MULTIVERB II

OWNER'S MANUAL

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INTRODUCTION

Congratulations! You have just purchased what many industry professionals consider the most technically advanced signal processor ever built!

The ART MULTIVERB II continues the trend of high quality cost effective professional digital signal processing. The twenty bit multiple effects processor will provide you with a virtually endless range of singular effects, plus the best of all MULTIPLE digital effects. Packed in a single high rack unit are numerous digital algorithms providing a full range of natural and simulated stereo reverberation effects. Also included are: digital delay, stereo chorusing and flanging, multitap delays and pitch transposition. The ability to combine effects together enables you to design studio effects easily, or a new generation of sound effects all your own.

The MULTIVERB II may be controlled and monitored directly from the front panel allowing you to permanently rack mount your unit. Certain functions and parameters may be controlled via MIDI.

Special consideration was given to provide features that make the MULTIVERB II more convenient to use in line with devices ranging from instruments to mixing consoles.

We strongly suggest that you read this manual and use it for reference while getting familiar with the MULTIVERB II and its many capabilities. The initial factory presets were not only designed for instant use, but also as a starting point for your own innovative sound patterns. There is no substitute for hands on experience. Let your imagination run wild and enjoy.

ART is a strong proponent of user friendliness, this manual is written to support the concept of a user-friendly product along with a dedicated USERS manual. We feel that ease of reading along with hands on examples will help you familiarize yourself with your MULTIVERB II. This will allow maximum efficient use of a sophisticated digital signal processor.

INSTALLATION

The MULTIVERB II may be used in a variety of setups including: mixing consoles with effect send and return facilities, directly in line between a musical instrument and amplifier, in the effects loop of an amplifier, and in the tape loop of a home receiver. Self contained in an all steel single high 19" rack mount case, the Multiverb ii is designed for continuous professional use. For touring rack applications, care should be taken to support the units rear if the rack might be subjected to mechanical shock. NOTE: The front panel may bend if no rear support is provided. Mounting location is not critical, but for greater reliability we recommend that you not place the unit on top of power amps, tube equipment, or other sources of heat.

You will notice there is no power switch on the MULTIVERB II. This is because we have found that in the majority of applications a rack of units has its power supplied via a power strip that is controlled by a main power switch. No harm will come to the MULTIVERB II if it is switched on and off in this manner.

CONNECTIONS

All audio connections to the MULTIVERB II are made at the rear of the unit via professional 1/4" phone jacks. The MIDI connections are accomplished via five pin "DIN" jacks on the rear panel. Fig. 1 shows the rear panel connections.

The LEFT and RIGHT inputs are single ended with an impedance of 1.0M ohm. True stereo processing is accomplished by using both inputs in a left/right application. If only one input is used, the signal is automatically routed to both channels.

The LEFT and RIGHT outputs are single ended with a source impedance of 1.0K ohms, and can provide a stereo or mono output. When a stereo signal is applied to the inputs, the resulting output is stereo. If both outputs are used with a mono input signal, a stereo image is produced. Using one output with a mono or stereo source provides a mono signal combining the processed information from both outputs.

A variety of input/output combinations may be used with the MULTIVERB II. One in one out (mono, either jack may be used), one in two out (stereo image), two in one out (summed mono output), and two in two out (stereo) may be achieved. NOTE: When using the MULTIVERB II in the stereo mode, only the dry signal will remain totally left and right orientated at the outputs. The processed signal will be a mix of the inputs with its own individual stereo image dictated by the algorithm used.
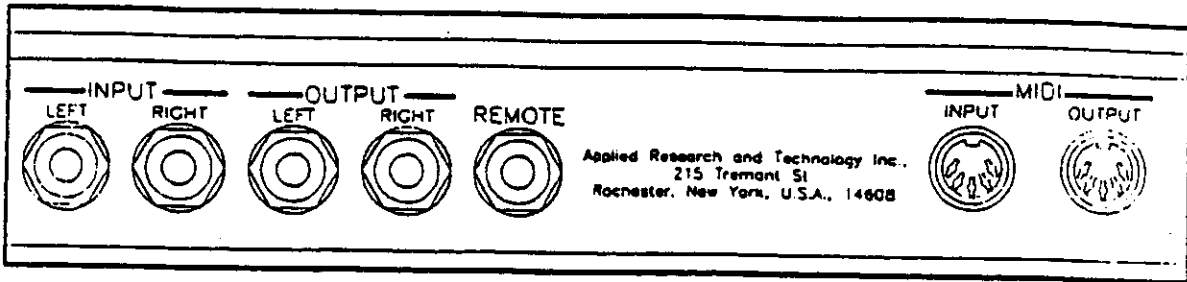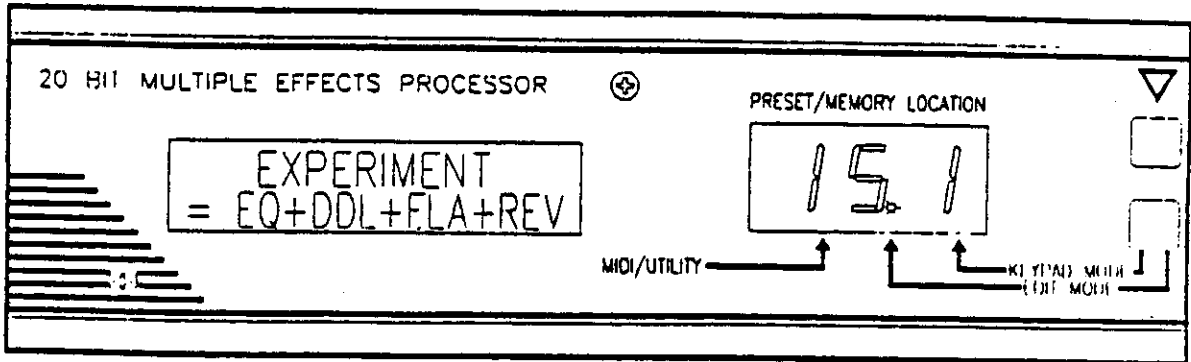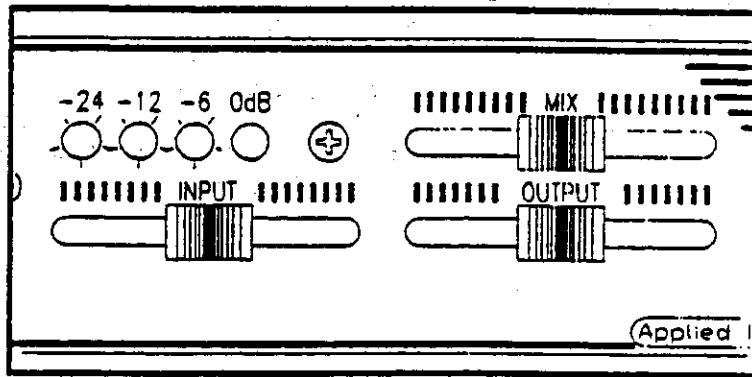
fig.1

20 BIT MULTIPLE EFFECTS PROCESSOR

EXPERIMENT
= EQ+DDL+FLA+REV

PRESET/MEMORY LOCATION

MIDI/UTILITY

KEYPAD MODE
EDIT MODE

fig.2

-24 -12 -6 0dB

MIX

INPUT

OUTPUT

Applied

fig. 3

CONTROLS AND OPERATION

INPUT LEVEL CONTROL

The Input Level Control is located on the front panel below the Input Level Indicators (see fig. 2). This slide control adjusts the input signal to accommodate a wide range of devices. Input levels may range from approximately -20dbV to +16dbV. Source inputs may range from musical instruments such as guitars and keyboards, mixing consoles and effects loops in amplifiers. Whatever the source, adjust the Input Level Control so that the Green LED's (-24dB & -12dB) are lit constantly, the Yellow LED (-6dB) lights with soft peaks and sharp peaks lighting the Red LED (0dB). For low level output devices the slider will be positioned more to the right side. With line level devices (mixers) center the slider and control the input level from the effects send. See the Equivalent Level Table in Appendix E for slider position vs. input level. For a starting point set all the sliders to the center position and if possible adjust the output level of the device sending the signal to the MULTIVERB II so that -6dB is lit on soft peaks. Use the Input Level control to compensate for minor level adjustments.

If the Input Level Control is not adjusted properly or the input source has a low output level, noise and distortion will be heard at the output of the MULTIVERB II. See APPENDIX A for some level suggestions.

INPUT LEVEL INDICATORS

Front panel LED indicators (fig. 2) show the input signal level at all times. For maximum dynamic range the -24,-12 and -6dB LED should be on most of the time with the 0dB LED briefly flashing on transients only. When using a guitar or other instruments which produce sharp transients, the input level should be set so only the -24 and -12dB LEDs are lit. This is a sufficient amount of input level to operate the MULTIVERB II and transients of up to 0dB will be handled without incident. If you find that you are clipping the unit simply reduce the input level to the MULTIVERB II or decrease the slide control slightly.

These indicators are reference levels only. Just because the 0dB LED is lit doesn't mean that there is 0dBV present at the input. For proper adjustment of level, review the Input Level Control section.

CONTROLS AND OPERATION

MIX CONTROL

The MIX control (fig. 2) varies the amount of effect signal in the output from dry only to effect only. When the control is fully towards the left, only the dry signal is apparent at the output(s). As the slider is moved towards the right, more processed signal is heard at the output(s). A fifty/fifty mix is achieved when the slider is in the center detent position. When the slider is fully towards the right, only processed signal is heard at the output.

OUTPUT LEVEL CONTROL

The Output Level Control (fig. 2) adjusts the final output level of the MULTIVERB II. With the slider fully to the left, there is no output signal present at the output jacks. As you move the slider to the right the output signal level of the unit increases. Refer to the Equivalent Level Table in Appendix E for measured signal levels. From the table you will see that you may acquire gain at the output. We do not recommend that the MULTIVERB II be used to make up for large losses of gain in a system. There are some circumstances where this is unavoidable. If this is the case, by all means compensate for loss.

The optimum setting is unity gain. With the Input Level Control and the Output Level Control set at center unity gain is achieved. Your output level most probably will be bumped a little up or down to compensate for small increases or decreases in the processed signal level.

SEVEN SEGMENT DISPLAY (Red Numeric Display)

The Seven Segment Display shown towards the right of fig. 3 (15.1), keeps you constantly informed of your Operation Mode, Preset Number or Memory Location. The decimal points indicate whether you are in Keypad Mode, Edit Mode or MIDI/Utility mode. The actual numbers refer to Preset Number or actual Memory Location. The only time a decimal point is not blinking is when the Keypad Mode is indicated.

LIQUID CRYSTAL DISPLAY (LCD)

All information relative to a preset indicated by the Seven Segment Display (left side of fig.3) is displayed by the LCD. Backlighting of the display is provided for ease of use in low light situations. The upper sixteen characters mainly display the Preset Title (name). If no title has been assigned, the display will read "<blank title>". In some cases other information will be displayed here. The lower sixteen characters display mainly the effects stored, to be selected or to be deleted in the preset, and effect
parameter information. Other information may appear here also.
The view angle may be adjusted and is covered in detail in the following section under MIDI/UTILITY function.

CONTROLS AND OPERATION

CONTROL BUTTONS

All of the control buttons with the exception of the PRESET SELECT UP and DOWN and the BYPASS buttons serve a dual purpose. The split functions are differentiated by color. Preset selection is depicted by the color purple. Preset control functions are labeled in grey. Two methods of Preset selection are used, scanning (up/down with rapid access) and keypad number entry. Refer to fig. 4 for reference to control buttons.
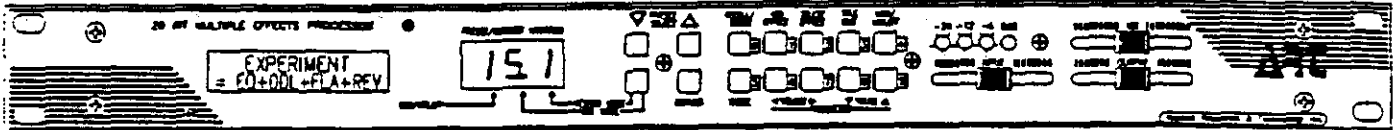
fig.4

PRESET SELECT

The UP and DOWN buttons shown as ascending and descending triangles in purple and labeled PRESET SELECT on the front panel are used to select PRESETs. Holding either button in will step you through all 200 PRESETs when you're in Keypad Mode at a moderate rate. You can step at a much quicker rate by using the RAPID ACCESS mode. To access RAPID ACCESS mode, first press and hold the button that is in the direction that you want to go, then simultaneously press the other button. As long as both are pressed the display will increment by a value of ten rather than one at a time. When you stop at the appropriate preset you do not have to hit recall, the signal is being processed constantly.

To preview presets before actually using them, press the grey button labeled KEYPAD MODE/EDIT MODE so that the center decimal point is lit (it will flash) indicating Edit Mode. I will explain this button in detail later. Use the PRESET SELECT buttons to scan through the presets. The processed output signal is not affected. This is to say that you are not changing presets audibly as you scan through them. The reason for this is so you can be ready for the next preset change when it is supposed to happen. When you stop scanning, the preset number in the Seven Segment Display will be flashing. To recall that preset when you are ready just press the RECALL/ENTER button.

Press the KEYPAD MODE /EDIT MODE button so that the right decimal point is lit. This indicates that you are in the KEYPAD MODE. Scan through the presets, you will instantly recall the preset when you stop.

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Keypad Entry

Make sure you are in the KEYPAD MODE. For instantaneous recall of the preset you must select the exact preset number. For example; you want preset 143, locate the buttons shown in fig. 4 labeled 0 through 9 on the front panel (the numbers are reversed image in purple), enter 1-4-3, instantly you will see the LCD read title and preset information. If you have audio hooked up you will notice that the preset has been instantly recalled. Let's try another number. Enter 34 (3-4). Oh no, what happened? What is that flashing digit and why didn't the preset change instantly? YOU MUST ENTER A THREE DIGIT NUMBER.
To instantly engage preset 34 you would have to enter the digits 0-3-4. Do this now and see that you get instantaneous results. Try preset 1. Did you do it right? (Enter 0-0-1) Now enter 1-5-1.

Let's discuss what happened when you entered preset 34 as 3-4. After the entry the digit flashed and then defaulted to the display of 034 and then recalled the preset. If you were to just enter one digit, the right digit would flash [_] and then the display would revert to the already existing preset.

KEYPAD MODE/ EDIT MODE BUTTON

THIS BUTTON IS PROBABLY THE MOST IMPORTANT BUTTON ON THE FRONT PANEL! If you are not in the right mode at the proper time needless aggravation will be the result. The Operation Mode is indicated by which decimal point is lit in the Seven Segment Display. Always remember to check the Mode Status Indicator to assure yourself which mode you are in.

When you are in the Keypad Mode indicated by a constantly lit decimal point to the far right of the Seven Segment Display, you are able to access all of the two hundred presets either by scanning or by keypad entry as discussed in the previous sections under Preset Select and Keypad Entry.

BYPASS

Pressing the BYPASS button kills the effects signal in the mix and is shown two ways by the LCD. When you first press the BYPASS button in either operating mode with a preset listed in the LCD, the display will first read **** BYPASS **by with the "by" flashing for about two seconds. Then it will list the preset name along with the "by" flashing to indicate you are currently in the bypass mode.

Pressing BYPASS again returns the unit to the ACTIVE mode indicated by the display ****ACTIVE**** for about two seconds and then just displaying the preset name and effects.

Another means of bypass is attained by programming the REMOTE jack on the rear panel for the bypass function described under the MIDI/UTILITY button and referred to as EXT SW MODE.

Bypassing the unit via MIDI may be done by recalling a totally blank preset. Preset 100 is set up for MIDI BYPASS.

MIDI/UTILITY

All the MIDI and System Utility functions are accessed when this button is pushed. To enter MIDI/UTILITY Mode you must first be in EDIT Mode. Press the EDIT Mode button and then press the MIDI/UTILITY button, the left decimal point in the Seven Segment Display will flash indicating that you are in the MIDI/UTILITY Operation Mode. To access individual parameters, use the SELECT < AND > BUTTONS. When you wish to change the variables use the UP and DOWN VALUE buttons. To exit the MIDI/UTILITY MODE you must press either the MIDI/UTILITY button or the EDIT button. Pressing the MIDI/UTILITY button will exit you to EDIT MODE. Pressing the EDIT Mode button will exit you directly to KEYPAD Mode.

Adjustable Parameters:

EXTernal SWitch MODE: BYPASS ON/OFF or INCRement PROGramS
programs REMOTE jack for BYPASS or INCREMENT PRESET MODE
Refer to APPENDIX B for examples of programming the REMOTE jack and further documentation.

MIDI ENABLE
PM= ON, OFF   [ON]
PROG= ON, OFF   [ON]
Allows you to turn on or off Performance MIDI and the Program change function independently. If you wish to use PM and not change presets via MIDI, set PROG to = OFF.

MIDI CHANNEL off-16
Sets MIDI send and receive channel number.

OMNI MODE on/off
Sets MIDI OMNI mode on or off.

MIDI PROGRAM TABLE
Allows you to edit the Midi Program Table (MPT).
Refer to APPENDIX B for examples of editing the MPT and further documentation.

MIDI MERGER ON/OFF
Programs the MIDI out jack to "echo" MIDI information to the next device.
When not using the merger, turn it off.

LCD VIEW ANGLE
Allows the viewing angle of the LCD Display to be adjusted.
Refer to APPENDIX B for an example of setting the view angle.

SOFTWARE VERSION LEVEL
Displays the software revision level currently installed in the
MULTIVERB II.

SEND PRESET
Dump a single preset via MIDI, hit UP or DOWN button.

SEND MPT
Dump entire MPT via MIDI, hit UP or DOWN button.

SEND ALL PRESETS
Dump all presets via MIDI, hit UP or DOWN button.

RECALL FACTORY PRESET
Allows you to recall any factory preset for comparison or editing
purposes. Refer to Appendix B for more details on how to use this
feature.

PRESET 1-100 LOCKED/UNLOCKED
Allows the first 100 presets to be overwritten or protected from
overwrite. Use the VALUE buttons to select LOCKED or UNLOCKED
status. You may UNLOCK only one Preset at a time. When the STORE
button is pressed, the LOCK becomes enabled. At first you may not
want to overwrite the factory presets, so increment up to a user
preset and store the new preset. See APPENDIX B for examples of
unlocking and copying a preset.
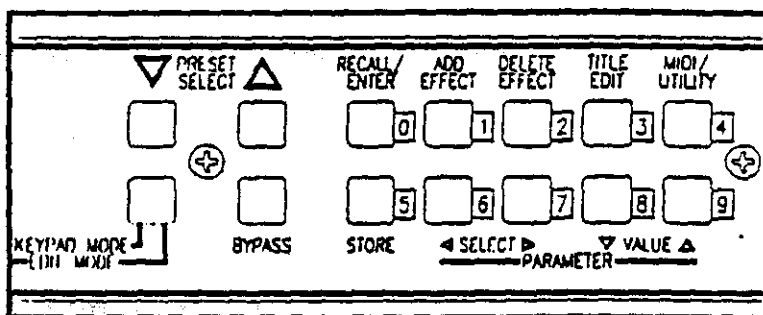
fig.5

CONTROLS AND OPERATION

EDIT MODE CONTROL BUTTONS

Refer to fig. 5 for Edit Mode buttons

RECALL/ENTER

The RECALL/ENTER button is used to Recall presets in the Edit Mode and to Enter or Delete effects when using the ADD or DELETE EFFECT button. To Recall a preset (the Seven Segment Display will be flashing a Preset number), select the proper Preset then press and press the RECALL/ENTER button. When prompted to Add or Delete an effect press the RECALL/ENTER button to finalize the command.

ADD EFFECT

Press the ADD EFFECT button to select which effect you want to insert into a preset. Let us first preview the effects you may add. A full description of these effects is found later in this manual. **MAKE SURE YOU ARE IN THE EDIT MODE.** Press the ADD EFFECT button once, notice that lower half of the LCD Display reads ADD:EQUALIZER?. Press the button again, ADD:FLANGER? is displayed. Continue to press the button until the display reads <no effects>. This will be twenty button pushes indicating that there are nineteen families to choose from!

When you wish to add an effect to the actual preset you must press the RECALL/ENTER button to finalize the command.]

To escape from ADD EFFECT, press either the VALUE UP or DOWN button or press the KEYPAD/EDIT MODE button. This will return you to square one.

It doesn't stop there! There are many sub variables of each effect to be explored. Right now lets just worry about operation and not the effects.

To simplify matters let's step through an example depicting the selection of four effects. We will use some of the buttons not yet explained but doing it this way will make the understanding of the programming much easier. The control buttons we use now will be defined in detail later in the manual.

When you see text within the [ ] brackets, it is describing the text that appears in the LCD.

Enter EDIT MODE
Using the PRESET SELECT buttons, scan up to preset 151
Press the RECALL/ENTER button [<blank title>, <no effects>]
Press the ADD EFFECT button once, [ADD:EQUALIZER?]
Press RECALL/ENTER (you have just entered the eq into the chain), bottom display reads [= EQ]
Press ADD EFFECT seven times, [ADD:REVERB-1?]
Press RECALL/ENTER (now the reverb algorithm is entered into the chain, display reads [= EQ+REV]

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Press ADD EFFECT again, select the FLANGER, enter it into the chain. (you pressed the ADD EFFECT button once and then pressed the RECALL/ENTER button), display should read [= EQ+FLA+REV]
Press the ADD EFFECT button one more time [ADD:MONO-DDL-S?]
Enter it into the chain (press RECALL/ENTER),[= EQ+DDL+FLA+REV]

IF YOU WISH TO SAVE THIS CHAIN OF EFFECTS AS A PRESET YOU MUST PRESS STORE NOW.

Press STORE (note the ≠ sign disappears)

What happens if we press the ADD EFFECT button one more time?
Press it and look at the LCD. It will read [ADD:MIDI CONTRL?].
Even though there are no more effects to add, you may still add
the PM controls. Press the ADD EFFECT button once more (we will
not add a controller) to continue. If you see this display and
there are only three effects entered in for processing, it only
means that you are using a considerable amount of processing
circuitry to achieve a suitable sound output.

REMINDER: you have not set any parameters as of yet. Don't worry
we have preselected a nominal value for each of the parameters
associated with an effect as a starting point. This provides a
user reference to a sound instead of starting at point zero. We
feel it is useful to hear a descriptive set of parameters so that
you may tailor them to your own specific sound requirements.
We'll look at these in just a moment as well as making a title
for this preset. First, the DELETE key will be explained.

DELETE EFFECT

To delete one or more of the selected effects from your preset
you will use the DELETE EFFECT button.

Recall preset 151, press the PRESET SELECT UP button once, press
STORE. We have just copied preset 151 into preset 152 so as not
to lose preset 151 which we will use periodically through this
manual.

Press the DELETE EFFECT once. [DEL:EQUALIZER?]
Do you want to delete the equalizer? NO.
Press the button again. [DEL:MONO-DDL-S?]. Let's delete this
effect. Press RECALL/ENTER [= EQ+FLA+REV] the effect has been
eliminated but not permanently. You will audibly hear the sound
change when the effect is deleted. Press STORE to make this
change permanent. Press STORE now. With the elimination of an
effect, you open up a space to insert another effect or leave
things as they are. If you choose not to eliminate the effect and
you wish to escape the Delete Mode, press either the Value up or
down button.

If you press the DELETE EFFECT button and there are no effects in
the preset, the display will read [DEL:NO FX TO DEL].

TITLE EDIT

One of the displays in the upper portion of the LCD is the title
of the preset. To either edit the title or create a new one you
must first enter the Title Edit Mode. Do this by pressing the
TITLE EDIT button once. The display will read [Title Edit] in
the upper portion and show a curser in the lower half. There is a
total of sixteen spaces with the complete ASCII character set
available to use in naming presets. We will name this preset
EXPERIMENT. To do this perform the following steps.

-Make sure you are in EDIT Mode (Press EDIT button if not).
-Recall preset 151.
-Press the TITLE EDIT button. Locate and hold in the VALUE UP
button. You will see characters displayed in an ascending order.
(to increase the speed, press the opposite button after you
depress the first, this works for both ascending and descending
orders) You may find that depressing the button with single
pushes works better at first.
-At the first cursor position, stop when "E" is displayed
-Locate and press the SELECT > button once (this moves the cursor
one space to the right)
-Use the VALUE buttons to display "X"
-Continue until you have spelled out [EXPERIMENT]

I'm sure you had to go between all four buttons to get the right
display, if not, congratulations.
-PRESS THE STORE BUTTON TO SAVE THIS.
Now that you have stored this title you must exit Title Edit
mode. To do this press, the EDIT TITLE button, notice the
display. The title is in the upper half of the LCD Display and
the selected effects are in the lower half. If you wish to change
the title just enter the Title Edit Mode and make the appropriate
changes. Don't forget to STORE the new title.

If there are characters you wish to delete in the display use the
SELECT < or SELECT > button to move the cursor and then press the
ADD or DELETE EFFECT button. If you wish to delete all sixteen
characters press the DELETE EFFECT or ADD EFFECT buttons sixteen
times. By doing this you will eliminate any characters and have a
blank display to start with.

To exit or escape from the Title Edit mode, press the TITLE EDIT
button once to escape to EDIT Mode or press the EDIT MODE button
to escape to keypad mode.

STORE

Any time you wish to permanently save information in a preset,
press the STORE button. All parameter values will be stored into
the chosen preset as well as TITLE information. When you press
the STORE button the LCD will display [PRESET STORED]. If the
word [LOCKED/SELECT LOCATION 101-200] appears don't panic.
Presets 1 through 100 are the factory presets and though the
parameters may be changed, the new values cannot be stored
without first UNLOCKING the presets (see MIDI/UTILITY section).

CONTROLS AND OPERATION

PARAMETER CONTROL BUTTONS

SELECT (< >)

The selection of available variables within a given parameter is accomplished using the SELECT <, and the SELECT > buttons. Treat these buttons like a cursor left and right on a computer. If the button is held in, the function will continue and cycle until it is released. We have already used these buttons to create a title, now we'll use them to view parameters and the selected variable. Once again recall preset 151. (Are you in the Edit Mode?)

Press the SELECT > once. [EQ:HF-CUT=THRU] This is the EQ variable.
Press the button again. [DDL:DELAY = 50ms] The delay variable is displayed.
The next four times you press the SELECT > button, the display will show the selected FLAnger parameter variables. Scan through these using the < SELECT button to reverse direction.
Scan forward until [REV:TYPE=HALL-1] is displayed. Scanning further will display the parameter variable information. (next four presses). Press the button one more time. The preset parameters are now displayed. The buttons cycle through the ends eliminating having to back up to the starting point.

VALUE DOWN & UP

These two buttons allow you to select or set the parameter variables for each preset. Like the SELECT buttons, they act like computer cursor keys. The function will not cycle through but stop at the end extremes.

I know you're still in preset 151! Press the RECALL button. If you press either the UP or DOWN button now nothing will happen. Press the SELECT > button once [EQ:HF-CUT=THRU]. Now start pressing the VALUE DOWN button either by single pushes or just holding it down. Notice that there are a total of thirteen values just for the EQ parameter. Select different parameters and use the VALUE buttons to view the different variables. If you changed any of the variables, the sound would be affected immediately. To save the change, merely press the STORE button. If you did not hit STORE, and used the SELECT buttons to get to the preset parameters, you will notice the LCD now has an extra character displayed on the left side. [= EQ+DDL+FLA+REV] This character [= (not equal)] indicates that the preset has different parameters than what is stored in the preset. If the character isn't there go back and change some values.

MIDI

To access all MIDI parameters you must first be in the EDIT MODE.

Enabling the MIDI Functions
Press the MIDI/UTILITY button
Press the SELECT> button once to change PM or press it twice to change PROG.
Use the VALUE UP or DOWN buttons to set a value.
Exit MIDI Mode (press the MIDI/UTILITY button).

Setting The MIDI Channel

Press the MIDI/UTILITY button.
Press the SELECT > three times.
Use the VALUE UP/DOWN buttons to select the channel number.
Exit MIDI MODE (press the MIDI/UTILITY button)

Setting the OMNI Mode

Press the MIDI/UTILITY button.
Press the SELECT > button four times.
Use the VALUE UP/DOWN buttons to turn OMNI [ON or OFF]
Exit MIDI MODE (press the MIDI/UTILITY button)

MIDI Program Table

The MIDI Program Table allows the MULTIVERB II to respond to a MIDI program change with any of its presets. The MPT is initialized for the first 128 presets to match the corresponding MIDI program number. (MIDI program numbers 0-127 will recall presets 1-128)

To edit the MPT:
Press the MIDI/UTILITY button.
Press the SELECT > five times.
Using the VALUE UP/DOWN buttons select the MIDI program number you wish to change the corresponding preset number for.
Press the SELECT > button again.
Now select the preset number you want recalled when that program number is accessed using the VALUE UP/DOWN buttons.
Continue editing if necessary.
Exit MIDI MODE. (press the MIDI/UTILITY button)

Note: full examples of editing the MPT may be found in Appendix B.

MIDI Merger

The MIDI Merger serves a useful function in the MULTIVERB II. With this feature you are able to "echo" MIDI information to other MIDI devices in line with the MULTIVERB II. This makes the MIDI OUT jack on the rear panel act the same as a MIDI THRU jack with a small delay of the MIDI information (less than 1 ms). The only difference is that if the MULTIVERB II is commanded to send a message of its own, it will Merge the message with other messages that may occur without disturbing other messages.
Note: when you are not using the MIDI Merger turn it OFF
Press the MIDI/UTILITY button.
Press the SELECT > button seven times.
Use the VALUE UP/DOWN button to either turn the Merger ON or OFF.
Exit the MIDI MODE. (press the MIDI/UTILITY button)

Sending Preset and MPT Information

Transferring a single preset, all presets or the entire MPT to another MULTIVERB II or a suitable MIDI device is accomplished by selecting the SEND A PRESET, SEND ENTIRE MPT or SEND ALL PRESETS function.

Press the MIDI/UTILITY button.
Use the SELECT buttons to select the appropriate command.
Follow the directions listed by the LCD Display.
Exit the MIDI MODE. press the MIDI/UTILITY button)

The MULTIVERB II is shipped from the factory in OMNI mode, allowing it to receive MIDI PROGRAM numbers on any MIDI channel.

Receiving Preset and MPT Information

To dump MIDI data into the MULTIVERB II from either another MULTIVERB II or an external MIDI device you must make sure the MIDI channels match or OMNI mode is used. The MULTIVERB II will accept MIDI data at all times regardless of what operating mode it is in.

REMOTE JACK

The REMOTE jack may be programmed to be used either to bypass the MULTIVERB II or access the Increment Preset Mode. A footswitch is the intended device to be used with this jack. Either a momentary (normally open), or an on/off (you will have to engage the footswitch twice per event) switch may be used. It is recommended to use a momentary switch. If the jack is programmed for the bypass feature, each time the footswitch is activated (hot connected to ground) the BYPASS function is accessed. This jack may also be programmed to allow for incrementing through a set of presets. This feature is covered later in the manual. Examples 4 and 5 show how to program the REMOTE jack.

CONTROLS AND OPERATION

PERFORMANCE MIDI   [PM

Performance Midi allows the Multiverb II to have up to eight of its parameters per preset adjusted simultaneously via MIDI. Selection of the parameter to be controlled, the actual MIDI controller, the Scale of the adjustment ratio and the starting Center Point of the Scale may be programmed from the front panel.

We have added Performance MIDI to ten of the factory presets in the Multiverb II. These presets are 1, 18, 23, 61, 64, 68, 76, 84, 87 and 90. In Appendix B, Examples, there is a complete example of setting up a preset with four parameters being controlled. There is also an example describing how to add PM to an existing preset. Refer to these examples to familiarize yourself with the programming of Performance MIDI. A table of MIDI controllers can be found in Appendix E, Tables and Charts.

When setting up a preset with PM, there will be three "screens" of programming information per controlled parameter displayed in the LCD.

When setting up a preset the first screen is used to select which parameter is to be controlled. In the top half of the display the message will read #(some number) IS CONTROLLING, and in the bottom half, the effect and parameter to be controlled.

The second screen displays the information to define the MIDI controller to be used to control the effect parameter you just chose. (To make selection quicker, some of the more popular controllers are listed first.)

The third screen is used to select and adjust the Scaling of the controller and the Center Point of the parameter. The number displayed in the upper left corner represents the MIDI Controller you are working with. Scaling determines the range of control used to efficiently change the parameter. The Center Point represents the starting value of the parameter. When setting up a preset with MIDI control you may find it easier to set these values using the MIDI controller while listening to the sound and watching the ranges in the display.

The top half of the display shows the Scaling value. Scaling is set such that the greater the magnitude of the number, the greater the parameter will change in response. Negative numbers allow inverse relations between the changes in the parameter value. See Appendix E for a quick reference chart for some suggested starting points for scaling of different parameters.

The bottom half displays the starting Center Point or the current value of the scaled parameter. Initially, when the preset is being set up or has just been recalled from memory the Center Point is displayed. This point could be described as the pivot point of change.

CONTROLS AND OPERATION

Confused? For a quick demo explanation it might be better to see
what is going on. With a keyboard properly connected (MIDI) to
the Multiverb II recall preset 61. In the lower right of the LCD
the number 2 is displayed. Whenever you see a number in this
location, it is indicating how many MIDI controllers are assigned
to that preset. In this case there are two.
- Press the Edit button.
- Press the Select > button nine times.
* You have just scrolled through the preset "sound" parameters.
* You are now viewing the first screen telling you that the first
  controller is controlling the EQ's frequency rolloff.
- Press the Select > button one time.
* You are now viewing the second screen indicating the MIDI
  controller being used is the MODulation WHEEL of the keyboard.
  Press the Select > button one time.
* You are now viewing the scale (or range) the MOD WHEEL is
  operating over in the top half of the display. The bottom half
  displays [EQ:HF-CUT=5.3K_] indicating the starting point of the
  frequency to be changed is 5.3K.
- Move the MOD WHEEL.
* Watch the values in both halves of the display change. As you
  move the wheel up the scale increases as does the frequency in
  in the lower half. Moving the wheel down decreases the scale
  and the frequency.
- Press the Select > button three time.
* You are viewing the second controllers scale and Center Point.
- Whack your keys for a sharp attack and watch the display.
* The DECAY time is short.
- Gently press your keys and watch the display.
* The decay time is long.
- Use varying degrees of attack on the keys and watch the
  display.

Hopefully this brief example has shown you how the MIDI
controllers vary the parameters they control. Please refer to
Appendix B, **Setting up a preset with MIDI Control** for an in depth
programming reference example.

DESCRIPTION OF ALGORITHMS & PARAMETERS

In all, there are nineteen separate categories of algorithms for you to choose from in selecting your effect or series of effects. Each category may have from one to several characteristic algorithms to choose from in the actual sound shaping process.

There are some categories that cannot be combined together. Rather than tell you which ones cannot be combined, the MULTIVERB II automatically selects (or defaults) to which algorithms may be combined and displays them in the LCD when you are "ADDing an EFFECT". The default settings for each parameter are shown in brackets [ ]. The MULTIVERB II will also automatically limit the extent of the algorithms control range.

EQUALIZER

Parameter:
EQ:HF-CUT=Selected frequency roll-offs from 665Hz to 15KHz [THRU]

There is one algorithm defining the EQ. The sound processing function of the EQ is a Low Pass Filter. This effect will always be placed at the front of the effects chain so as to tailor the frequency response of the effect and not the final product which should be further modified at the board. Thirteen possible selections of roll-off frequencies are provided.

FLANGER

Parameters:
TYPE= POST, PRE, OFF (two algorithms) [POST]
WIDTH= 0 to 100 percent in % increments [76%]
SPEED= 0 to 15 [4]
REGENeration= 0 to 100 percent in % increments [67%]

A wide range of flanging effects may be created with the MULTIVERB II. The base delay of is set for the flanger and the sweep WIDTH and SPEED is user controlled. REGENeration may be adjusted to vary the "strength" of the processed signal. The output level of the FLANGER algorithm is set for 100% and is not user adjustable. When the Flanger TYPE= POST the flanger is positioned last in the chain. This is to assure that maximum effect and presence is maintained in all effects combinations. Using Flanger TYPE= PRE positions the FLANGER in parallel with any Reverb or DDL effect. By positioning the Flanger like this, the processed signal is not delayed or reverberated and then flanged. Fig. 6 shows the signal path.

DESCRIPTION OF ALGORITHMS & PARAMETERS

CHORUS

Parameters:
TYPE= POST, PRE, OFF (two algorithms) [POST]
WIDTH= 0 to 100 percent in % increments [35%]
SPEED= 0 to 15 [0]
DELAY= 0 to 66ms in 1 ms increments [30]

Chorus may be used to thicken or sweeten the final processed
sound. It is created by sweeping a comb filter through a base
delay time and generally using between a 30 to 60 percent mix
between the dry and wet signal. The base delay time plays an
important role in the "depth" perception of the effect. Longer
base delays are more preferable to give a deep rich sound to
vocals and guitars, while shorter base delays are used for more
delicate enhancement purposes. The width plays an important role
in the range of perceived effect and is best used in conjunction
with the speed parameter. Like the FLANGER, the effect type may
either be POST or PRE located in relation to reverb or delay.
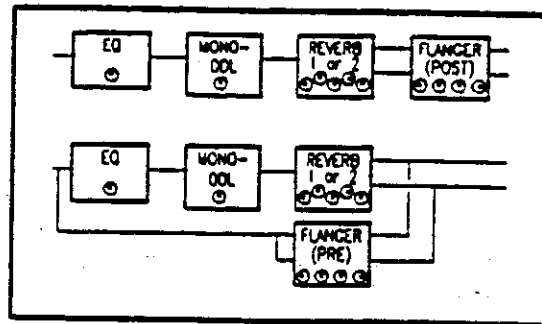
fig. 6

PITCH-TRANSposer

Parameters:
TYPE= SMOOTH, NORMAL, QUICK, OFF (three algorithms) [SMOOTH]
PITCH = (-)12 to (+)12 half steps in 1 half step increments [0]
FINE = (-)1.00 to (+)1.00 half steps in 0.06 half step increments
[0.00]
BASE KEY = OFF, 1 through 127 (key note on)   [OFF]
REGENeration = 0 to 100 percent in % increments [0%]
LEVEL = 0 to 100 percent level in % increments [100%]

Pitch Transposing or pitch shifting can be used to develop
helpful second harmonies or other effects for vocals, instruments
and even mixed material. The range of pitch change is just over
two octaves. There are three "types" of pitch transposing to
choose from in the MULTIVERB II, Smooth, Normal and Quick.

DESCRIPTION OF ALGORITHMS & PARAMETERS

Smooth relates directly to processing and splicing the signal more slowly, resulting in a cleaner more precise sound. Use the Smooth setting when you are shifting pitch more than a fifth with lower frequency inputs such as the low strings on a guitar.

Normal should be used for virtually all other applications of pitch shifting. There is a little less delay than the Smooth setting and qualitive processing is achieved.

When you select the Quick setting, a shorter delay time is used causing faster splicing. REGENeration is useful when you stack the Pitch Transposer with the MONO DDL algorithm. Each time a repeat is done it is shifted up or down by the pitch selected.

Generally you should use the Normal Type for most applications. If you encounter problems relating to delay time, use the Quick Type and if detuning becomes a problem, use the Smooth Type. Fig. 7 shows the signal path of the Pitch Transposer.

The Base Key parameter should be used when triggering the Pitch Transposer from a MIDI keyboard. The amount of pitch shift may be set by MIDI Note On messages. The values selected in the Base Key parameter correspond to the MIDI Key Number. Example: BASE KEY = 60, (= middle C) if a D above middle C is played, the shift amount will be set to (2). If base key is set to OFF, Note On messages will not affect pitch.

Applications for the Pitch Transposer may be found in APPENDIX A.
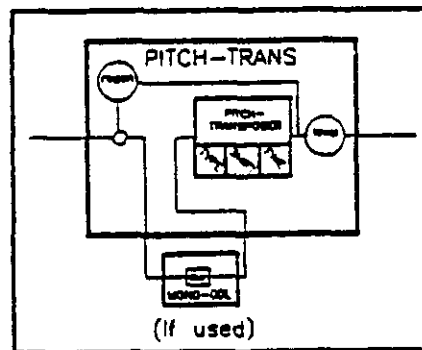
fig.7

DESCRIPTION OF ALGORITHMS & PARAMETERS

PANNER

Parameters:
MOD % =0 to 100 percent in % increments [100%]
SPEED = 0 to 15 [8]

Panning automatically pans the audio image from the left to the
right in the stereo sound field. By varying the MODulation, you
adjust the "depth" into the stereo field (how far left and right
you go). The SPEED merely controls the rate at which you do so.

MONO-DDL-S
Mono Digital Delay - Short

Parameter:
DELAY - 0 to 100 ms in 5 ms increments [50ms]

Use this DDL effect for Short delay times such as slap-backs or
with any other effect that requires only a small predelay as in
reverb effects. Placement is second in the effects chain.

MONO-DDL-L
Mono Digital Delay - Long

Parameter:
DELAY = 0 to 240 ms in 5 ms increments [125ms]

When Longer delay times than the MONO-DDL-S, are required, this
effect should be used. The effect will be placed second in the
chain of effects.

REVERB-1

Parameters:
TYPE= HALL-1, ROOM-1, PLATE-1, VOCAL-1, OFF (four algorithms)
[HALL-1]
DECAY = 0 to 25 seconds in varying increments [2.4s]
HF-DAM= 0 to 50 percent in % increments [14%]
        definition: High Frequency Damping
POSITN= FRONT to REAR in % increments [83%]
        definition: Position
LEVEL = 0 to 100 percent in % increments [100%]

REVERB-1 algorithms are best used when you are using multiple
effects. They have less density and are more suited to effects
+where the reverb is not the main effect but is used for
presence.

DESCRIPTION OF ALGORITHMS & PARAMETERS

REVERB-2

Parameters:
TYPE= HALL-2, ROOM-2, PLATE-2, VOCAL-2, OFF (four algorithms)
       (REVERB-1 TYPEs are also available) [HALL-2]
DECAY = 0 to 25 seconds in varying increments [2.4s]
HF-DAM= 0 to 50 percent in % increments [14%]
        definition: High Frequency Damping
POSITN= FRONT to REAR in % increments [93%]
        definition: Position
LEVEL = 0 to 100 percent in % increments [100%]

REVERB-2 algorithms use more delay and have a higher complexity
than the REVERB-1 algorithms.

REVERB-3

Parameters:
TYPE= HALL-3, ROOM-3, PLATE-3, VOCAL-3, OFF
(REVERB-1 and REVERB-2 TYPEs are also available) [HALL-3]
DECAY = 0 to 25 seconds in varying increments [2.4s]
HF-DAM= 0 to 50 percent in % increments [14%]
        definition: High Frequency Damping
POSITN= FRONT to REAR in % increments [67%]
        definition: Position
DIFFUS= 40 to 100 percent in four % increments [100%]
        definition: Diffusion
LEVEL = 0 to 100 percent in % increments [100%]

REVERB-3 algorithms are the most complex and dense. Always use
REVERB-3 when building "reverb only" programs.

GATE-VERB-1
Gated Reverb

Parameters:
TYPE= SLOPE-1, FLAT-1, RVRS-1A, RVRS-1B, OFF (four algorithms)
      [SLOPE-1]
      definition: RVRS = reverse reverb
DECAY = 0.05 to 0.25 ms in 5 ms increments [0.25s]
DIFFUS= 60 to 100 percent in four increments of 20% [100%]
        definition: Diffusion
LEVEL = 0 to 100 percent in % increments [100%]

DESCRIPTION OF ALGORITHMS & PARAMETERS

GATE-VERB-2
Gated Reverb

Parameters:
TYPE= SLOPE-2, FLAT-2, RVRS-2A, RVRS-2B, OFF (four algorithms)
        [SLOPE-2]
        definition: RVRS = reverse reverb
DECAY = 0.05 to 0.40 ms in 5 ms increments [0.40s]
DIFFUS= 20 to 100 percent in four increments of 20% [100%]
        definition: Diffusion
LEVEL = 0 to 100 percent in % increments [100%]

GATE-VERB-3
Gated Reverb

Parameters:
TYPE= SLOPE-3, FLAT-3, RVRS-3A, RVRS-3B four algorithms)
        [SLOPE-3]
        definition: RVRS = reverse reverb
DECAY = 0.05 to 0.40 ms in 5 ms increments [0.40
DIFFUS= 60 to 100 percent in four increments of 20% [100%]
        definition: Diffusion
LEVEL = 0 to 100 percent in % increments [100%]

Both GATE-VERB-1 and GATE-VERB-2 have forward and reverse gated
reverb algorithms which are not quite as dense or complex as
those found in the GATE-VERB-3 algorithms. For an equal decay,
GATE-VERB-1 is denser than GATE-VERB-2. The decay times found in
GATE-VERB-2 are longer. When used in a four effect stack of
effects these gated sounds will fill in nicely. If you choose to
use these effects alone, they will be loose and moderately
sparse. By varying the amount of diffusion you directly affect
the tightness (or looseness) of the sound. High diffusion equates
to a tighter effect.

GATE-VERB-3 algorithms are the most complex and dense. Always use
GATE-VERB-3 when building "reverb only" programs.

Fig. 9 shows the difference between normal reverb decays and
decays when a gated program is used. You will notice that the
normal decay gradually fades into nothing while the gated decays
in an abrupt manner. The most interesting gated program is the
flat setting. Here there is no decay but the equivalent of a
short burst of sound.
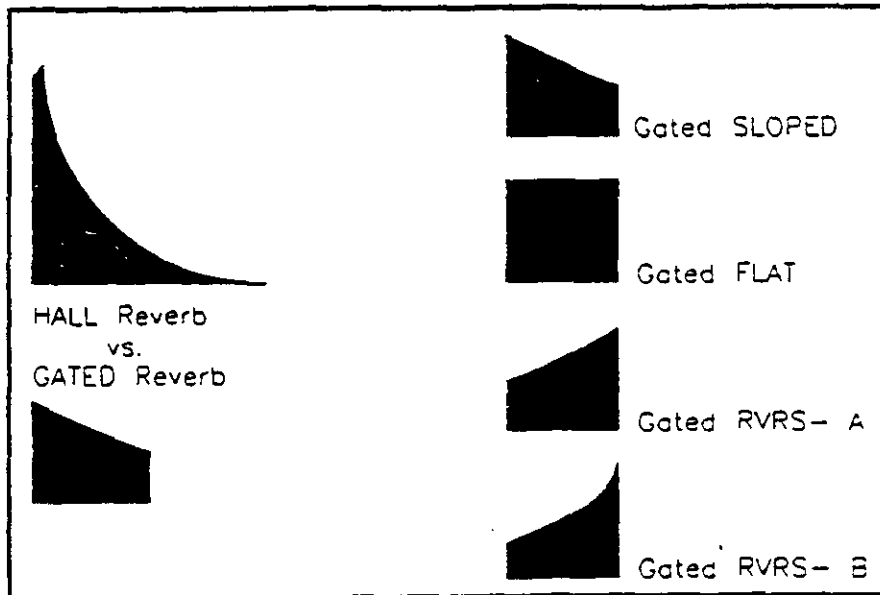
fig. 8
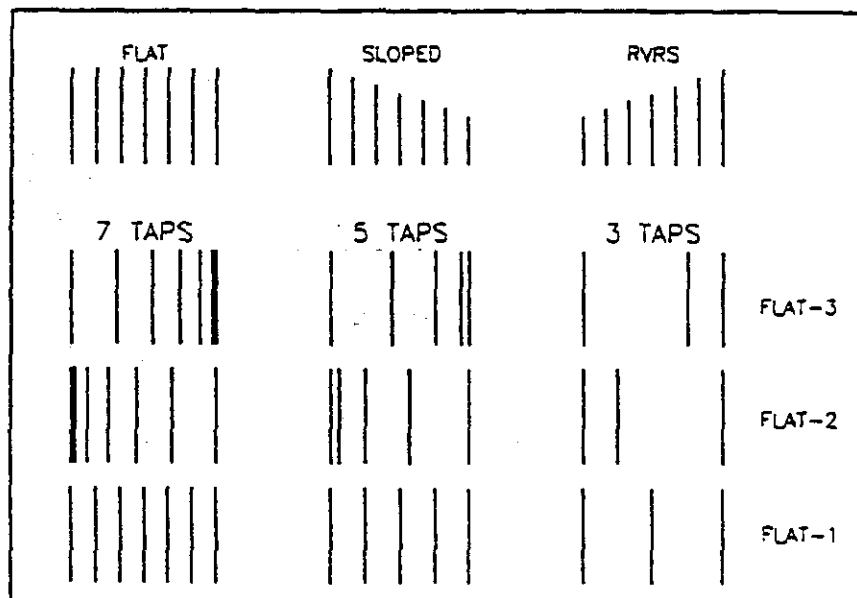
fig. 9

TAP'D-DDL-S
Tapped Digital Delay - Short

Parameters:
TYPE:= FLAT-1m, FLAT-1s, RVRS-1m, RVRS-1s, SLOPE1m, SLOPE1s, (E)
       FLAT-2m, FLAT-2s, RVRS-2m, RVRS-2s, SLOPE2m, SLOPE2s, (S)
       FLAT-3m, FLAT-3s, RVRS-3m, RVRS-3s, SLOPE3m, SLOPE3s (L)
       (eighteen algorithms) [FLAT-1m]
TAPS= 1 to 7 in one step increments [2]
DELAY= 0 to 100 ms in 5 ms increments [100ms]
LEVEL= 0 to 100 percent in % increments [100%]

TAP'D-DDL-L
Tapped Digital Delay - Long

Parameters:
TYPE:= FLAT-1m, FLAT-1s, RVRS-1m, RVRS-1s, SLOPE1m, SLOPE1s, (E)
       FLAT-2m, FLAT-2s, RVRS-2m, RVRS-2s, SLOPE2m, SLOPE2s, (S)
       FLAT-3m, FLAT-3s, RVRS-3m, RVRS-3s, SLOPE3m, SLOPE3s (L)
       (eighteen algorithms) [FLAT-1m]
TAPS= 1 to 7 in one step increments [3]
DELAY= 0 to 240 ms in 5 ms increments [240ms]
LEVEL= 0 to 100 percent in % increments [100%]

There are three levels of tapped delays in the MULTIVERB II.
These are what we call Even (E), Shortened (S), and Lengthened
(L). See fig. 9 for a graphic representation. (1's are Even, 2's
are Shortened, 3's are Lengthened) Even means that the delay taps
are at evenly spaced intervals. Shortened means that as the taps
approach the set delay, the intervals are closer together. As the
taps approach the set delay in the Lengthened mode they are
farther apart. In the types you will see an [m] and an [s], the
[m] means mono and the [s] signifies stereo. The mono tapped
delay has its left and right taps at the same delay points where
the stereo taps are staggered. When using the stereo tapped
delays the first right tap is half the delay time before the
first left tap. There also are three slopes used in the tapped
delays, Flat, Reverse and Forward.
Flat has a flat linear response. Reverse exponentially increases
in amplitude as the signal approaches the end. Forward
exponentially decreases in amplitude as the signal approaches its
end point. See figure 9. TYPE 3 taps are dense and full.
Use the longer tapped delay programs when you need to add some
expansiveness to short reverb patches. Use the longer tapped
delays especially the Sloped algorithms to create a fundamental
front end reverb.

DESCRIPTION OF ALGORITHMS & PARAMETERS

REGEN-DDL-S
Regenerated Digital Delay - Short

Parameters:
DELAY= 0 to 100 ms in 5 ms increments [100ms]
REGEN= 0 to 100 percent in % increments [57%]
LEVEL= 0 to 100 percent in % increments [100%]

Since this delay algorithm has the characteristic of being in
parallel with a reverb program if used with one, it can be used
to add a small amount of depth, or wrap-around effect to the
sound. A "hard reverb" effect may be achieved by using longer
delay and a moderate amount of regeneration. Tonal sounding
drones may be found using short delay and large amounts of
regeneration.

REGEN-DDL-L
Regenerated Digital Delay - Long

Parameters:
DELAY= 0 to 240 ms in 5 ms increments [200ms]
REGEN= 0 to 100 percent in % increments [50%]
LEVEL= 0 to 100 percent in % increments [100%]

Use this algorithm for the same reasons and applications as the
short Regen-DDL, only now the delay time is more than twice as
long allowing for more effect.

STREO-DDL-S
Stereo Digital Delay - Short

Parameters:
DLY-L= 0 to 360 ms in 5 ms increments [80ms]
        definition: Delay Time Left Channel
DLY-R= 0 to 360 ms in 5 ms increments [110ms]
        definition: Delay Time Right Channel
REGEN= 0 to 100 percent in % increments [57%]
HF-DAM= 0 to 100 percent in % increments [0%]
        definition: High Frequency Damping
LEVEL= 0 to 100 percent in % increments [100%]

STREO-DDL-L
Stereo Digital Delay - Long

Parameters:
DLY-L= 0 to 500 ms in 5 ms increments [250ms]
        definition: Delay Time Left Channel
DLY-R= 0 to 500 ms in 5 ms increments [125ms]
        definition: Delay Time Right Channel
REGEN= 0 to 100 percent in % increments [50%]
HF-DAM= 0 to 100 percent in % increments [0%]
        definition: High Frequency Damping
LEVEL= 0 to 100 percent in % increments [100%]

You can split image or create alternating regenerative patterns between the left and right outputs using Stereo Digital Delay. The ability to set separate delay times for each channel enables you to do this. When used in conjunction with the Flanger, Chorus or Panner, spatial effects are the result. Regeneration is derived from the left channel.

When longer delay times are needed, use the STEREO-DDL-L algorithm. Set both Left and Right Delay times at 500 ms for maximum delay output with no separation. You may also operate this effect in mono.

MULTIVERB II PRESET LIST

```
1.   REVERB #1 HALL
       EQ+DDL+REV  1        dense hall              PM
-------------------------------------------------------------
2.   REVERB #2 ROOM
       EQ+REV               dense room
-------------------------------------------------------------
3.   REVERB #3 VOCAL
       EQ+DDL+REV           vocal enhancement
-------------------------------------------------------------
4.   REVERB #4 PLATE
       EQ+DDL+REV           deep and rich
-------------------------------------------------------------
5.   EARLY REFLECT #1
       DDL+REV              wide and distinct
-------------------------------------------------------------
6.   EARLY REFLECT #2
       DDL+REV              front image
-------------------------------------------------------------
7.   STEREO DELAY
       DDL                  short
-------------------------------------------------------------
8.   STEREO ECHO
       DDL                  long
-------------------------------------------------------------
9.   VOCAL DOUBLER
       DDL+CHO              subtle doubling
-------------------------------------------------------------
10.  VOCAL IMAGER
       EQ+DDL+REV           crisp separation
-------------------------------------------------------------
11.  REV + VOC DELAY
       EQ+DDL+REV           deep reverb
-------------------------------------------------------------
12.  REV + VOCAL ECHO
       DDL+REV              vocal hall
-------------------------------------------------------------
13.  RVRS REV + DELAY
       DDL+GAT              delayed reverse
-------------------------------------------------------------
14.  GATED REVERB #1
       EQ+GAT               short gate
-------------------------------------------------------------
15.  GATED REVERB #2
       DDL+REV              dense gate
-------------------------------------------------------------
16.  GATE REV+REVERB
       DDL+REV              reverberated gate
-------------------------------------------------------------
```

MULTIVERB II PRESET LIST

17. REVERSE REVERB
    EQ+GAT   short reverse
----

18. PITCH TRANSPOSER
    PTr   1   zero shift starting point   **PM**
----

19. PTR SHIFT 5th UP
    DDL+PTr   perfect fifth
----

20. MICRO PTR SHIFT
    DDL+PTr   the ultimate pitch shift chorus
----

21. OCTAVE SHIFT
    PTr   octave up
----

22. PITCH SHIFT DBLE
    DDL+PTr   vocal doubler
----

23. STEREO CHORUS A
    CHO   1   moderate rate   **PM**
----

24. STEREO CHORUS B
    CHO   fast rate
----

25. STEREO FLANGE A
    FLA   basic flanging
----

26. STEREO FLANGE B
    FLA   less regeneration
----

27. TAPE ECHO
    EQ+DDL   500ms echo
----

28. STEREO ECHOREC
    DDL   split echo
----

29. VIBRATO
    CHO   subtle vibrato
----

30. DELAYED VIBRATO
    DDL+CHO   deep vibrato
----

31. TREMOLO
    FLA   subtle tremolo
----

32. SYMPHONIC
    DDL+FLA   delayed tremolo
----

33. CHOIR
    DDL+REV   vocal reverberation

MULTIVERB II PRESET LIST

34. TWIN VOICES
    DDL+PTr   thick vocal doubler
----

35. SOFT SLAP ECHO
    DDL+REV   slap-back doubling
----

36. STEREO PHASE
    EQ+FLA   guitar phaser
----

37. FLANGE & REV A
    DDL+FLA+REV   reverberated flange--subtle
----

38. FLANGE & REV B
    DDL+FLA+REV   reverberated flange--pronounced
----

39. GATED FLANGE+REV
    DDL+FLA+GAT   sharp cutoff flanger
----

40. DELAY + REVERB
    DDL+REV   200ms predelay then reverb
----

41. TAP DELAY + REV
    DDL+REV   tapped delay with reverb
----

42. CHORUS + REV A
    CHO+REV   subtle chorus with reverb
----

43. CHORUS + REV B
    CHO+REV   full chorus with reverb
----

44. CHORUS+GATE REV
    CHO+GAT   sharp cutoff chorus
----

45. STER DLY+CHOR A
    DDL+CHO   delayed chorus fast
----

46. STER DLY+CHOR B
    DDL+CHO   delayed chorus moderate
----

47. STER DLY+FLAN A
    DDL+FLA   delayed flange fast
----

48. STER DLY+FLAN B
    DDL+FLA   delayed flange moderate
----

49. CHORUS+DLY+REV
    EQ+DDL+CHO+REV   large room with chorus
----

50. FLANGE+DLY+REV
    EQ+DDL+FLA+REV   large room with fast flange
----

51. DEATH FLANGE
    FLA+GAT   sharp cutoff regenerated flange

```
52. BARBER POLE FLAN
      EQ+DDL+PTr              slow motion flange
--------------------------------------------------------------------

53. SPACE SHIFT
      DDL+PTr                 shimmer!
--------------------------------------------------------------------

54. ARPEGGIATED FLAN
      DDL:FLA:REV             heavily delayed flange with reverb
--------------------------------------------------------------------

55. ROTATING LESLIE
      EQ+FLA                  leslie effect
--------------------------------------------------------------------

56. CONCERT LESLIE
      DDL+FLA+REV             leslie effect with reverb
--------------------------------------------------------------------

57. ECHOING CHORUS
      EQ+DDL+CHO              chorus with echo
--------------------------------------------------------------------

58. VARIPITCH CHORUS
      EQ+DDL+PTr              regenerated pitch-shift chorus
--------------------------------------------------------------------

59. CHORUS VIBRATO
      EQ+DDL+CHO+REV          delayed reverb with fast chorus
--------------------------------------------------------------------

60. CATHEDRAL REVERB
      EQ+DDL+REV              large vocal reverb
--------------------------------------------------------------------

61. CONCERT REVERB
      EQ+DDL+REV    2         dense room reverb            PM
--------------------------------------------------------------------

62. STUDIO PLATE REV
      EQ+DDL+REV              quality plate reverb
--------------------------------------------------------------------

63. CHOIR LOFT REV
      EQ+DDL+REV              open air reverb
--------------------------------------------------------------------

64. CHURCH HALL REV
      EQ+DDL+REV    3         middle position dense reverb    PM
--------------------------------------------------------------------

65. AMBIENT PERCUSS.
      EQ+REV                  short plate reverb with HF rolloff
--------------------------------------------------------------------

66. CONCERT GATE REV
      DDL+REV                 large room gated reverb
--------------------------------------------------------------------

67. STUDIO PLATE GAT
      GAT                     short sharp gate
--------------------------------------------------------------------
```

68. THUNDER SNARE
      DDL+REV   1   tapped delay with reverb   PM

69. WAREHOUSE SNARE
      DDL+REV   seven tap delay with reverb

70. SNARE IN SHOWER
      EQ+REV   short rolled-off reverb

71. STRATO KILLER
      DDL+PTr   delayed small pitch shift

72. STER METAL GUITR
      DDL+CHO   stereo delayed chorus

73. 12 STRING GUITAR
      DDL+PTr   one octave up with regeneration

74. GUITAR DREAM
      DDL+CHO   thick chorus with delay

75. SILKY STRAT
      EQ+FLA+REV   full reverb with flanging

76. THRASH FLANGE
      EQ+DDL+FLA+REV2   flanger paralleled with delay   PM

77. BLUES MAN GUITAR
      DDL+REV   long delayed reverb

78. ICE GUITAR
      DDL+PTr   off-pitch delay

79. 60'S ROCK
      EQ+DDL+REV   seven tap delay rolled off with reverb

80. ER REF+CHORUS
      CHO+REV   early reflections chorused

81. ER REF+FLANGE
      FLA+REV   early reflections flanged

82. ER REF+DELAY
      DDL+REV   early reflections with five tap delay

83. PREDELAYED REV
      DDL+REV   100ms predelay into hall reverb

84. PREDELAYED GATE
      DDL+GAT   2   100ms predelay into 400ms gate PM

MULTIVERB II PRESET LIST

85. ECHOVERB
     DDL+REV   deep echo with reverb

---

86. FANNING DELAY
     DDL+PAN   regenerated delay with fast panning

---

87. IMAGED CHORUS
     DDL+CHO   3   full stereo imaged chorus   **PM**

---

88. IMAGED FLANGE
     DDL+FLA   full stereo imaged flanger

---

89. FANNING CHOIR
     DDL+REV+PAN   large hall with left right panning

---

90. DRY SWEEP SLOW
     PAN   2   side to side panning   **PM**

---

91. DRY SWEEP FAST
     PAN   side to side panning

---

92. REV+DELAY+PAN
     DDL+REV+PAN   large room with fast panning

---

93. IMAGED REVERB A
     DDL+REV+PAN   room reverberation with fast panning

---

94. IMAGED REVERB B
     DDL+REV+PAN   hall reverb with fast panning

---

95. PING PONG DELAY
     DDL   fast ping pong

---

96. MULTI-TAP PAN
     DDL+PAN   delayed side to side panning

---

97. REV+M-TAP P-PONG
     DDL+REV+PAN   large room with panning

---

98. REVERSE REV+PAN
     GAT+PAN   panned reverse reverb

---

99. GATE REV P-PONG
     GAT+PAN   panned gate reverb

---

100. <blank title>
     <no effects>   MIDI bypass preset

MISCELLANEOUS

Battery Backup

When power is terminated to the MULTIVERB II, the edited MPT as well as the last preset used and the MIDI Channel will be active when the unit is next powered up. Memory retention is expected to last four years. Should you encounter memory loss, contact our service department. If you determine the battery needs to be replaced, refer to the Service Information section, Replacing the Lithium Battery.

Software Revision Level

There is a way to correctly identify the software version residing in the unit. Press the MIDI/UTILITY button, press the SELECT > button seven times. The current version as well as the date will be displayed in the LCD. The MULTIVERB II's software is contained in a socketed EPROM and is field replaceable. This software controls the MULTIVERB II's functions as well as its sounds.

User Registration Card

Be sure to fill out the USER REGISTRATION CARD at the back of this manual and send it in to our Customer Service Department. Doing this will insure that you are notified of any updates or other important information regarding your MULTIVERB II. Please be sure to write in your serial number.

Factory Reset

There is a Factory Reset sequence which will reinitialize the MULTIVERB II to ALL of its original values. Be sure that you have either downloaded or kept a written record of the Presets you want saved since they will be eliminated. To perform a Factory Reset you must press and hold the **PRESET DOWN**, **ADD EFFECT** and **MIDI/UTILITY** buttons simultaneously.

Contact Information

Applied Research & Technology, Inc. (ART)
215 Tremont Street
Rochester, New York 14608
USA

(716) 436-2720
(716) 436-3942 (FAX)

Telex: 4949793 ARTROC

CIRCUIT DESCRIPTION

Although the MULTIVERB II is predominantly digital, it must interface with analog audio signals. If you look at fig. 10, you will see that the audio signal passes directly down the chain of processing stages with all of the control provided by the control processor. The Input Processing stage buffers between the audio source and the MULTIVERB II's internal circuitry. This stage also has the input filtering circuitry to remove unwanted very high frequency material. The signal is then sampled at discrete instants of time and converted into a continuous stream of digital numbers by the analog to digital (A to D) converter. After this conversion the numbers are then stored in memory.

At the heart of the MULTIVERB II is the high speed 20 bit digital signal processor. This processor is capable of performing virtually millions of arithmetic calculations per second. The Digital Signal Processor retrieves the encoded numbers representing the input signal from memory and processes them according to the currently selected parameters. After that is done, the information is again stored in memory.

At regular intervals the processed data is recalled from memory and converted back into an audio signal by the digital to analog (D to A) converter. Alternate samples go to each of the two output sections and produce the left and right parts of a stereo image. Finally the output sections remove unwanted high frequency noise which may have been produced during processing and then is available at the outputs.

The Control Processor, along with its operating software (in EPROM), determines the "personality" of the MULTIVERB II. It monitors the front panel controls, MIDI, Remote and inputs and outputs setting information to the user via the front panel displays. Button depressions are translated into commands understood by the Digital Signal Processor. Thus the user can make quick changes to the reverberant sound using concepts such as "Hall 1" without being concerned about the details.

The Control Processor also controls the storage of front panel settings in Preset Memory and their retrieval for later use or immediate comparison. A lithium battery preserves the presets when AC power is removed.

fig. 10
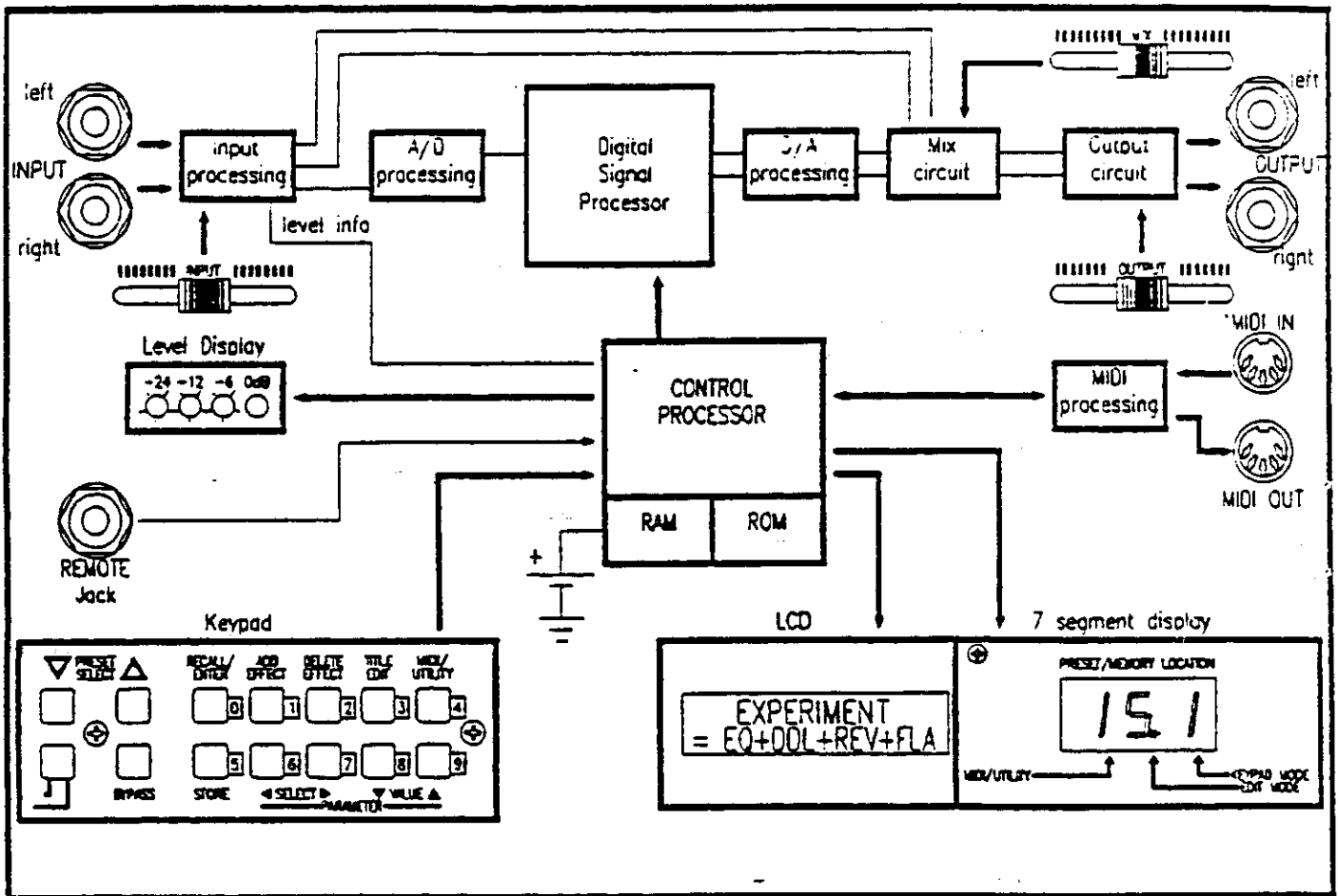
SPECIFICATIONS

Presets: 100

Memory Locations   200

Dynamic Range: >90dB Typical

Operating Level: +16dBV max

Input Impedance: 1M ohm

Output Impedance: 1K ohm

Mechanical: 1.75"H X 19"W X 10"D, all steel case

Power Requirements: 117 Volts AC, 60Hz, Internal Fuse,
                                    Export unit configured for
                                    destination country.

MIDI Receive Channel: 1-16, OMNI (all), Off

MIDI Programs: May be assigned to any Preset #.

Connections: Stereo In/Out 1/4" phone, MIDI IN/OUT

All specifications subject to change without notice.

Applied Research & Technology, Inc.
215 Tremont Street
Rochester, New York 14608 USA
(716) 436-2720
(716) 436-3942 (FAX)

Telex: 4949733 ARTROC

SERVICE INFORMATION

Returning the Unit to the Factory for Service

The following information is provided for the unlikely event your unit requires service.

1) Be sure the unit is the cause of the problem. Check to make sure the unit has power supplied, all cables are connected correctly, cables themselves are in working condition and you are in the correct operating mode for what you are doing.

2) If you find the unit to be at fault, write down a description of the problem including how and when the problem occurs. Include this information with your unit.

3) Pack the unit in it's original carton or a reasonable substitute. The packing box is not recommended for a shipping carton. If possible put the packaged unit in another box for shipping. NOTE: The front panel is subject to damage in shipping if the unit is poorly packaged.

4) Include with your unit: a return shipping address (We cannot ship to a P.O. Box), a copy of your purchase receipt, a daytime phone number in case we need to contact you and the description of the problem.

5) Ship the unit to:
   APPLIED RESEARCH & TECHNOLOGY, INC.
   215 TREMONT STREET
   ROCHESTER, NY 14608
   ATTN: REPAIR DEPARTMENT

6) If you have questions regarding repairs, or if you think your unit may (or may not) need to be repaired feel free to contact our customer service department at (716) 436-2720.

CAUTION. The following servicing instructions are for use by qualified service personnel only. To avoid electric shock do not perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

Replacing the Lithium Battery

CAUTION, battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

Make sure power is removed from the device. Place the unit on a flat, stable surface, right side up, with the front facing you. Remove the four screws (two on each side of the case). Lift the cover up to remove. Locate the battery holder on the PC board. Lift the retaining finger and slide the battery out.

Replace the battery with Matsushita, Part No. BR2325 (or equiv.) by lifting the retaining finger and sliding the battery in place. Make sure the "+" mark on the battery is facing up. Slide the cover down on top of the unit, put the screws in about half way, slide the cover as far forward as possible and tighten the screws.

WARRANTY

Warranty service for this unit will be provided by Applied Research & Technology, Inc. in accordance with the following warranty statement.

Applied Research & Technology, Inc. warrants to the original purchaser that this product and the components thereof, will be free from defects in workmanship and materials for a period of one year from the date of purchase.

Applied Research & Technology, Inc. (ART) will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to an authorized service center or the factory service department, accompanied by proof of purchase date in the form of a valid sales receipt.

EXCLUSIONS: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. This warranty is void if the serial number is altered, defaced, or removed.

ART shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may also have other rights which vary from state to state.

APPENDIX A

APPLICATIONS

LEVEL

It is not suggested to use a microphone plugged directly into the
MULTIVERB II. Even though the device will function properly with
some types of microphones you may encounter level mismatch or
level problems. Some type of preamplifier is required since the
input sensitivity of most microphones is less than -40dB.

When using guitars with high output pickups it may be necessary
to set the input control farther to the left. Sharp transients
from the guitar will light the -6dB LED and the unit will not
clip.

Chorusing and Flanging have always been susceptible to clipping
due to their own characteristics. It may be necessary to use a
slightly lower input level when using these effects.

Some effects have a Level control parameter. Use this control to
adjust for depth, apparent mix level, volume adjustment for each
preset as well as normal output level. By adjusting level in this
manner, you need not constantly adjust the Output Level Control.

PITCH TRANSPOSER

The Pitch Transposer's most obvious area of use is in producing
real-time vocal and instrument harmonies. Some knowledge of music
theory is necessary to use the Pitch Transposer. It is helpful to
have a basic understanding of musical intervals and scales.

Each musical note has a specific physical or sound attribute
called its frequency or pitch. The range of pitches used to
create music is divided into intervals between pitches. The basic
interval is the octave. The two pitches which span an interval of
an octave have a frequency ratio of 2:1. The higher pitch is
exactly twice the frequency of the lower pitch. The octave is
divided into twelve intervals called half steps. One half step is
the interval between adjacent frets on a guitar or between
successive keys, including the black keys on a piano. Other
intervals smaller than an octave may be formed by combining half
steps. These intervals are listed on the following page.

Number of Half Steps / Interval
     1 / Half Step, Semitone, Minor Second
     2 / Whole Step, Whole Tone, Major Second
     3 / Minor Third
     4 / Major Third
     5 / Perfect Fourth
     6 / Augmented Forth, Tritone, Diminished Fifth
     7 / Perfect Fifth
     8 / Augmented Fifth, Minor Sixth
     9 / Major Sixth
   10 / Minor Seventh, Dominant Seventh
   11 / Major Seventh
   12 / Octave

A musical scale is a consecutive series of notes within an octave. Each scale is compromised of a specific sequence of whole and half steps from the tonic or key note. A scale containing all twelve half steps is termed the chromatic scale. The most common scale ,and the basis for other scales is the major scale. (Do-Re-Me-etc.). The major scale adheres to the following pattern:
I -- II -- III -- IV -- V -- VI -- VII -- VIII
whole-whole---half-whole-whole-whole-half

This scale and all others spans an octave. Other scales follow different series of whole and half steps that add up to an octave.

Unfortunately, a basic melodic harmony to the major scale is comprised of a series of notes which are an interval of a minor or major third above the original scale. The specific sequence for harmonies above a major scale is shown in the chart found in APPENDIX E. Relative minor scale sequences are shown in a separate table in the same appendix. Note that, while the interval of an octave is not normally thought of as a harmony , it is the easiest to perform, since the harmony scale is always twelve half steps above or below the major or relative minor scale (preset 21). The interval of a fifth (seven half steps, preset 19) is also quite useful, since, in general long passages may be played without changing intervals.

To use the Pitch Transpose to play a correct harmony other than an octave to a melody line, it is necessary to set up two or more presets for different intervals and alternate between them.

EXAMPLES

CREATING A PRESET

Enter EDIT MODE
Using the PRESET SELECT buttons, scan up to preset 151
Press the RECALL/ENTER button [<blank title>, <no effects>]
Press the ADD EFFECT button once, [ADD:EQUALIZER?]
Press RECALL/ENTER (you have just entered the eq into the chain),
bottom display reads [= EQ]
Press ADD EFFECT seven times, [ADD:REVERB-1?]
Press RECALL/ENTER (now the reverb algorithm is entered into the
chain, display reads [= EQ+REV]
Press ADD EFFECT again, select the FLANGER, enter it into the
chain. (you pressed the ADD EFFECT button once and then pressed
the RECALL/ENTER button), display should read like [= EQ+FLA+REV]
Press the ADD EFFECT button one more time [ADD:MONO-DDL-S?]
Enter it into the chain (press RECALL/ENTER),[= EQ+DDL+FLA+REV]

IF YOU WISH TO SAVE THIS CHAIN OF EFFECTS AS A PRESET YOU MUST
PRESS **STORE** NOW.

Press STORE (note the ≠ sign disappears)

COPYING A PRESET
You may copy a preset from any location into another easily.(If
you want to copy a factory preset into another factory preset
location, you must first Unlock the destination preset.) To copy
a factory preset into one of the 100 user presets follow the
following steps.

-Enter EDIT Mode.
-Use the PRESET SELECT buttons to select the preset you want to
 copy.
-Press the RECALL button.
-Use the PRESET SELECT buttons to select the preset location you
 are copying to.
-Press the STORE button.

The preset has now been copied and stored to the new location.

RECALLING A FACTORY PRESET

-Make sure you are in the EDIT Mode. (Press EDIT button if not)
-Press the MIDI/UTILITY button.
-Press the SELECT> button ten times.
-Use the VALUE buttons to select the preset you want to recall.
-Press the RECALL button.

*The factory preset is now active, but , IT IS NOT PERMANENT. If
you wish to make the preset permanent, you must STORE it. To
store the preset in the first 100 locations, you must first
unlock the existing preset. (See the paragraph on unlocking a
preset) If you are copying to a location above 100, press the
STORE button now.

UNLOCKING A PRESET

-Make sure you are in the EDIT Mode. (Press EDIT button if not)
-Select and then RECALL the preset you wish to unlock.
-Press the MIDI/UTILITY button.
-Press the SELECT< button once. [PRESET 1..100/ = LOCKED _]
-Press the VALUE DOWN button once. [PRESET 1..100/ = UNLOCKED]
-Press the MIDI/UTILITY button again.
*The preset is now unlocked. If you wish to store new information
in this location, press the STORE button now.

EXAMPLE 1:
Editing the MPT from the MULTIVERB II front panel controls.

In this example, we will edit the MPT so that when MIDI numbers 1
and 2 are received, MULTIVERB II PRESETS 60 and 151 will be
recalled. It is assumed that the MULTIVERB II's MPT has not been
edited.

-Make sure you are in the EDIT Mode. (Press EDIT button if not)
-Press the MIDI/UTILITY button.
-Press the SELECT > button five times. You will see in the LCD
[MIDI PROG= 0_] at the top and [PRESET= 1] on the bottom.
-Press the SELECT > again. The [_] now is to the right of
[PRESET= 1].
-Hold in the VALUE UP button until the display reads [PRESET=
60_].
-Press the SELECT < button once.
-Press the VALUE UP button once.
-Press the SELECT > once.
-Use the VALUE buttons to select preset 151 (use rapid access
mode)
-Exit MIDI mode by pressing the MIDI/UTILITY button once.

You may assign any preset # to any program # including a preset
to a multiple of program #'s. To test the reassigned numbers, use
a MIDI device to recall the presets. Your reassigned presets
should be recalled.

EXAMPLE 2:
Editing the MPT with a keyboard or external controller.

Using this method of editing, you select the desired patch on the
keyboard, and then select the desired PRESET on the MULTIVERB II
for that sound. You can do this while you are listening to the
MULTIVERB II.

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When used with a keyboard or other device that will send MIDI PROGRAM CHANGE messages, MPT editing may be simplified. We will edit the MPT so that when MIDI numbers 3 and 4, are received, presets 96 and 1 will be recalled. It is assumed that the MULTIVERB II has not had its MPT edited.

The keyboard MIDI OUT must be connected to the MULTIVERB II's MIDI IN jack. The MIDI channel on the MULTIVERB II must be set to the same channel that the keyboard will be sending messages on, or the MULTIVERB II's OMNI mode must be ON.

-Make sure you are in EDIT Mode. (Press EDIT button if not)
-Press the MIDI/UTILITY button.
-Press the SELECT > button six times.
-Select a patch on the keyboard so that [MIDI PROG= 2] is displayed If the MPT has never been edited, [PRESET= 3] should be in the lower half of the display.
The patch that causes [MIDI PROG= 2] to appear in the display is usually the second or third patch of the lowest numbered bank if the keyboard has banks of patches.
-Use the VALUE UP and DOWN keys to select preset 96.
-With the keyboard change the MIDI PROGram number to 4.
-Set the PRESET to = 1.

You may continue to program each of the keyboard's patches (say there are 64) in this manner assigning any preset # to the patch. In the previous examples four of the MPT entries were edited. You may edit the entire MPT if desired. If you do not have access to a MIDI controller and you wish to change between PRESETs easily, you may want to edit the MPT for incrementing through a sequence of presets. Example three illustrates how this is done.

EXAMPLE 3
Setting up a preset sequence including a bypass preset.

If you need to change between presets quickly without scanning or MIDI, this procedure will be to your advantage. As in the other examples, editing the MPT is the key. In this example we will edit the MPT to sequence through ten presets. Ten is not the limit. You may program a sequence of 127 presets if you wish. These presets will be in the order: 60, 151, 96, 1, 151, 35, 1, 69, 100 and 61. Notice that we repeated some presets and included preset 100 which is set up from the factory as a bypass preset (no effects stored in it). Remember that you can assign any preset to a MIDI number including using a preset at multiple locations. Using an empty preset as a bypass enables you to select no effect eliminating the need to bypass the unit from the front panel and then continuing on with an effect preset next in the chain. NOTE: If your mix control is fully to the right (all wet), no signal will pass through the MULTIVERB II.

-Make sure you are in EDIT Mode. (Press EDIT button if not)
-Press the MIDI/UTILITY button.
-Press the SELECT > five times.
-Press the VALUE UP button until top of the display reads [MIDI PROG= 4_]. The sequence must start at program location # 0. Since we have programmed 0-3 already we will start at location # 4. (If you wanted _different preset #'s in the first four locations reprogramming would be required.)
-Press the SELECT > button once.
-Use the VALUE UP button to select preset 151.
-Press the SELECT < button once.
-Change the MIDI PROG # to = 5
-Press the SELECT > again.
-Change the preset # to equal 35.
-Continue this way until all the presets are entered the last being 61 at [MIDI PROG=   9].
-Press the SELECT < button once.
-Press the VALUE DOWN button nine times (each time you press the button notice the [PRESET=] is reading the preset # you have programmed in.)

INCREMENT PROGRAM

Now that we have a sequence of presets, what do we do with them? To access these presets we must program the REMOTE JACK to increment the programs. You can only increment up through the programs.

External Switch Mode [EXT SW MODE] allows you to program the REMOTE jack on the rear panel so that you may use a footswitch to increment through a desired set of presets or to operate as a normal bypass jack.

Example four describes how program the REMOTE jack to sequence through the ten presets you set up in Example three with a footswitch. Example five shows how to program the REMOTE jack for normal bypass operation.

EXAMPLE 4
Programming the REMOTE jack for Incrementing Programs

-Make sure you are in EDIT Mode. (press EDIT button if not)
-Press the MIDI/UTILITY button. The display will read [EXT SW MODE] in the top half and [= INCR PROGS   1 in the bottom half.
-Use the VALUE UP button to change the number to 9.

You have just programmed the MULTIVERB II to sequence through the ten presets set in Example 3 when using a momentary footswitch plugged into the REMOTE jack.

EXAMPLE 5
Programming the REMOTE jack for the BYPASS function.

-Make sure you are in the EDIT Mode. (press EDIT button if not)
-Press the MIDI/UTILITY button. The display will read [EXT SW MODE] in the top half and [= INCR PROGS   1] in the bottom half.
-Use the VALUE DOWN button to change the display to read [= BYPASS ON/OFF] in the lower part of the display.

Now when the footswitch is used the BYPASS function is accessed. Remember, if the MIX control is set to all wet, no signal will be present at the output(s).

EXAMPLE 6
Setting the LCD view angle.

You may change the LCD view angle for the best visibility. The
angle may be adjusted to maximize legibility of the characters
from top, front or under viewing angles. When viewing from the
top, use a higher number. If you are viewing the display directly
from the front, use the middle numbers. Viewing the LCD when the
MULTIVERB II is above you, adjust the view angle with the lower
numbers.

-Make sure you are in EDIT Mode. (Press EDIT button if not)
-Press the MIDI/UTILITY button.
-Press the SELECT < button three times.
-Use the VALUE UP or DOWN buttons to adjust the view angle

EXAMPLE 7
Setting up a preset with MIDI control.

In this example we will set up a preset using four effects and
four MIDI controllers to control a parameter in each effect.
First, we will select the four effects, next, we'll predecide
which parameters are to be controlled and then, assign the PM
information to the preset. The four effects are: EQ, FLANGER,
MONO-DDL-S and REVERB-1. Since we know we are going to control
four parameters we will also add four MIDI Control "effects"
also. The HF-CUT in the EQ will be controlled by a MOD WHEEL.
DELAY time in the DDL will be controlled by a PITCH WHEEL.
FLANGER REGENERATION will be controlled by NOTE ON VELOCITY.
POSITION in the REVERB will be controlled by NOTE ON VALUE.

Just to keep the example as simple as possible we will not modify
any of the effects parameters when programming. The default
settings for each parameter will provide an excellent starting
point.

-Select Preset 153 (this should be blank preset).
-Press the EDIT MODE button.
-Press ADD EFFECT once.
-Press the RECALL/ENTER button to add the EQ.
-Press ADD EFFECT once.
-Press ENTER to add the FLANGER to the preset.
-Press the ADD EFFECT button once.
-Press ENTER to add the MONO-DDL-S.
-Press ADD EFFECT once.
-Press ENTER to add REVERB-1 to the preset.
*We have added all our effects at this point.
-Press ADD EFFECT once.
-Press the ENTER button to add the first of four PM MIDI CONTROL
-Press ADD EFFECT once.
-Press the ENTER button to add the second PM MIDI CONTROL.
-Press ADD EFFECT once.
-Press the ENTER button to add the third PM MIDI CONTROL.
-Press the ADD EFFECT button for the last time.
-Press the ENTER button to add the last PM MIDI CONTROL.
*Notice the numeral 4 in the lower right of the LCD. This
 indicates there are four PM MIDI CONTROLS in the preset.
-Press the STORE button. This is not necessary to do now for
 programming, it is only a precaution.
*We are now going to assign the control values.
-Press the SELECT> button twelve [12] times.
-Don't change anything, this is what we want to be controlled.
-Press the SELECT> button once.
*Now we select the first MIDI CONTROLLER.
-Press and hold the VALUE DOWN until the bottom of the LCD reads
 [MC 1:MOD WHEEL].
-Press the SELECT> button once.
-Use the VALUE UP button to change the SCALE value to 17.
-Press the SELECT> button once.
-Use the VALUE DOWN button to change the value to 5.3K.
-Press the SELECT> button once.
-Press the VALUE UP button once.
-Press the SELECT> button once.

-Press the VALUE DOWN button once.
-Press the SELECT> button once.
-Use the VALUE UP button to change the value to 17.
-Press the SELECT> button twice.
-Press the VALUE UP button five times.
-Press the SELECT> button once.
-Press the VALUE DOWN button four times.
-Press the SELECT> button once.
-Use the VALUE UP button to set the SCALE value to 60.
-Press the SELECT> button twice.
-Press the VALUE UP button nine times.
-Press the SELECT> button once.
-Press the VALUE DOWN button five times.
-Press the SELECT> button once.
-Use the VALUE UP button to set the SCALE value to 33.
-Press the SELECT> button twice.
-Press the STORE button.

That's it! We've just programmed a preset for the effects and
controls we mentioned at the beginning of this example. What's
even better is this preset works. Hook it up to a keyboard and
try it. With the MOD WHEEL, kill the high frequencies when the
wheel is down. Increase the delay time by moving the PITCH WHEEL
up and decrease it when bringing it down. At its center position
the delay remains in the middle of the range. When you play the
keyboard softly, the flanger's regeneration is subtle. If you
play quicker, the regeneration increases. As you travel up the
keyboard notice that the position of the reverberated signal goes
further and further towards the rear. The lower registers are
more towards the front of the room. To reverse the
characteristics of the affected parameters, edit the preset just
created by changing all the SCALE values to the same number only
NEGATIVE. This provides the same control effects only INVERSE of
what was originally programmed.

EXAMPLE 8
Adding Performance MIDI to an existing preset.

In this example we are going to add PM to preset 62.   The effect
parameters we will control are: HF-CUT in the EQ and DECAY in
PLATE-3. The MOD WHEEL and NOTE ON VELOCITY   are the MIDI
controllers we will assign.

-Recall preset 62.
-Press the EDIT button.
-Press the ADD EFFECT button.
-Press the RECALL/ENTER button.
-Press the ADD EFFECT button.
-Press the ENTER button.
-Press the SELECT> button nine times.
-Do not change anything, this is what you want to control.
-Press the SELECT> button once.
-Use the VALUE DOWN button (press and hold in) to display
 [MC 1:MOD WHEEL].
-Press the SELECT> button once.
-Use the VALUE DOWN button to change the SCALE value to 17.
-Press the SELECT> button once.
-Use the VALUE DOWN button to change the Center Value to 5.3K.

-Press the SELECT> button once.
-Press the VALUE UP button three times.
-Press the SELECT button once.
-Press the VALUE DOWN button four times.
-Press the SELECT> button once.
-Use the VALUE DOWN button to set the SCALE value to 33.
-Press the SELECT> button twice.
-To store this preset you must first UNLOCK it.
-Press the MIDI button.
-Press the SELECT< button once.
-Press the VALUE DOWN button once.
-Press the MIDI button again.
-Press the STORE button.

You now have edited a Factory Preset for PM control. You may edit
any existing preset to be controlled by PM.

APPENDIX C

MULTIVERB II MIDI MESSAGES

The Multiverb II responds to the following messages:

Program change:
      Cxh ddh
      x = channel number 0h to Fh for channels 1 to 16
      dd = program number 0h to 7Fh or 0 to 127

If the channel that the Multiverb II is set to is not off and the
channel matches (either it is the same number or OMNI is on),
then the Multiverb II will look up the preset in the MIDI Program
Table (MPT) and recall the corresponding preset.

Channel Mode message for OMNI on/off
        Bxh 7Ch 0h : OMNI Mode Off
        Bxh 7Dh 0h : OMNI Mode On
        x = channel number, 0h to Fh for channels 1 to 16

If the channel matches the Multiverb II's channel number, it will
set the OMNI mode accordingly.   The current OMNI mode does not
affect this message, the channel must match regardless of current
OMNI mode.

SYSTEM EXCLUSIVE MESSAGES

message format:
      general: <System Exclusive Status> <ART ID> <channel>
                  <product ID> <message ID> <message...> <EOX>

      in hex: F0h 1Ah 0xh 06h <message ID> <message...> F7h

            F0h - System Exclusive status byte.
            1Ah - ART manufacturer's ID number.
            0xh - channel number, 0 to 0Fh.
            06h - Multiverb II product id code.
            F7h - End Of exclusive status byte.

Message ID values >= 40h are requests. A request is a message
that when received by the Multiverb II causes a message to be
sent by the Multiverb II.

0x is the channel number, 0 to 15 (00h to 0Fh). To the user, the
channel number is displayed as 1 to 16.

Internally, presets are numbered 0 to 199. When a preset number
is displayed, it is shown as 1 to 200. Any messages that refer
to the Multiverb II preset number refer to the internal number,
0..199. Preset numbers are referenced in message with 2 data
bytes, least significant 7 bits, then most significant bit in the
lsb of the next byte. Example: preset 1 on the LCD is referenced
with 00h 00h, and preset 200 is referenced with 47h, 01h.

When channel number is OFF and a front panel command for a dump is processed, the Multiverb II sends a message coded for channel 1 (the lowest channel number).

DETAILED DESCRIPTION OF MESSAGES

Set Bypass OFF   F0 1A 0x 06 03 00 00 F7
Set Bypass ON   F0 1A 0x 06 03 00 01 F7

This allows remotely setting the state of BYPASS in the Multiverb II without affecting anything else in the unit.

request DUMP all presets   F0 1A 0x 06 4B F7
     LOAD all presets   F0 1A 0x 06 0B <many bytes> F7

Dumps all presets in preset number order.   No compression of the data is done.

request MPT table   F0 1A 0x 06 4C F7
set MPT table   F0 1A 0x 06 0C <128 * 2 bytes> F7

For each MIDI program number there is a corresponding Multiverb II preset number. Each entry (internally) is 0..199 and is sent as 2 bytes. First the least significant 7 bits, then the msb. This is done for each of the 128 MIDI program numbers.

If you find you require additional MIDI technical information, please contact or Customer Service department at (716) 436-2720.

ART MULTIVERB II model 360   Date: April 1989
20 BIT MULTIPLE EFFECTS PROCESSOR.   Version: 1.00

Function	Transmitted	Recognized	Remarks
Basic Default	X	1-16	note 1
Channel Channel	X	1-16	
Mode Default	X	Mode 1,3	note 1
Mode Messages	X	OMNI ON/OFF	
Altered	X	O	
Note	X	O	
Number True Voice	X	O	
Velocity Note ON	X	O	
Note OFF	X	O	
After Key's	X	O	
Touch Ch's	X	O	
Pitch Bender	X	O	
Control Change	X	O	
Prog	X	0-127	assignable to any
Change True #	X		preset
System Exclusive	O	O	See manual
System :Song Pos	X	X	
:Song Sel	X	X	
Common :tune	X	X	
System :Clock	X	X	
Real Time:Commands	X	X	
Aux :Local ON/OFF	X	X	
Mes- :All Notes Off	X	X	
sages:Active Sense	X	X	
:Reset	X	O	

Notes
  1: Factory default is channel 1, OMNI ON. Current setting is
     maintained in non-volatile RAM and does not change when the
     MULTIVERB II is powered on.
Mode 1: OMNI ON, POLY   Mode 2: OMNI ON, MONO   O: Yes
Mode 3: OMNI OFF, POLY   Mode 3: OMNI OFF, MONO   X: No

Scaling Value Suggestions

PARAMETER	PBW	NONVEL	NONVAL	MW
EQ:HF-CUT	12	–	–	17
DDL:DELAY	25	30	45	22
DDL:DLY-L	15	30	74	19
DDL:DLY-R	15	30	74	19
DDL:REGEN	15	20	30	55
DDL:HFDAMP	55	53	100	55
DDL:LEVEL	55	75	–	63
CHO:WIDTH	64	35	32	7
CHO:SPEED	33	20	32	33
CHO:DELAY	15	6	6	20
REV:TYPE	–	–	–	–
REV:DECAY	30	15	25	15
REV:HFDAMP	20	–	–	25
REV:POSITN	15	–	–	15
REV:LEVEL	30	30	30	31
REV:DIFFUS	15	–	–	9
FLA:WIDTH	30	35	32	35
FLA:SPEED	30	20	32	35
FLA:REGEN	30	–	–	30
GAT:TYPE	–	–	–	–
GAT:DECAY	17	25	25	15
GAT:DIFFUS	9	–	–	15
GAT:LEVEL	33	40	69	25
PTR:TYPE	–	–	–	–
PTR:PITCH	25	–	50	30
PTR:FINE	33	–	27	12
PTR:REGEN	25	–	–	26
PTR:LEVEL	33	–	25	25
PAN:MOD	25	–	–	33
PAN:SPEED	25	–	–	33

PBW=PITCH BEND WHEEL
NONVEL=NOTE ON VELOCITY
NONVAL=NOTE ON VALUE (NOTE ON KEY #)
MW=MODULATION WHEEL
DE=DATA ENTRY

When a (-) is displayed, no value is suggested, but the parameter
is still controllable by a MIDI controller.

EQUIVALENT LEVEL TABLE
(MEASUREMENTS IN dBV)

INPUT SLIDER	INPUT LEVEL (REF 0dB)	OUTPUT LEFT	OUTPUT CENTER	OUTPUT RIGHT
LEFT	(+)10	(-)75	(+)6	(+)10
CENTER	(+)6	(-)75	(+)6	(+)10
RIGHT	(-)15	(-)75	(+)6	(+)10

MAJOR SCALE HARMONY TABLE

	I	II	III	IV	V	VI	VII
FIRST ABOVE	+4	+3	+3	+4	+4	+3	+3
FIRST BELOW	-5	-5	-5	-5	-5	-5	-6
SECOND ABOVE	+7	+7	+7	+7	+7	+7	+6
SECOND BELOW	-8	-9	-9	-8	-8	-9	-9
OCTAVE ABOVE	+12	+12	+12	+12	+12	+12	+12
OCTAVE BELOW	-12	-12	-12	-12	-12	-12	-12

RELATIVE MINOR SCALE HARMONY TABLE

	I	II	III	IV	V	VI	VII
FIRST ABOVE	+3	+3	+4	+3	+3	+4	+4
FIRST BELOW	-9	-9	-8	-9	-9	-9	-8
SECOND ABOVE	+7	+6	+7	+7	+7	+7	+7
SECOND BELOW	-5	-6	-5	-5	-5	-5	-5
OCTAVE ABOVE	+12	+12	+12	+12	+12	+12	+12
OCTAVE BELOW	-12	-12	-12	-12	-12	-12	-12

APPENDIX E - Preset worksheets

	PARAMETER	VALUE	PARAMETER	VALUE	PARAMETER	VALUE
PRESET**/**						
TITLE						
EFFECTS						
PRESET**/**						
TITLE						
EFFECTS						
PRESET**/**						
TITLE						
EFFECTS						
PRESET**/**						
TITLE						
EFFECTS						
PRESET**/**						
TITLE						
EFFECTS						
PRESET**/**						
TITLE						
EFFECTS						
PRESET**/**						
TITLE						
EFFECTS						
PRESET**/**						
TITLE						
EFFECTS						

NOTES:

MIDI: CONTROLLERS & NUMBERS

CONTROLLER #	CONTROLLER DESCRIPTION
0	UNDEFINED
1	MOD WHEEL
2	BREATH CONTROLLER
3	UNDEFINED
4	FOOT CONTROLLER
5	PORTAMENTO TIME
6	DATA ENTRY (msb)
7	MAIN VOLUME
8	BALANCE
9	UNDEFINED
10	PAN
11	EXPRESSION CONTROLLER
12-15	UNDEFINED
16-19	GENERAL PURPOSE #'S 1-4
20-31	UNDEFINED
32-63	LSB FOR VALUES 0-31
64	DAMPER PEDAL (SUSTAIN)
65	PORTAMENTO
66	SOSTENUTO
67	SOFT PEDAL
68	UNDEFINED
69	HOLD 2
70-79	UNDEFINED
80-83	GENERAL PURPOSE #'S 5-8
84-90	UNDEFINED
91	EXTERNAL EFFECTS DEPTH
92	TREMELO DEPTH
93	CHORUS DEPTH
94	CELESTE (DETUNE) DEPTH
95	PHASER DEPTH
96	DATA INCREMENT
97	DATA DECREMENT
98	NON-REGISTERED PARAMETER # LSB
99	NON-REGISTERED PARAMETER # MSB
100	REGISTERED PARAMETER # LSB
101	REGISTERED PARAMETER # MSB
102-120	UNDEFINED
121-127	RESERVED FOR CHANNEL MODE MESSAGES

CONTINUOUS CONTROLLERS

PITCH BEND WHEEL
CHANNEL PRESSURE
POLY AFTER TOUCH
NOTE ON VELOCITY
NOTE ON KEY #
NOTE OFF VELOCITY
NOTE OFF KEY #

APPENDIX E - Preset worksheets

	PARAMETER	VALUE	PARAMETER	VALUE	PARAMETER	VALUE
PRESET#						
TITLE						
EFFECTS						
PRESET#						
TITLE						
EFFECTS						
PRESET#						
TITLE						
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PRESET#						
TITLE						
EFFECTS						
PRESET#						
TITLE						
EFFECTS						

NOTES:

REVERBERATION--A complex sonic phenomenon characterized by multiple sound reflections from room surfaces, with a gradual decay in overall level and rolling off of higher frequency components.

EARLY REFLECTION--One cue comes from the time delay between the initial sound and the early well defined echoes of the first reflections off the floor, ceiling and walls. This time relates directly to the perceived size of the space.

PRE DELAY--In conventional recording practice, a delay is often used between the console and the reverb chamber. This pre delay adds an apparent depth to the reverb sound as well as separating the initial sound from the dense reverberation.

DECAY--Natural reverberation results when sound reflects off the boundaries of a confined space. The character of the reverberant sound depends on the size and shape of the space, the composition of the boundaries and the presence of objects in the space which reflect or absorb sound energy. Decay time is defined as the time required for the reverberant sound to decay to one millionth (-60 dB, RT-60) of its original energy.

H.F. Damping--As sound travels through air, or reflects off soft surfaces, the higher frequencies are absorbed quicker than the rest of the sound. This absorption of high frequency is termed damping.

POSITION--You may hear the reverberant sound from a number of different locations in a reverberant space. If you are near the front of the room, you will hear more of the initial sound. As you move towards the rear of the room you will hear more reverberant sound and less of the initial sound.

DIFFUSION--Varies the reverb sound from rough to smooth by increasing echo density and filling in the spaces between individual echoes. As diffusion is increased so is the smoothness of the sound.