fully clockwise achieves maximum input level (and thus unity gain output — see "OUTPUT MIX Knob", "INPUT Jack" and "OUTPUT Jacks" below).

Ideally, a setting of around 8 to 10 should cause the three lower (green) segments of the indicator to light up most of the time with the red one flashing occasionally during input signal peaks. Adjust the output volume of your instrument or the effect send level on your mixer accordingly for best results. You may have to change the position of the rear panel attenuator switch ❺ (see p.6).

❸ OUTPUT MIX Knob

Regulates the volume balance between the DIRECT sound and the EFFECT sound. When set to the extreme left, you will hear only the direct sound without any effect whatsoever. This amounts to bypassing the DRV-2000. Turning this knob to the right (clockwise) gradually increases the effect level within the DIRECT/EFFECT mix until only the effect sound itself is heard.

Adjust this knob to obtain the balance most suitable for the application at hand. Turning it towards DIRECT will increase output volume somewhat (because the direct sound is louder than the effect) while lowering the level of the effect component in the overall sound.

Notice however that this control actually regulates the output mix and not the output level. On the DRV-2000, which provides unity gain and therefore no additional amplification, output level is determined by the volume of the incoming sound and the position of the INPUT LEVEL knob.

❹ PROGRAM NO. LED Display

Indicates the currently selected program number with two seven-segment light emitting diodes.

Blinks to show when you can choose a number for program data storage.

❺ LCD Character Display

Easy to read even on a dark stage, this back-lit liquid crystal display is the main information center of your DRV-2000, showing program titles, programmable parameters and their values as well as various other messages. It is essential for editing, making speedy and precise programming easy.

The meanings of the displayed messages and parameters, which often appear in abbreviated form, are explained along with the operations.

To the right of the LCD are seven feather-touch keys for program selection, editing and storage. Most of their functions are described in detail in section III, the "OPERATION GUIDE", further below. Here will just introduce them shortly for your reference.

❻ WRITE Key

This key is used to store edited programs in the user program area (memory locations 17 to 96). For details on the WRITE function, see p. 10.

❼ PROGRAM Key

Pressing this button enters PROGRAM mode, shown by the built-in red indicator. This mode allows selection of programs with the **UP** and **DOWN** keys described below.

The **PROGRAM** key is also pushed when you wish to exit from other modes. Refer to p. 9.

❽ PARAMETER Key

Used to enter PARAMETER mode (p. 10), indicated by the key's LED lighting up, and to switch between program and utility parameters for data editing.

Repeatedly pushing this button displays the parameters of a program on the LCD one after the other, showing which one can currently be changed (edited) with the **UP** and **DOWN** keys.

If you press **UTILITY** while holding down **PARAMETER**, Multi Modulation mode is entered. (For details on this mode, see p. 14)

In addition, the PARAMETER key is used in conjunction with the **UP** and **DOWN** keys to move the cursor when editing program titles in UTILITY mode.

❾ UTILITY Key

Briefly pushing this key enters UTILITY mode (see p. 12). The built-in LED will light up. Further pressing it consecutively calls up the utility functions on the LCD for adjustment with the **PARAMETER, UP** and **DOWN** buttons.

If this key is kept pressed for longer than 1 second, the DRV-2000 automatically switches from UTILITY back to the previous mode. (An exception: if the previous mode was WRITE, it switches to the mode selected before that.)

❿ CANCEL Key

This cancels the effect sound so that only the direct sound is output from the DRV-2000. In this respect, it functions just like a bypass switch. However, unlike a conventional bypass, the OUTPUT MIX knob is still effective, regulating the volume of the direct sound so that nothing at all is heard if **CANCEL** is pressed and the OUTPUT knob ❸ turned fully to the right (pointing to EFFECT). The button's LED shows you when the CANCEL function is on. Press the key again to release CANCEL.

⓫ UP and DOWN Keys

As mentioned above, these two keys select program numbers in PROGRAM mode and adjust data in the PARAMETER and UTILITY modes.

The **UP** key increases program numbers or numeric data, while **DOWN** decreases them. These buttons also switch between non-numeric data settings.

Pushing **UP** or **DOWN** shortly causes increments or decrements in single steps. Keeping these keys depressed makes the values or settings change continuously.

This can be further speeded up by additionally pressing the opposite key — **DOWN** if are holding down **UP**, **UP** if you are pushing **DOWN**. In other words, the key first pressed determines the direction of value change when using this acceleration function.

⓬ POWER Switch

Press to power up the unit. Initially, only the blue LCD will light up, displaying

```
┌─────────────────────────┐
│  KORG    DRV-2000        │
│  DIGITAL   REVERB        │
└─────────────────────────┘
```

After a second, the message "SYSTEM SET UP!" will start blinking on the second display line, during which no operation of the unit is possible.

Finally, the **PROGRAM** key indicator will light up. At the same time, the red PROGRAM NO. LEDs will show the number of the program selected when power was last turned off. The name of this program and an adjustable parameter will appear on the LCD.

B CREAR PANEL
– Terminals and Connections

After introducing the terminals and switches on the rear panel here, the following chapter will show you how to connect your new effect unit to other equipment. Depending on the system you are using, there are many different ways you can hook up the DRV-2000 with instruments, mixers and amplification. Four common examples are illustrated under C) "SYSTEM CONNECTION EXAMPLES". Use the one closest to your own application as a model setup and adapt it according to your own needs.

We repeat that all connections (except those of foot switches) should be made with power turned off.
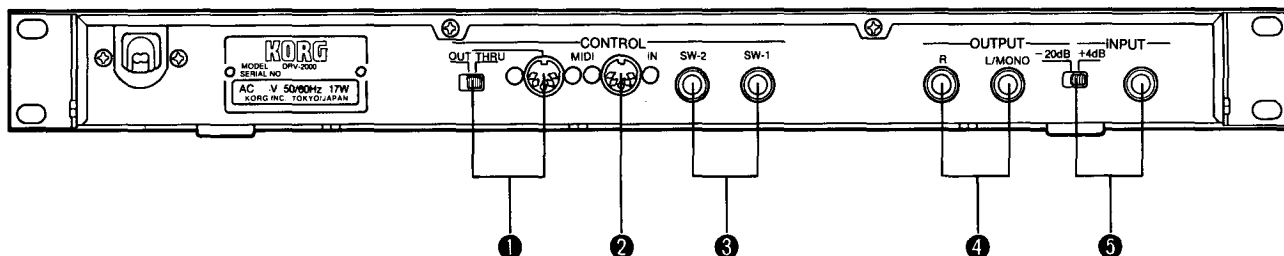
❶ MIDI OUT/THRU Terminal and Switch

The setting of the OUT/THRU switch determines whether the left MIDI connector functions as an OUT or THRU terminal.

When set to THRU, this terminal simply re-transmits the data received at MIDI IN as it is. Connecting it to the MIDI IN of another instrument then allows direct control of that instrument from the equipment plugged into DRV-2000 MIDI IN.

Setting the switch to OUT transmits MIDI data processed by the DRV-2000, for example information received at MIDI IN which has been altered by its MIDI Program Change or Note Program Change functions.

❷ MIDI IN Terminal

The DRV-2000 is capable of receiving MIDI data through this standard MIDI connector, allowing (automatic) effect program selection according to MIDI program change or note on messages.

MIDI sources for Multi Modulation control are also connected here.

❸ SW-1 and SW-2 Foot Switch and Controller Jacks

These are for connection of optional KORG foot switches or continuous foot controllers (volume pedals) as well as other equipment such as KORG drum machines which output ‾‾֍ GND type trigger signals. Depending on the UTILITY switch assignment program (see p. 12) and the type of foot or other control connected, the devices plugged in can cancel the effect (as with the **CANCEL** key) and switch the program number up or down, or let you control Multi Modulation with your feet (or external drum machine trigger signals). These jacks are therefore extremely practical especially during live performances.

For the PROGRAM UP and DOWN or effect CANCEL functions, it is usually best to plug in ‾‾֍ GND type foot switches such as KORG PS-1 and S-2, or connect the ‾‾֍ GND trigger output of a PS-2 pedal switch. (Other types of trigger signals will not work.)

When you want to control Multi Modulation continuously by foot, connect the output jack of a KORG KVP-001 or KVP-002 foot volume. Please do not use any other kinds of foot controls as this may lead to malfunctions and even damage the DRV-2000.

Note that such switches and volume pedals should not be connected to the audio INPUT jack.

Connection Example

KVP-001 or KVP-002
(MINIMUM VOLUME: 0)

SW-2   SW-1
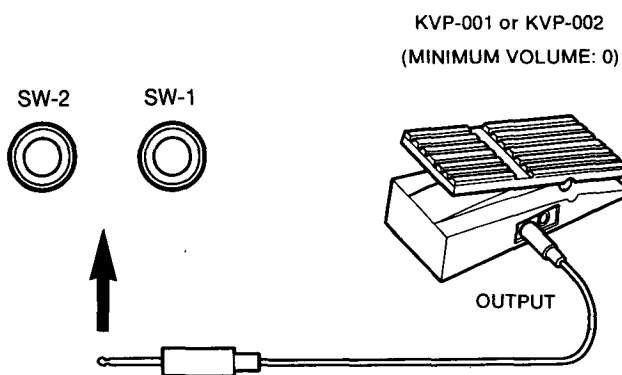
OUTPUT

The trigger outputs of drum machines such as the KORG DDD-1 may also be used as a Multi Modulation source (see p. 14).

❹ OUTPUT Jacks (L/MONO and R)

Since the DRV-2000 is a sophisticated two-channel re-verberation unit, it has two outputs, L/MONO (left or monaural) and R (right). Whenever possible, connect it to a stereo amplification system. Otherwise, you will not be able to appreciate the many superb stereo effects the DRV-2000 is capable of.

Both output jacks deliver a mix of the direct and effect sound. The volume balance between these two sound components is adjusted with the OUTPUT knob ❸ on the front panel.

If no stereo system is available, connect amplification to the L/MONO jack. (Of course, none of the stereo programs such as Space Pan or stereo echo will produce any stereo effect with such a setup.)

We remind you that that the input/output ratio on the DRV-2000 is 1:1, or unity, when INPUT LEVEL is set to 10. If your output level is still too low after having adjusted the INPUT volume as explained above while watching the HEADROOM indicator, you will have to increase amplification on the equipment receiving the DRV-2000 output. For instance, raise the effect return volume on your mixer.

Do not further increase the DRV-2000 INPUT LEVEL to obtain more output if this would lead to the HEADROOM indicator's red segment lighting up continuously. Such a setting would only cause distortion noise, thus impairing sound quality.

❺ INPUT Jack with Attenuator Switch

Plug your instrument or mixer effect send bus into this standard mono 1/4 inch phone jack. The two-position attenuator switch to the left of it is used to adapt the nominal input level to the type of equipment connected. Set it as shown below.

Switch Position	Type of Equipment Connected
+ 4 dB	PA and recording mixers, other professional audio equipment, microphones and some miked acoustic instruments. So-called "mic level input".
− 20 dB	Instruments with high-level outputs such as synthesizers or other electronic keyboards, electric guitars and basses; other effect units. So-called "line-level" input.

When the INPUT LEVEL knob is set to 10, the input/output gain is unity, meaning that the input and output sounds will have the same volume. Switching the attenuator therefore also changes the output level obtained with the following two jacks.

Audio signals you wish to use as Multi Modulation sources are also plugged into INPUT.

C / SYSTEM CONNECTION EXAMPLES /

1. SOLO PERFORMANCE INSTRUMENT / MIKE SYSTEM

This is the most basic setup, with the DRV-2000 connected immediately following an instrument or microphone. The effector's stereo (or mono = L) output directly feeds an instrument amplifier or a sound reinforcement system. Useful especially for soloists who want to control the effects themselves (for instance via foot switch) rather than leave that to a mixing engineer.

Diagram 1

TO INSTRUMENT AMP OR SOUND REINFORCEMENT

STEREO OR L/MONO OUTPUT

DRV-2000

INPUT

ELECTRIC GUITAR

OUTPUT

SYNTHESIZER, KEYBOARD etc.
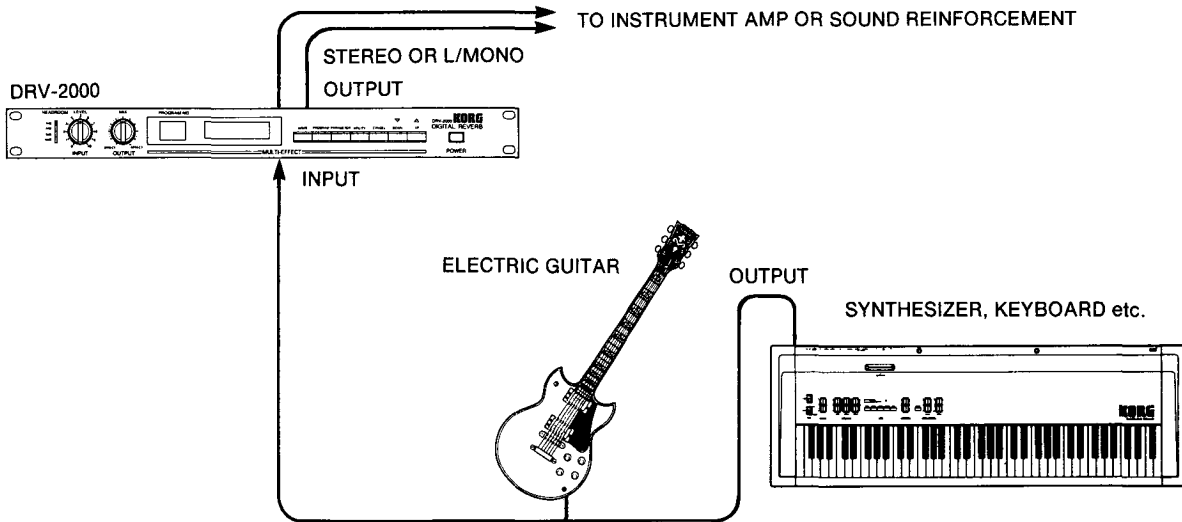
Set rear panel attenuator switch ⑤ according to the type of instrument used.

2. MIDI KEYBOARD PERFORMANCE SYSTEM

This is a variation of the above setup which gives you additional MIDI control over the DRV-2000 for automatic selection of the ideal effect for each synthesizer voice, or for Multi Modulation.

Diagram 2

TO INSTRUMENT AMP OR SOUND REINFORCEMENT SYSTEM

DRV-2000   STEREO OUTPUTS

MIDI IN   INPUT

MIDI SYNTESIZER

OUTPUT

MIDI OUT
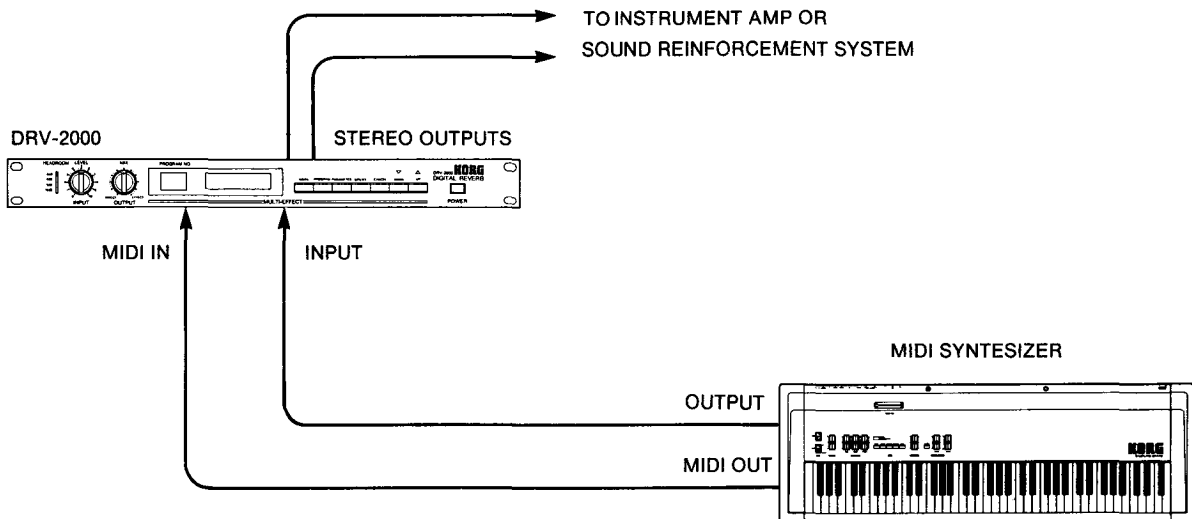
Set rear panel attenuator switch ⑤ to " −20dB".

7

3. RECORDING SYSTEM

Flexibility is the main requirement of a recording system. Ideally, the DRV-2000 INPUT and OUTPUTs should therefore be hooked up to a patch bay where they are available for connection of any device.

Sometimes you may want to patch an instrument output directly to the DRV-2000, processing the sound before it enters a mixer's channel input (a setup similar to example 1). In other situations, for instance during mix-down, it is best to have the DRV-2000 patched into the mixer's effects send/return loop.

This latter connection (to the mixer effects loop) is recommended for recording when no patch bay is available.

Diagram 3
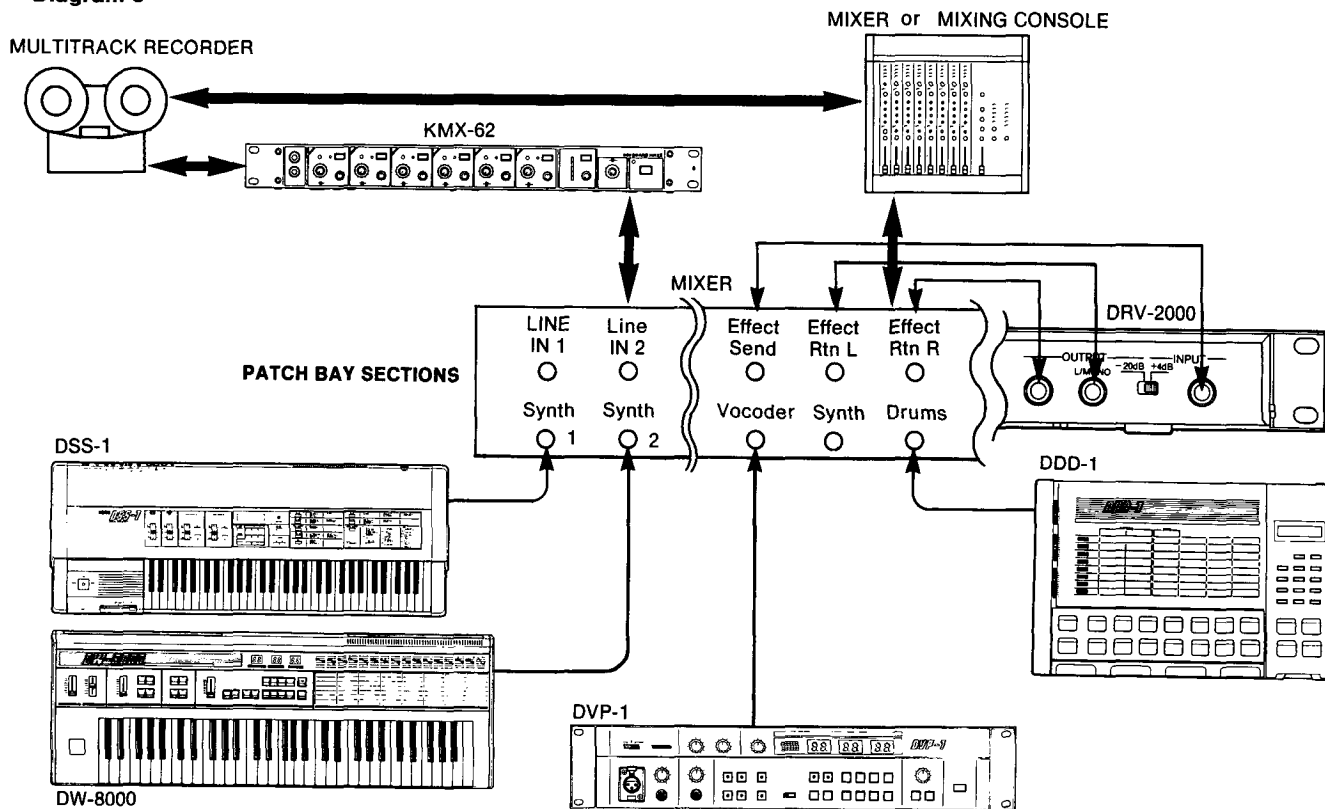
4. PA SYSTEM

Basically, this setup is similar to the one described for recording, except that generally less flexibility is required so that the DRV-2000 can be permanently patched into the mixing console's effects or auxiliary loop.

Diagram 4

8
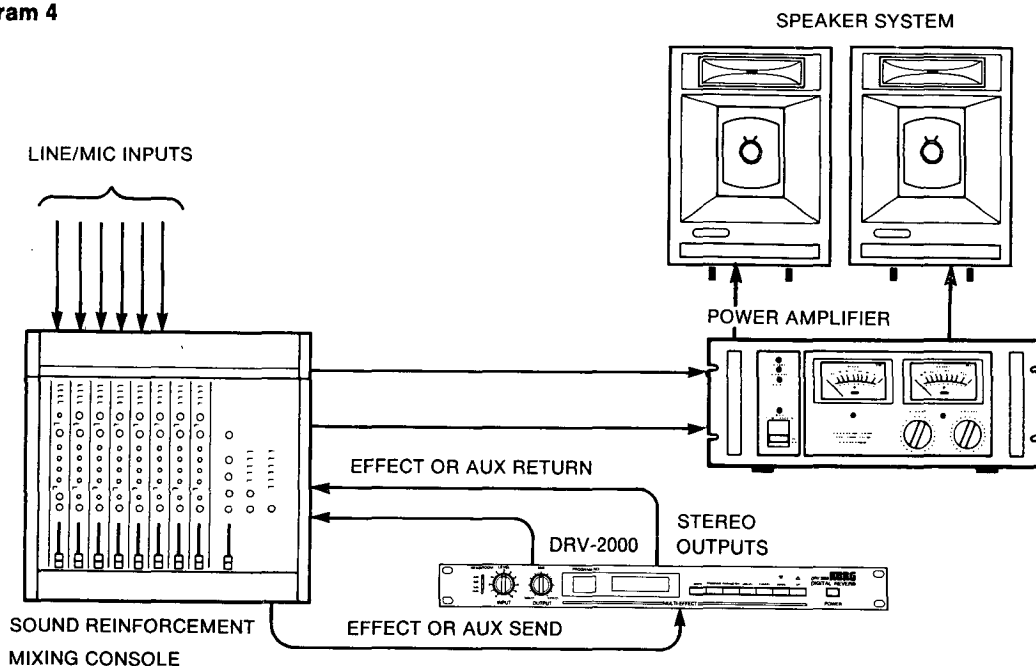
SECTION III:
OPERATION GUIDE

The DRV-2000 has 4 distinct operating modes and one sub-mode used for various important jobs such as program selection, editing and storage. We will explain them in an easy-to-understand order which is not necessarily identical with the way the various keys are laid out on the front panel. A short summary of their functions is given for your reference.

All modes are entered with the correspondingly labeled key except Multi Modulation mode, which is called up by keeping **PARAMETER** depressed and pushing **UTILITY**.

| Mode Name	Main Functions
PROGRAM mode	Program selection Program storage with WRITE sub-mode
PARAMETER mode	Program parameter selection for editing Program storage with WRITE sub-mode
WRITE sub-mode	Storage of edited programs in user program area
UTILITY mode	Program title editing MIDI control and program change Switch program change Switch assignment, peak hold
MULTI MODULATION mode	External control of program parameter values

A ⎯⎯ PROGRAM MODE ⎯⎯

This most basic mode of the DRV-2000 calls up programs for immediate use or subsequent editing in the PA-RAMETER mode. Edited programs can then be saved with the WRITE function.

Selection of external sources and internal parameters for Multi Modulation control of individual programs is performed by entering UTILITY from PROGRAM mode. Reverting to the latter allows you to save such Multi Modulation settings with WRITE.

The PROGRAM mode has priority over all other modes including WRITE. Pressing the **PROGRAM** key therefore exits from any other mode and cancels WRITE, entering PROGRAM mode.

The DRV-2000 has a total of 96 program memory locations all of which are pre-programmed at the factory. The first 16 constitute the "preset program area". They cannot be erased or permanently altered, being stored in a ROM (Read Only Memory).

The so-called "user program area", denoting the 80 memory numbers 17 through 96, is for storage of your own programs. Though this RAM (Random Access Memory) area already contains programs. Program selection is identical for either area.

1. PROGRAM SELECTION

1) Press PROGRAM to enter PROGRAM mode.

Lignts up   or
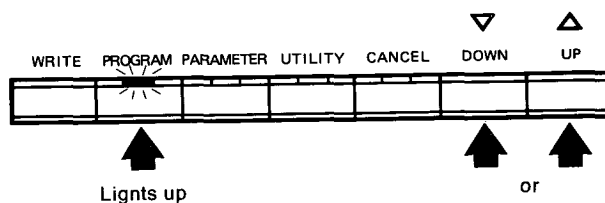
2) Use **UP** or **DOWN** to display the desired program number.

PROGRAM NO.


```
REV  (S  HALL)
REV  TIME  =  1. 0  s
```

3) Press **UP** once to obtain.

PROGRAM NO.


```
REV  (L  HALL)
REV  TIME  =  2. 4  s
```
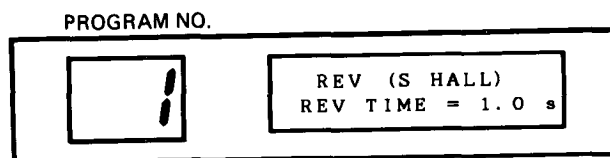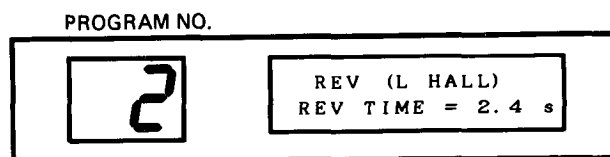
How to achieve faster program number changes with the **UP** and **DOWN** buttons was explained above in the paragraph "UP and DOWN keys".

Please note that all effects are canceled briefly during actual program changes to avoid noise.

When changing programs with foot switches or accessing them according to MIDI messages, it is also necessary to enter PROGRAM mode. In addition, this mode must be chosen when loading data from the MEX-8000 memory expander.

B PARAMETER (EDIT) MODE

This mode lets you check the parameters affecting sound on the LCD for each program and change their values to alter the effect. You may therefore just as well think of it as the edit mode of the DRV-2000.
Before entering PARAMETER mode, you must select the program you wish to check or edit with the **PROGRAM** and **UP/DOWN** keys.

Any changes in a program made in the PARAMETER mode can be saved with the WRITE function. If they are not saved in this manner, the changes will be canceled when you switch to another program. This enables you to experiment freely with any settings you like — as soon as you change program numbers, they will all revert to the previous values.
You can edit both preset programs 1 to 16 as well as the programs in the user area. However, any alterations of preset programs can not be saved with WRITE in that memory location, but must be stored within the user area. If you edit one of your own programs (numbers 17 to 96), you can save the changed data under the same program number.

1. PROGRAM EDITING (PARAMETER MODE)

1) Making sure you are in PROGRAM mode and the program you want to edit is selected, press **PARAMETER**.

Lights up, showing
PARAMETER mode is entered.

2) Select the desired parameter with either of these two methods, a) or b):

   a) Repeatedly press the **PARAMETER** key briefly to call up the next parameters one after the other.
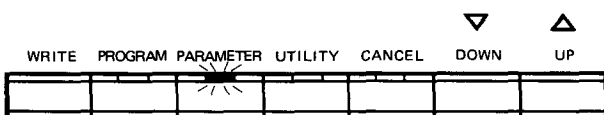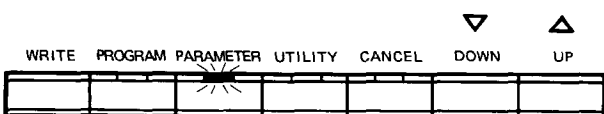

Push shortly to
switch PARAMETERS.

b) While holding down the **PARAMETER** key, use **UP** or **DOWN** to switch to the next parameter in either direction.
Pressing **UP** once calls up the following parameter, pressing **DOWN** once the preceding one. Keeping **DOWN** or **UP** depressed (while still holding down **PARAMETER**) consecutively accesses parameters in either direction, forward or backward.
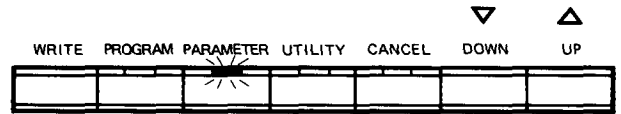
While pushing this press either Down or Up

3) When the desired parameter is displayed on the LCD, alter its value with the **UP** or **DOWN** keys in the same manner as explained for program number selection (p. 9). Push them once to increase or decrease the value in small (single) steps, continuously for consecutive value alteration, and both together to accelerate the speed of displayed value changes.

C WRITE SUB-MODE

We call WRITE a sub-mode because it can only be accessed when the PROGRAM or PARAMETER indicators are lit, meaning that the WRITE function is used exclusively in these two modes.

NOTE:

All data alterations concerning individual programs you wish to store must be saved with WRITE **before switching to a different program**. Otherwise, any changes made will be lost as soon as another program number is called up.

WRITE allows you to store programs you have edited yourself in the user program area, that is memory locations 17 to 98. It is not possible to write data to numbers 1 to 16.
In the WRITE sub-mode, you can also copy existing programs to other user memory locations as they are, or change the order of user programs. This may be helpful during live performances when you want to call up programs in a certain order with a connected foot switch. You could for instance "swap" programs 22 and 28 by first copying (writing) 22 to a vacant memory location (or overwrite a program no longer needed), say 70, then copying 28 to 22, and finally copying 70 to 28.

The following kinds of data can be saved with the WRITE function:
- Program type
- Program parameter values
- Parameters used for Multi Modulation, the modulation (control) sources and modulation depth (SENSE)
- Program titles (up to 16 characters)

How to store altered program names is explained in the following paragraph under "Title Edit". Names can be saved along with edited parameters or changed later. If you want to store a new program name right away (which we recommend), simply follow the Title Edit procedure in the next paragraph after having edited a program, but before saving it with WRITE as shown below.

Storing Multi Modulation settings is described in the chapter IV. C, "MULTI MODULATION". This can also be done when saving an edited program or any time later on.

Note that the number of the edited program you want to save must be selected BEFORE you begin the WRITE procedure.

1. PROGRAM STORAGE WITH WRITE

1) Make sure PROGRAM or PARAMETER mode is entered and the program you wish to store selected. If not, **press the PROGRAM key and select the desired program number.**

Either should be lit.
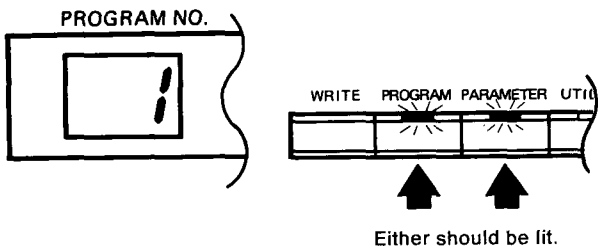
Must show number of the program you wish to save.

2) **Press WRITE to enter WRITE sub-mode.**
The LED program number will start to blink, and one of the following two messages will appear on the LCD, depending on whether the blinking LED number is within the preset program area or in the user area.

Example 1-1
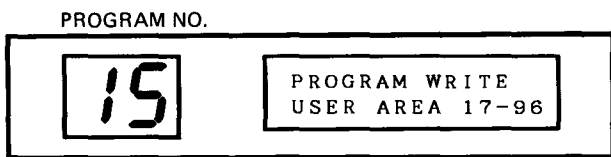
This LED starts to blink.   This message appears on the LCD if preset area is accessed.

OR

Example 2-1
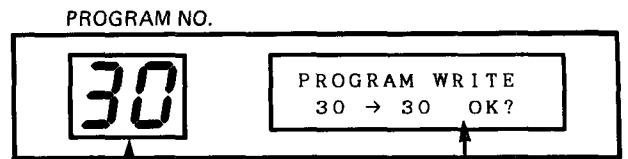
This LED starts to blink.   This message appears on the LCD if user area is accessed.

3) **Select the desired memory number you want to write to between 17 and 96 with the UP and DOWN keys.** The blinking LED program number and the destination memory number on the LCD will change accordingly. Assuming you wish to write to memory no. 38, our example displays will show:

Example 1-2
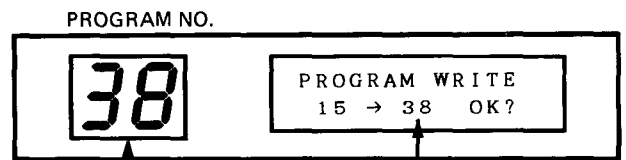
Destination program memory number

OR

Example 2-2
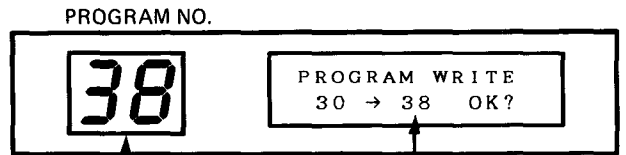
Destination program memory number

4) **Press WRITE again** to store the originally selected program (indicated on the left of the LCD) in the displayed destination memory number.
The LED indicating the new program number stops blinking and the message on the LCD shows when storage has been "Completed!". The DRV-2000 then reverts from WRITE sub-mode to the previous mode (PROGRAM or PARAMETER).
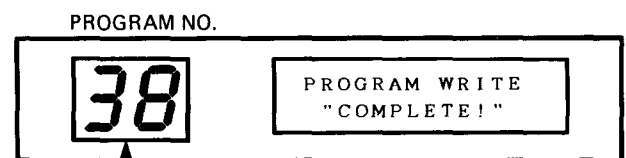
New program memory number

NOTE:

If you press the WRITE key by mistake, you can cancel WRITE sub-mode by pressing **PROGRAM**, **PARAMETER** or **UTILITY**. The LCD will display the message "ESCAPED!", and the DRV-2000 will enter the mode of the key just pushed.

D / UTILITY MODE /

Like the PARAMETER mode, UTILITY mode is entered when you want to edit certain parameters. With the exception of Title Edit however, the UTILITY parameters can not be adjusted individually for each program. Rather, they influence the DRV-2000 as a whole. They are concerned with external foot switch or MIDI control of the DRV-2000 or external data storage, and none of the UTILITY settings influence the programmed effects themselves.

The only UTILITY feature we will explain here is Title Edit, because it is necessary for keeping track of programs you save with WRITE. All others are described under IV. B, "UTILITY FUNCTIONS".

1. TITLE EDIT FUNCTION

The Title Edit function lets you name or rename any program edited by yourself and stored in the user program area. (It is not possible to change the preset names.) This is helpful for keeping programs apart, enabling easier location of a desired program. Be sure to choose an evocative name that will make it easier to remember the type of program and applications.
A name can contain up to 16 characters selected from the following table of 147 letters (English, German and Japanese), numerals and other symbols.

Characters Available for Title Editing

➡ **Up**

г	」	˚	・	ー	ア	ァ	イ	ィ	ウ	ゥ	エ	ェ	オ	ォ	カ	キ	ク
ケ	コ	サ	シ	ス	セ	ソ	タ	チ	ツ	ッ	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		#	0	1	2	3	4	5	6	7	8	9
	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		a	a	b	c	d	e	f	g
h	i	j	k	l	m	n	o	o	p	q	r	s	t	u	u	v	w
x	y	z		[	]	<	>	:	.	*	+	−	=	&	/	,	.
'	%	!	?	→	←	"											

Down ⬅

Note that you must WRITE the title together with the entire contents of a program to an appropriate memory location in order to store the new name. Otherwise, it

will not be memorized. When renaming or changing the name after having stored the program, you can simply WRITE the new title together with the previous contents to the same memory number as before.

Title Editing

1) Make sure the program whose title you wish to edit is currently displayed.

Example

PROGRAM NO.


```
┌──────────────────────────────────┐
│  ┌───┐    ┌────────────────────┐  │
│  │ 44│    │  SPACE  PAN        │  │
│  └───┘    │  PAN SPEED=    3   │  │
│           └────────────────────┘  │
└──────────────────────────────────┘
```

2) Push the UTILITY key briefly to enter UTILITY mode. Its indicator will light up and the following message will appear on the LCD.
   (If you are already in UTILITY mode, call up this message by repeatedly pressing UTILITY briefly, or else hold this key down until its indicator goes out, then press it again shortly.)

▽ △

WRITE PROGRAM PARAMETER UTILITY CANCEL DOWN UP

This indicator must be lit.

PROGRAM NO.

```
┌──────────────────────────────────┐
│  ┌───┐    ┌────────────────────┐  │
│  │ 44│    │  _  SPACE  PAN     │  │
│  └───┘    │     TITLE  EDIT    │  │
│           └────────────────────┘  │
└──────────────────────────────────┘
```

Cursor

This message should be displayed.
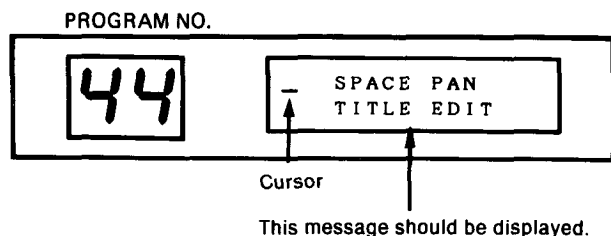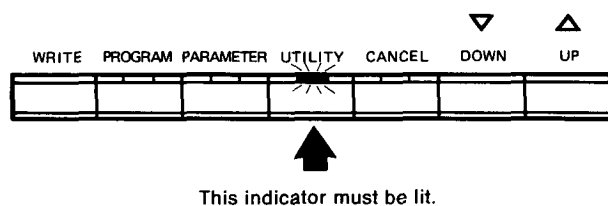
3) The cursor indicates the position where you can enter a new character or change an existing one.
   To move the cursor to the desired location, two methods are possible. Pressing the **PARAMETER** key shifts it to the right in single steps.
   You can also keep the **PARAMETER** key depressed and use the **UP** and **DOWN** buttons as usual. (Push them once to move the cursor by a single step, continuously for consecutive cursor movement, and both together to accelerate. **PARAMETER** must be held down all the time.)

Example
To move the cursor to "S", keep **PARAMETER** depressed and push **UP** three times.

▽ △

WRITE PROGRAM PARAMETER UTILITY CANCEL DOWN UP

Hold down and push 3 times
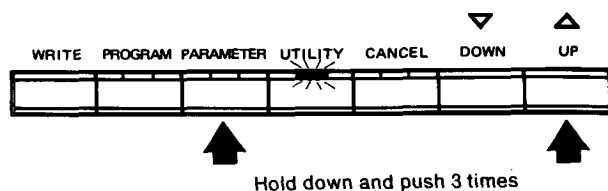
The display will change to

PROGRAM NO.

```
┌─────────────────────────────────────────────┐
│  ┌────┐   ┌────────────────────────────┐     │
│  │ 44 │   │ ▸ SPACE  PAN               │     │
│  │    │   │   TITLE  EDIT              │     │
│  └────┘   └────────────────────────────┘     │
└─────────────────────────────────────────────┘
```
Cursor
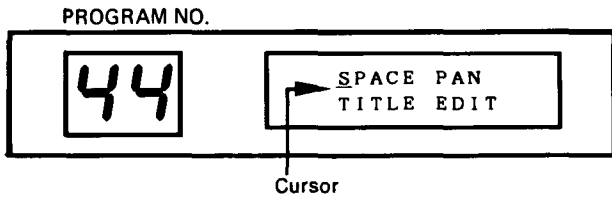
4) If you release the **PARAMETER** key, **UP** and **DOWN** can be used to call up any of the 147 available characters.

Say you would like to alter the name "SPACE PAN" to "RACE PAN 2".

To erase the "S", you must enter a blank instead.

```
                                    ▽      △
WRITE  PROGRAM  PARAMETER  UTILITY  CANCEL  DOWN   UP
┌────┬────┬────┬────┬────┬────┬────┐
│    │    │    │ ╳  │    │    │    │
└────┴────┴────┴────┴────┴────┴────┘
                                    ⬆
```

Hold down until LCD shows

```
┌─────────────────────────────────┐
│  ▸ _PACE  PAN                    │
│    TITLE  EDIT                   │
└─────────────────────────────────┘
```
Cursor

If you keep **UP** depressed too long and "overshoot" the space after "Z", push **DOWN** to revert.

To change the first "P" into an "R", move the cursor one step the right with **PARAMETER** , then press **UP** twice.

```
                                    ▽      △
WRITE  PROGRAM  PARAMETER  UTILITY  CANCEL  DOWN   UP
┌────┬────┬────┬────┬────┬────┬────┐
│    │    │    │ ╳  │    │    │    │
└────┴────┴────┴────┴────┴────┴────┘
              ⬆                     ⬆
         Press once.          Push twice.
```

```
┌─────────────────────────────────┐
│  ▸ PACE  PAN                     │
│    TITLE  EDIT                   │
└─────────────────────────────────┘
```
Cursor

Finally, move the cursor "backwards" to the second location after "PAN" where you wish to add a number "2", this time using **PARAMETER** and the **DOWN** key.

```
                                    ▽      △
WRITE  PROGRAM  PARAMETER  UTILITY  CANCEL  DOWN   UP
┌────┬────┬────┬────┬────┬────┬────┐
│    │    │    │ ╳  │    │    │    │
└────┴────┴────┴────┴────┴────┴────┘
              ⬆                     ⬆
```

Hold down and push 7 times (or keep depressed until cursor in desired location).

```
┌─────────────────────────────────┐
│   RACE   PAN_ ◂                  │
│   TITLE  EDIT                    │
└─────────────────────────────────┘
```
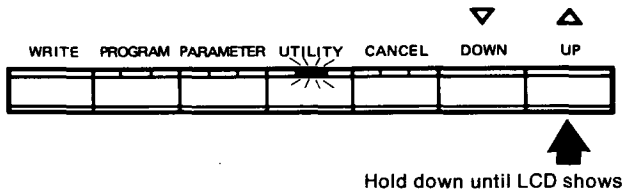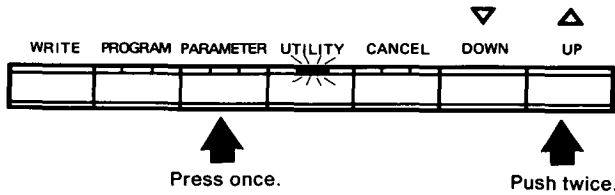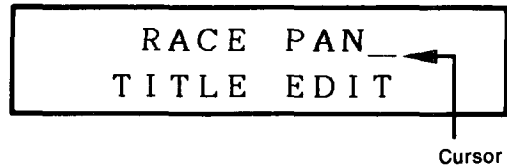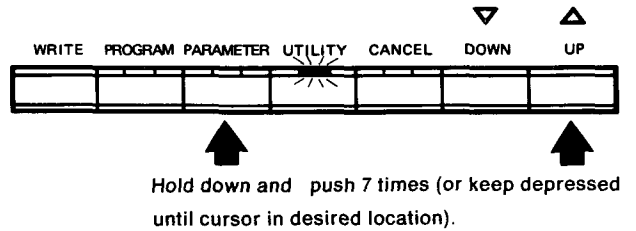Cursor

Push **DOWN** 8 times (or hold down continuously) to produce the intended new program title.

```
┌─────────────────────────────────┐
│   RACE   PAN2                    │
│   TITLE  EDIT                    │
└─────────────────────────────────┘
```

5) Save this new name by entering PROGRAM mode and pressing **WRITE** twice.

```
                                    ▽      △
WRITE  PROGRAM  PARAMETER  UTILITY  CANCEL  DOWN   UP
┌────┬────┬────┬────┬────┬────┬────┐
│ ╳  │ ╳  │    │    │    │    │    │
└────┴────┴────┴────┴────┴────┴────┘
  ⬆    ⬆
```

Press (indicator lights up) then press to call up

PROGRAM NO.

```
┌─────────────────────────────────────────────┐
│  ┌────┐   ┌────────────────────────────┐     │
│  │ 44 │   │  PROGRAM  WRITE            │     │
│  │    │   │  44 → 44   OK?             │     │
│  └────┘   └────────────────────────────┘     │
│     ⬆                                         │
└─────────────────────────────────────────────┘
```
blinks
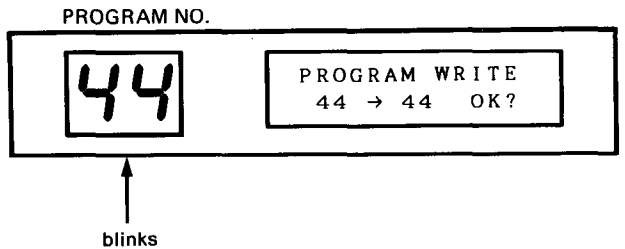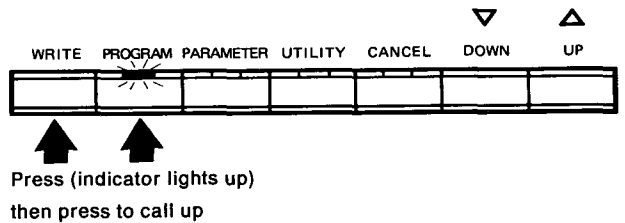
Pressing **WRITE** again saves the edited title. After the "COMPLETE!" message, the displays show the program with its new name.

PROGRAM NO.

```
┌─────────────────────────────────────────────┐
│  ┌────┐   ┌────────────────────────────┐     │
│  │ 44 │   │     RACE  PAN2             │     │
│  │    │   │   PAN  SPEED=    3         │     │
│  └────┘   └────────────────────────────┘     │
└─────────────────────────────────────────────┘
```

⌐MULTI MODULATION MODE⌐

On the DRV-2000, the term "Multi Modulation" denotes real-time control of various program parameters via external signals such as those coming from foot switches, an audio input or MIDI devices. This means you can use such signals or devices (like MIDI pitch bend levers, synthesizer keys and their velocity or after touch data) to achieve interesting and expressive results by flexibly regulating certain aspects of an effect, such as the length of reverb time, during performance.

You could for instance program the DRV-2000 to produce longer reverb or echo the stronger keys on a MIDI keyboard are hit. Or you could raise and lower chorus intensity and/or modulation speed with a synthesizer's pitch bend wheel. Or you could... The number of possible applications is enormous. Multi Modulation will no doubt greatly enhance your expressive potential, proving that "effects" are actually musical elements in their own right.

In the MULTI MODULATION mode, you can program such external effects control individually for any program number. This mode allows you to select the parameters to be externally regulated as well as the sources (devices) used for modulation (control) and adjust the depth of the effect. All settings can then be saved using WRITE.
Since Multi Modulation works independently for each program, you must first select one in PROGRAM mode. MULTI MODULATION mode is then entered from the PROGRAM or PARAMETER mode by keeping the PARAMETER key depressed and pushing **UTILITY**.

In order to be able to appreciate the amazing possibilities offered by Multi Modulation, it will first be necessary to get acquainted with the DRV-2000 programs and the parameters you can control externally. Multi Modulation is therefore explained in more detail in the "PROGRAMS AND PARAMETERS" section.

SECTION IV:
PROGRAMS AND PARAMETERS

The preceding sections have given you most of the basic information you need to operate your DRV-2000. However, we still have to explain the purpose and individual characteristics of the 16 basic preset programs and their parameters as well as the UTILITY functions and Multi Modulation.

This section describes all of these programs and functions and how to edit them, giving some examples for application. Please try them out right away and also experiment by yourself with various settings. More than any explanation, this will help learn how to program the DRV-2000 quickly and effectively to obtain exactly the kind of effect you have in mind.

A⁻THE 16 PRESET PROGRAMS⁷

The 16 factory-preset programs of the DRV-2000 can be roughly divided into
(1) Reverberation programs (numbers 1 to 8)
(2) Stereo echo programs (numbers 9 to 10)
(3) Stereo flanger and stereo chorus effects (numbers 12 and 13)
(4) Space Pan (number 14)
(5) Combination programs (15 and 16).

1. REVERBERATION PROGRAMS (1 − 8)

Among these, two different types can be distinguished − regular reverb and gate reverb. Since they differ considerably both in effect and application, they are treated separately.

As will be explained, the addition of "regular" (natural) reverberation is an absolute necessity for any kind of music recorded in a studio or at home. This is because it produces an essential effect that invariably occurs in any acoustically satisfactory surroundings where music is usually played. By the same token, DRV-2000 reverb can "liven up" or change the roominess and resonant quality of sound during live performances anywhere.

Gate reverb, on the other hand, does not occur "naturally". It has a distinct "sound effect" quality to it that is currently very popular on the professional music scene especially for percussion. The gate reverb programs on the DRV-2000 are incredibly flexible, giving a whole host of impressive results great not only for drums but any application you can imagine.

What is Reverberation?

When you record instruments like a synthesizer or an electric guitar directly onto tape without using any effects at all, it will usually sound flat, dry and unnatural. This is because we are used to hearing music within an ambient environment, such as a concert hall, or from records where various professional effects like artificial reverberation have been added. If such natural and/or artificial ambience is lacking, the sound will seem lifeless.

The REV(erberation) programs of the DRV-2000 electronically simulate this essential sonic atmosphere, which is caused by the physical properties of a room (distances between walls, floor and ceiling, reflective quality of

the surfaces, and so on) and the relatively slow speed at which sound travels. Our ears and brains are sensitive enough to pick up the time lag between a sound "itself" (the direct sound, which seems so lifeless on its own) and the myriad reflections that add life to it. Everything we hear is therefore actually a mixture of the direct sound and its many "aftersounds" bouncing off reflective surfaces such as walls, floor or furniture.

The graphic illustration below shows how the DRV-2000 recreates this property of ambient spaces.

Basic Reverberation Envelope
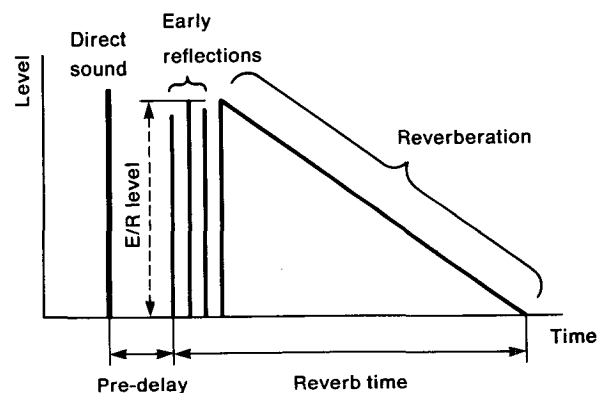
An envelope shows the change of a parameter

As you can see, the first thing you hear (for instance when a note is played on a piano in a hall) is the direct sound of the note itself because it has the shortest distance to travel before reaching your ears. Very soon (in fractions of seconds, after the "pre-delay" time), this is followed by the so-called "early reflections" (E/R) of the note bouncing off walls, ceiling and floor. Finally, these reflections themselves are reflected over and over again to produce the resonant effect called "reverberation", which continues until the volumes drop to an inaudible level and the sound dies out.

Depending on the acoustic properties of the room, the effect will differ immensely. Just imagine the difference between singing in the bathroom and a gothic cathedral. In the first case, there will be no distinct early reflections at all. Unless your bathroom is luxuriously large, you will hear them practically simultaneously with the direct sound of your voice. Since bathrooms are usually acoustically "live" (reflect sound well), seldom containing velvet curtains and upholstered furniture (which

would absorb sound, making the room "dead"), reverberation itself will be quite noticeable, but rather short. In the middle of a great gothic cathedral with a ceiling 150 feet above where you might be standing and walls as far apart, there would be a very clear delay before any now not-so-early reflections of your voice reached your ears at all. In fact, it would take the sound in the range of 0.15 seconds (150 milliseconds = ms) from the walls and even 300 ms from the ceiling to rebound to where you are. Then, reverberation might continue for several seconds in this superbly "live" sonic atmosphere.

Early Reflections in a Cathedral
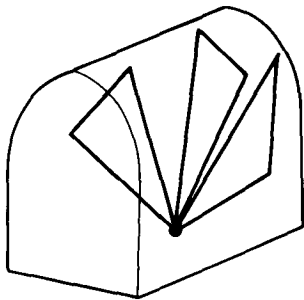
When you think of the grand sound of a pipe organ, you will invariably imagine it within its "natural surroundings", such as a great cathedral. That is because the cathedral is contributing nearly as much to the majestic organ sound we consider typical as the instrument itself. Even if you could get it into your bathroom, the same organ would not sound very majestic there, because the ambience would be lacking.

The basic DRV-2000 reverb programs (no. 1 to 6) can be adjusted so as to reproduce the ambience of anything from a bathroom to a cathedral and more. In other words, they let the DRV-2000 function as your own cathedral or small room, creating an atmosphere of grandeur or cosiness or whatever you need to bring out the best in your sound.

Character of Basic Reverb Programs

With the exception of number 3, REV (ROOM), these 6 presets produce "linear reverberation". That is to say, their reverberation shows a linear decrease in level over time to produce a triangular envelope. The duration of the effect is adjusted with the REV TIME parameter.
In the case of program 3, the envelope is "non-linear" in order to simulate the particular acoustic quality of moderately sized rooms. As the reverb time is quite short in such an environment, it is adjusted with the AMBIENCE parameter, providing finer control than would be possible with a REV TIME setting.

Linear Reverb Envelope
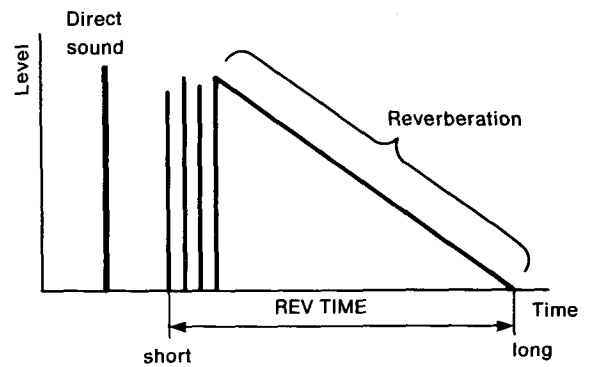
Non-linear Reverb Envelope
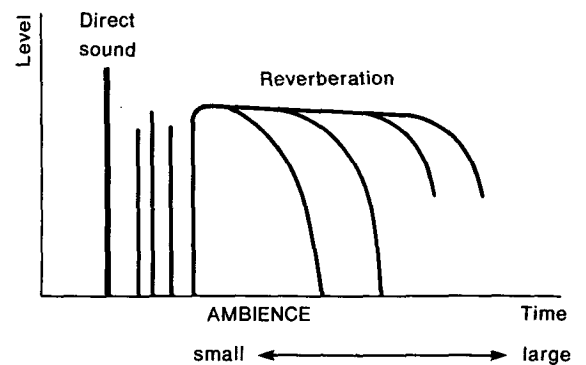
● **Program 1: REV (S HALL) (Small Hall)**

Provides the beautiful, warm resonance of a small multi-purpose concert hall.

● **Program 2: REV (L HALL) (Large Hall)**

This preset simulates the wide, spacious atmosphere of a large concert hall or auditorium for expansive reverberation with a lot of depth. Can also be used to obtain cathedral- or canyon-like effects with extreme settings.

● **Program 3: REV (ROOM)**

The only non-linear reverb program on the DRV-2000, ROOM gives an especially clear resonance. Since the envelope shows a very fast drop-off, the reverberation sound remains distinct without becoming "muddy" at larger AMBIENCE settings. ROOM is particularly suitable for removing the extreme dryness of direct recordings, adding presence and warmth but not too much "space".

● **Program 4: REV (GARAGE)**

Ideal for reproducing the "walled-in" reverberation of a concrete garage or basement room and thus the tight, dense atmosphere of certain clubs or discos.

● **Program 5: REV (VOCAL) (Vocal Plate)**

Before the advent of digital reverberation, most large professional studios relied mainly on reverb plate devices such as the famous EMT. This program recreates a plate effect which enhances the middle frequency range. It gives the human voice intensity and presence while preserving its fine nuances.

● **Program 6: REV (INST) (Instrument Plate)**

Another reverb plate preset, but with a somewhat harder edge for adding presence and power to various musical instruments. Excellent for achieving a "live" feeling during recording or performances in rooms of limited size.

Editing Basic Reverberation Programs — the Parameters

Now that you have understood the meaning of reverberation and the implication of parameters such as pre-delay, early reflection level and reverb time, you should try adjusting (editing) the parameters of the 6 preset programs described above to suit your own music. Except for the first parameter, all of these basic REVerb programs have the same configuration. Their editing is therefore treated together.

The parameters are listed in the order they are called up on the LCD by pressing the **PARAMETER** key. The basic reverb envelope is reproduced here again, this time with the numbers of adjustable parameters added.
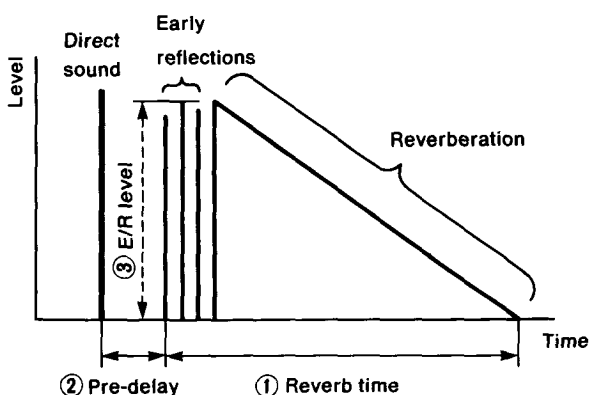
① **REV TIME (Reverberation Time)**

REV (S HALL), (L HALL)	Range = 0.3 - 10.0 s
REV (GARAGE)	Range = 0.3 - 7.0 s
REV (VOCAL), (INST)	Range = 0.3 - 5.0 s

Determines the time it takes for the low- and mid-range reverberation sound to die out. The high end can be individually adjusted with the H. DAMP parameter. Displayed values are in seconds.

Raising this parameter's setting creates the impression of larger spaces by lengthening the reverberation time, while lowering it gives the opposite effect.

In preset 3 REV (ROOM), this parameter is replaced by

① **AMBIENCE** **Range: 0 - 100%**

Adjusts the spaciousness of the room and intensity of the reverb sound with a percentage rating for finer control. The setting "100%" gives the strongest ambience — but watch out for distortion, keeping INPUT levels comparatively low.

② **PRE DLY (Pre-Delay Time) Range: 0.1 - 70.0ms**

Regulates the time that elapses between the direct sound and the first early reflections. Lengthening pre- delay time by increasing this value makes them sound as if they were coming from further away, thus producing a more expansive spatial effect and adding depth.

③ **E/R LEVEL (Early Reflection Level)**

Range: 0 - 100%

Adjusts the level of the early reflections. Raising the value accentuates the sound for a more vibrant, live atmosphere and distinct impression of space. Higher early reflection levels also increases brilliance and impact.

④ **H. DAMP (High Frequency Damping)**

Range: 1 - 10

Allows control of the rate with which high frequency components of a sound decay (die out). The higher the setting, the stronger such high frequencies are damped, providing a warmer effect, while lower values can give more clarity and coolness by increasing the proportion of treble.

⑤ **INPUT (Input Level) Range: 0 - 100%**

Digitally adjusts the maximum input level that can be achieved with the INPUT LEVEL knob individually for each reverb program. Unity gain is obtained when that knob is turned fully clockwise to 10 and this parameter is set to 100%.

⑥ **OUTPUT (Output Level)**   **Range: −100 - 100%**

For individual digital adjustment of the maximum reverb effect output level that can be obtained with the MIX OUTPUT knob.

As with the preceding INPUT parameter, this allows you to set a different intensity of reverberation for each reverb program, thus adapting it to the intended application.

The difference between positive and negative settings is in the phase of the effect sound. Selecting a negative value inverts the phase of the effect.

Please experiment with various settings, listening to the results. Remember that the spaciousness of the reverb effect (that is the size of the simulated hall or room) is determined mainly by the first two parameters. To create the impression of a larger, roomier atmosphere, lengthen both REV TIME and PRE DLY.

On the other hand, E/R LEVEL and H.DAMP settings mainly influence the "liveness" of the environment, which in turn also reflects somewhat on how spacy it will sound. Choose the program most suitable for the application at hand, and try to achieve a coordination between all of these parameters to get precisely the kind of reverberation you want.

Gate Reverb Programs

Unlike regular reverb, the DRV-2000 GATE REVERB presets produce only early reflections, but no actual reverberation. They therefore create what might be called a kind of "light reverb".

"Gate" as used here is just another word for envelope. Think of gate reverb as producing early reflections confined within an envelope whose shape you can change at will to produce a variety of exciting effects. (See illustrations below.)

The applications of these two programs are many. An effective "conservative" approach would be to use them where excessive reverberation would muddy the sound, say, of a rhythm guitar.

When it comes to "special effects", the applications are limited only by your imagination. For instance, an impressive "drum roll" can be achieved with GATE REVERB 1 by lengthening its size. Reversing the envelope shape can give zany, out-of-this-world effects like reversed echo or reverb, with the delayed sounds growing louder and stopping abruptly instead of becoming softer and fading out gradually as would be natural. As always, we suggest you experiment to find some exiting applications of your own, not only for percussion but any other sound as well.
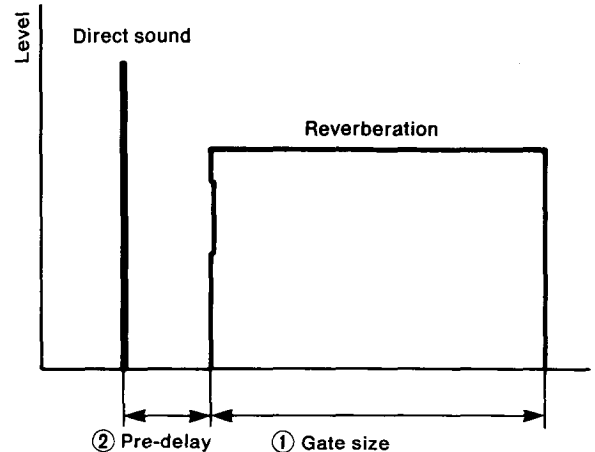
● **Program 7: GATE REVERB 1**

A preset producing relatively fewer early reflections and a shorter gate (envelope). Particularly effective for percussion such as drums.

● **Program 8: GATE REVERB 2**

Creates many early reflections within a longer gate. Due to the greater complexity of the reverb effect, it is excellent for sounds like that of a cymbal.

Gate Reverb Envelope

The gate reverb parameters are listed in the order they appear on the LCD when pressing the **PARAMETER** key. They are identical for both GATE REVERB programs.

① **GATE SIZE**   **Range: 1 - 50**

Sets the time interval between each early reflection and thus the length of the gate (envelope) since the number of early reflections itself always remains the same. A wider spacing (larger value) thus leads to a longer gate.
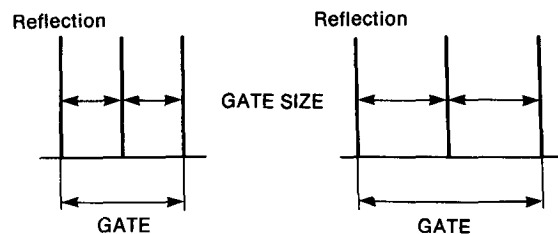
② **PRE DLY (Pre-Delay)**   **Range: 0.1 - 70.0ms**

As with regular reverb programs, this parameter regulates the time elapsing between the direct sound and the first reflection.

③ **GATE SHAPE**   **Range: 0 - 100%**

Lets you determine the shape of the reflection envelope. A setting of 0% produces a reverb-type envelope similar to the one used in the REV (ROOM) program, while a value of 50% creates a square gate. Raising the value to 100% gives a reversed reverb envelope.

Gate Shape

0% ◄────────────────►50%◄───────────────► 100%
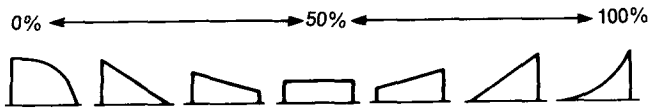
The last three parameters are identical with those used in the regular REV programs:

④ **H. DAMP (High Frequency Damping)**

Range: 1 - 10

Controls the rate with which high frequency components of a sound decay.

⑤ **INPUT** **Range: 0 - 100%**

Digitally adjusts the maximum input level that can be achieved with the INPUT LEVEL knob.

⑥ **OUTPUT** **Range: −100 - 100%**

For digital adjustment of the maximum gate reverb effect output level that can be obtained with the MIX OUT-PUT knob. Selecting a negative value inverts the phase of the effect sound.

2. STEREO ECHO PROGRAMS (9 to 10)

The terms "echo" and "reverberation" are often confused, with many people referring to echo when they actually mean reverb. However, these are quite different effects, both in nature and in the studio.

Almost everyone has experienced natural echoes somewhere out of doors, where shouting a word will cause it to be repeated clearly once or several times. This is due to particularly distinct and very late initial reflections of the sound waves (and their repetitions), with a delay sometimes in the range of seconds.

By contrast, reverberation consists of far more numerous and complicated reflections following very shortly one after the other (or even simultaneously) so that they can no longer be distinguished as a duplicate of the original sound, as echo reflections can.

As far as the extremely flexible stereo echo programs of the DRV-2000 are concerned, this explanation is actually not quite accurate. The delay times can be set so short that no distinct repetition is obtained, but other effects such as doubling and tripling instead. In general, though, echo and reverb can be kept apart as just explained.

The three echo presets available all have a stereo configuration, meaning that a different effect can be achieved for the left and right channel. The DRV-2000 can therefore function like two monaural echo machines. In fact, you can even achieve results that would not be possible at all with such a double mono setup.

● Program 9: STEREO ECHO 1

This preset lets you use the DRV-2000 as you would two independent mono digital delays to process the same input sound, thus allowing totally individual echo adjustment for the left and right stereo channels and the creation of very impressive stereo effects. For instance, you can make the echoed sound move across the stereo field in either direction while at the same time receding into the distance. Settings for this and other effects are explained in "Advanced Application Advice".

STEREO ECHO 1 Configuration
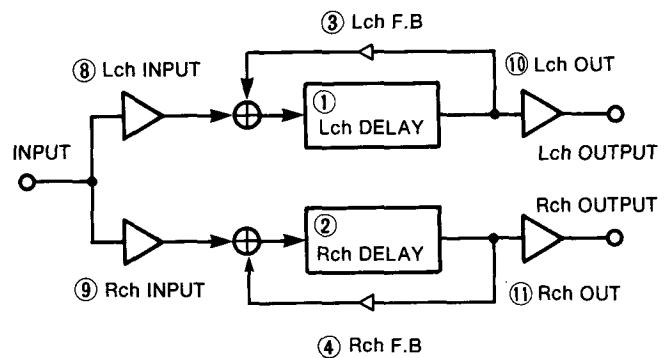
● Program 10: STEREO ECHO 2

This program is basically very similar to the preceding one, except that feedback crosses over between the channels with the left channel delay module output feeding the right channel delay input and vice versa. It therefore makes stereo ping pong and other interesting effects possible.

STEREO ECHO 2 Configuration
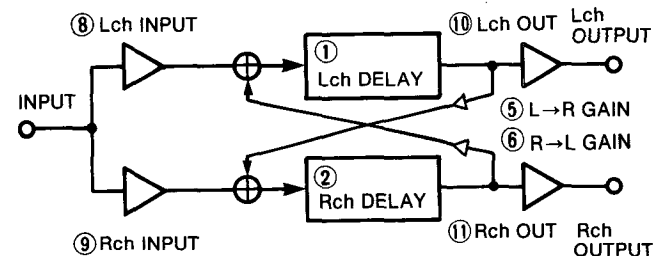
● Program 11: STEREO ECHO 3

Here, the left channel functions as a single echo (producing only a single repetition of the original sound), while the right channel has multiple feedback, initially receiving the left and then the right channel delayed signals. Right channel echoes therefore always follow the echo from the left channel.

STEREO ECHO 3 Configuration

The parameters of the three stereo echo presets are identical except for numbers 3 and 4. Due to the differences in program configuration, their settings will of course not necessarily produce the same kind of effect for each preset.

All stereo echo parameters are treated here together in the order they appear on the LCD when pressing the **PARAMETER** key. Their different functions will become clearer if you experiment. Also refer to "Advanced Application Advice".

① Lch DLY (Left Channel Delay) Range: 0.1 - 800ms

Sets the time that elapses between the left channel's direct sound and its initial repetition. If feedback level is raised to obtain more than one echo, the interval between them is always the identical with this delay value.
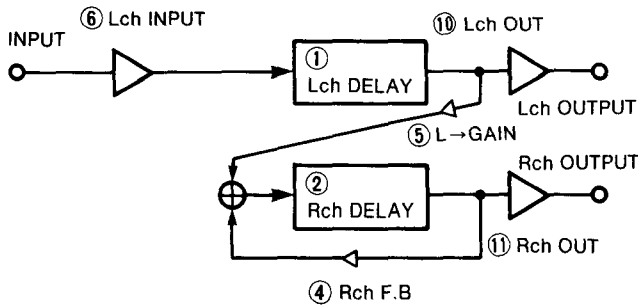
② Rch DLY (Right Channel Delay)

Range: 0.1 - 800ms

In the same manner as the preceding parameter, this sets the time that elapses between the right channel's direct sound and its initial repetition.

③ Lch F.B (Left Channel Feedback Gain)

Range: −100 - 100%

Adjusts the gain (level) of feedback from the output of the left channel delay module back to its own input. A negative value produces feedback with an inverted phase.

Raising this feedback value increases the number of repetitions (echoes) obtained from the left channel. Setting the value to 0 means there will be only a single echo. If you increase feedback to ± 100%, the left channel sound will continue "for ever", or at least until you switch to another program. This effect is often referred to as "hold".

④ Rch F.B (Right Channel Feedback Gain)

Range: −100 - 100%

Adjusts the level of feedback from the output of the right channel delay module back to its own input. Again, a negative value produces feedback with an inverted phase. Settings work the same way as for the preceding parameter, only they influence the output from the right channel.

⑤ L → R GAIN   Range: −100 - 100%

Regulates the gain (level) of feedback from the output of the left channel delay module to the input of the one on the right channel. Negative values produce feedback with an inverted phase.

Raising this feedback value increases the number of echoes delivered from the right channel, with 0 producing only a single repetition.

Due to the particular configuration of Stereo Echo program 2, a hold effect is only obtained when both this and the next parameter are set to ± 100%.

In Stereo Echo Program 3, no hold can be produced at all with this setting.

⑥ R → GAIN   Range: −100 - 100%

For regulation of feedback level from the output of the right channel delay module to the input of the one on the left channel. Negative values indicate phase inversion.

Increase this feedback value when you want multiple echoes from the left channel.

⑦ H. DAMP (High Frequency Damping)

Range: 1 - 10

Adjusts the level of high frequency components within the feedback sound. It can thus be used to soften the echo sound by lowering the proportion of treble it contains. The higher this value, the faster the decay of the high frequency components and thus the milder the tone quality of the echo.

⑧ Lch INPUT (Left Channel Input Level)

Range: 0 - 100%

Sets the maximum input level of the direct sound to the left channel delay module that can be achieved with the INPUT LEVEL knob.

⑨ Rch INPUT (Right Channel Input Level)

Range: 0 - 100%

Determines the maximum input level of the direct sound to the right channel delay module that can be obtained with the INPUT LEVEL knob.

⑩ Lch OUTPUT (Left Channel Output Level)

Range: −100 - 100%

For adjustment of the maximum output level from the left channel and the phase of the output effect sound, a negative value indicating an inverted phase.

⑪ Rch OUTPUT (Right Channel Output Level)

Range: −100 - 100%

Determines the maximum output level from the right channel as well as the phase of the effect.

**⑫ OUT MODE   Settings: STEREO or MONO**

When using stereo amplification, this parameter should always be set to STEREO. Choosing MONO causes the right channel to be output as it is from the right OUTPUT jack on the rear panel, while the L/MONO jack produces a mix of the two channels.

MONO OUT MODE Setting

OUT MODE = MONO
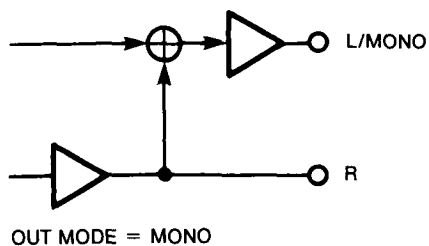
Stereo effects are only possible when STEREO has been selected, in which case the two channels produce totally independent outputs.

STEREO OUT MODE Setting
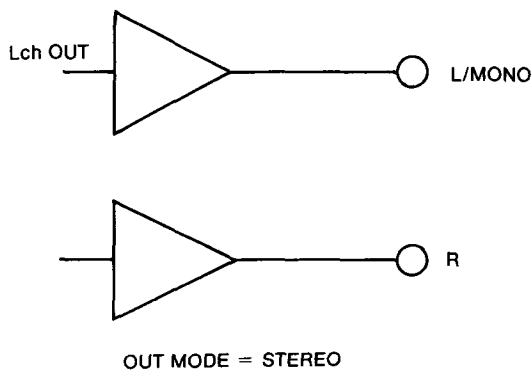
OUT MODE = STEREO

NOTE:

Depending on the OUT MODE setting, excessive left and right channel feedback levels may cause self-oscillation or even a condition where no output is obtained at all.

3. STEREO FLANGER AND STEREO CHORUS EFFECTS (12 and 13)

These are modulation effects that have been extremely popular ever since someone found out that a very attractive sound could be achieved by recording the same signal on two tape recorders and then slightly changing the speed of one of them during playback. Decades ago, this was done by alternately applying pressure to the flanges of both recorders' supply reels — hence the term flanging.

The same effect is often called "phasing" because it leads to the cancellation of those frequencies which are out of phase with each other (originally because the playback signal of one tape recorder was delayed), while in-phase frequencies will result in constructive combination.

With chorus, you can make solo instruments sound "fatter" or as if several of them were being played at the

same time (ensemble effect). In addition, chorus can also produce a reverb-like ambience, imparting a feeling of spatial depth.

The two DRV-2000 modulation programs can digitally create a large variety of attractive flanging, phasing and chorus effects in stereo, allowing you to add color, motion and modulation together with a "spacier" atmosphere to any instrument as well as human voices. Some orthodox applications are hard flanging for electric guitar, producing a beautiful swirling, swishing metallic sound; stereo phasing for organs to obtain a rotational (Leslie) speaker effect; or chorus for strings, brass and electric piano to thicken the sound and make it warmer. Of course, uses of these presets are limited only by your own resourcefulness and originality.

● **Program 12: STEREO FLANGER**

FLANGER Parameter Configuration
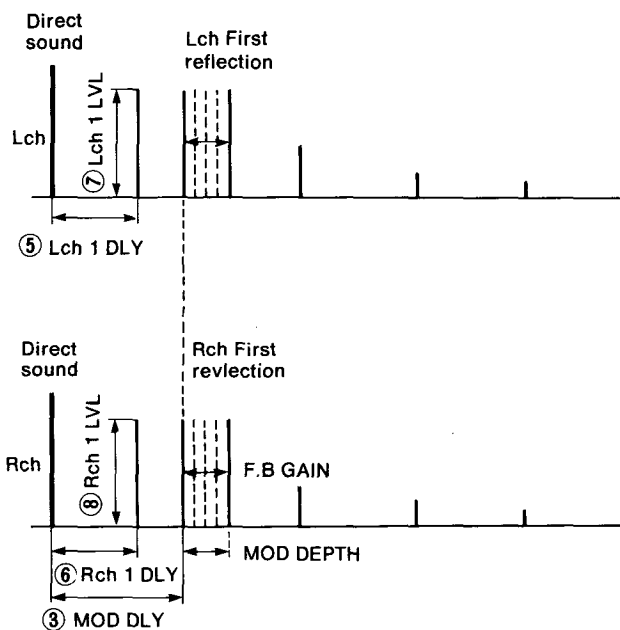
① **MOD FREQ (Modulation Frequency)**

Range: 1 - 49

Adjusts the speed of the modulation effect. To stay with the tape recorder analogy explained above, think of this value as how quickly the application of pressure was switched from the reel of one recorder to the other. The higher this value, the faster the flanging (or phasing) motion.

② **MOD DEPTH (Modulation Depth)   Range: 0 - 30**

Determines the intensity of the effect. Raising the value produces stronger modulation.

NOTE:

In the modulation programs 12 (FLANGER) and 13 (CHORUS) and programs 16 (REVERB & CHORUS) and 14 (SPACE PAN), care must be taken with the settings MOD FREQ (PAN SPEED) and MOD (PAN) DEPTH. Depending on the input source, excessively high values may lead to noise and distortion.

③ **MOD DLY (Modulation Delay Time)**
Range: 0.05 - 30.0 ms

Adjusts the time it takes for phasing (flanging) to set in after the direct (unmodulated) sound.

④ **F.B GAIN (Feedback Gain) Range: −100 - 100%**

Allows you to determine how much of the delay module's output is fed back to its input. It thus sets the length of the effect.

⑤ **Lch 1 DLY (Left Channel First Reflection Delay Time) Range: 0.1 - 50.0ms**

Indicates the time interval between the direct sound and the first reflection output from the left channel.

⑥ **Rch 1 DLY (Right Channel First Reflection Delay Time) Range: 0.1 - 50.0ms**

Determines the time interval between the direct sound and the first reflection of the right channel.

⑦ **Lch 1 LVL (Left Channel First Reflection Level) Range: −100 - 100%**

Sets the level (volume) of the first reflection in the left channel.

⑧ **Lch 1 LVL (Left Channel First Reflection Level) Range: −100 - 100%**

Adjusts the level of the first right channel reflection.

⑨ **INPUT Range: 0 - 100%**

Digitally regulates the maximum input level that can be achieved with the INPUT LEVEL knob.

⑩ **OUTPUT Range: −100 - 100%**

For digital adjustment of the maximum flanging (phasing) effect output level that can be obtained with the MIX OUTPUT knob. Selecting a negative value inverts the phase of the effect sound.

● **Program 13: STEREO CHORUS**

① **MOD FREQ (Modulation Frequency)**
Range: 1 - 49

Regulates the speed of the modulation effect. Selecting higher values speeds up the motion you perceive.

② **MOD DEPTH (Modulation Depth) Range: 0 - 30**

Determines the intensity of the effect. Raising the value produces stronger modulation.

③ **INPUT Range: 0 - 100%**

Controls the maximum input level obtainable with the INPUT LEVEL knob.

④ **OUTPUT Range: −100 - 100%**

Sets the maximum chorus effect output level you can achieve with the MIX OUTPUT knob. Negative values invert the phase of the effect sound.

4. SPACE PAN (14)

This breath-taking new effect produces a kind of two-dimensional panning that was hitherto impossible even with two-channel processors. To do so, it synchronizes two distinct effects, namely auto-panning and tremolo. (Tremolo is the periodical rising and falling of a sound's volume.)

Conventional auto-panning simply moves sound across the stereo field, usually back and forth between left and right. With the DRV-2000, an independent "line" is used for each direction.

Conventional Auto Pan

L ◄─────────────► R

DRV-2000 Auto Pan

L ◄═════════════► R
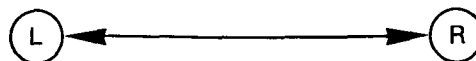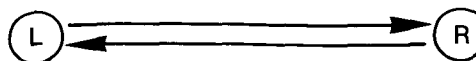
By synchronizing motion in both directions with tremolo, the impression is achieved that the sound is not only moving between the left and right, but simultaneously coming closer and receding into the distance. (As with echo and other effects, decreasing volume makes a sound more distant and vice versa.)

Space Pan

Minimum volume (sound most distant)

L R

Maximum volume (sound closest)
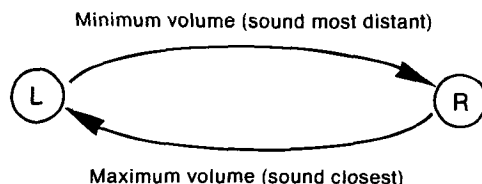
The SPACE PAN program lets you choose the rotational direction of the effect as well as alter its depth and speed and even produce "elliptical" motion. You could for instance have the sound seem closest between center and left and furthest away in the back towards the right (see Fig. 3 below).

The direction of the perceived movement depends on the setting of the PHASE parameter. This determines the point on an imaginary circle where the sound will be loudest and thus seem closest. Selecting a PHASE

be loudest and thus seem closest. Selecting a PHASE value of 270 degrees will therefore produce "counterclockwise" motion as shown below.

Fig. 1

TREMOLO = 30
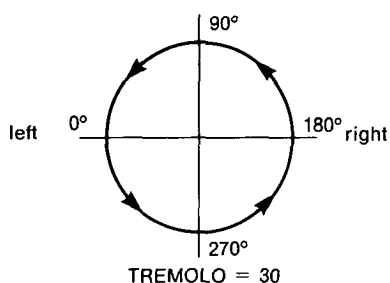
You can reverse the direction of rotation by setting PHASE to 90° instead.

Fig. 2

TREMOLO = 30
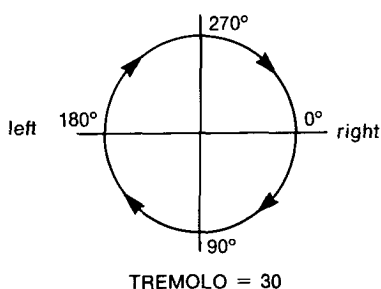
To produce "elliptical" motion, select a value in between, for example 300°.

Fig. 3

PHASE Setting · Perceived effect

PHASE Setting · Perceived effect
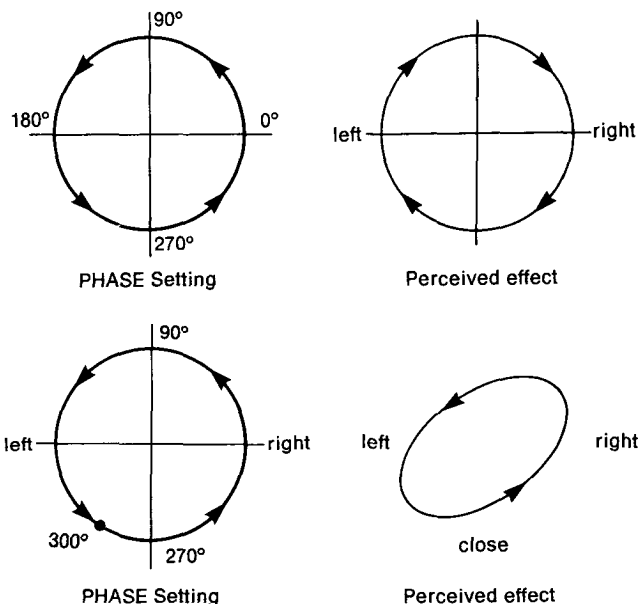
① PAN SPEED   Range: 1 - 34

Lets you alter the speed of SPACE PAN rotation. The value indicates how quickly the sound will travel around the stereo field. At a setting of 1, it will take the sound a leisurely 10 seconds or so for a full round trip, while it will race around the programmed course many times per second with the maximum setting.

Refer to the NOTE on p. 22 when adjusting this value and the next one.

② PAN DEPTH   Range: 0 - 30

How strong the impression of motion between left and right will be depends on this parameter. Raising the value intensifies the feeling of left-right movement. Setting PAN DEPTH to 0 allows you to use SPACE PAN as a conventional tremolo effect without any motion across the stereo field.

By the same token, lowering TREMOLO to 0 makes ordinary auto panning according to this parameter possible where the sound just moves back and forth between the two channels but does not come closer or recede.

③ TREMOLO   Range: 0 - 30

By itself, tremolo is a simple, very commonly used effect — the periodical variation of volume. In the SPACE PAN preset, where it is synchronized with auto panning, it determines how close the closest sound and how far away the most distant sound will be perceived and therefore contributes to the feeling of two- dimensional motion and spatial depth.

If the preceding parameter has been set to 0, you can adjust TREMOLO to achieve a regular tremolo effect, causing the sound volume of any connected instrument to rise and fall cyclically. Tremolo speed can then be regulated with the PAN SPEED value.

④ PHASE   Range: 0° - 345°

Selects the phase angle of the loudest effect sound during panning. As explained above, a phase angle of 90° causes clockwise motion, one of 270° movement in the opposite direction. Selecting values in between gives the impression of asymmetrical elliptical motion.

Settings are performed in 15° steps.

⑤ INPUT   Range: 0 - 100%

Controls the maximum input level obtainable with the INPUT LEVEL knob.

⑥ OUTPUT   Range: −100 - 100%

Sets the maximum SPACE PAN effect output level you can achieve with the MIX OUTPUT knob. Negative values invert the phase of the effect sound.

5. COMBINATION PROGRAMS (15 and 16)

These two programs combine reverberation with another effect, letting you obtain results with the DRV-2000 that are normally only possible with two separate processors. The pairings available are REVERB & ECHO and REVERB & CHORUS.

● Program 15: REVERB & ECHO

This preset is a parallel combination of echo (left channel) and reverb (right channel), which can therefore be adjusted and used independently. The type of reverberation corresponds to that of S(mall) HALL.

REVERB & ECHO Configuration
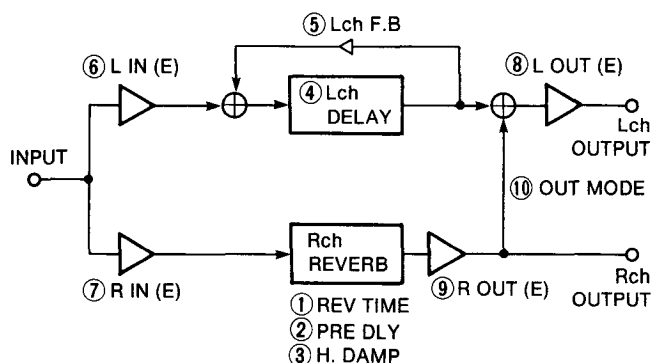
① REV TIME (Reverb Time)   **Range: 0.3 - 10.0 s**

Indicates the length (in seconds) of the reverberation produced by the right channel reverb module.

② PRE DLY (Pre Delay Time)   **Range: 0.1 - 70.0ms**

For adjustment of the delay (in milliseconds) between the direct sound and right channel reverberation.

③ H. DAMP (High Damping)   **Range: 1 - 10**

Raising this value increases damping of the high frequency components within the right channel reverb sound, making it warmer.

④ Lch DLY (Left Channel Delay Time)
                        Range: 0.1 - 300.0ms

Sets the time lag between the direct sound and the first echo from the left channel as well as the interval between any subsequent echoes.

⑤ Lch F.B (Left Channel Feedback)
                        Range: −100 - 100%

Determines the level of feedback from the output of the left channel delay module to its own input. Raising this value increases the number of echo repetitions.
As usual, a setting of 0 produces only a single echo, while ± 100% gives a hold effect.
Negative settings invert the feedback phase.

⑥ L IN (E) (Left Channel Input Level (ECHO))
                        Range: 0 - 100%

Controls the maximum input level to the left channel delay module obtainable with the INPUT LEVEL knob.

⑦ R IN (R) (Right Channel Input Level (REVERB))
                        Range: 0 - 100%

Sets the maximum input level to the right channel reverb module that can be obtained with the INPUT LEVEL knob.

⑧ L OUT (E) (Left Channel Output Level (ECHO))
                        Range: −100 - 100%

Regulates the maximum left channel (echo effect) output level.
Negative values invert the phase of the effect sound.

⑨ R OUT (E) (Right Channel Output Level (REVERB))
                        Range: −100 - 100%

Regulates the maximum right channel (reverberation effect) output level.
Negative values invert the phase of the effect sound.

⑩ OUT MODE   **Settings: STEREO, MONO**

When using stereo amplification, this parameter should always be set to STEREO. This enables independent use of the effects available on the two channels − echo on the left, reverb on the right.
Setting it to MONO causes a mix of the reverb and echo effects to be output from the rear panel L/MONO jack, while the R jack continues to deliver an independent reverb effect.

● **Program 16: REVERB & CHORUS**

In this preset, the reverb and chorus modules are connected in series, giving you the possibility of using chorus and reverberation effects simultaneously for the same sound. With this program, you can for instance "thicken" an instrument voice or add pulsation with chorus, and then further enhance it with the spaciness of reverb.

① REV TIME (Reverb Time)   **Range: 0.3 - 10.0 s**

Shows the length (in seconds) of the reverberation produced by the reverb module.

② PRE DLY (Pre Delay Time)   **Range: 0.1 - 70.0ms**

For adjustment of the delay (in milliseconds) between the direct sound and the effect sound.

3. H. DAMP (High Damping)   **Range: 1 - 10**

Raising this value increases damping of the effect's high frequency components, making it sound warmer.

④ MOD FREQ (Modulation Frequency)
                        Range: 1 - 49 Hz

Regulates the speed of the chorus modulation effect. Selecting higher values speeds up pulsation.
Refer to the NOTE on p. 22 for precautions when setting this and the next parameter.

⑤ MOD DEPTH (Modulation Depth)   **Range: 0 - 30**

Determines the intensity of chorus modulation. Raising the value produces a stronger effect.

⑥ INPUT   **Range: 0 - 100%**

Controls the maximum input level you can achieve with the INPUT LEVEL knob.

⑦ OUTPUT   Range: −100 - 100%

Sets the maximum chorus effect output level obtainable with the MIX OUTPUT knob. Negative values invert the phase of the effect sound.
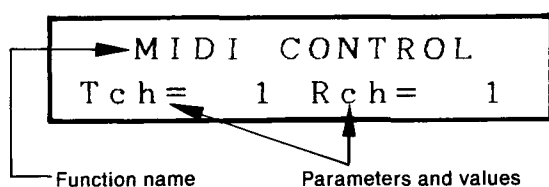
B   UTILITY FUNCTIONS

With the exception of Title Edit, all UTILITY functions and their parameters are concerned with overall external control of the DRV-2000 or external data storage. Since none of the UTILITY settings therefore influence any particular effect programs, they are not saved along with them. Instead, they are altered whenever necessary according to the kind of overall control you are going to use — for instance for external program selection or effect cancellation.

The following list of utility functions shows the order in which they are called up on the LCD for programming by pressing the **UTILITY** key. Pressing this key after having accessed job 8 (when in the preset program area) or 9 (in the user area) or pushing it for longer than a second exits UTILITY mode and reverts to the previously selected mode. (If this was WRITE mode, the mode before that will be entered.)

1. UTILITY FUNCTIONS (JOBS)

(1) Title Edit (explained on p. 12)
(2) MIDI Control Channel Selection
(3) MIDI Program Change
(4) MIDI Note Program Change
(5) Switch Program Change Range
(6) Switch 1 Assignment
(7) Switch 2 Assignment
(8) Peak Hold
(9) Data Dump Save (not available for the 16 preset programs)

Function name   Parameters and values

To call up the individual jobs (functions), repeatedly press **UTILITY** shortly until the name of the desired job is displayed on the LCD.

Functions can only be accessed in the above order. Switching back to a previous one is not possible. If you "overshoot" the desired job, exit from UTILITY mode by pressing **UTILITY** for longer than a second, then start again.

In general, any settings made on the DRV-2000 must be saved using WRITE in order to become effective. However, UTILITY MIDI and SWITCH settings are exceptions in that they are stored automatically when exiting from UTILITY mode.

How to set the individual parameters is described for each function. All explanations assume you are already in UTILITY mode. If not, press the **UTILITY** key first. Its LED must be lit to perform the explained operations.

2. MIDI CONTROL CHANNEL SELECTION

MIDI Transmit channel   MIDI Receive channel
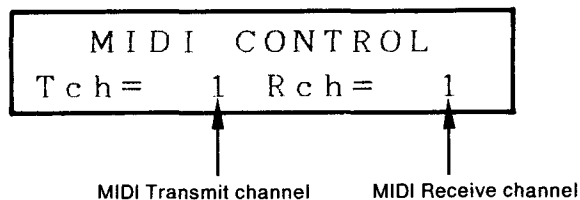
These parameters allow selection of the reception and transmission channels for MIDI data. They must be specified correctly for external MIDI control of the DRV-2000, when controlling other equipment from the DRV-2000 via MIDI or when saving or loading data to and from external memories such as the MEX-8000. The MIDI format uses 16 discreet communication channels. If a MIDI device is set to OMNI mode, it will receive data transmitted on any of these channels.

Tch (MIDI Transmission Channel)
                    Settings: 1 - 16, OFF

Determines on which MIDI channel information transmitted from the rear panel MIDI OUT/THRU terminal (must be set to OUT) will be sent. When controlling external equipment, that device must be set for reception of data on this DRV-2000 transmission channel, otherwise no communication will be possible.

Selecting OFF enables you to cancel any MIDI transmission from the DRV-2000.

Rch (MIDI Reception Channel)
                    Settings: 1 - 16, OMNI, OFF

Allows selection of the MIDI channel number corresponding to the transmission channel of external equipment you wish to control the DRV-2000 from. Only when the channel numbers are identical on both sides (or when the DRV-2000 is in OMNI mode) is such external control possible.

Setting the DRV-2000 Rch to OMNI enables reception of data on any incoming MIDI channel. Selecting OFF makes it impossible to receive any MIDI messages. The values of these parameters can be changed by the following method.

Selected with **PARAMETER**   Selected with **UP DOWN**
and **UP DOWN**
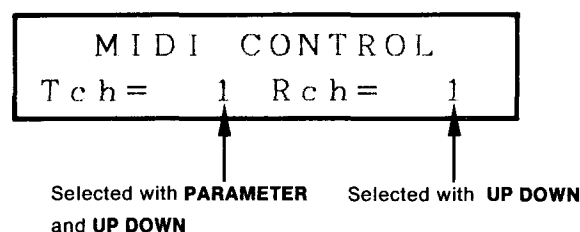
The **UP** and **DOWN** keys alone are used to select the reception channel Rch or set it to OMNI or OFF. (The OFF and OMNI settings are displayed after Rch 16 and before number 1.)

When you want to change the transmission channel, press the **PARAMETER** key to raise the channel number, or else keep that key depressed and use **UP** or **DOWN** to select the channel. (The OFF setting follows Tch 16 and precedes Tch 1.)

These settings are automatically memorized when exiting from the UTILITY mode.

3. MIDI PROGRAM CHANGE

```
┌─────────────────────────────┐
│ M I D I   P R O G   C H A N G E │
│ M I D I :     1 = P R O G :   1 │
└─────────────────────────────┘
```

MIDI program change number
or (note number + 1)

Corresponding DRV-2000
program number

This function lets you match program change or note on data (values 0 – 127) received from external equipment with a DRV-2000 program number, making it possible to access any DRV-2000 program you like according to notes played or voices selected on a synthesizer or other MIDI device.
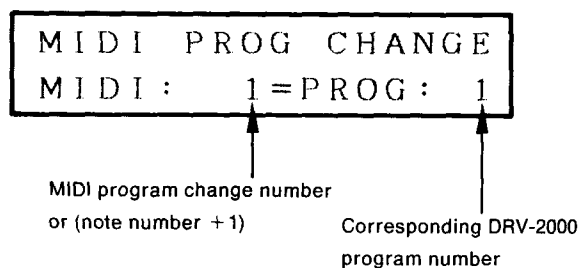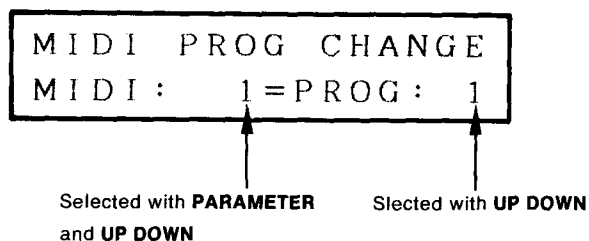
This means you can fully "automate" DRV-2000 program selection so that a certain synthesizer flute voice will always call up a particular Space Pan program, a strings voice a certain Reverb & Chorus effect, and so on. The MIDI program change function is therefore invaluable especially during live keyboard performances. Computer buffs will be interested in the following information.

|	Status byte	2nd byte	3rd byte
Note on event	1000 nnnn	0KKK KKKK	0VVV VVVV
Program change	1010 nnnn	0KKK KKKK	----------

nnnn: MIDI channel 1 – 16 (binary)
KKK KKKK: Data (1 – 128) received as DRV-2000 program change data.

In plain English, this means:
Each synthesizer voice program has a corresponding "program change" number. Usually, voice no. 1 has the program change number 1, and so on. Selecting a voice on a connected synthesizer will normally access the DRV-2000 program corresponding to that voice's program change number (if MIDI channels correspond and the proper connections are made.)

With MIDI PROG CHANGE, you can now adjust the DRV-2000 to respond to selection of voice no. 32 on a synthesizer by calling up, say, Small Hall reverberation (program 1) and not program 32.

In addition, you can have the DRV-2000 access its programs according to keys played on a MIDI keyboard. This is possible because each key has a MIDI number transmitted as part of "note on" messages.

Normally, the DRV-2000 will transform MIDI key numbers into internal program change numbers by adding 1. The key C1 (decimal MIDI key number 36) will therefore be displayed as "37" by the DRV-2000, and the corresponding program selected if the NOTE PROG CHANGE function explained below is enabled.

With MIDI PROG CHANGE, you can assign any desired effect program to any key on a MIDI keyboard so that it can be called up simply by pressing that key. Parameter settings are performed as follows.

```
┌─────────────────────────────┐
│ M I D I   P R O G   C H A N G E │
│ M I D I :     1 = P R O G :   1 │
└─────────────────────────────┘
```

Selected with **PARAMETER**
and **UP DOWN**

Slected with **UP DOWN**

Use the **UP** and **DOWN** keys alone to select the PROG value, which indicates the DRV-2000 program number you wish to match to the second byte of received MIDI data. Choose 0 for the PROG parameter when you want a MIDI program change number to be ignored.

To change the MIDI program number or note number value that determines which received MIDI program change or note on message will select the DRV-2000 program shown by PROG, press **PARAMETER** to raise the number, or else keep that key depressed and use **UP** or **DOWN**.

Example

```
┌─────────────────────────────┐
│ M I D I   P R O G   C H A N G E │
│ M I D I :   6 1 = P R O G : 1 6 │
└─────────────────────────────┘
```
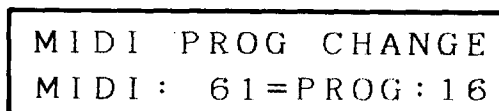
Shows that the DRV-2000 will select its program number 16 whenever a MIDI program change message is received whose second byte has the value 61. If the NOTE PROG CHANGE function (see below) has been turned on, program 16 will be selected whenever note on data for the key C3 (MIDI note number 60) is received.

These settings are automatically memorized when you exit from the UTILITY mode. External MIDI control will only work, though, if the correct channel has been selected with the MIDI CONTROL parameter explained further above.

Setting the MIDI OUT/THRU switch to OUT causes the program change data set with this function to be output to any subsequent MIDI equipment connected to that terminal.

Note that PROGRAM mode must be entered for program changes to be possible via external control.

4. MIDI NOTE PROGRAM CHANGE

As indicated in the preceding paragraph, the programs of the DRV-2000 can be selected via MIDI note on data, which are internally transformed into program change data.

Settings are performed in exactly the same manner as for external program change data. In addition, it is necessary to enable note program change by setting this function's mode to ENABLE.

```
NOTE  PROG  CHANGE
MODE  =  DISABLE
```

switch with **UP**   switch with **DOWN**

```
NOTE  PROG  CHANGE
MODE  =   ENABLE
```
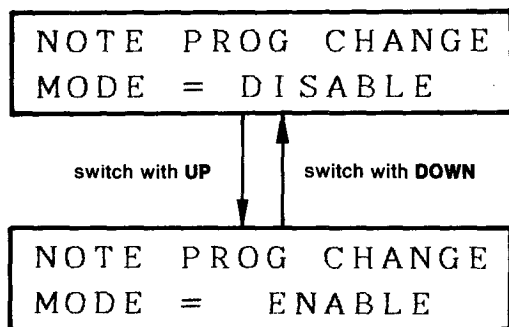
Switching between DISABLE and ENABLE is performed with the **UP** and **DOWN** keys.
If you set the MIDI OUT/THRU switch to OUT, the program change data selected with MIDI PROG CHANGE can be output to subsequent MIDI equipment. Again, PROGRAM mode must be entered for program changes to be possible.
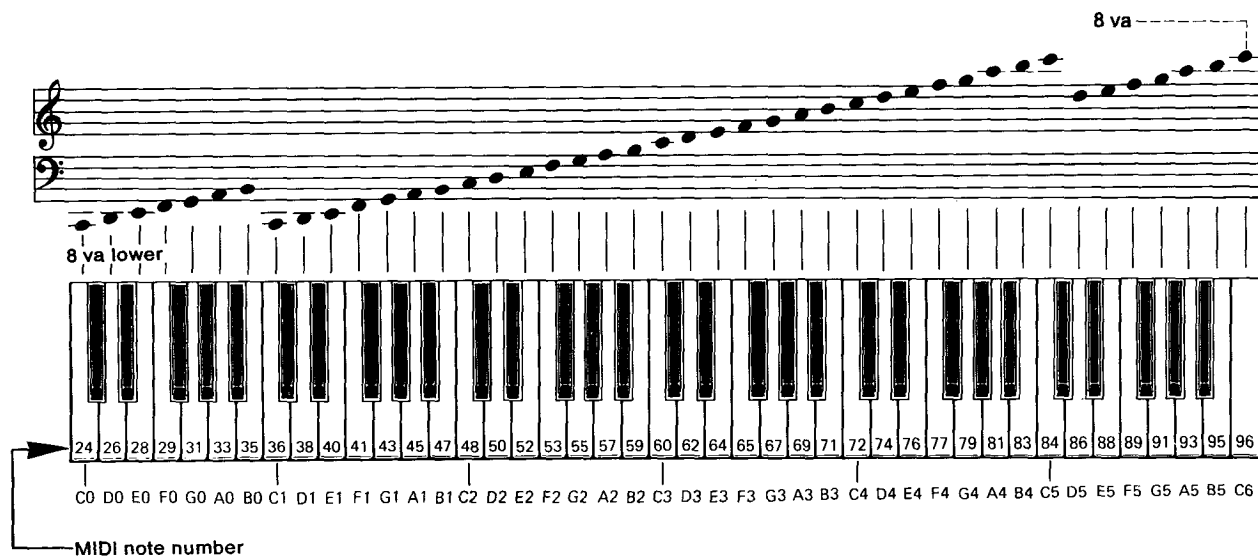
Remember that the number displayed as the PROG value (see above) corresponds to the value of the second data byte plus one. Thus C3, with the second byte value (MIDI key number) 60, is displayed as 61 on the the DRV-2000 LCD, and so on.

This holds true also when using the MIDI pedal keyboard MPK-130 as a practical remote program change control for the DRV-2000. Since the MPK-130 is can be switched between three octaves, a total of 36 DRV-2000 program numbers can be assigned at will to any of the pedal keys.

DRV-2000

MIDI IN

MPK-130

PS-1

Assignment example:

MPK-130 octave	Note numbers	DRV-2000 programs
L	24 − 36	25 − 37
M	36 − 48	37 − 49
H	48 − 60	49 − 61

On Switch Assignment and Functions
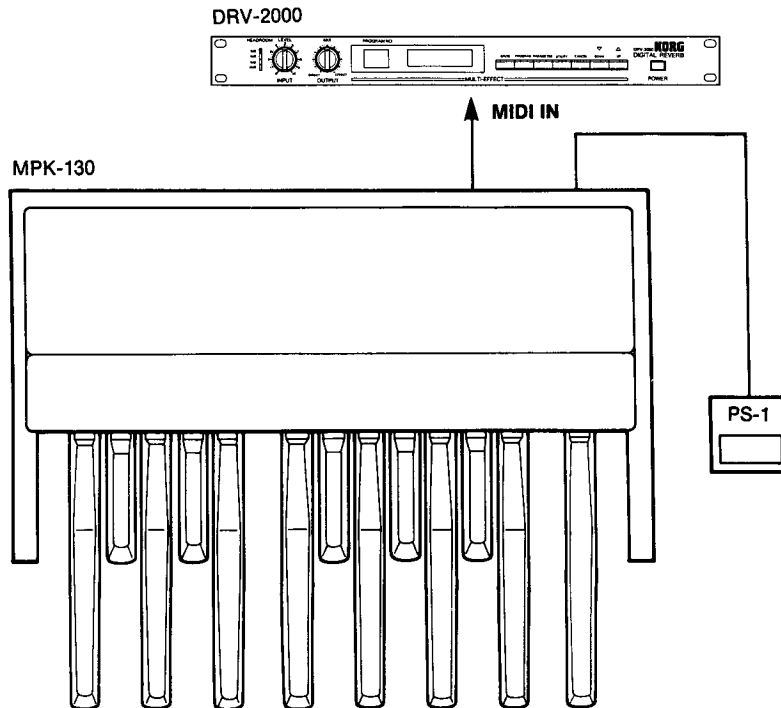
The following 4 kinds of functions can be performed by devices connected to the rear panel SW-1 and SW-2 jacks. (Refer back to section II for information on connections to these rear panel jacks.)

1) PROGRAM UP

Generally speaking, this enables upward switching of programs (from lower to higher numbers) in single increments according to foot switch operation. Depending on the PROGRAM RANGE parameter setting described in the following however, this order of selection may be reversed.

2) PROGRAM DOWN

Identical with PROGRAM UP, except that programs are usually switched in the order from higher to lower numbers. Again, this is determined by the PROGRAM RANGE setting.

3) EFFECT CANCEL

Allows you to remotely control the CANCEL function of the **CANCEL** key with a foot switch. Pressing a connected switch will cancel the effect sound, causing the CANCEL LED to light up. Stepping on the switch once more releases CANCEL.

4) MULTI MODULATION

This function is selected when you wish to to use connected foot switches or volume pedals as Multi Modulation sources. (See p. 32 for details on Multi Modulation.)

Any of these functions can be assigned individually to SW-1 and SW-2 as explained under 6.
Take care to use the correct type of device in order to achieve the desired kind of control. In general, functions 1 to 3 are performed with foot switches, while a volume pedal or external trigger signal is used as the Multi Modulation source of function 4. However, it is possible to use a volume pedal to switch programs or cancel the

effect. In such a case, the volume pedal must be pushed down fully and then returned to its original position to achieve switching.

After having completed the settings shown in the next paragraph, program change can be accomplished by switch operation as soon as PROGRAM mode is entered.

5. SWITCH PROGRAM CHANGE RANGE

```
┌─────────────────────────┐
│  SW  PROG  CHANGE        │
│  RANGE    1  TO  96      │
└─────────────────────────┘
```
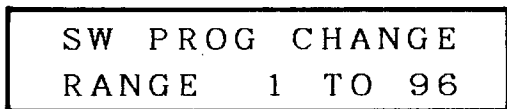
If the PROGRAM UP or PROGRAM DOWN functions have been assigned to SW-1 or SW-2 as described under 6, this parameter must also be adjusted to set the range of selectable program numbers. The numeral after RANGE indicates the program at which selection will start, the number after TO the final program after which selection will recommence from the beginning.
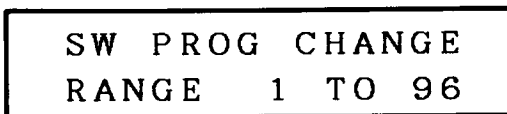
Taking the above display as an example, program change with SW-1 will be performed in the following order if PROGRAM UP has been selected for that switch.
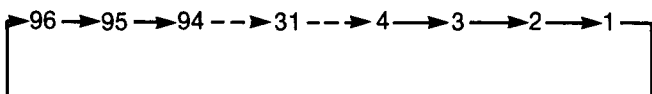
```
┌►1 ─►2 ─►3 ─►4 ---►31 --►94 ─►95 ─►96 ┐
└                                      ┘
```
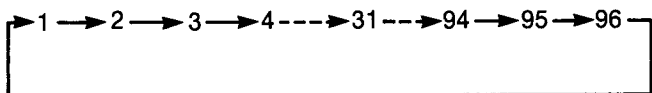
If SW-2 has been assigned for PROGRAM DOWN switching, the same display will indicate this order.

```
┌►1 ─►96 ─►95 ─►94 ---►30 --►4 ─►3 ─►2 ┐
└                                      ┘
```
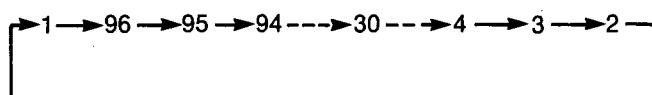
Reversing the RANGE setting like this

```
┌─────────────────────────┐
│  SW  PROG  CHANGE        │
│  RANGE    1  TO  96      │
└─────────────────────────┘
```

would then indicate the PROGRAM UP order

```
┌►96 ─►95 ─►94 --►31 --►4 ─►3 ─►2 ─►1 ┐
└                                     ┘
```

and the PROGRAM DOWN order

```
┌►96 ─►1 ─►2 ---►30 --►92 ─►93 ─►94 ─►95 ┐
└                                        ┘
```
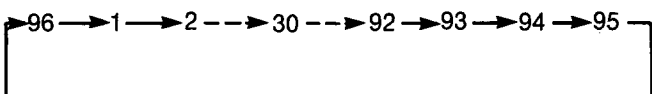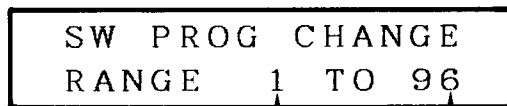
In other words, the RANGE parameter setting has priority over the switch assignment PROGRAM UP or DOWN setting. Depending on the RANGE, PRO-

GRAM UP assignment may therefore nevertheless lead to downward switching and vice versa. Take care not to overlook this fact, which takes a bit of getting used to.

Use the **UP/DOWN** and **PARAMETER** keys to determine the program change RANGE. As always, you can speed things up by pressing **UP** and **DOWN** simultaneously. (This is also possible while keeping **PARAMETER** depressed for faster selection of the value after RANGE.)

```
┌─────────────────────────┐
│  SW  PROG  CHANGE        │
│  RANGE    1  TO  96      │
└─────────────────────────┘
           ▲          ▲
           │          │
```
Select with **PARAMTER**   Slected with **UP DOWN**
and/or **UP DOWN**

Example

If you wish to limit the upward program change range to programs 10 to 20 with a PROGRAM UP assignment, make adjustments to obtain the following display

```
┌─────────────────────────┐
│  SW  PROG  CHANGE        │
│  RANGE    10  TO  96     │
└─────────────────────────┘
```
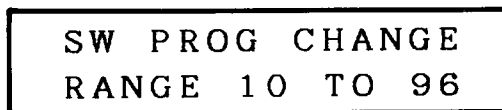
and thus the following switching order

```
┌►1 ─►2 ─►3 ─►4 -------►18 ─►19 ─►20 ┐
└                                    ┘
```
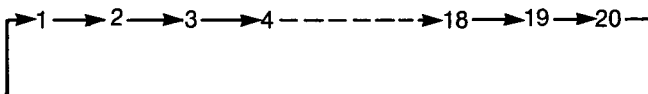
Pressing a connected foot switch will now continuously loop through the program numbers 10 to 20, starting again from 10 after 20 has been reached.

6. SWITCH 1 ASSIGNMENT

```
┌─────────────────────────┐
│   SW-1  ASSIGN           │
│   PROGRAM  UP            │
└─────────────────────────┘
```

When this type of message appears on the LCD, you can select the function you wish to assign to the SW-1 jack with **UP** or **DOWN**. These keys loop through the four available settings.

```
┌►PROGRAM ─►PROGRAM ─►EFFECT ─►MULTI ┐
│  UP        DOWN       CANCEL   MODULATION
└                                    ┘

┌UP┐ ─►                    ◄─ ┌DOWN┐
```
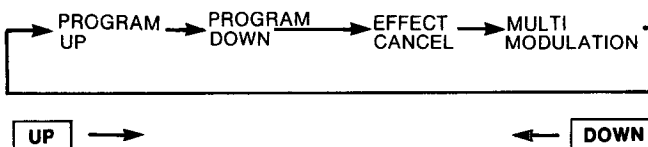
Like all other SW settings treated here, these do not have to be saved with WRITE and remain stored until you next adjust them even when power is turned off.

7. SWITCH 2 ASSIGNMENT

Identical with the above, except that the device plugged into the SW-2 jack is programmed.

8. PEAK HOLD FUNCTION

```
┌─────────────────────────┐
│   P E A K   H O L D     │
│   L E V E L :       0  %│
└─────────────────────────┘
```

```
┌─────────────────────────┐
│   P E A K   H O L D     │
│   S W - 1  :     - 4 0  %│
└─────────────────────────┘
```

```
┌─────────────────────────┐
│   P E A K   H O L D     │
│   S W - 2  :        0  %│
└─────────────────────────┘
```

PEAK HOLD is used in conjunction with Multi Modulation. Setting the three parameters LEVEL, SW-1 and SW-2 allows the peak (maximum) level of incoming signals used as Multi Modulation sources to be held for an adjustable time when this is necessary to obtain the desired Multi Modulation effect.

① **LEVEL (INPUT Level Peak Hold Time)**
Range: −100 - 100%

Raising the absolute value of this parameter increases the time a signal peak applied to the rear panel INPUT jack is held. Usually, positive values are selected when the incoming signal is of type H (high), such as a normal audio signal. Negative values would for instance cause the controlled effect to be heard after the direct sound has faded out for some interesting results.
A value of 100% or −100% causes the level to be held indefinitely.
The following two examples show the effect obtained with a LEVEL value of about 20% during a typical application.

Example 1
You would like to use a very percussive sound such as a snare drum (applied to INPUT jack) as a Multi Modulation source. Since the snare drum envelope itself is too short for this kind of application, you can lengthen it with PEAK HOLD.

Without PEAK HOLD

(regular snare drum envelope)

With PEAK HOLD

HOLD effect
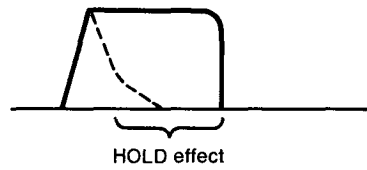
Example 2
If an audio signal with a higher peak (a louder sound) is input while the previous one is still being held, the new peak will further raise the HOLD level.

HOLD   HOLD
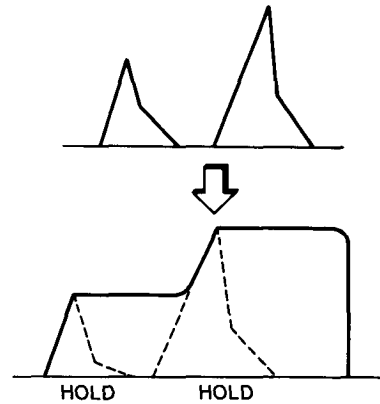
NOTE:

This PEAK HOLD function is only effective in conjunction with Multi Modulation. The direct sound itself will not change as illustrated above, i.e. no peak hold effect can be obtained for the input audio signal, which will sound the same as before. The change is heard in the Multi Modulation effect sound.

② **SW-1 (SW-1 Input Peak Hold Time)**
Range: −100 - 100%

③ **SW-2 (SW-2 Input Peak Hold Time)**
Range: −100 - 100%

Since the only difference between these parameters is the switch input jack they determine values for, they are treated here together.
Besides H-type audio signal peaks, the PEAK HOLD function can also lengthen the hold time for L (low)-type signals, like triggers, which call for negative value settings. Even very narrow trigger pulses such as those output by drum machines or foot switches may then be used as Multi Modulation sources. In addition, you can create trigger masks or delay trigger signals with this function.
As with LEVEL, settings of 100% or −100% cause the level to be held indefinitely.
As an example, we will show the effect of a SW-1 or SW-2 setting on a trigger signal applied to the rear panel SW-1 or SW-2 jack.

Example 1

If a ⌐┐ GND type trigger output from a drum machine such as the KORG DDD-1 or DDM-110 is connected to the SW-1 or SW-2 jack, it will normally produce this kind of narrow trigger pulse:

TRIG OUT
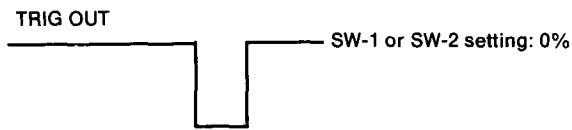
—————————————————— SW-1 or SW-2 setting: 0%

"Raising" the negative value of the SW-1 or SW-2 parameter lengthens the trigger time used by the DRV-2000. This is because PEAK HOLD holds this ⌐┐ GND type trigger at GND level when a negative setting is made.

DRV-2000
internal trigger time

—————————————————— SW-1 or SW-2 setting: −40%

Hold

To adjust the three PEAK HOLD parameters, first access this function with the **UTILITY** key and then switch between parameters with the **PARAMETER** button. Adjust the value, thus regulating the length of the hold effect, with the **UP** and **DOWN** keys.

```
              ┌─────────────────────┐
         ┌──→ │  P E A K   H O L D  │ ←──┐
         │    │  L E V E L :    0 % │    │
         │    └─────────────────────┘    │
         │              ↓                 │
adjusted with │ P E A K   H O L D │ switched with
UP DOWN──→  │ S W − 1 :   −40 % │  PARAMETER
         │    └─────────────────────┘    │
         │              ↓                 │
         │    ┌─────────────────────┐    │
         └──→ │  P E A K   H O L D  │ ←──┘
              │  S W − 2 :     0 %  │
              └─────────────────────┘
```
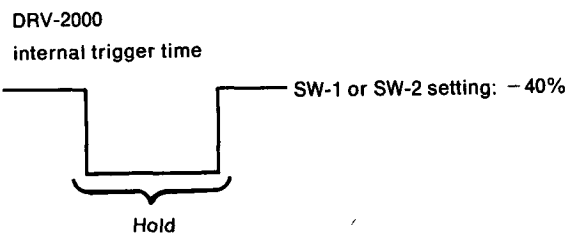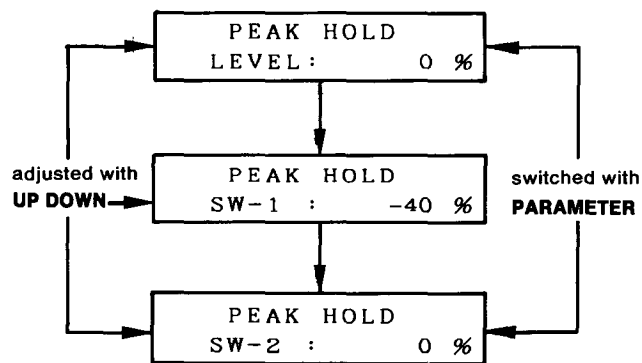
More details on PEAK HOLD applications will be given in the chapter on Multi Modulation.

9. DATA DUMP – STORING DATA IN THE MEX-8000

The data dump function enables you to store DRV-2000 user area programs (17 – 96) in the KORG Memory Expander MEX-8000. Saving is performed in the UTILITY mode when one of these user programs has been accessed. You can save either all 80 user programs or just the currently selected one. Stored programs can then be loaded from the MEX-8000 in the PROGRAM mode.

Only data that has already been memorized by the DRV-2000 with the WRITE function can be saved to the MEX-8000. In other words, parameter values you are currently editing will not be saved unless you first carry out a WRITE operation.

Connections

MIDI Date Dump
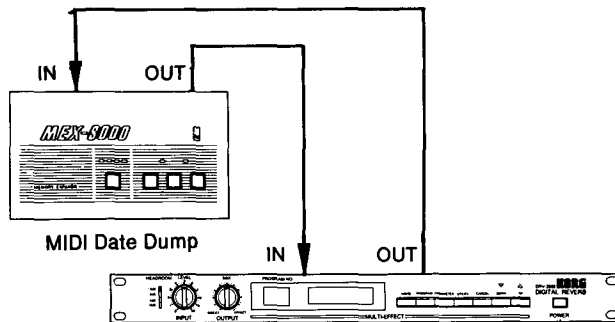
The rear panel MIDI OUT/THRU switch must be set to OUT.

MEX-8000 settings:

DEVICE: ◕ ◔ ◔ ◕

      0   1   1   0

MIDI CH: Must be identical with DRV-2000 MIDI channel.

PROTECT: Must be OFF for the bank used.
(Note that BANK D cannot be used.)

Saving Procedure

1) When saving a particular program, make sure it is selected before entering UTILITY mode. If you wish to save all 80 user programs, confirm that a program number over 16 is displayed on the LED.

2) Push **UTILITY** several times to call up the following type of display.

Indicates which program number can currently be saved. →

```
┌─────────────────────────┐
│  D A T A   D U M P   S A V E │
│  N o 1 7  :  P U S H  " U P " │
└─────────────────────────┘
```

switched with **PARAMETER**

Shows that all 80 user programs can be saved. →

```
┌─────────────────────────┐
│  D A T A   D U M P   S A V E │
│  A L L  :  P U S H  " U P "   │
└─────────────────────────┘
```
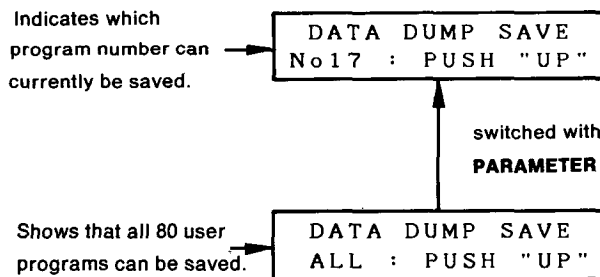
3) Press **PARAMETER** to switch between single and all program saving.

4) Select the desired bank (except D) on the MEX-8000 and press the **SAVE** key.

SAVE

Press

    A   B   C   D

LED of selected bank will light.

31
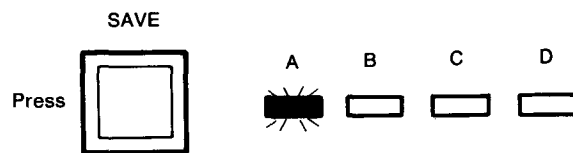
5) Push the DRV-2000 **UP** key to implement saving. The "GOOD" indicator on the MEX-8000 will light up for about a second to show that saving has been successfully completed.
You can now press the **UTILITY** key for a second to exit from UTILITY mode.

Loading Procedure

1) To load data stored in the MEX-8000 back to the DRV-2000, make sure the MIDI channels on both devices correspond, then enter PROGRAM mode with the **PROGRAM** key.
Note that loading can also be carried out when in the preset program area.

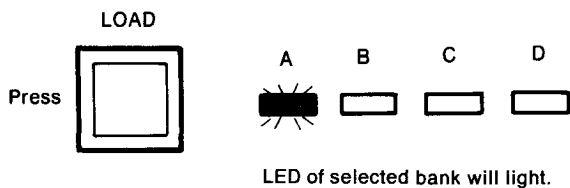2) Select the MEX-8000 bank where the data was stored and press the **LOAD** key.

LED of selected bank will light.

If single program was saved, it will be loaded to its original program number. In case all 80 programs were saved, they will be loaded to the entire user area and the number "96" will appear on the LED display.

C MULTI MODULATION

1. CONTROLLABLE PARAMETERS AND MODULATION SOURCES

As explained on in section III, the term "Multi Modulation" denotes control of various program parameters according to external signals.

The number of parameters available for Multi Modulation differs depending on the program, ranging between 3 and 7. Two of these can be selected per program for simultaneous external control. Parameters that can be used for Multi Modulation are indicated on the "PROGRAMS AND PARAMETERS CHART" on p. 46. We will list them up here for your convenience.

Multi Modulation Parameters

Program (Number)	Parameters
REV (1 – 8)	REV TIME (or AMBIENCE), E/R LVL, INPUT, OUTPUT
GATE REVERB (7,8)	GATE SHAPE, INPUT, OUTPUT
STEREO ECHO (9 – 11)	Lch F.B, Rch F.B (or L→R GAIN, R→L GAIN), Lch INPUT, Rch INPUT, Lch OUT, Rch OUT
FLANGER (12)	MOD FREQ, MOD DEPTH, F.B GAIN, Lch 1 LVL, Rch 1 LVL, INPUT, OUTPUT
CHORUS (13)	MOD FREQ, MOD DEPTH, INPUT, OUTPUT

SPACE PAN (14)	PAN SPEED, PAN DEPTH, TREMOLO, INPUT, OUTPUT
REVERB & ECHO (15)	REV TIME, Lch F.B, L IN(E), R IN(R), L OUT(E), R OUT(R)
REVERB & CHORUS (16)	REV TIME, E/R LVL, MOD FREQ, MOD DEPTH, INPUT, OUTPUT

A total of 72 sources is available for modulation of these parameters, giving you unprecedented flexibility of control. A single source can be used to regulate two different parameters at the same time.

Multi Modulation Sources

Jack input signals: SW-1 input
SW-2 input
LEVEL (INPUT jack signal level)

		LCD Display
MIDI data:	Pitch bend +	MIDI BEND +
	Pitch bend −	MIDI BEND −
	Channel pressure (after touch)	MIDI PRESS
	Note on number	MIDI NOTE
	Note on key velocity	MIDI VELO
	Control change number 0	MIDI CON 0
	Control change number 1	MIDI CON 1
	Control change number 2	MIDI CON 2
	⋮	⋮
	Control change number 31	MIDI CON 31
	Control change number 64	MIDI CON 64
	Control change number 65	MIDI CON 65
	⋮	⋮
	Control change number 95	MIDI CON 95

Control change:	
1 →	OSC MOD
2 →	VCF MOD
7 →	VOLUME
64 →	DAMPER
65 →	PORTAMENTO
66 →	SOSTENUTO
67 →	SOFTPEDAL

Source signals applied to the three jacks SW-1, SW-2 or INPUT can be processed with the UTILITY PEAK HOLD function (see p. 30) to lengthen or mask the Multi Modulation effect.
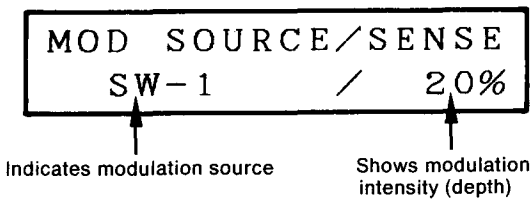
2. MULTI MODULATION SENSE PROGRAMMING

Before showing you how to select parameters and sources for Multi Modulation, some rather detailed explanations concerning depth adjustment (SENSE parameter) are necessary as this depends on the kind of modulation source (external control) and parameter settings used.

Multi Modulation SENSE (Depth)

Range: − 100 − 100%

A typical display appearing when you enter Multi Modulation mode looks like this.

```
MOD  SOURCE/SENSE
  SW-1        /   2,0%
```

Indicates modulation source   Shows modulation
                                      intensity (depth)

Depending on the type of modulation source selected, positive or negative SENSE values can be set. Audio INPUT and MIDI signals generally call for positive settings while ⎯⏋GND type triggers from a foot switch (like the PS-1) or drum machine (such as the DDD-1) require negative values. (See paragraph on PEAK HOLD, p. 30.)

In many cases, choosing either positive or negative settings can reverse the resulting control function. For example, foot controllers plugged into the SW-1 or SW-2 jacks can cause the intensity of the Multi Modulation effect to increase or decrease when pressed down, depending on whether a positive or negative value has been selected.

In other words, positive or negative SENSE settings indicate the "direction" in which parameter values are changed due to external signals. They must therefore be chosen according to the type of control device and desired effect.

Take MIDI information, say from a KORG synthesizer pitch bender, as an example. Put simply, pushing the bend lever to the right will bend sound upward and thereby positively increase the value of the output MIDI data. Accordingly, a positive SENSE setting should be carried out when using "BEND +" as a modulation source. On the other hand, you will want to use a negative SENSE value with "BEND −" because MIDI data value will decrease when the bend lever is tilted towards the left to create a downward pitch bend.

Another example

A foot switch will output a "negative" signal (a drop in level) when stepped on to produce an effect. Therefore, a negative SENSE setting is required.
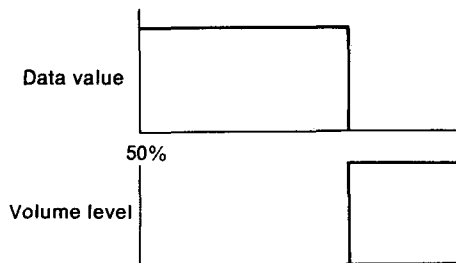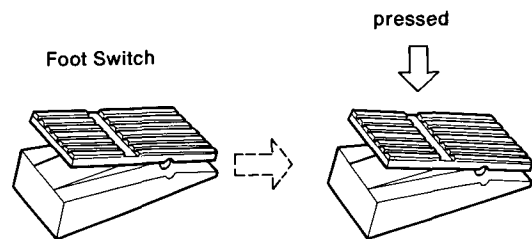
Of course, you can experiment with negative and positive values to reverse the control effect for special applications. Remember that the UTILITY PEAK HOLD setting, which may be plus or minus, will also influence the result.

The graphic illustration of what happens should make things clearer. In the examples below, the OUTPUT (volume level) parameter of a program has been selected for Multi Modulation. Modulation sources are a MIDI pitch bend lever and a foot switch connected to SW-1. The effect will be that output is raised (by tilting the bender to the right) or produced at all (by stepping on the foot switch) according to operation of the external

control. The SENSE settings have been adapted to the type of control device.
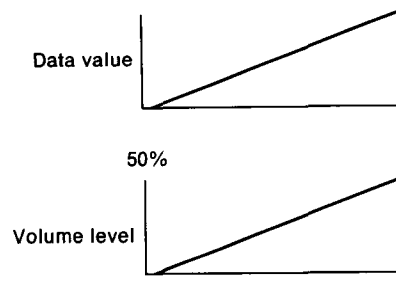
| Parameter: | OUTPUT = 0% |
| **Multi Modulation SENSE:** | BEND + / 50% |

| Parameter: | OUTPUT = 50% |
| **Multi Modulation SENSE:** | SW-1 / − 50% |

We have seen how negative and positive SENSE settings determine the direction of program parameter value changes via external signals. What about the parameters' programmed values? How do they influence Multi Modulation?

This much should be obvious: The "starting point" for the alteration is always the (absolute) value of the parameter setting.

Since positive SENSE, for instance, increases the **absolute** value, this means that negative parameter settings like − 50 will change in the direction of − 100, and not towards 0.

The precise relationship between the original program parameter settings and SENSE will again be easier to understand after having had a look at the graphic examples in the next paragraph. They show how the combination of SENSE and parameter adjustment influences the Multi Modulation result.

3. RELATION BETWEEN PARAMETER AND SENSE VALUES

First of all, consider that different sources divide the parameter value alteration range adjusted by SENSE into more or fewer steps. Usually, you will hardly notice any difference though because even the 127 steps provided by MIDI BEND are fine enough to seem like a continuous change.

Alteration Steps

SW-1	0 − 255	MIDI BEND +	0 − 127
SW-2	0 − 255	MIDI BEND −	0 − 127
LEVEL	0 − 255	MIDI PRESS	0 − 127
		MIDI NOTE	0 − 127
		MIDI VELO	0 − 127
		MIDI CON 0	0 − 127
		MIDI CON 1	0 − 127
		⋮	⋮
		MIDI CON 31	0 − 127
		MIDI CON 64	0 − 127

Positive SENSE

Alteration Range
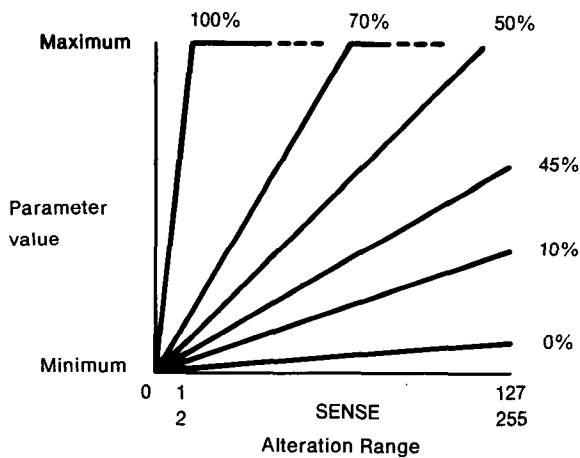
This shows the two most important points to remember about SENSE setting:

- **SENSE 100% enables ON/OFF switching by the source.**
- **SENSE 50% allows linear value adjustment by the source.**

Why? Because with a 100% SENSE setting, any source data value except 0 will raise the parameter value to 100% (maximum), regardless of the original (programmed) parameter setting. Source data 0, on the other hand, always lowers the parameter value to minimum. Linear control is achieved with SENSE 50% because the parameter value will increase by 1 for each source data increase by 1. How this relates to the programmed parameter setting is shown in examples below.

Please note that the illustration above is based on a minimum (absolute) programmed parameter value. In the case of REV TIME, this would indicate 0.3 s.

Incidentally, the kind of relationship between SENSE and parameters in Multi Modulation being treated here is the reason why percentages have been chosen for many parameters rather than other types of values.

Negative SENSE

Alteration Range
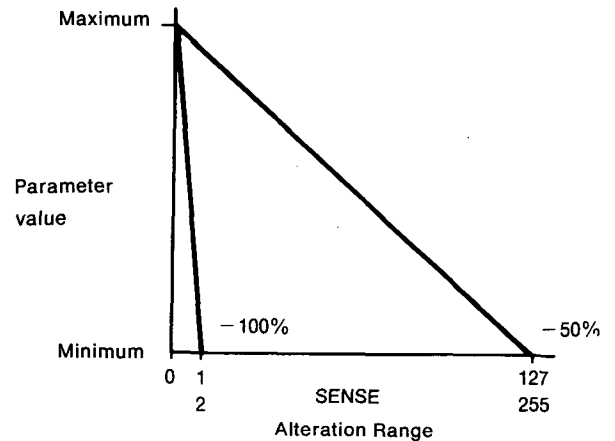
Here, SENSE − 100% will provide reversed ON/OFF switching. The parameter value will be maximum when source data is 0, and minimum with any larger source data.

SENSE − 50% provides reversed linear control, with the parameter value decreasing by 1 for each source data increase by 1.

The illustration above is based on a maximum (absolute) programmed parameter value. In the case of REV TIME, this would be 10.0 s.

To further clarify the complex relationship involved here, several concrete examples are given. Once you get used to the SENSE concept though, you will appreciate the flexibility and delicacy of control it makes possible.

For these examples, we assume that you are using a volume pedal connected to SW-1 to continuously adjust the effect (reverberation) OUTPUT of program 1, REV (S HALL).

Settings	**Parameters**			
		REV TIME	=	5.0 S
		PRE DLY	=	0.1 ms
		E/R LVL	=	100%
		H.DAMP	=	5
		INPUT	=	100%
		OUTPUT	=	controlled by Multi Modulation

Multi Modulation source : SW-1 (connected volume pedal)

If you would like to try out the adjustments introduced here yourself, as we suggest, read the following paragraph on Multi Modulation programming first.

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Ratio of Source Data Alteration with Volume Pedal

pedal data 0 ➝ pedal data 127 ➝ pedal data 255
source data 0   source data 50   source data 100

"OFF"   Push down halfway   Fully pushed down
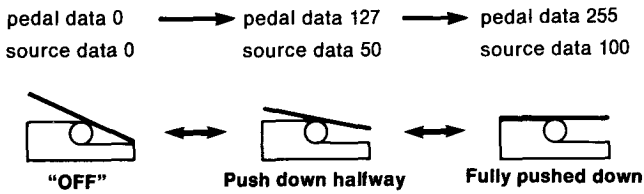
Example 1-1
Original OUTPUT = 0%   MOD SENSE = 100%

For the first four examples, the OUTPUT value programmed for REV (S HALL) should be 0%.
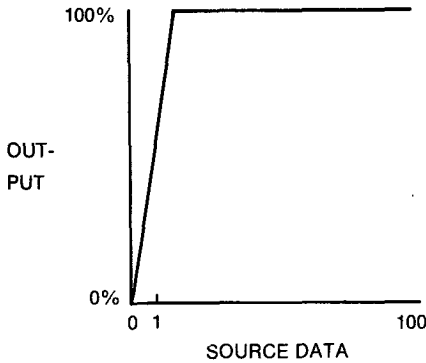
As you can see from the illustration, even slightly pressing the volume pedal will immediately raise OUTPUT level to 100%, thus switching the effect sound on.
This means that the only OUTPUT parameter values that can be obtained are 0% and 100%. In other words, the volume pedal functions as an effect ON/OFF switch.

Example 1-2
Original OUTPUT = 0%   MOD SENSE = 50%
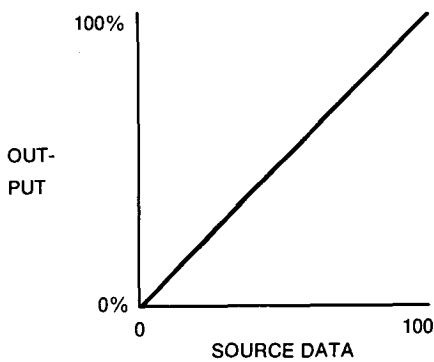
This setting enables smooth linear control of the effect level for the finest possible regulation over the maximum range via volume pedal. The OUTPUT achieved always corresponds exactly to the pedal position.

Example 1-3
Original OUTPUT = 0%   MOD SENSE = 75%
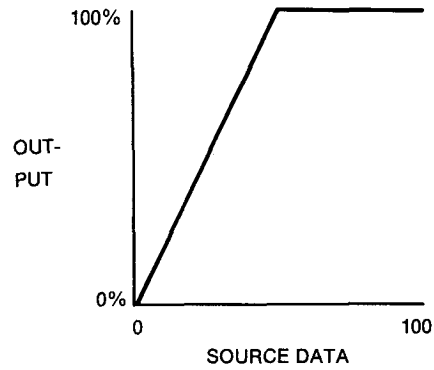
Here, maximum effect OUTPUT level is reached before pushing the pedal down fully. This may be practical when you want to make sure you get maximum effect even without having to step all the way down.

Example 1-4
Original OUTPUT = 0%   MOD SENSE = 25%
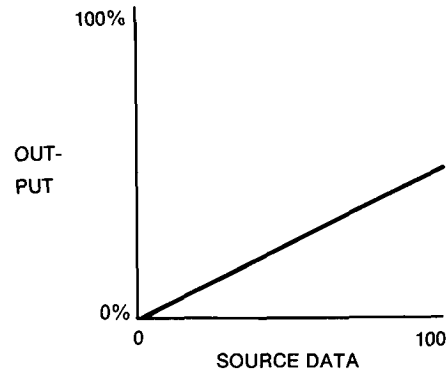
In this case, maximum value is never achieved at all. Useful for applications where only delicate effects are desirable.

Example 2-1
Original OUTPUT = 50%   MOD SENSE = 100%

For this and the following three examples, programmed OUTPUT has been raised to 50%.
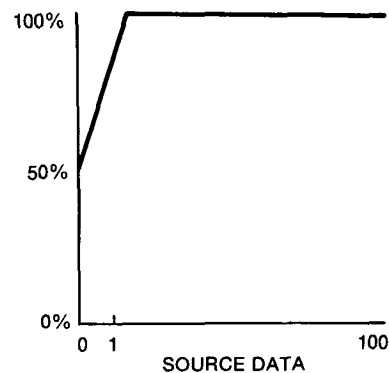
Again, the volume pedal can be used like a switch. This time however, it does not switch between effect ON and OFF as it did when programmed OUTPUT was 0%, but between a softer setting (50%) and the full effect.

Example 2-2

Original OUTPUT = 0%   MOD SENSE = 50%
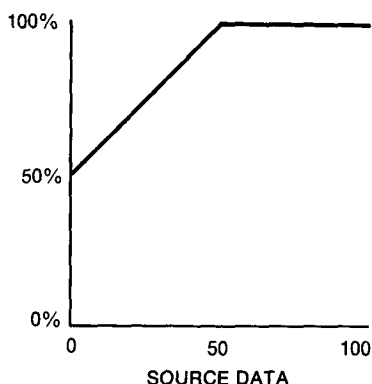
Control starts out from the 50% effect level and is linear up to the halfway position of the pedal, where OUTPUT reaches 100%. Pressing the pedal down further than that therefore no longer has any effect on the sound.

Example 2-3

Original OUTPUT = 50%   MOD SENSE = approx. 25%
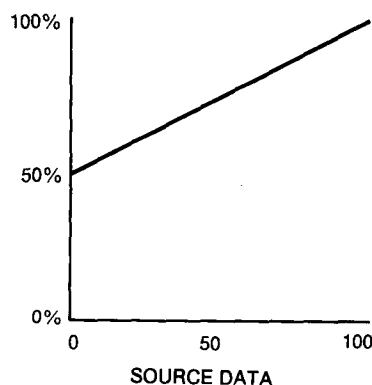
This example shows you how you can obtain full linear pedal control over a limited range, here covering OUTPUT levels 50% − 100%.

Example 2-4

Original OUTPUT = 50%   MOD SENSE = approx. 20%
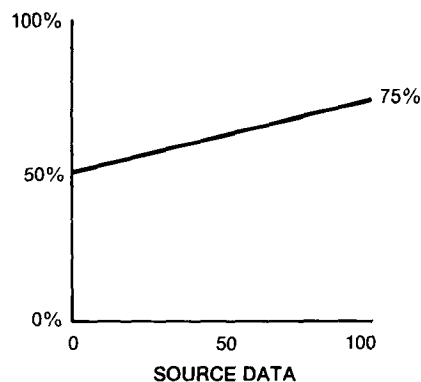
The control range has been limited even further to cover only the 25% between OUTPUT 50% and 75%.

We hope these examples have the clarified merits of the complex SENSE and parameter relation which makes such fine and flexible settings possible.

Limiting the control range is an absolute necessity for the parameters of many programs. Just think of Stereo Echo 1, where a feedback gain of 100% would lead to a hold effect. Reaching this value can be avoided with settings like ex. 1-4 or 2-4.

In other cases, it will be advisable to limit the lower end of the range so that an effect sets in with a certain minimum parameter value below which it would not be perceptible anyway. This can be done in analogy to our examples by setting the programmed parameter value to, say, 20% and SENSE to maybe 30%, giving a control range of around 20% to 60%.

The examples shown above have all used positive SENSE settings. It is of course possible to achieve similar (but reversed) Multi Modulation results with negative values. During Multi Modulation programming, remember that it controls the absolute values of parameters. Of course, this is relevant only where values are negative.

Another detail: negative settings are sometimes used for parameters such as OUTPUT and feedback to invert the phase of the effect sound. In such cases, the minimum value is − 1%, not 0%. This is because 0% itself is part of the regular phase range (0% to maximum 100 %) on the DRV-2000. The negative phase range starts from − 1%, maximum is − 100%.

4. MULTI MODULATION PROGRAMMING

To program Multi Modulation effects (select parameters and sources, adjust range of control), you must

(A) make the necessary UTILITY settings such as SW assignment or MIDI channel specification, depending on the external device used,

(B) choose the number of the effect program you wish to control externally in the PROGRAM mode,

(C) select the parameter used for Multi Modulation with **PARAMETER**, and finally

(D) enter MULTI MODULATION mode by keeping the **PARAMETER** key depressed and pushing **UTILITY**. (When you wish to exit from this mode, press **PROGRAM**.)

If you enter Multi Modulation mode from a parameter which has not yet been adjusted for external control, the following kind of message will be displayed.

```
MOD  SOURCE/SENSE
_____ /    0%
```

This shows that no modulation source has yet been selected for this parameter. Sources can now be called up in the following order.

MIDI BEND +
MIDI BEND −
MIDI PRESS
MIDI VELO
MIDI NOTE   **Switched with DOWN while**
SW-1   *holding down* **PARAMETER**
SW-2
LEVEL

     Starting point
– – – – – –   (indicates no
     source selected)

MIDI CON 1
MIDI CON 2   **Switched with PARAMETER**
     (or **UP** while holding
MIDI CON 31   *down* **PARAMETER**)
MIDI CON 64

The LCD will also give you the following kind of useful information:

```
┌─────────────────────────┐
│  MOD  SOURCE/SENSE      │
│  SW-2        /PRG-D     │
└─────────────────────────┘
```

The message PRG-D shows that a device, in this case SW-2, has already been programmed for a UTILITY function, for instance PROGRAM UP. Such devices can not be used as Multi Modulation sources unless you change their assigned function to MULTI MODULATION in UTILITY mode.

```
┌─────────────────────────┐
│  MOD  SOURCE/SENSE      │
│  LEVEL (H) /    0%      │
└─────────────────────────┘
```

A capital H in brackets next to a device (in the example, the one connected to the INPUT jack, to which LEVEL corresponds) indicates that the PEAK HOLD function is being applied to its signal.

When you do not intend to use a parameter for Multi Modulation, be sure to return the MOD SOURCE display to "-------".
To adjust the MOD SENSE value, access the desired modulation source in Multi Modulation mode and then use **UP** and **DOWN**.

```
┌─────────────────────────┐
│  MOD  SOURCE/SENSE      │
│  SW-2        /  ??%     │
└─────────────────────────┘
```
    ↑   ↑
MOD SOURCE selected with   **MOD SENSE** adjusted with
PARAMETER + **UP/DOWN**   **UP/DOWN** only

As soon as you select a source by calling it up on the LCD, the respective parameter will be considered as "programmed" for Multi Modulation, even if SENSE is still 0 (meaning no control is yet possible). This is indicated by the first letter of the parameter name

changing to lower case. (Switch back to PROGRAM mode to confirm this.) For example

```
┌─────────────────────────┐
│   REV  (ROOM)           │
│   AMBIENCE =   50 %     │
└─────────────────────────┘
```

will change to

```
┌─────────────────────────┐
│   REV  (ROOM)           │
│   aMBIENCE =   50 %     │
└─────────────────────────┘
```

You can therefore easily check which parameters in a program are being controlled by Multi Modulation.

5. MULTI MODULATION EXAMPLE PROGRAM

The objective is to create a program that works somewhat like the "Long On" feature of the KORG DRV-1000. Reverb time is raised to maximum whenever a foot switch is pressed and returns to minimum again when it is released. The effect is similar to that achieved with a piano damper (or synthesizer sustain) pedal, only that it is far more impressive and gives the feeling of a suddenly expanded, spacy atmosphere.
In our example, we will be using preset program no. 1, Small Hall reverberation, and a KORG PS-1 type foot switch connected to the SW-1 jack.
(A) First, assign SW-1 to MULTI MODULATION. Also make sure PEAK HOLD is off for the connected device. This is done in the UTILITY mode.
1) Press **UTILITY** 6 times to call up the SW-1 assignment message

```
┌─────────────────────────┐
│   SW-1  ASSIGN          │
│   PROGRAM  UP           │
└─────────────────────────┘
```
                          (Example)

2) If SW-1 is not yet assigned to MULTI MODULATION, use **UP/DOWN** until the message

```
┌─────────────────────────┐
│   SW-1  ASSIGN          │
│   MULTI-MODULATION      │
└─────────────────────────┘
```

appears on the LCD.
3) Press **UTILITY** a further two times to obtain this kind of message.

```
┌─────────────────────────┐
│    PEAK  HOLD           │
│    LEVEL :     0 %      │
└─────────────────────────┘
```

4) To check the SW-1 PEAK HOLD setting, call it up with **PARAMETER**.

```
┌─────────────────────────────┐
│   P E A K   H O L D         │
│   S W - 1   :       1 0  %  │
└─────────────────────────────┘
```
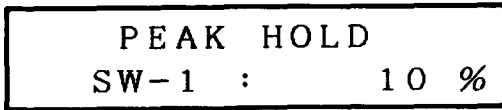
5) Set the value to 0 with **UP/DOWN**.

```
┌─────────────────────────────┐
│   P E A K   H O L D         │
│   S W - 1   :        0  %   │
└─────────────────────────────┘
```
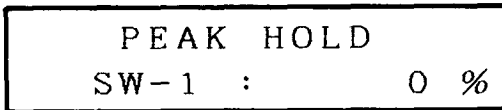
(B) Enter PROGRAM mode by pushing **PROGRAM** in order to select program 1. Even if it is already accessed (number displayed by LED), you must exit from UTILITY mode in this way, though the following step can be dropped.

1) Select program 1 with **UP/DOWN**.

PROGRAM NO.

```
┌──────────────────────────────────┐
│  ┌────┐    ┌───────────────────┐ │
│  │ 1  │    │  REV  (S HALL)    │ │
│  │    │    │  REV TIME= 1.0  s │ │
│  └────┘    └───────────────────┘ │
└──────────────────────────────────┘
```
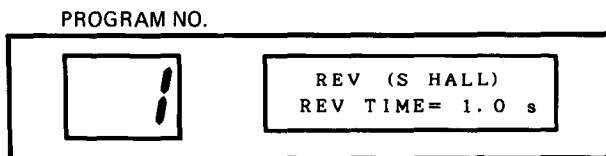
(C) Normally, the next step is to access the parameter you want to use for Multi Modulation with **PARAMETER**.

Since you will probably have obtained the above display already when entering PROGRAM mode, you can skip this step here and jump to (2). We will explain it anyway just in case.

1) Suppose the display does not show the desired parameter, like this.

PROGRAM NO.

```
┌──────────────────────────────────┐
│  ┌────┐    ┌───────────────────┐ │
│  │ 1  │    │  REV  (S HALL)    │ │
│  │    │    │  H.DAMP=  5       │ │
│  └────┘    └───────────────────┘ │
└──────────────────────────────────┘
```

Use **PARAMETER** (+ **UP/DOWN**) to call up the one you want to control externally.

PROGRAM NO.

```
┌──────────────────────────────────┐
│  ┌────┐    ┌───────────────────┐ │
│  │ 1  │    │  REV  (S HALL)    │ │
│  │    │    │  REV TIME= 1.0_s  │ │
│  └────┘    └───────────────────┘ │
└──────────────────────────────────┘
```
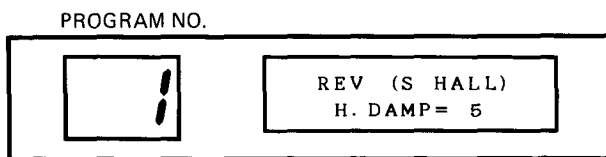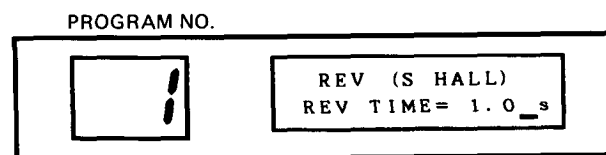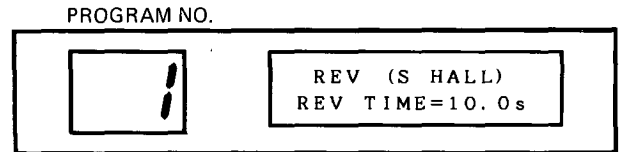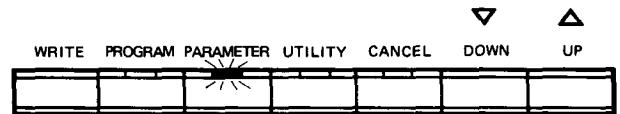
2) Adjust the programmed ("original") value of the parameter with **UP/DOWN**.

Since we want maximum reverberation time when pressing the foot switch, set REV TIME to 10.0 s.

PROGRAM NO.

```
┌──────────────────────────────────┐
│  ┌────┐    ┌───────────────────┐ │
│  │ 1  │    │  REV  (S HALL)    │ │
│  │    │    │  REV TIME=10.0s   │ │
│  └────┘    └───────────────────┘ │
└──────────────────────────────────┘
```

(D) Finally, enter Multi Modulation mode to select the source and adjust MOD SENSE.

1) Hold down **PARAMETER** and push **UTILITY**. When the **PARAMETER** indicator is lit

```
                              ▽     △
WRITE  PROGRAM PARAMETER UTILITY CANCEL DOWN  UP
┌─────┬─────┬─────┬─────┬─────┬─────┬─────┐
│     │     │ ░░░ │     │     │     │     │
└─────┴─────┴─────┴─────┴─────┴─────┴─────┘
```

and the MOD SOURCE/SENSE message is displayed

```
┌─────────────────────────────┐
│  MOD  SOURCE/SENSE          │
│  ─ ─ ─ ─ ─ ─ ─ ─  /    0%   │
└─────────────────────────────┘
```

this shows you are in Multi Modulation mode.

NOTE:

Multi Modulation mode can only be entered when a parameter is displayed that can be controlled by an external device. In all other cases, pressing **PARAMETER** and **UTILITY** simultaneously will have no effect.

2) Select the desired source with **PARAMETER** and **UP/DOWN**.

In our example, hold down **PARAMETER** and press **DOWN** three times to call up

```
┌─────────────────────────────┐
│  MOD  SOURCE/SENSE          │
│  SW-1          /    0%      │
└─────────────────────────────┘
```

3) Adjust MOD SENSE with **UP/DOWN**.

Since we want a SENSE setting of −100% (because a ⌐∤ GND type trigger pulse is being used as the external control signal), keep **DOWN** depressed and then push **UP** for fastest adjustment.

```
┌─────────────────────────────┐
│  MOD  SOURCE/SENSE          │
│  SW-1          /-100%       │
└─────────────────────────────┘
```

4) Exit from Multi Modulation mode with **PROGRAM**.

The small letter at the beginning of "rEV TIME" now tells you that this parameter has been adjusted for Multi Modulation.

PROGRAM NO.

```
        ┌──────────────────┐
│    REV  (S  HALL) │
│  rEV  TIME=10. 0  s │
        └──────────────────┘
```

The DRV-2000 is now all set and ready for the "Long On" foot switch effect. Try it out.

When you play without pressing the foot switch, reverb time will be minimum (0.3 sec.) Stepping on the pedal will at once raise REV TIME to 10.0s, but the perceived result will depend on the timing with which you press the foot switch (before playing a note, while playing a note). REV TIME will be maximum as long as the switch is depressed. As soon as you release the pedal, reverberation time will drop to minimum, giving the impression of a more or less abrupt cessation of the reverb sound.

SECTION V:
ADVANCED APPLICATION ADVICE

Many articles and even books have been written on the subject of effects (such as reverberation) for professional use in the recording studio and sound reinforcement. It is far beyond the scope of this manual to treat that topic here. Since such information is available, for instance in sound and recording magazines, we highly recommend reading it to find out what the pros do.

The DRV-2000 itself boasts truly professional specifications and offers control possibilities (Multi Modulation) hitherto not even available in the most sophisticated studio. By informing yourself and above all by your own experimentation, you will be able to make your sound meet the most exacting standards and obtain new effects never realized before at all.

To make things a little easier for beginners, we are including a few hints and easy to understand examples for actual application. The 96 factory-programmed settings should also prove helpful as guidelines. In the end, though, it will up to you to find your own personal way of making the most of the DRV-2000.

A REVERB PROGRAMS

The "regular", or what might be called "natural", reverberation programs 1 to 6 certainly offer the widest range of application of all effects possible with the DRV-2000. There is quite simply NO music that will not be enhanced by natural reverberation.

As for the gate reverb programs, especially GATE REVERB 1, these come closer to "sound effects" and are generally not suitable when you want to create a resonant atmosphere for the overall sound. Rather, they are best when applied to single instruments.

Since the settings themselves are quite straightforward and easy to understand, and the ideal values depend very much on the sound sources used, we will refrain from giving any concrete setting examples here – just a few basic tips to start you off on your own adjustments. Also remember to have a good look at the factory-programmed reverb effects.

1. With multitrack recording, it is usually best to save reverb for the final mixdown. If you add different kinds of reverberation to several instruments, using various programs, the mixed sound may become blurred and indistinct ("muddy").

2. For special applications, for instance when adding tension and power to certain drum sounds or emphasizing a particular instrument with stronger reverb, it may be quite alright to "ignore" tip 1. However, particular care must then be taken not to blur the effect during mixdown. At least totally turn down the effect send for channels where special reverberation has already been used during initial recording when applying overall mixdown reverb.

3. In any case, muddiness tends to be the number one problem with many reverb settings. Take this into account and remember that "less can mean more" – like a slightly shorter REV TIME or a somewhat lower INPUT level. The individual character of the sound being processed is an another important consideration here – H.DAMP values can make a lot of difference depending on the frequency spectrum of an instrument. Experiment both with parameter values and by changing the reverb program.

4. Never determine settings by just listening to the effect on single notes out of the musical context. Taking the VOCAL plate reverb as an example, adjust REV TIME and other parameters according to the tempo of the song (among other things). Long reverberation might give a beautiful, deep resonance during slow ballads – but make vocals indistinct during up-tempo songs. Lower REV TIME when the beat gets faster.

B STEREO ECHO PROGRAMS

Each of the three basic stereo echo programs has its own delay module/feedback configuration, making certain effects possible with one program that would not work as well (or at all) with another. Experiment on your own with the following three examples as starting points to find out the peculiarities of the three configurations. Referring to the diagrams on p. 19 will help you understand the necessary settings.

1. PANNED ECHO EFFECTS

A kind of effect where the sound image moves across the stereo field. You could for instance make the echoes start in the center and then gradually recede into the distance towards the right or left.

To achieve this kind of impression, the L and R channel DLY times should be equal, but the feedback levels must differ somewhat to obtain the feeling of movement across either half of the stereo field.

Both stereo echo programs 1 and 2 are suited to this effect, which is not possible with number 3.

To compare the two, set delay time to about 300.0 ms on both channels and use slightly different feedback values (e.g. 70 and 65) or L→R / R→L values (e.g. 56 and 60).

2. PING-PONG ECHO EFFECTS

As the name "ping-pong" implies, these give the impression of the echoes jumping between left and right with the direct sound heard in the center of the stereo field. Stereo echo 1 and 2 are both ideal for this kind of effect. (As explained in paragraph 3, the third echo

program will cause the sound to jump between channels only once.)

If you would like the echo to jump back and forth with each repetition, the necessary settings will differ depending on the selected program. When using stereo echo 1, a ping-pong effect is obtained with a 1:2 ratio between the channel DLY times. In other words, you must double the DLY setting of one channel as opposed to the other one. The feedback levels should be identical for both channels.

With stereo echo 2, you must select an identical DLY time for both channels and then adjust feedback and channel input levels accordingly.

Example :

Lch DLY = Rch	DLY = 300 ms
L → R = 70	R → L = 25
Lch INPUT = 30%	Rch INPUT = 100%

"Rhythmical ping-pong" can be created by varying the delay time ratios of the channels. With stereo echo 2 for instance, try doubling the value of one channel (e.g. Rch DLY 250 and Lch 500 ms), then double the feedback value to the channel with the shorter delay as opposed to the long-delay channel (e.g. L→R 80, R→L 40). The echoes will jump back and forth between L and R, with two repetitions being heard on the short-delay channel for every one on the channel with the long delay, providing a rhythmical feeling.

Experiment with different DLY time ratios (not only 1:2 as in the above example, but 2:3, 1:4 etc.) to vary the ping- pong rhythms.

With any DLY time settings, feedback ratios determine the volume balance between the echo channels as well as the individual number of repetitions (effect duration) for L and R.

3. ECHO WITH SINGLE L → R JUMP

This is the basic effect of stereo echo 3. Raise the Lch DLY of preset program 11 to between 300 and 400 ms and you will be able to notice more distinctly that the right channels echoes set in only after the left channel echo has been heard, however long that may be delayed. The reason why is quite clear when you look at the diagram again.

The sound signal enters the Rch delay module only after having passed through Lch delay, which it does only once. With a mixer, you can invert channels as necessary. (The addition of a high-quality mixer such as the compact KORG KMX-62 is highly recommended as it further increases the flexibility of the DRV-2000.)

⌐ PHASING, FLANGING, CHORUS ⌐

Not only are these effects themselves often very similar, many people also use terms like "phasing" and "flanging" indiscriminately.

As a rule, these and other related effects can be kept apart (roughly) as follows.

Effect	Delay Time	Feedback
Flanging	1 - 15 ms	yes
Phasing	15 - 25 ms	yes
Chorus	25 - 32 (35) ms	no
Doubling	30 - 50 ms	enough for 1 repetition
Slap echo	50 - 150 ms	enough for 1 repetition

Not all professionals will necessarily agree with the listed distinguishing criteria. Some will for instance use a single echo repetition with a delay of only 10 ms and still call it "doubling". Therefore consider the above as a rule of thumb.

We again encourage you to inform yourself on applications for the above effects. Of course, it is entirely up to you how you use them with your music, and there is no need to worry whether what you have just done to your guitar sound is really "flanging" or "phasing". The above list is only intended as a helpful reference if you for instance happen to read somewhere that "doubling" creates the impression of two instruments being played or may be used to thicken the timbre of a weak voice.

The DRV-2000 programs are so flexible that it is possible to achieve certain kinds of flanging and other "modulation" effects with the stereo echo or REVERB & ECHO programs by using very short delay times. For doubling or slap, these echo programs are used in any case.

D ⌜MORE MULTI MODULATION⌐
EXAMPLES ⌟

Multi Modulation is definitely the DRV-2000 feature that sets it apart from any other multi-effect processor available today at any price. Learning how to use the incredible range of control it places at your finger (or foot-) tips will put you far ahead of the crowd, giving you expressive possibilities no one else can imitate.

We would like to conclude this section with five practical Multi Modulation programs. Hundreds more are there for you to discover.

1. OLD-FASHIONED GATE REVERB

Mem-ory No.	Program name	Type	Parameter									
			1	2	3	4	5	6	7	8	9	10
	REV GATE	1	REV TIME	PRE DLY	E/R LVL	H. DAMP	INPUT	OUTPUT				
			8.5s	0.1ms	80%	6	100%	0%				
Multi modulation		6	LEVEL / 100%				/					
Peak hold			LEVEL : 6%				:					

This Multi Modulation program creates an "old-fashioned" gate reverb effect, similar to what used to be done with a combination of reverb and noise gate. It modulates the parameter 6 (OUTPUT) of preset program 1 REV (S HALL) and is controlled by the audio signal connected to the INPUT jack (MOD SENSE adjusted for LEVEL).

These settings are particularly suitable for percussion sounds, giving a somewhat different effect than the preset GATE REVERB programs. They can form the basis for further experimentation on your own part, using other REV programs instead.

You can lengthen the gate time by increasing the PEAK HOLD percentage value.

2. REVERB TIME CONTROL VIA MIDI KEY PRESSURE

Mem-ory No.	Program name	Type	Parameter									
			1	2	3	4	5	6	7	8	9	10
	PRESS LONG	2	REV TIME	PRE DLY	E/R LVL	H. DAMP	INPUT	OUTPUT				
			2.4s	0.1ms	100%	3	100%	100%				
Multi modulation		1	MIDI PRESS / 60%				/					
Peak hold			:				:					

Allows you to lengthen the reverberation time by pressing down harder on synthesizer keys. Needless to say, the controlled parameter is no. 1, REV TIME. As REV program, we have chosen Large HALL. (Of course, your MIDI instrument has to have after-touch ability to be able to use this setting.)

This expressive means of control is particularly effective with "acoustic" sounds such as piano.

3. "AFTERSOUND" REVERB

Sometimes, you will not want reverb to be effective as long as the direct sound is heard so as not to impair clarity. Still, you might like to add reverberation to the sound afterwards. This seemingly paradox requirement can be fulfilled by the above program.

The effect is has a certain resemblance to reverse reverb, but produces a characteristic aftersound resonance that follows the direct sound like applause.

Instead of controlling this program with the INPUT audio signal, you could for instance use MIDI key velocity.

Mem-ory No.	Program name	Type	Parameter									
			1	2	3	4	5	6	7	8	9	10
	REV BACK	6	REV TIME	PRE DLY	E/R LVL	H. DAMP	INPUT	OUTPUT				
			9.5s	0.1ms	30%	2	100%	100%				
Multi modulation			6		LEVEL / − 100%			/				
Peak hold					:			:				

4. GATE SHAPE CONTROL VIA PEDAL

Mem-ory No.	Program name	Type	Parameter									
			1	2	3	4	5	6	7	8	9	10
	PEDAL SHAPE	8	GATE SIZE	PRE DLY	GATE SHAPE	H. DAMP	INPUT	OUTPUT				
			36	0.4ms	20%	8	100%	100%				
Multi modulation			3		SW-1 / 56%			/				
Peak hold					:			:				

A highly recommended program for the drummer. By connecting a volume pedal (KORG KVP-001, KVP-002) to SW-1, you can continuously alter the shape of the gate envelope from "normal" to reverse according to pedal position.

5. "PANNING" WITH MIDI BENDER LEVER (WHEEL)

Mem-ory No.	Program name	Type	Parameter									
			1	2	3	4	5	6	7	8	9	10
	BEND PAN	9	Lch DLY	Rch DLY	Lch F.B	Rch F.B	H. DAMP	Lch INPUT	Rch INPUT	Lch OUT	Rch OUT	OUT MODE
			0.1ms	0.1ms	0%	0%	2	100%	100%	65%	0	STEREO
Multi modulation			8		BEND + / − 65	9		BEND + / 65				
Peak hold					:			:				

Another impressive means of control for the MIDI keyboardist. Allows you to shift the sound towards the right of the stereo field with a bender lever or wheel.

This is an example where the same external source (BEND +) is used to simultaneously modulate two different parameters (Lch and Rch OUT).

You can edit this program to pan the sound according to MIDI NOTE data instead. The music will then shift within the stereo field depending on the positions of keys being played on the keyboard.

Of course, you can also change the direction of panning control by reversing the settings for Lch and Rch OUT.

SECTION VI:

MIDI

A MIDI IMPLEMENTATION

1. TRANSMITTED DATA

Channel Message

STATUS	SECOND	THIRD	DESCRIPTION
1100 nnnn	0ppp pppp	——	PROGRAM CHANGE

NOTE:

nnnn	=	MIDI CHANNEL NUMBER (0000 ~ 1111)
ppp pppp	=	PROGRAM NUMBER (0 ~ 95)

System Exclusive Messages

BYTE	DESCRIPTION
1111 0000	Exclusive Status
0100 0010	KORG ID 42H
0011 nnnn	Format ID 3nH (n = ch)
0001 0100	DRV-2000 ID 14H
0ddd dddd	
⋮	DATA
0ddd dddd	
1111 0111	EOX

2. RECOGNIZED RECEIVE DATA

Channel Messages

STATUS	SECOND	THIRD	DESCRIPTION	
1000 nnnn	0kkk kkkk	0vvv vvvv	Note On vvv vvvv = 1 − 127 (7 bit resolution)	NOTE 1 NOTE 2
1011 nnnn	0000 0001	0vvv vvvv	NOTE 2	
	⋮	⋮		
1011 nnnn	0001 1111	0vvv vvvv		
1011 nnnn	0100 0000	0vvv vvvv	NOTE 2	
	⋮	⋮		
1011 nnnn	0101 1111	0vvv vvvv		
1100 nnnn	0ppp pppp	——	Program Change	
1101 nnnn	0vvv vvvv	——	Channel Pressure (After-Touch) vvv vvvv = 0 − 127 (7 bit resolution)	NOTE 2
1110 nnnn	0bxx xxxx	0bbb bbbb	Pitch Bender Change (8 bit resolution)	NOTE 2

★ 0kkk kkkk = 0 − 127 : Note Number
★ 0ppp pppp = 0 − 127 : Program Number

NOTE:

1. When in Program change, the second byte is recognized as a Program Number according to utility setting.
2. This can be used as "sense" of Multi Modulation.

System Real Time Message

BYTE	DESCRIPTION
1111 1110	Active Sensing

System Exclusive Messages

BYTE	DESCRIPTION
1111 0000	Exclusive Status
0100 0010	KORG ID 42H
0011 nnnn	Format ID 3nH (n = ch)
0001 0100	DRV-2000 ID 14H
0ddd dddd	
⋮	DATA
0ddd dddd	
1111 0111	EOX

3. PROGRAMS AND PARAMETERS CHART

(The parameter circled with bold line can be used for Multi Modulation.)

Program No.	Program Name	Parameter 1	2	3	4	5	6	7	8	9	10
1	REV (S HALL)	REV TIME (0.3~10.0s)	PRE DLY (0.1~70.0ms)	E/R LVL (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
2	REV (L HALL)	REV TIME (0.3~10.0s)	PRE DLY (0.1~70.0ms)	E/R LVL (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
3	REV (ROOM)	AMBIENCE (0~100%)	PRE DLY (0.1~70.0ms)	E/R LVL (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
4	REV (GARAGE)	REV TIME (0.3~7.0s)	PRE DLY (0.1~70.0ms)	E/R LVL (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
5	REV (VOCAL)	REV TIME (0.3~5.0s)	PRE DLY (0.1~70.0ms)	E/R LVL (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
6	REV (INST)	REV TIME (0.3~5.0s)	PRE DLY (0.1~70.0ms)	E/R LVL (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
7	GATE REVERB 1	GATE SIZE (1~50)	PRE DLY (0.1~70.0ms)	GATE SHAPE (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
8	GATE REVERB 2	GATE SIZE (1~50)	PRE DLY (0.1~70.0ms)	GATE SHAPE (0~100%)	H.DAMP (1~10)	INPUT (0~100%)	OUTPUT (−100~100%)				
9	STEREO ECHO 1	Lch DLY (0.1~800.0ms)	Rch DLY (0.1~800.0ms)	Lch F.B (−100~100%)	Rch F.B (−100~100%)	H.DAMP (1~10)	Lch INPUT (0~100%)	Rch INPUT (0~100%)	Lch OUT (−100~100%)	Rch OUT (−100~100%)	OUT MODE (STEREO,MONO)
10	STEREO ECHO 2	Lch DLY (0.1~800.0ms)	Rch DLY (0.1~800.0ms)	L→R GAIN (−100~100%)	R→L GAIN (−100~100%)	H.DAMP (1~10)	Lch INPUT (0~100%)	Rch INPUT (0~100%)	Lch OUT (−100~100%)	Rch OUT (−100~100%)	OUT MODE (STEREO,MONO)
11	STEREO ECHO 3	Lch DLY (0.1~800.0ms)	Rch DLY (0.1~800.0ms)	L→R GAIN (−100~100%)	Rch F.B. (−100~100%)	H.DAMP (1~10)	Lch INPUT (0~100%)	Lch OUT (−100~100%)	Rch OUT (−100~100%)	OUT MODE (STEREO,MONO)	
12	STEREO FLANGER	MOD FREQ (1~49)	MOD DEPTH (0~30)	MOD DLY (0.05~30.0ms)	F.B GAIN (−100~100%)	Lch I DLY (0.1~50.0ms)	Rch I DLY (0.1~50.0ms)	Lch I LVL (−100~100%)	Rch I LVL (−100~100%)	INPUT (0~100%)	OUTPUT (−100~100%)
13	STEREO CHORUS	MOD FREQ (1~49)	MOD DEPTH (0~30)	INPUT (0~100%)	OUTPUT (−100~100%)						
14	SPACE PAN	PAN SPEED (1~34)	PAN DEPTH (0~30)	TREMOLO (0~30)	PHASE (0°~345°)	INPUT (0~100%)	OUTPUT (−100~100%)				
15	REVERB & ECHO	REV TIME (0.3~10.0s)	PRE DLY (0.1~70.0ms)	H.DAMP (1~10)	Lch DLY (0.1~300.0ms)	Lch F.B (−100~100%)	L IN(E) (0~100%)	R IN (R) (0~100%)	L OUT (E) (−100~100%)	R OUT (R) (−100~100%)	OUT MODE (STEREO,MONO)
16	REVERB & CHORUS	REV TIME (0.3~10.0s)	PRE DLY (0.1~70.0ms)	E/R LVL (0~100%)	H.DAMP (1~10)	MOD FREQ (1~49Hz)	MOD DEPTH (0~30)	INPUT (0~100%)	OUT PUT (−100~100%)		

4. MIDI IMPLEMENTATION CHART

```
[ Digital Reverb                    ]            Date:11/07, 1986
  Model DRV-2000 MIDI Implementation Chart     Version:1.0
```

Function···	Transmitted	Recognized	Remarks
Basic Default	1-16	1-16	memorized
Channel Changed	1-16	1-16	
Mode Default	×	OMNI ON/OMNI OFF	memorized
Mode Messages	×	×	
Mode Altered	*************		
Note	×	○	NOTE1,NOTE2
Number : True voice	*************	×	
Velocity Note ON	×	○	NOTE2
Velocity Note OFF	×	×	
After Key's	×	×	
Touch Ch's	×	○	NOTE2
Pitch Bender	×	○	NOTE2
0-31	×	○	NOTE2
64-95	×	○	NOTE2
Control Change			
Prog	○ 0-95	○ 0-127	
Change : True #	*************		
System Exclusive	○	○	
System : Song Pos	×	×	
: Song Sel	×	×	
: Tune #	×	×	
System :Clock	×	×	
Real Time :Commands	×	×	
Aux :Local ON/OFF	×	×	
:All Notes OFF	×	×	
Mes- :Active sense	×	○	
sages :Reset	×	×	

```
Notes:1)When in program change,this can be used as a
        program number according to utility setting.

      2)This can be used as "sense" of multimodulation.
```

○:YES
×:NO

SECTION VII:

SPECIFICATIONS

INPUT: +4dBm/−20dBm 10KΩ
                                    +19dBm max GAIN UNITY

OUTPUT: +4dBm (+19dBm max)/−20dBm (−4dBm max) 1kΩ Lch/MONO MIX
                                    +4dBm (+19dBm max)/−20dBm (−4dBm max) 1kΩ Rch MIX

FREQUENCY CHARACTERESTICS: 20−20kHz ± dB DIRECT
                                    20−12KHz +1, −3dB EFFECT

DYNAMIC RANGE: 95dB (IHF-A)   DIRECT
                                    80dB (IHF-A)   EFFECT

DISTORTION RATE: 0.01%   DIRECT
                                    0.05%   EFFECT

AD/DA METHOD: 16 bits linear

DISPLAY: LCD (16 charact × 2 line)
                                    LED × 2 (7 segment)

CONNECTORS: Input jack, Output jack (L/MONO, R)
                                    Foot switch jack (SW-1, SW-2)
                                    MIDI IN, MIDI OUT/THRU

MEMORY:
        Preset Program: No.1 ∼ 16
        Users Program: No. 17 ∼ 96

POWER SUPPLY: 117V, 220V or 240V   50/60Hz

POWER CONSUMPTION: 17W

DIMENSIONS: 482 (W) × 44 (H) × 291 (D) mm

WEIGHT: 4.0 kg

(Specifications subject to change without notice)