TABLE OF CONTENTS

SGE MACH II
USER GUIDE

SGE MACH II PRESET LIST

001 ROCK CONCERT GTR	037 TRAIN COMIN' DLY	074 FLAN-FUNK RHYTHM
002 DYNA COMP WHA	038 ARPEGGIATOR UP	075 DARK GTR FLANGE
003 CONCERT GTR WHA	039 DOWNWARD SPIRAL	076 PANNING REVERB
004 MONSTER GTR	040 REVERB #1 HALL	077 REV + M-TAP PAN
005 BRITISH STACK	041 REVERB #2 ROOM	078 SPACE DELAY
006 BRITISH THUNDER	042 REVERB #3 VOCAL	079 SWEPT SHIFT DLY
007 METAL CONCERT	043 REVERB #4 PLATE	080 JET LAG SLAP
008 TURBO FLANGE	044 EARLY REFLECTION	081 BARBER POLE FLAN
009 SHIMMERING CHOR	045 CATHEDRAL REVERB	082 SPACE SHIFTER
010 GLISTENING CHOR	046 STUDIO PLATE REV	083 PING PONG DELAY
011 DREAM FLANGE	047 CHOIR LOFT REV	084 MR. WALSH
012 RAIN FOREST CHRS	048 CHURCH HALL REV	085 WARM TUBE BLUES
013 MELLOW	049 INFINITE PLATE	086 OVERDRIVE TUBES
012 STRING	050 AMBIENT PERCUSS.	087 WARM OVERDRIVE
014 BRITE 12 STRING	051 DANCE DRUMS REV	088 SMOOTH DRIVE
015 VARIPITCH CHORUS	052 GATED VERB #1	089 ROCK-N-ROLL OVRD
016 ROTATING LESLIE	053 GATED VERB #2	090 ROCK IN THE HALL
017 CONCERT LESLIE	054 GATED REV+REVERB	091 TURBO CHORUS
018 TURBO LESLIE	055 REVERSE REVERB	092 TUBE SHRT STACK
019 GTR AUTO SAMPLER	056 STUDIO PLATE GAT	093 TUBE FULL STACK
020 PYSCHO SAMPLER	057 THUNDER SNARE	094 GLASS SHATTER
021 GTR JAZZ HALL	058 WAREHOUSE SNARE	095 HEAVY METAL SOLO
022 GTR BLUES HALL	059 BALLAD SNARE	096 FAT AND WET
023 CONCERT RHYTHM	060 VOICE ENHANCER	097 FAT AND DRY
024 OVERDRIVE 12 STR	061 VOCAL CHORUS	098 PAN AM JAM
025 BASS SYNTHESIZER	062 VOCAL RVRS+SLAP	099 SUPER FEEDBACK
026 CHICKEN PLUCK	063 VOCAL BALLAD	100 NO EFFECT
027 SUPERDRIVE BASS	064 CONCERT VOCALS	101 HOLLOW GTR LEAD
028 CONCERT LEAD GTR	065 BOX OF BOOMS	102 WAREHOUSE STACK
029 ENGLISH TUBES	066 PITCH TRANS +5TH	103 WALL-O-SOUND DST
030 ELECTRO FUZZTONE	067 SPACE CHORUS	104 MANUAL SAMPLER
031 SHARP GLASS LEAD	068 TOTAL WEIRDNESS	105 AUTO SAMPLER
032 HOT FULL STACK	069 STEREO DLY+CHOR	106 MIDI SAMPLER
033 BIG-N-BOLD	070 STEREO DLY+FLANG	107 'VERBED SAMPLE 1
034 NIGHT DEMON GTR	071 SWEET CLEAN JAZZ	108 'VERBED SAMPLE 2
035 ROCK SYNTH FIFTH	072 WARM SWEET JAZZ	109 MAN SAMP REPEAT
036 PIGS IN SPACE	073 GATED FLANGE	110 SAMPLE + FIVE

INSTALLATION

The SGE MACH II may be used in a variety of setups including: mixing consoles with reverb send and return facilities, in the effects loop of an amplifier, directly in line between a musical instrument and amplifier or mixer and in the tape loop of a home receiver. It is not recommended to use the device as a stand alone preamp. Self contained in an all steel single high 19" rack mount case, the SGE MACH 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.

CONNECTIONS

All audio connections to the SGE MACH II are made at the rear of the unit via professional 1/4" phone jacks. The MIDI connection is accomplished via a five pin "DIN" jack on the rear panel.

INPUT

The LEFT and RIGHT inputs are single ended (unbalanced) with an impedance of 1M 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.

OUTPUT

The LEFT and RIGHT outputs are single ended (unbalanced) with a source impedance of 1.0K ohm, and can provide a stereo or mono output. When a true stereo signal is applied to the inputs, the resulting output is true stereo (dry signal only). 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 reverberant information from both outputs. If you do not want both output signals combined (such as only one delay time required), plug a dummy plug into the unused output.

NOTE: The effect output is a proccessed combination of both the left and right input signals.

A variety of input/output combinations may be used with the SGE MACH II. One in one out (mono), one in two out (stereo image), two in one out (summed mono), and two in two out (true stereo) may be achieved. NOTE: When using the SGE MACH II in the true 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 imposed by the algorithm used. This imitates the occurrence of natural reverberation in a normal room.

CONTROLS AND OPERATION

INPUT LEVEL INDICATORS

Four front panel LED indicators display the signal level at all times. These LED's do not display the direct input to the SGE MACH II. What is indicated is the signal level about to be converted to digital after it has been passed through the dynamic section. Therefore, if the Compressor is part of the chain of effects, don't expect to light all four LED's.

For maximum dynamic range the -40 and -12 LED should be on most of the time with the 0dB LED briefly flashing on transients only (except when the Compressor is in). This is a sufficient amount of input level to operate the SGE MACH 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 SGE MACH II or decrease the Input 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.

INPUT LEVEL CONTROL

The Input Level Control is located on the front panel below the Input Level Indicators. There are suggested input level settings screened on the front panel for reference or quick setup. 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 or effects loops in preamps and amplifiers. Whatever the source, adjust the Input Level Control so that the Green LED's (-40dB & -12dB) are lit constantly, the Yellow LED (-6dB) lights with soft peaks and sharp peaks lighting the Red LED (0dB).

NOTE: With the Compressor in the effects chain, you may not be able to light the (-)6 and 0dB LED's.

IMPORTANT NOTE: For maximum guitar crunch, the input slider must be all the way to the right!

If an instrument such as a guitar is plugged directly into the SGE MACH II, set the slider fully to the right when using the Distortion or Compressor in the effects chain. This will insure maximium saturation for the Distortion, and maximum input level for the Compressor. You may have to set the slider more towards the center when these effects are not in the chain to avoid clipping.

With line level devices (mixers, some keyboards, effects loops) center the slider and control the input level from the effects send. 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 SGE MACH II so that -6dB is occasionally 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 SGE MACH II. See APPENDIX A for some level suggestions.

MIX CONTROL

The MIX control varies the amount of effect signal present in the output and may be programmed to pass either dry only or Dynamic Effects (DYN EFX) only to Reverb, Modulation, and Delay effects only. When the control is fully towards the left, only the dry or Dynamic Effects signal (programmed) is apparent at the output(s). As the slider is moved towards the right, more digital 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 digital processed signal is heard at the output(s).

NOTE: With the slider fully right, (full wet) and the DRY/MIX ASSIGN set to POST DYN EFX, you will hear the dynamic effects signal digitally processed.

Refer to the DRY/MIX ASSIGN section for more information.

NOTE: Presets may have varying output levels. You may vary the individual effect output Level parameter to directly change the apparent mix of the effect in the preset.

OUTPUT LEVEL CONTROL/
MASTER PROGRAMMABLE OUTPUT

The Output Level Control adjusts the final output level of the SGE MACH II. With the slider fully to the left, there is no output signal present at the output jacks (0%). As you move the slider to the right the output signal level of the unit increases. When the slider is fully to the right, 100% output is achieved. WARNING!: You may acquire gain at the output, we do not recommend that the SGE MACH 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.

Different output levels of presets are made possible by adjusting the output levels of the individual effects programmed into the preset.

NOTE: To match the output levels of all presets, use the Output Level parameter of the Expander to control the overall output level of the preset. This controls the master level V.C.A.

You may notice there are points set as suggested settings for line and instrument level devices. Use these settings as a starting point for adjusting your level settings. 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 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 is displayed in 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 number and abbreviated description of effects stored, effects to be selected or deleted in the preset, and effect parameter information. Other information may appear here also. The view angle may be adjusted and is covered in the following section under MIDI/UTILITY function.

A user or factory preset would be displayed in the LCD like the following representation.

```
+————————————+
+EXPERIMENT        +
+3 DST+CHO+REV 2  +
+————————————+
```

The title appears in the top half of the display. It may be up to sixteen characters long.

The number that appears at the far left in the bottom half of the display indicates the number of effects in the preset.

In the center of the bottom half of the display three letter abbreviations of the effects appear. No more than three effects are displayed at one time.

A diagonal arrow to the right or left of the effects indicates there are more effects to be viewed. To view the additional effects enter Edit Mode (press the gray button) and use the Value Up and Down buttons.

A number at the far right of the bottom half of the display indicates how many MIDI controllers are assigned to the preset if Performance MIDI is engaged.

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 and is refered to as KEYPAD MODE. Preset parameter control and Utilities are labeled in grey and are refered to as EDIT MODE.

Two methods of Preset selection are used, scanning (up/down with rapid access) and keypad number entry. Refer to the front panel for reference to control buttons. Never press all the buttons at the same time.

PRESET SELECT
Scanning

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 at a moderate rate when you're in Keypad Mode. Signal is being processed constantly while you are scanning through the presets.

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

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 indicating the direction you want to go, then simultaneously press the button indicating the other direction. As long as both are pressed the display will increment by a value of ten rather than one at a time.

PRESET SELECT
Edit Mode

To preview presets before actually using them, press the grey button labeled KEYPAD MODE/EDIT MODE so 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, you are viewing only the preset titles. The reason for this is so you can set up 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.

PRESET SELECT
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 on the front panel labeled 0 through 9 (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 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** for instant recall. Try preset 1. Did you do it right? (Enter 0-0-1) Now enter 1-5-1.

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. This is a default condition that allows two digit numbers to recall presets. The result just isn't instantaneous.

If you were to just enter one digit, the right digit would flash [_] and then the display would revert to the already existing preset. You cannot recall a preset by just pressing a single digit.

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 this Mode status indicator to assure yourself which mode you are in.

Keypad Mode is 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.

Edit Mode is indicated by a flashing decimal point in the center of the Seven Segment Display. All preset parameter editing is done while in this mode. You may access all two hundred presets in this mode using the Preset Select buttons to determine the preset and then pressing the Recall button to initiate the preset.

MIDI/Utility Mode is indicated by a flashing decimal point after the first digit in the Seven Segment Display. All MIDI and Utility features may be edited while in this mode.

BYPASS

Pressing the BYPASS button kills the effects signal in the mix passing only dry signal to the outputs 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.

NOTE: If the MIX control is set fully to the right, and BYPASS is initiated, no signal will be present at the outputs.

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/MIX TITLE button and referred to as EXT SW MODE. Refer to the REMOTE JACK section for additional information.

Bypassing the unit via MIDI may be done by recalling a totally blank preset. Preset 100 is a Factory Preset set up for MIDI BYPASS. Any null (empty) preset may be used. For convenience, just title a blank preset BYPASS.

MIDI/MIX TITLE

All the MIDI System Utilities, assigning the Mix and the preset Title feature functions are accessed when this button is pushed. **To enter MIDI Mode you must first be in EDIT Mode.** Press the EDIT Mode button and then press the MIDI/MIX TITLE button, the left decimal point in the Seven Segment Display will flash indicating you are in the MIDI Operation Mode. The LCD will be displaying [HIT VALUE UP TO / EDIT TITLE]. To access individual parameters, use the SELECT< and SELECT> buttons. When you wish to change the variables use the UP and DOWN VALUE buttons. To exit the MIDI MODE you must press either the MIDI/TITLE button or the EDIT button. Pressing the MIDI/TITLE button will exit you to EDIT MODE. Pressing the EDIT Mode button will exit you directly to KEYPAD Mode.

TITLE EDIT

One of the displays to appear 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 MIDI/MIX TITLE button once. The display will read [HIT VALUE UP TO: (top), EDIT TITLE (bottom)]. There is a total of sixteen spaces with the complete ASCII character set available to use in naming presets. To enter the Title Edit Mode, press the MIDI/MIX TITLE button and then press the VALUE UP button once. [Title Edit] appears in the top half of the display and a cursor appears in the bottom half. Use the Value buttons to select characters, the Select buttons to position the cursor. You may find that depressing the Value buttons with single pushes works better at first. Press the Store button to save your title. The title is in the upper half of the LCD Display and any 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 buttons 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 button to escape to KEYPAD Mode.

DRY/MIX ASSIGN INPUT, POST DYN EFX
Assigns the path of the input signal to go directly to the dry side of the MIX control or through the dynamic section of the SGE MACH II first.

INPUT

Select INPUT if you desire dry signal to be present at the outputs when the MIX slider is set to the left. In this configuration, the MIX control will vary the amount of input (dry) and processed signal. With the MIX control fully to the left, only the dry signal is heard. Fully to the right permits only the wet signal to be present at the output(s).

NOTE: When the Dry Mix Assign is set to Input, the dry signal retains the individual left/right characteristic. This means the left input signal will appear at the left output only and the right input will appear at the right output only if both inputs and outputs are used.

POST DYN EFX

The output of the dynamic section is present when the MIX control is set fully to the left and POST DYN EFX (DYN EFX = dynamic effects) is the selected parameter.

NOTE: There may be more gain present in this configuration determined by which dynamic effects are selected and where their LEVEL parameters are set. As the slider is moved towards the right, more digital processed signal is mixed in at the output. Remember, the dynamic section drives into the digital section using this setting. You may have to tailor your gain into the digital section by adjusting the dynamic output level parameters. Use the Output level parameter of the Expander for an overall level control for the preset.

NOTE: Left and Right input signals will be combined and appear at both outputs when POST DYN EFX is selected.

EXT SW MODE
EXTernal SWitch MODE: BYPASS ON/OFF, SAMPLE-TRIGGER, INCRement PROGramS

Programs REMOTE jack for BYPASS, SAMPLE-TRIGGER 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.

Enabling the MIDI functions
Press the MIDI/MIX TITLE button
Press the SELECT> button two times to change **PM** enable or three times to change PROG enable. Use the VALUE UP or DOWN buttons to set a value. To exit MIDI mode, press the MIDI/MIX TITLE button.

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

Setting The MIDI Channel
Press the MIDI/MIX TITLE button.

Press the SELECT> four times. Use the VALUE UP/DOWN buttons to select the channel number. To exit MIDI MODE, press the MIDI/MIX TITLE button.

OMNI MODE ON, OFF
Sets MIDI OMNI mode on or off.

Setting the OMNI Mode
Press the MIDI/MIX TITLE button. Press the SELECT> button five times. Use the VALUE UP/DOWN buttons to turn OMNI ON or OFF. To exit MIDI MODE, press the MIDI/MIX TITLE button.

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

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.

Editing MIDI Program Table

The MIDI Program Table allows the SGE MACH 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.

NOTE: MIDI program numbers 0-127 will recall presets 1-128.

To edit the MPT: Press the MIDI/MIX TITLE button. Press the SELECT> until the display reads [MIDI PROG = #] at the top and [PRESET = #] at the bottom. (The [#] sign defines some number). 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. The cursor shifts to the number in the lower half of the display. Now select the preset number you want recalled when that program number is accessed using the VALUE UP/DOWN buttons. Continue editing if necessary.

To exit MIDI MODE press the MIDI/MIX TITLE button.

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

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.

IMPORTANT NOTE: WHEN RECEIVING PRESETS, OR MPT INFORMATION FROM ANOTHER SGE MACH II OR MIDI STORAGE DEVICE, THE MERGER MUST BE OFF.

Editing MIDI Merger

The MIDI Merger serves a useful function in the SGE MACH II. With this feature you are able to "echo" MIDI information to other MIDI devices in line with the SGE MACH 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 SGE MACH 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/MIX TITLE button.
-Press the SELECT> button eight times.
-Use the VALUE UP/DOWN button to either turn the Merger ON or OFF.
-Press the MIDI/MIX TITLE button to exit the MIDI MODE.

MIDI EVENT data MONITORING MODE

When you select this Mode, MIDI information is displayed in easy to read and understand or technical terms. The LCD displays certain MIDI events as they occur, regardless of which MIDI channel is selected. Information displayed is the MIDI event itself, its attributes with a choice of display formats (in either decimal or hexadecimal base 16).

For detailed information, please refer to the MIDI DATA MONITOR section in Appendix A.

LCD VIEW ANGLE

Allows the viewing angle of the LCD Display to be adjusted. 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 SGE MACH II is above you, adjust the view angle with the lower numbers.

Changing the View Angle

-Press the MIDI/MIX TITLE button.
-Press the Select> button ten times.
-Use the Value Up and Down buttons to adjust the view angle.

SOFTWARE VERSION LEVEL

Displays the software revision level currently installed in the SGE MACH II.

Viewing the Software Level

There is a way to correctly identify the software version residing in the unit.
-Press the MIDI/MIX TITLE button.
-Press the SELECT> button eleven times.

The current version as well as the date will be displayed in the LCD. The SGE MACH II's software is contained in a socketed EPROM and is field replaceable. This software controls the SGE MACH II's functions as well as its sounds.

SEND PRESET

Dump a single preset via MIDI to another SGE MACH II or MIDI storage device, hit UP or DOWN button.

Sending Preset and MPT Information

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

IMPORTANT NOTE: WHEN RECEIVING PRESETS, OR MPT INFORMATION FROM ANOTHER SGE MACH II OR MIDI STORAGE DEVICE, THE MERGER MUST BE OFF.

Press the MIDI/MIX TITLE button. Use the SELECT buttons to select the appropriate command. Follow the directions listed by the LCD Display. To exit the MIDI MODE, press the MIDI/MIX TITLE button.

IMPORTANT NOTE For:

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

IMPORTANT NOTE: WHEN RECEIVING PRESETS, OR MPT INFORMATION FROM ANOTHER SGE MACH II OR MIDI STORAGE DEVICE, THE MERGER MUST BE OFF.

SEND ENTIRE MPT

Dump entire MPT via MIDI to another SGE MACH II or MIDI storage device, hit UP or DOWN button.

Sending Preset and MPT Information

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

IMPORTANT NOTE: WHEN RECEIVING PRESETS, OR MPT INFORMATION FROM ANOTHER SGE MACH II OR MIDI STORAGE DEVICE, THE MERGER MUST BE OFF.

Press the MIDI/MIX TITLE button.
Use the SELECT buttons to select the appropriate command. Follow the directions listed by the LCD Display. To exit the MIDI MODE, press the MIDI/MIX TITLE button.

IMPORTANT NOTE For:

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

SEND ALL PRESETS

Dump all presets via MIDI to another SGE MACH II or MIDI storage device, hit UP or DOWN button.

4

Sending Preset and MPT Information

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

IMPORTANT NOTE: WHEN RECEIVING PRESETS, OR MPT INFORMATION FROM ANOTHER SGE MACH II OR MIDI STORAGE DEVICE, THE MERGER MUST BE OFF.

Press the MIDI/MIX TITLE button. Use the SELECT buttons to select the appropriate command. Follow the directions listed by the LCD Display. To exit the MIDI MODE, press the MIDI/MIX TITLE button.

IMPORTANT NOTE For: Receiving Preset and MPT Information

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

PRESET MEMORY ALLOCATION
MEMORY USED=
AVAILABLE=

Displays how much user memory has been used and how much user memory is available for further storage. for more information.

You now have a Utility that informs you how much User Preset Memory has been used or how much memory there is available for storing presets. When you first access user memory there are approximately 6000 bytes (6 Kbytes) of space available. Each time you store a preset more space is used up. As a rule of thumb, a preset uses approximately 30 bytes. Sometimes the display will inform you that there is space available, but you are not allowed to store any more information.

Viewing Memory Data
-Press the MIDI/MIX TITLE button.
-Press the Select < button three times.
-To exit MIDI Mode, press the MIDI/MIX TITLE 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 1-110 LOCKED/UNLOCKED

Allows the first 110 presets to be overwritten or protected from overwrite. Use the VALUE buttons to select LOCKED or UNLOCKED status. The factory presets may be unlocked for editing. When you set the value for Unlocked, all factory presets are unlocked and ready to edit. To relock the presets, select the Locked value when you are done editing. 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.

EDIT MODE CONTROL BUTTONS

RECALL/ENTER

The RECALL/ENTER button is used to Recall presets and to Enter or Delete effects when using the ADD or DELETE EFFECT button while in the Edit Mode. To Recall a preset (the Seven Segment Display will be flashing a Preset number), select the proper Preset 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. To do this we must first have a virgin preset. While in Keypad Mode, enter 1-5-1, [blank title/no effects] is displayed indicating a blank preset. A full description of available effects is found later in this manual. **MAKE SURE YOU ARE IN THE EDIT MODE** (Press the grey button). Press the ADD EFFECT button once, notice that lower half of the LCD Display reads [ADD:HAR-EXCITER?]. Press the button again, [ADD:EQUALIZER?] is displayed. Continue to press the button until the display reads <no effects>. **This will be twenty-six more button pushes indicating there are twenty-seven 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. Doing this inserts the effect temporarily in memory. If audio is passing through the SGE MACH II, you will hear the effect when you press the ENTER button.

To escape from ADD EFFECT, press either the VALUE UP or DOWN button or press the KEYPAD/EDIT MODE button.

It doesn't stop there! There are many sub variables of each effect to be explored. Right now let's just worry about operation and not the effects themselves. To simplify matters let's step through an example depicting the selection of seven 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 as it appears in the LCD.

-Enter EDIT MODE. (press the grey button)
-If you are not viewing preset 151, Use the PRESET SELECT buttons to scan up to preset 151.
-Press the RECALL/ENTER button [<blank title>, <no effects>].
-Press the ADD EFFECT button once, [ADD:HAR-EXCITER?].
*We are not going to choose this effect.
-Press the ADD EFFECT button again, [ADD:EQUALIZER?].
-Press RECALL/ENTER.
*You have just entered the equalizer into the chain, bottom display reads [1= EQu].
-Press ADD EFFECT three times, [ADD:DISTORTION?].
-Press RECALL/ENTER. *Now a distortion algorithm is entered into the chain, [2= DST+EQu].
-Press ADD EFFECT twice, enter the CMPSR-LMTR into the chain. *You pressed the ADD EFFECT button twice and then pressed the RECALL/ENTER button), display reads [4= CMP+DST+EQu].
-Press the ADD EFFECT button two more times, [ADD:EXPANDR-GAT?].
-Enter it into the chain (press RECALL/ENTER).[6= CMP+DST+EQu/].
-Press ADD EFFECT four times [ADD:FLANGER?].
-Enter the Flanger into the effects chain [7= CMP+DST+EQu/]
*Hey, what's that diagonal arrow? Why isn't [FLA] in the display?
-Press the VALUE UP button. [7=/DST+EQu+EXP/]
-Press the VALUE UP BUTTON again. [7=/EQu+EXP+FLA]
*Since the display cannot show all of the information, the diagonal arrows indicate more information to be viewed. Use the VALUE UP button to view right and the VALUE DOWN button to view left.
-Press the ADD EFFECT button four times and enter the MONO-DDL-S effect into the chain. [8=/EQu+EXP+DDL+/]
-Press the ADD EFFECT button four more times and enter the REVERB-1 effect into the chain. [9=/EQu+EXP+DDL+/]
*We have just entered all the effects desired for this preset.

IF YOU WISH TO SAVE THIS CHAIN OF EFFECTS AS A PRESET YOU MUST PRESS **STORE** NOW.
-Press STORE.
*The effects we have selected are now stored permanently in preset 151.

You may have noticed a number and a not equals sign at the bottom left hand side of the LCD. This number indicates the number of effects present in the preset. The not equals sign indicates the changes have been made to the original values of the preset. When Store is pressed this character disappears.

What happens if we continue to press the ADD EFFECT? You will notice that we could still add more effects plus MIDI control. Press it and watch the LCD. It will display the available effects (including MIDI Control) that could be added to this preset. 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:CMPSR-LMTR?]
*Let's delete this effect.
-Press RECALL/ENTER, [EQu+DST+EXP+/].
*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].

SAMPLE/TRIGGER

YOU MUST BE USING A PRESET SET UP FOR SAMPLING AND IN THE EDIT MODE FOR THIS FUNCTION TO OPERATE

This button accesses two parameters for the Sampler algorithm. It allows you to either "grab" a sample of the program material or play back that portion (sample) of material you "grabbed."

For a full programming and use of the Sampler feature please go to APPENDIX A for a complete application.

When you first recall a Sampler preset it is usually geared up and ready to grab a sample. All you need to do is press the SAMPLE/TRIGGER button to "record" that portion of material you want as a sample at the appropriate time. Once you do this the sample is ready to be used.

Now you may replay this sample as recorded at any time by pressing the button again. If the PLAY parameter is set in the SINGLE position and you hit the button quickly and repeatedly, you will get that stuttering "rap" effect. When the MIX control is in any position except totally wet or dry, the sampled sound can be played back by hitting the button or using a footswitch connected to the properly programmed REMOTE jack.

You may determine the length of the sample time regardless of what the Length parameter is set for in the Preset with this button. Say your Length is set for 2.00 seconds and you feel the length should end at a specific point. All you need to do is press the SAMPLE/TRIGGER button once when you feel the sample should stop. This automatically sets the Length parameter for that amount of time. [It takes approximately two seconds to say out loud one thousand one, one thousand two. To get a recorded sample length of one second, press the SAMPLE/TRIGGER button right after you say one thousand one. This is an example of using the button to manually determine the record time length.]

Note: You will have to reset the LENGTH parameter back to its original value if the full length is required. To do this simply hit the RECALL button, doing this will restore the LENGTH parameter to its original value without affecting the "recorded" sample. (It is assumed that the preset has been STORED)

To reset the SGE MACH II to record a new sample, press the VALUE UP button.

NOTE: The LCD must be displaying the STATus of the sampler. (ex. [SMP:STAT=IDLE].) This will re-arm the STATus to RECord-REadY. Press the SAMPLE/TRIGGER button to record a new sample.

Remember, if you changed the length, you must either recall the preset or adjust the LENGTH parameter for the sample time desired.

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 phrase [LOCKED/SELECT LOCATION 111-200] appears don't panic. Presets 1 through 110 are the factory presets and though the parameters may be changed, the new values cannot be stored without first UNLOCKING the presets (see MIDI/MIX TITLE section).

TO DELETE A STORED PRESET, thereby releasing its memory to be used again, you must store a null preset at the preset number you wish to delete. A null preset consists of a blank title (all spaces, displayed as <blank title>) and no effects (displayed as <no effects>). Because of this, we recommend that you save one preset that is already blank to make it easy to delete stored presets. Presets 110 through 200 are null when you receive your unit or after a factory reset.

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 cursor left and right buttons 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. [EQu:POSN=POST] This is an EQ variable. Press the button again. [EQu:100Hz = 0db] The Equalizer 100Hz filter band variable is displayed. The next twenty-four times you press the SELECT> button, the display will show the selected parameter variables for all the effects stored in this preset. Use 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 effects are now displayed. [9 CMP+DST+EQu/] 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.

When more than four effects are in a preset, you may view the additional effects by using these buttons. Diagonal arrows at either end of the LCD indicate there is more information to be viewed. Press the VALUE UP button to view right and the VALUE DOWN button to view left.

I know you're still in preset 151! Press the RECALL button. Press the SELECT> button nine times [DST:TURBO-DIST 2]. 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 Distortion TYPE 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. [9= 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.

REMOTE JACK

The REMOTE jack may be programmed to either bypass the SGE MACH II or access the Increment Preset Mode. A footswitch and any two conductor cable is intended to be used with this jack. A momentary (normally open) switch should be used. 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 increment through a set of presets. The jack may also be programmed to allow a footswitch to be used for the accessing the SAMPLE/TRIGGER function when using the Sampler program.For examples of how to program the REMOTE JACK see Appendix B.

PERFORMANCE MIDI   [PM]

Performance Midi allows the SGE MACH 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.

There is also a means to monitor MIDI information being sent to the SGE MACH II. While you are in the PM Mode you can select the MIDI Monitor utility and verify MIDI data being sent to the device. Refer to Appendix B for additionnal information regarding the use of the MIDI DataMONITOR.

You may add Performance MIDI to any of the factory presets which would benefit to the addition of real time MIDI control. A factory preset with a number in the lower right corner of the LCD (# of MIDI controllers) indicates PM is included. 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 CONTROLING, and in the bottom half, the effect and parameter to be controlled. The MIDI DataMONITOR may be selected for use in this screen.

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.) At the bottom of the list is the MIDI Monitor Utility. Select this utility to view MIDI data being sent to the SGE MACH II.

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.

You may also view MIDI data with this screen too. You are allowed to change MIDI controllers and view the corrosponding data in this screen. The top half of the display will show the numerical value of the MIDI data being received by the SGE MACH II. Displayed in the bottom half is the actual MIDI controller being used. Use the Value Up or Down key to change the MIDI controller. When you change the controller, its MIDI data will be displayed in the top half of the LCD.

Please refer to Appendix B, **Setting up a preset with MIDI Control** and **Using the MIDI DataMONITOR** for an in-depth programming reference example.

7

DESCRIPTION OF ALGORITHMS

In all, there are twenty-eight separate *categories* of algorithms for you to choose from when 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. Twenty-two of these are digital effects and the remaining six are dynamic effects. The dynamic effects are located at the beginning of the effects chain.

There are some digital categories that cannot be combined together. All six of the dynamic categories can be combined and then added to a digital effects chain. Rather than tell you which effects cannot be combined, the SGE MACH 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 SGE MACH II will also automatically limit the extent of the algorithms control range.

NOTE: When setting up your own presets, select the digital effect you want most in your effects chain first. By doing this, you are able to determine what other effects may be combined with the selected effect.

DYNAMIC EFFECTS

HARMONIC EXCITER [HAR-EXCITER], [EXC]
Parameters:
:POSN= POST, PRE [PRE]
:RANGE= OFF, 0 to 100% in % increments [86%]

The Harmonic Exciter is an exotic level and attack sensitive circuit which accents the natural harmonic content of a signal and gives it a brilliant edge. For live sound, its use will make a vocal brighter and much more intelligable. In the studio, any source will sound much more open and natural. With a guitar, it can punch a solo through the din of heavy line amplification and add a cutting edge to fast leads.

The Harmonic Exciter should be used when you want to enhance or bring new life to an instrument and add clarity to vocals in a mix. The position in the signal chain may be put inn front of the Compressor or after the Distortion effect. The RANGE parameter adjusts the threshold of the effect. More effect is perceived as the range approaches 100%.

EQUALIZER [EQUALIZER], [EQu]
Parameters:
:POSN= POST, PRE [POST]
:100Hz= 0, +3, +6, +12, -3, -6, -12 db [0db]
:1KHz= 0, +3, +6, +12, -3, -6, -12 db [0db]
:10KHz= 0, +3, +6, +12, -3, -6, -12 db [0db]

Use this equalizer to boost or cut these three frequency bands. It acts much like BASS, MID or HIGH tone controls. Position in the chain may be first (if the Harmonic Exciter is not in the chain) or after the Compressor and Distortion.

COMPRESSOR and LIMITER [CMPRSR-LMTR], [CMP]
Parameters:
:SLOPE= OFF, 2:1, 4:1, LIMIT [4:1]
:DRIVE= 12 to 100% IN % increments [75%]
:RELEAS= SLOW, QUICK [QUICK]
:OUTPUT= 12 to 100% in % increments [75%]

When the Compressor is added to the effects chain, the display indicates two effects added, the Compressor and the Peak Limiter.

The Compressor and Limiter may be used on a studio vocal track to smooth out peaks and dips and prevent the tape from being overloaded. In live sound, patch it in on a vocal or instrumental sub-group and use it to function as a master dynamics controller. Peaks will be limited to prevent overdriving the effects buss. With a guitar the compressor can be used to provide increased gain and sustain so single notes can be as loud as chords and sustain much longer. On a bass guitar the Compressor-Limiter can increase sustain and control the dynamic difference between plucked or slapped strings.

For a small amount of compression with vocals use a 2:1 slope. For good guitar sustain, use a 4:1 slope, a lot of drive with the release set at slow. Use the Limiter to really crunch your signal and protect your speakers.

This effect is a true RMS compressor with a fixed peak limiter. The SLOPE parameter selects the compression slope. DRIVE adjusts the maximum amount of gain covering a 30dB range in eight steps. RELEASE may be set to either FAST or SLOW. The release function is defined as the rate at which the gain increases as the input signal drops. NOTE: The Fast setting releases so quickly, the source loses most of its dynamics. To increase this effect even more, set the Slope higher. The OUTPUT of this effect is adjustable in 3dB steps over a 24dB range. Unity gain is achieved when the Output is set to 100% and the Slope is set to OFF. The output level of the compressed signal is 0dB with the OUTPUT parameter set to 75%. If the OUTPUT is set at 100%, the Limiter will dominate the attack characteristics. The Peak Limiter threshold is fixed at +3dB and is defeated only when the Slope is set to OFF. If the signal exceeds the fixed threshold, the gain is reduced almost instantly.

DISTORTION [DISTORTION], [DST]
Parameters:
:TYPE= OFF, OVER DRIVE (1,2,3),
DISTORTION (1,2,3), TURBO-ODRV (1,2,3), TURBO-DIST (1,2,3),
[TURBO-DIST 2]
:DRIVE= 12 to 100% in % increments
:BITE= OFF, ON [ON]
:OUTPUT= 12 to 100% in % increments [87%]

Twelve different types of distortion are available! Use the Overdrive type distortion when subtle distortion is required. For clipping distortion use the Distortion type. The Turbo types are bass frequency enhanced for fuller bottom sounds. Bite allows for harmonics to figure more prominently in the character of the distortion and to add a sharp edge to the sound. Modification of the type of distortion can be done by adjusting the DRIVE parameter and turning BITE on and off.

EXPANDER/GATE [EXPANDR-GAT], [EXP]
Parameters:
:TYPE= OFF, EXPANDR, N-GATE, EXP+GAT, ENVFILT [EXP+GAT]
:SRCE= INPUT, POST-CP, OUTPUT [INPUT]
:RANGE= 12 to 100% in % increments [62%]
:TUNING= 12 to 100% in % increments [100%]
:OUTPUT= 12 to 100 % in % increments [100%]

When the Expander-Gate is added to the effects chain, the display indicates two effects added, the Expander and the Noise Gate.

The Expander section may be programmed as just an expander to be used for subtle dynamic noise reduction. Program it for a standard noise gate for noise reduction starting at a certain threshold level. Using the combination of the two provides both dynamic and pre-determined noise reduction. The Expander may also be programmed as a dynamic envelope filter which re-creates the sound of the vintage waa-waa pedals.

The Expander has a slope of 1.5:1 and the Gate (an expander with a higher slope) has a slope of 3:1. Above the threshold, both types are unity gain. The Envelope Filter is a high Q sweepable Low Pass Filter with a range of 30:1. The Tuning parameter sets the sweep range covering a two octave range. At 100% the sweep range is 110Hz to 3.5KHz. A sweep range of 28Hz to 875Hz is set when the parameter is set at 12%. The RANGE parameter sets the threshold for these effects in eight steps from 12 to 100%. The highest threshold or least sensitive setting is 100%. The Gate threshold is set 12dB below the Expander threshold.

NOTE: If you experience the loss off sustain or the signal cuting off before you want it to with the Expander-Gate in the effects chain, reduce the Range parameter to less than fifty percent. The Range parameter determines the threshold point of the noise gate therefore determining when the signal is chopped off.

LINE EQUALIZER [LINE-EQ],[LEQ]
Parameter:
:TYPE= WARM SS, BASS SS, EDGE SS [WARM SS]

The Line-Eq lets you select three different speaker cabinet curves to be used with the preset.

DIGITAL EFFECTS

LOW PASS FILTER [LOW-PASS],[LPF]

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

There is one algorithm defining the Low Pass Filter. This effect will always be placed at the front of the digital 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 [FLANGER], [FLA]

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 SGE MACH 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.

CHORUS [CHORUS], [CHO]

Parameters:
:TYPE= POST, PRE, OFF (two algorithms) [POST]
:WIDTH= 0 to 100 percent in % increments [35%]
:SPEED= 0 to 15 [8]
: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.

PITCH-TRANSPOSER [PITCH-TRANS], [PTr]

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 SGE MACH II, Smooth, Normal and Quick. 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.

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 are found in APPENDIX A.

PANNER [PANNER], [PAN]

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-DDL-S], [DDL]

Mono Digital Delay—Short
Parameter:
:DELAY = 0 to 1600 ms [50ms] increments:5ms;0-250, 10ms;250-500 20ms;500-1200, 50ms;1200-1600

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-DDL-L], [DDL]

Mono Digital Delay—Long
Parameter:
:DELAY = 0 to 1800ms [125ms] increments:5ms;0-250, 10ms;250-500 20ms;500-1200, 50ms;1200-1800

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 [REVERB-1], [REV]

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.

REVERB-2 [REVERB-2], [REV]

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 [83%] 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 [REVERB-3], [REV]
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 [GATE-VERB-1], [GAT]
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%]

GATE-VERB-2 [GATE-VERB-2], [GAT]
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= 60 to 100 percent in four increments of 20% [100%]
definition: Diffusion
:LEVEL = 0 to 100 percent in % increments [100%]

GATE-VERB-3 [GATE-VERB-3], [GAT]
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.

The difference between normal reverb decays and decays when a gated program is the normal decay gradually fades into nothing while the gated decay ends 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.

TAP'D-DDL-S [TAP'D-DDL-S], [DDL]
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 1600ms [100ms] increments:5ms;0-250, 10ms;250-500
20ms;500-1200, 50ms;1200-1600
:LEVEL= 0 to 100 percent in % increments [100%]

TAP'D-DDL-L [TAP'D-DDL-L], [DDL]
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 1800ms [240ms] increments:5ms;0-250,
10ms;250-500 20ms;500-1200, 50ms;1200-1800
:LEVEL= 0 to 100 percent in % increments [100%]

There are three levels of tapped delays in the SGE MACH II. These are what we call Even (E), Shortened (S), and Lengthened (L). (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 increases in amplitude exponentially as the signal approaches the end. Forward exponentially decreases in amplitude as the signal approaches its end point. TYPE 3 taps are dense and full. Use the longer tapped delay programs to add some expansiveness to short reverb patches. Use the longer tapped delays especially the Sloped algorithms to create a fundamental front end reverb.

REGEN-DDL-S [REGEN-DDL-S], [DDL]
Regenerated Digital Delay—Short
Parameters:
:DELAY= 0 to 1600ms [100ms] increments:5ms;0-250, 10ms;250-500
20ms;500-1200, 50ms;1200-1600
: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 [REGEN-DDL-L], [DDL]
Regenerated Digital Delay—Long
Parameters:
:DELAY= 0 to 1800ms [200ms] increments:5ms;0-250,
10ms;250-500
20ms;500-1200, 50ms;1200-1800
: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 [STREO-DDL-S], [DDL]
Stereo Digital Delay—Short
Parameters:
:DLY-L= 0 to 1800ms [80ms]
definition: Delay Time Left Channel
:DLY-R= 0 to 1800ms [110ms]
definition: Delay Time Right Channel
increments:5ms;0-250, 10ms;250-500
20ms;500-1200, 50ms;1200-1800
: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 [STREO-DDL-L], [DDL]
Stereo Digital Delay—Long
Parameters:
:DLY-L= 0 to 2000ms [250ms]
definition: Delay Time Left Channel
:DLY-R= 0 to 2000ms [125ms]
definition: Delay Time Right Channel increments:5ms;0-250,
10ms;250-500 20ms;500-1200, 50ms;1200-2000
: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 STREO-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.

SAMPLER-S Sampler-Short
Parameters:
STAT=REC-RDY, PLAY, IDLE [REC-RDY]
RECORD=AUTO, MANUL, MIDI [AUTO]
PLAY=SINGLE, REPEAT, MIDI [SINGLE]
LENGTH= 0.02s to 1.70s in 20 ms increments [1.70s]
START= 0 to 100ms [5ms]
LEVEL=0 to 100 percent in % increments [100%]

SAMPLER-L Sampler-Long
Parameters:
STAT=REC-RDY, PLAY, IDLE [REC-RDY]
RECORD=AUTO, MANUL, MIDI [AUTO]
PLAY=SINGLE, REPEAT, MIDI [SINGLE]
LENGTH= 0.02s to 2.00s in 20 ms increments [2.00s]
START= 0 to 100ms [5ms]
LEVEL=0 to 100 percent in % increments [100%]

SAMPLER+PTr
Sampler Plus Pitch Transposer
Parameters:
STAT=REC-RDY, PLAY, IDLE [REC-RDY]
RECORD=AUTO, MANUL, MIDI [AUTO]
PLAY=SINGLE, REPEAT, MIDI [SINGLE]
LENGTH= 0.02s to 2.00s in 20 ms increments [2.00s]
START= 0 to 100ms [5ms]
PITCH= (-)12 to (+)12 half steps in 1 half step increments [0]
FINE=(-)1.00 to (+)1.00 half steps in 0.06 cent increments [0.00]
BASE KEY=OFF, 1 through 127 (key note on) [OFF]
LEVEL= 0 to 100 percent in % increments [100%]

Use the Short Sampler, [SAMPLER-S] when you want to combine a sampled sound with reverb. The algorithms from reverb groups one and two are available. Every time the sample is played back it will be subjected to the reverb parameters you have set.

The Long Sampler [SAMPLER-L] should be used when you require two full seconds of sampling time.

You should use the Sampler with Pitch Transposer [SAMPLER+PTr] algorithm when you want to shift the pitch of the sample during playback. Each time the sample is played back it will be subjected to the pitch parameters set.

The Equalizer [EQ] acts as a high frequency rolloff to the signal before it is sampled and may be added to all three algorithm choices.

If you select the MIDI option in either the Record or Play parameter, you are enabling the SGE MACH II to be triggered from MIDI Note On messages.

The front panel Trigger always works.

You may program the Remote Jack to access the Sample/Trigger feature.

BASE KEY in the SAMPLER + PTr algorithm has no effect on triggering samples.

See APPENDIX A, for more information regarding the SAMPLER.

MISCELLANEOUS

Battery Backup
When power is terminated to the SGE MACH 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/MIX TITLE button, press the SELECT> button eleven times. The current version as well as the date will be displayed in the LCD. The SGE MACH II's software is contained in a socketed EPROM and is field replaceable. This software controls the SGE MACH 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 SGE MACH II. Please be sure to write in your serial number. If you do not wish to mutilate your manual, you may send a copy of the registration form.

Factory Reset
There is a Factory Reset sequence which will reinitialize the SGE MACH II to ALL of its original values. Be sure you have either downloaded or kept a written record of your Presets since they will be eliminated. To perform a Factory Reset,press and hold the PRESET DOWN, ADD EFFECT and SAMPLE/TRIGGER buttons simultaneously.

Preset Worksheet
A Preset Worksheet is located in the back of the manual. Use this sheet to record favorite presets for future reference. We suggest you make copies of this worksheet first.

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 SGE MACH II is predominantly digital, it must inter-face with analog audio signals. The Input Processing stage buffers between the audio source and the SGE MACH 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 con-version the numbers are then stored in memory.

At the heart of the SGE MACH 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 SGE MACH 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 com-parison. A lithium battery preserves the presets when AC power is removed.

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) Call the factory for a Return Authorization Number. This number is used for tracking and proper routing of your unit. If we receive a box without an RA#, it may be refused!

4) Pack the unit in its 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.

5) 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.

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

7) To obtain an RA#, or 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.

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 pur-chaser 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 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 SGE MACH 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.

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

When using Distortion, you may increase saturation by running the input slider wide open.

NOTE: Presets may have varying output levels. Output level may be programmed in a preset by using an algorithm such as REVERB or DELAY. Algorithms such as these have a LEVEL parameter which may be set to vary the presets output level. We recommend that you set the front panel sliders for optimum dynamic range and vary the output level of the presets by programming the LEVEL parameter.

For the effects that have the 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.

To control the overall output level of a preset, use the Level parameter of the Expander. If the preset does not have the Expander in it add only the Expander.

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.

Number of Half Steps	/	Interval
1	/	Half Step, Semitone, Minor Second
2	/	Whole Step, Whole Tone, Major
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.). 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.

SAMPLER

At first, you may think the sampler is difficult to operate. This is not true! Once you've played around with the sampler a few times you'll see how easy it is. To get you started, we'll use one of the sampler Factory Presets as a working example.

Recall preset 104, MANUAL SAMPLER. As the title implies this sampler is manually triggered by you. First, let's review the parameters that are used.
-Press the EDIT button.
-Press the SELECT> button once. This parameter determines the status [STAT] of the sampler. Right now it is telling you that the sampler is ready to record [REC-RDY].
-Press the SAMPLE/TRIGGER button. Watch the display. At first it reads [SAMPLER/RECORDING], then reads [=RECRDNG] and finally stops at [=IDLE]. When the button was pushed a sample recording was made. If you had signal present you would now have a 2 second sample in memory. When the status is indicated as "idle" it means there is a sample residing in memory ready to be played or to be recorded over.
-Press the SAMPLE/TRIGGER button again. Watch the display. At first it reads [SAMPLER/PLAYING], then reads [=PLAY] and finally stops at [=IDLE]. When the button was pushed, the sample residing in memory was played. The status is now "idle" meaning it is ready to be played again or recorded over.
-Press the SELECT> button again. The manner in which the sample is recorded is now displayed, [RECORD=MANUL]. This means that you must press the SAMPLE/TRIGGER button to start recording a sample.
-Press the VALUE down button. The display changes to [=AUTO]. When the record parameter is set on auto and the status is record-ready, the sampler starts recording the sample when signal is applied to the EXT. This eliminates the need to press the Sample/Trigger button to start recording. Of course you may still manually start the sample by hitting the Sample/Trigger button.
-Press the SELECT> button again. How the sample is played back is what this parameter sets. The display now reads [PLAY=SINGLE] indicating that when the sample is played it will only play once.
-Press the VALUE up button. The display changes to [=REPEAT]. Now when the Sample/Trigger switch is pressed once, the sample will continue to play until the button is pressed once more.
-Press the SELECT> button again [LENGTH=2.00s]. This parameter sets the length of the sample time. Right now it is set at the maximum time of two seconds. Use the Value up or down buttons to change the sample time. You may change the length of the sample even when it is stored in memory.
-Press the SELECT> button [START= 0ms]. The Start parameter allows you to tailor the starting edge of the sample.
-Press the SELECT> button one more time [LEVEL= 100%]. The LEVEL parameter allows you to adjust the output level of the Sampler effect.

Recall the different sampler presets and experiment with them. View the parameters and change them to get a good feel for what they are doing.

MEMORY

You now have a Utility that informs you how much User Preset Memory has been used or how much memory there is available for storing presets. When you first access user memory there are approximately 6000 bytes (6 Kbytes) of space available. Each time you store a preset more space is used up. As a rule of thumb, a preset uses approximately 30 bytes. Sometimes the display will inform you that there is space available, but you are not allowed to store any more information.

MIDI DATA MONITOR

The SGE MACH II has 2 MIDI features collectively called "MIDI DATA MONITORing". These include the Performance MIDI™ Data Monitor, referred to as [DM] and the MIDI EVENT MONITOR, referred to as [MEM].

PERFORMANCE MIDI Data Monitor [DM]

This Data Monitor allows a user, while viewing a Performance MIDI (PM) controller's definition under "EDIT MODE", to see the data associated with the MIDI event selected to control an effect's parameter unaltered. A user having selected MOD WHEEL to control reverb decay time can optionally see the MOD WHEEL values themselves without having it affect reverb decay time. This feature serves as a MIDI setup debugging tool. You can determine if the MOD WHEEL

is in fact being seen by the unit, particularly if you are unsure about the scale value and as a result, see little or no change of the particular effect parameter's value.

You enter DM Mode while in "EDIT MODE" viewing the first window of a PM controller definition, by using the VALUE down button to move past all available effect parameters to the message, "MIDI DataMONITOR". See below for examples. The 2nd window stills reads the same. The 3rd window changes in DM Mode. The top line displays ["#n DATA IS"]. This line will show the actual data value associated with the selected MIDI event, as they are received. The space after "DATA IS" stays blank until the unit receives the selected event. The bottom line is identical to the 2nd window bottom line and you are able to select MIDI events in this window by using the VALUE Up/Down keys, without having to go back to the 2nd window. Whenever a new MIDI event is selected under DM, the portion of the window that displays the actual value is blanked until the new MIDI event data is received.

Example of PERFORMANCE MIDI Controller Definition Screens

```
Screen      #1
+ ——————————— +
+#2  IS  CONTROLING+
+REV:DECAY   =  1.2s+
+ ——————————— +

Screen      #2
+ ——————————— +
+#2  CONTROLLER  IS+
+MC  1:MOD  WHEEL  +
+ ——————————— +

Screen      #3
+ ——————————— +
+#2  SCALE  IS  +  50+
+REV:DECAY   =  1.2s+
+ ——————————— +
```

Example of same PM Controller, in MIDI Data Monitor Mode:

```
Screen      #1
+ ——————————— +
+#2  IS  CONTROLING+
+MIDI  DataMONITOR+
+ ——————————— +

Screen      #2
+ ——————————— +
+#2  CONTROLLER  IS+
+MC  1:MOD  WHEEL  +
+ ——————————— +

Screen      #3
+ ——————————— +
+#2  DATA  IS  +   +
+REV:DECAY   =  1.2s+
+ ——————————— +
```

After receiving data from the selected MIDI event:

```
Screen      #3
+ ——————————— +
+#2   DATA  IS  037+
+MC  1:MOD  WHEEL  +
+ ——————————— +
```

After selecting a new MIDI event (Pitch Bend) but before the new event is received:

```
Screen      #3
+ ——————————— +
+#2   DATA  IS   +
+PITCH  BEND  WHEEL+
+ ——————————— +
```

Each controller can be left in DM mode independently of others that might be defined.

NOTE: If data from the selected MIDI event is received before Screen #3 (the DM "DATA IS" window) is actually being viewed, the data seen when #3 is in view will be the last event received (this is different from the MIDI Event Monitor which shows you MIDI events received only AFTER MEM mode is invoked).

MIDI EVENT MONITOR [MEM]

The MIDI EVENT MONITOR (MEM) feature is available under MIDI/Utility.

Its MIDI monitoring capabilities are much more extensive than DM. This mode shows the user an "English-ed" version of certain MIDI events as they occur, regardless of MIDI channel. The information displayed shows the type of MIDI event and its attributes with a choice of display formats, called "English-ed" or "Raw Data". Each of these formats offers a choice of display numeric info in either decimal or hexadecimal (base 16, a convenient format for experienced MIDI users).

MEM works like this: When MEM mode is selected from the MIDI/Utility menu the LCD will display:

```
+ ——————————— +
+MIDI  EVENT  data  +
+MONITORING MODE +
+ ——————————— +
```

The unit is now ready to display the following types of MIDI Events:

MIDI CONTROLLERS:

All, 0 thru 120 (MOD WHEEL, MIDI CONTROLLER #001 etc).

CHANNEL VOICE events:

NOTE ON, NOTE OFF: Actual note names and accidentals (Sharp only) shown.

POLYPHONIC AFTERTOUCH (Note names and accidentals).

CHANNEL PRESSURE AFTER TOUCH

PITCH BEND CHANGE

Other MIDI events monitored:

PROGRAM CHANGE

MEM does NOT monitor:

System Exclusive messages

Channel Mode messages (All Notes Off etc.)

Real Time messages (Timing Clock)

System Common messages (MIDI Time Code)

Each MIDI event is displayed depending on which display mode is active. The default display mode is "English-ed" decimal. Using the VALUE Up/Down keys will move through the two display modes (with two numeric formats each). The latest event is reformatted accordingly. In the case of NOTE ON/OFF and POLYPHONIC AFTERTOUCH events, the musical note associated with the event has its note name displayed next to the numeric value of the note.

Examples:

"ENGLISHed"   "RAW DATA" Mode

PITCH BEND event

Decimal Screen #1	Hexadecimal #2	Decimal #3	Hexadecimal #4
+PTCHBND=225 CH02 +	+PTCHBND=E1h CH02 +	+225 000 064 +	+E1h 00h 40h +
+LSB=000 MSB=064 +	+LSB=00h MSB=040h +	+LSB=000 MSB=064 +	+LSB=00h MSB=40h +

MOD WHEEL event

Screen #1	#2	#3	#4
+MIDICTL=176 CH01 +	+MIDICTL=B0h CH01 +	+176 001 020 +	+B0h 01h 14h +
+MODWHEEL=001:020 +	+MODWHEEL=01h:14h +	+MODWHEEL=001:020 +	+MODWHEEL=01h:14h +

NOTE ON event(for C# above MIDDLE C)

Screen #1	#2	#3	#4
+NOTE ON=144 CH01 +	+NOTE ON=90h CH01 +	+144 060 064 +	+90h 3Ch 40h +
+060(C#4) VEL=064 +	+3Ch(C#4) VEL=40h +	+060(C#4) VEL=064 +	+3Ch(C#4) VEL=40h +

PROGRAM CHANGE event (Switch to PROGRAM #119)

Screen #1	#2	#3	#4
+PGMCHNG=223 CH16 +	+PGMCHNG=DFh CH16 +	+223 118 +	+90h 3Ch 40h +
+PROGRAM #118 +	+PROGRAM #76h +	+PROGRAM #118 +	+3Ch(C#4) VEL=40h +

The following is a list of the individual MIDI Controller names displayed as such (the rest are displayed as "UNDEFIND"):

DISPLAYED TEXT	ACTUAL NAME	MIDI CONTROLLER #
MODWHEEL	Modulation Wheel	001
BREATH	Breath Controller	002
FOOTCTLR	Foot Controller	004
PORTAtim	Portamento Time	005
DATA msb	Data Entry MSB	006
MAIN VOL	Main Volume	007
BALANCE	Balance	008
PAN	Pan	010/0Ah
EXP CTLR	Expression Controller	011/0Bh
GENERAL1	General Purpose #1	016/20h
GENERAL2	General Purpose #2	017/11h
GENERAL3	General Purpose #3	018/12h
GENERAL4	General Purpose #4	019/13h
DAMP PED	Damper Pedal	064/40h
PORTAMEN	Portamento	065/41h
SOSTENUT	Sostenuto	066/42h
SOFTPEDL	Soft Pedal	067/43h
HOLD 2	Hold 2	069/45h
GENERAL5	General Purpose #5	080/50h
GENERAL6	General Purpose #6	081/51h
GENERAL7	General Purpose #7	082/52h
GENERAL8	General Purpose #8	083/53h
ExtFXdpt	External Effects Depth	091/5Bh
TREM dpt	Tremolo Depth	092/5Ch
CHOR dpt	Chorus Depth	093/5Dh
CELESdpt	Celeste Depth	094/5Eh
PHASEdpt	Phaser Depth	095/5Fh

IDIOSYNCRACIES:

The only accidental displayed is the sharp, "#".

PROGRAM CHANGE events: The actual program number specified in the event is a 0-origin number and will be displayed as such, consistant with the unit's display of program numbers under the MIDI PROGRAM TABLE MIDI/Utility menu item. Thus a MIDI program change event to program #5 is actually a message to go to (excluding mapping via MIDI PROGRAM TABLE) to program #6!

MIDI CHANNEL #s: The display "CHnn" (where "nn" is the channel # associated with a particular MIDI event) shows the channel # as a 1-origin number. Thus a MIDI event with a channel # value of 2 will display as "CH03"!

If, while in MEM mode, the unit is enabled to respond to PROGRAM CHANGE events (and those events occur on the same channel on which the unit is listening) and such an event occurs which causes the unit to switch to a preset that has the SAMPLER effect, a message may display for a few moments indicating that the SAMPLER is RECORD-READY. When this message (or others) is finished, the display will return to the most recent event and display mode.

16

APPENDIX B

EXAMPLES

CREATING A PRESET

-Enter EDIT MODE. (press the grey button)

-If you are not viewing preset 151, Use the PRESET SELECT buttons to scan up to preset 151.
-Press the RECALL/ENTER button [<blank title>, <no effects>].
-Press the ADD EFFECT button once, [ADD:HAR-EXCITER?].
*We are not going to choose this effect.
-Press the ADD EFFECT button again, [ADD:EQUALIZER?].
-Press RECALL/ENTER.
*You have just entered the equalizer into the chain, bottom display reads [1= EQu].
-Press ADD EFFECT three times, [ADD:DISTORTION?].
-Press RECALL/ENTER.
*Now a distortion algorithm is entered into the chain, [2= DST+EQu].
-Press ADD EFFECT twice, enter the CMPSR-LMTR into the chain.
*You pressed the ADD EFFECT button twice and then pressed the RECALL/ENTER button), display reads [4= CMP+DST+EQu].
-Press the ADD EFFECT button two more times, [ADD:EXPANDR-GAT?].
-Enter it into the chain (press RECALL/ENTER).[6= CMP+DST+EQu/].
-Press ADD EFFECT four times [ADD:FLANGER?].
-Enter the Flanger into the effects chain [7= CMP+DST+EQu/]
*Hey, what's that diagonal arrow? Why isn't [FLA] in the display?
-Press the VALUE UP button. [7=/DST+EQu+EXP/]
-Press the VALUE UP BUTTON again. [7=/EQu+EXP+FLA]
*Since the display cannot show all of the information, the diagonal arrows indicate more information to be viewed. Use the VALUE UP button to view right and the VALUE DOWN button to view left.
-Press the ADD EFFECT button four times and enter the MONO-DDL-S effect into the chain. [8=/EQu+EXP+DDL+/]
-Press the ADD EFFECT button four more times and enter the REVERB-1 effect into the chain. [9=/EQu+EXP+DDL+/]

*We have just entered all the effects desired for this preset.

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

-Press STORE.
*The effects we have selected are now stored permanently in preset 151.

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 90 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/MIX TITLE button.
-Press the SELECT< button two times.
-Use the VALUE buttons to select the preset you want to recall.
-Press the RECALL button.
*Even though the title is not displayed in the LCD, 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 110, press the STORE button now.
-Press STORE.
*Notice that when you pressed the STORE button the Factory Preset's title appears in the display.

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/MIX TITLE button.
-Press the SELECT< button once. [PRESET 1..110/ = LOCKED]
-Press the VALUE DOWN button once. [PRESET 1..110/ = UNLOCKED]
-Press the MIDI/MIX TITLE button again.
*The preset is now unlocked. If you wish to store new information in this location, press the STORE button now.

FACTORY RESET

There is a Factory Reset sequence which will reinitialize the SGE MACH 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 SAMPLE/ TRIGGER** buttons simultaneously.

EXAMPLE 1

Editing the MPT from the SGE MACH II front panel controls.

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

-Make sure you are in the EDIT Mode. (Press EDIT button if not)
-Press the MIDI/MIX TITLE button.
-Press the SELECT > button seven 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/MIX TITLE 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 SGE MACH II for that sound. You can do this while you are listening to the SGE MACH II.

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 SGE MACH II has not had its MPT edited.

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

-Make sure you are in EDIT Mode. (Press EDIT button if not)
-Press the MIDI/MIX TITLE button.
-Press the SELECT > button eight 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.

INCREMENT PROGRAM

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 3 illustrates how this is done.

The sequence programmed in Example 3 may be accessed from the front panel. A more useful way of using a programmed sequence is to access the sequence using the REMOTE jack and a momentary footswitch. To access these presets we must program the REMOTE JACK to increment the programs. You can only increment up through the programs. Example 4 describes how program the REMOTE jack to sequence through the ten presets set up in Example 3 with a footswitch. Example five shows how to program the REMOTE jack for normal bypass operation.

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 SGE MACH II.

-Make sure you are in EDIT Mode. (Press EDIT button if not)
-Press the MIDI/MIX TITLE button.
-Press the SELECT > seven 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.)

If you wish to access this sequence from the front panel, you must be in the MPT edit mode. With the cursor in the top half of the LCD ([MIDI PROG= #]), use the VALUE buttons to select the Preset number associated with the Program number.

EXAMPLE 4

Programming the REMOTE jack for Incrementing 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. Remember, you may only increment up when using a footswitch and the sequence cycles through to the beginning.

-Make sure you are in EDIT Mode. (press EDIT button if not)
-Press the MIDI/MIX TITLE button.
-Press the SELECT > button twice. 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 SGE MACH 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.

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.

-Make sure you are in the EDIT Mode. (press EDIT button if not)
-Press the MIDI/MIX TITLE button.
-Press the SELECT> button twice. 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 SGE MACH 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/MIX TITLE button.
-Press the SELECT< button eight 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: LPF, 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 Low Pass Filter (LPF) 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 a blank preset).
-Press the EDIT MODE button.
-Press ADD EFFECT seven times.
-Press the RECALL/ENTER button to add the LPF.
-Press ADD EFFECT seven times.
-Press ENTER to add the FLANGER to the preset.
-Press ADD EFFECT button seven times.
-Press ENTER to add the MONO-DDL-S.
-Press ADD EFFECT seven times.
-Press ENTER to add REVERB-1 to the preset.
*We have added all our effects at this point.
-Press ADD EFFECT seven times.
-Press the ENTER button to add the first of four PM MIDI CONTROL
*Repeat these last two commands three times to add three more PM MIDI CONTROLS to the preset. *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 four times.[DELAY = 50ms]
-Press the SELECT> button once.
-Press the VALUE DOWN button once. [PITCH BEND WHEEL]
-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.[REGEN = 67%]
-Press the SELECT> button once.
-Press the VALUE DOWN button four times.[NOTE ON VELOCITY]
-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.[POSITN= 83%]
-Press the SELECT> button once.
-Press the VALUE DOWN button five times.[NOTE ON KEY #]
-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 46, STUDIO PLATE REV. The effect parameters we will control are: HF-CUT in the LPF and DECAY in the Reverb. The MOD WHEEL and NOTE ON VELOCITY are the MIDI controllers we will assign.

-Recall preset 40.
-Press the EDIT button.
-Press the ADD EFFECT button until [ADD:MIDI CONTRL?] is displayed in the lower half of the LCD.
-Press the RECALL/ENTER button.
-Press the ADD EFFECT button until [ADD:MIDI CONTRL?] is displayed again.
-Press the RECALL/ENTER button.
* We have just added two MIDI controllers to the preset.
-Press the SELECT< button eight times.
-Press the VALUE UP button eight times.[HF-CUT=THRU
-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 until [REV:DECAY = 3.0s] is displayed in the lower half of the LCD.
-Press the SELECT button once.
-Press the VALUE DOWN button four times.[NOTE ON VELOCITY].
-Press the SELECT> button once.
-Use the VALUE DOWN button to set the SCALE value to 33.
-Press the SELECT> button twice.
* We will not change the decay time.
* To store this preset you must first UNLOCK it.
-Press the MIDI/MIX TITLE button.
-Press the SELECT< button once.[PRESET 1..110 = LOCKED]
-Press the VALUE DOWN button once.[PRESET 1..110 = UNLOCKED]
-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. Remember to UNLOCK the preset to STORE your changes.

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

ART SGE MACH II SPECIFICATIONS

Presets 110
Memory Locations 90
Bandwidth .... 35Hz to 20KHz
Dynamic Range .... 90dB Typical
(Digital Effects Path)
Equivalent Input Noise .... -107dBv
(Input Control max, Compressor max Gain)
Operating Level .... +16dBV max
Mechanical .... 1.75"H X 19"W X 10"D, all steel case
Power Requirements .... 105-125 Volts AC, 60Hz, Internal Fuse, 195ma @ 115VAC, 22.4W
(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

Harmonic Exciter:
Boost .... 16dB at 16.5KHz
Attack 1msec
Release 100msec

Equalizer:
Filter Bands (3) 100Hz, 1KHz, 10KHz
Boost/Cut .... (+/-)12dB

Compressor:
Gain .... (-)10 to (+)30 dB
Attack Time (Compressor) 5msec
Attack Time (Limiter) .... (.1)msec
Release Time (Fast) 75msec
Release Time (Slow) 300msec
Output Level .... 0dB to (-)24dB

Distortion:
Types: 12
Gain .... (+)30dB

Expander/Gate:
Attack Time 2msec
Expander Attenuation .... (-)30dB
Gate Attenuation .... (-)60dB
Expander Threshold .... (-)10 to (-)50dBv
Gate Threshold .... (-)22 to (-)62dBv
Envelope Filter Threshold .... (+)3 to (-)37dBv
Envelope Filter Sweep Range .... 110Hz to 3.5KHz
Envelope Filter Tuning .... 2 octaves, 1/2 octaves per step

Delay:
Types 21
Maximum Delay .... 2.0 seconds

ART retains a policy of constant product improvement. Specifications are subject to change without notice.

Designed and manufactured in the United States of America.