



# **Installation Guide**

## **Professional Wavetable Upgrade Kit**



**MEDIA VISION**



## **MEDIA VISION**

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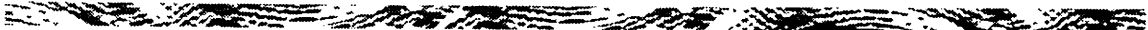
**47300 Bayside Parkway  
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*Media Vision (MVIS: NASDAQ) views the multimedia phenomenon as a series of "evolutionary," rather than revolutionary, stages of market and product development. The company is committed to offering multimedia solutions one step at a time—in affordable pieces.*

*Media Vision's products include audio and video add-in cards for personal computers, multimedia upgrade kits, and multimedia chips for adding sound and video to next generation personal computers. Future products will include more chips, boards, and subsystems, at affordable prices and in compliance with accepted industry standards as they evolve.*

*Media Vision's technology strength is key to executing this strategy successfully. The company has entered into an agreement with Stanford University's Center of Computer Research in Music and Acoustics to develop new audio technology products. Moreover, Media Vision is among an elite group of companies that are sponsors of MIT's Media Laboratory*

*Since its founding in early 1990 and first product availability in April 1991, Media Vision has shipped more than 275,000 multimedia products for personal computers. The speed of product development is a result, in part, of the fact that the management team had worked together in the past. The company's president, Paul Jain, and several other Media Vision founders were previously with Video Seven, Inc., which was responsible for popularizing color graphics on personal computers by introducing the first low cost graphics boards.*



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- ❖ Reorient or relocate the receiving antenna
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- ❖ If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.



### Caution

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This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Any changes or modifications to the equipment by the user not expressly approved by the grantee or manufacturer bound void the user's authority to operate such equipment.



### Caution

This product may utilize a laser. Use of control or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Do not open covers and do not repair yourself. Refer servicing to qualified personnel. Product complies with DHHS Rules 21 CFR Subchapter J.



Class I Laser Product

Wavelength: 780 nm

To assure continued FCC compliance, the user must use only provided shielded interface cable with ferrite cores when connecting this device to a host computer. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate this device.

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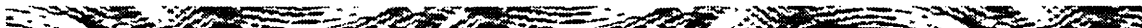
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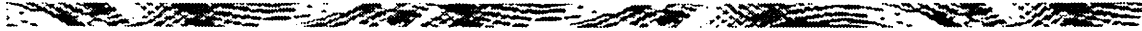
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# Professional Wavetable Upgrade

## Better Tunes Through Technology



### Note

*The Professional Wavetable Upgrade does not require a separate software installation program. It simply attaches to your existing sound card.*

You can think of a Professional Wavetable Upgrade not as an itty-bitty, teeny weeny sound card, but as a miniature Smithsonian Library for musical instruments. Instead of having actual instruments enclosed in glass cases gathering dust, the instruments are electronic bits encased in silicon chips. Wavetable synthesis provides the most realistic synthesis available. The average listener cannot tell good wavetable synthesis from the real thing. Wavetable synthesis is totally dependent upon sound that can be recorded in the real world and its main goal in life is to recreate the shape of a sound's waveform. Is the Professional Wavetable Upgrade difficult to install? If you know how to snap together Lego™ blocks or Lincoln Logs™ and can use a screwdriver, you can install a Professional Wavetable Upgrade. If you are familiar with wavetable synthesis you can skip this introduction and get your hands dirty installing the actual Professional Wavetable Upgrade daughtercard (see Installing the Professional Wavetable Upgrade on page 3).

### Chapter Contents

- Better Tunes Through Technology on page 1
- Installing the Professional Wavetable Upgrade on page 3
- Using Your Software to Use the Professional Wavetable Upgrade on page 7
- Editing the MIDI Map for Recording Session on page 7
- Loading A MIDI Map on page 8



## Professional Wavetable Upgrade



### Note

*Smaller, snap-on cards are sometimes referred to as "Daughtercards" because when motherboards were first produced a name had to be given to the cards attached to the motherboard. Sonboards just didn't sound as good. Eventually, expansion slots were invented and the term peripheral cards appeared.*

## What is a Professional Wavetable Upgrade?

The Professional Wavetable Upgrade is a true 32-voice wavetable synthesizer which provides true professional sample playback capabilities (including reverb and chorus effects) that attaches to a Media Vision 3-D Sound Card. Now say that five times quickly. Best of all there are no cables to connect. The Professional Wavetable Upgrade uses digitized recordings of real instruments to play sounds. Technically this is not synthesis since the sound is a recording of real instrument, but the phrase "Wavetable Synthesis" is a common misnomer. A typical wave sampler may have four different waveforms of single instrument.

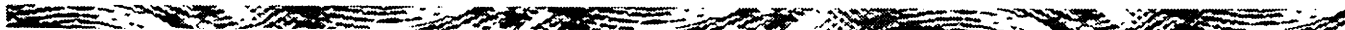
### Polly Want a What?

The number of notes a wavetable synthesizer can play at once is referred to as its Polyphony. A wavetable synthesizer uses a voice to play each note. The Professional Wavetable Upgrade uses 16 part multitimbral, which in plain English means it can play a total of 16 instruments at once (just think of the word multitimbral as meaning multi-talented). The "Instruments and

Voices" work together to create the varying melodies that we can recognize as music. Without this synergistic relationship, the sound may appear flat. It is the reverb and chorus effects capability that separates the Professional Wavetable Upgrade from its competitors. Reverb and Chorus are two manipulations that can be applied as easily as you adjust the treble and bass enhancements on your stereo (these effects are used extensively by sound engineers). These two sound effects are used extensively in almost all music and sound recordings that you hear. Let's take a closer look at these two flavors of sound:

- ❖ Chorus: this effect adds a choir-like fullness to a person's voice. This effect is quite good at making one instrument sound like many.
- ❖ Reverb: this effect adds the ambiance of a large orchestra pit or can even reproduce the acoustic environment of a recording studio.

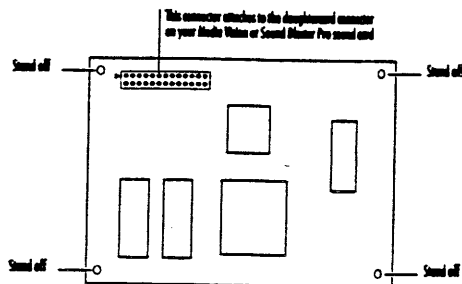
Generic wavetable synthesis cards and FM synthesizers can generate music that sounds tinny and unrealistic. The sound from these inexpensive cards simply cannot fill the requirements needed in the fields of audio engineering, soundtrack development and multimedia, but the Media Vision Professional Wavetable Upgrade can fill these needs. The Professional Wavetable Upgrade uses studio quality samples of







real instruments and the same Korg synthesizer as used in professional recording studios. A full 4MB of ROM space is used to store these samples.



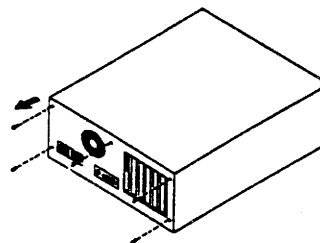
## Installing the Professional Wavetable Upgrade

The inside of a computer is often jumbled with cables and hardware projections making it difficult to see clearly, so exercise care when installing the Professional Wavetable Upgrade.

### Caution

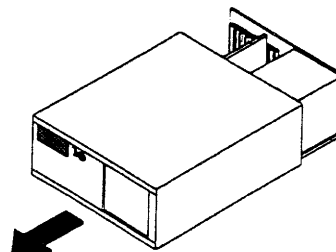
*There may be sharp edges inside the computer. Also, disconnect the power plug before removing the PC's cover.*

### 1. Open your computer



Remove the screws from the back of your computer cover. If your computer doesn't use screws, refer to your PC's owner's manual for more information. Put the screws inside a container so you don't lose them in the shag carpet or inside the computer.

Slide the cover off carefully. Most computer covers slide towards the front of the computer. Put the cover aside.





## Professional Wavetable Upgrade

2. Remove the Professional Wavetable Upgrade from its anti-static bag.



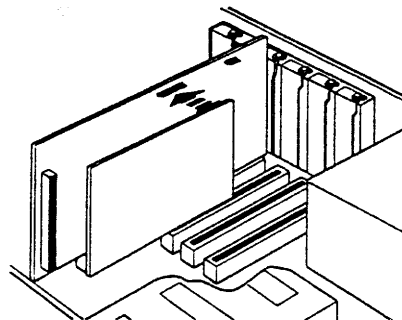
Touch a metal portion of the case to dissipate any static electricity.



### Note

*Make sure that you have a free expansion slot to the right of your sound card. The Professional Wavetable Upgrade needs a little elbow room when correctly attached.*

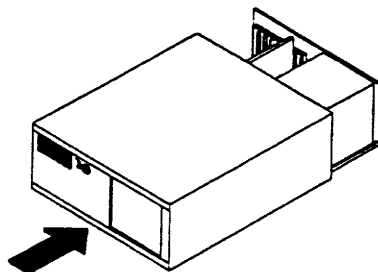
3. Press the Professional Wavetable Upgrade connector (J3) onto the Media Vision 3-D Sound Card's wavetable connector. Press firmly so the standoffs (small, plastic knobs) enter the holes on the Media Vision 3-D Sound Card.)



Place the cover back onto the PC and secure it with the screws you used earlier.

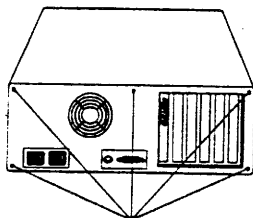


#### 4. Close your computer



Slide the cover back onto your computer.

#### 5. Secure the cover with the screws you removed earlier.



## Telling Your Software To Use the Professional Wavetable Upgrade

After you install the Professional Wavetable Upgrade you will want to let your software know that it is attached and ready to receive information from the Media Vision 3-D Sound Card. For instance if you are going to play a game application that makes use of FM synthesis (most of the games applications do use FM synthesis), you will want to switch your drivers software to use the Media Vision 3-D Sound Card's FM synthesizer chip. If you have the Professional Wavetable Upgrade you definitely want to use it instead of the FM synthesizer chip. The steps below tell you how to select the Professional Wavetable Upgrade from the Windows' driver applet. These instructions assume you are already running Windows. You must perform these steps if you want to use the Professional Wavetable Upgrade with either Sound Impression or Recording Sessions.

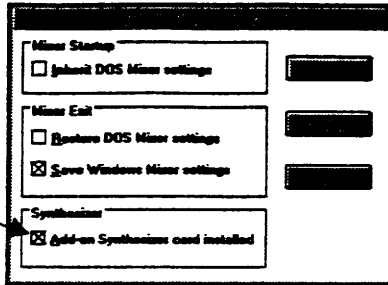
1. From the Main group, double-click on the *Control Panel* icon.
2. Double-click on the *Drivers* icon.
3. Highlight the *Media Vision Mixer* item and click on the *Setup* button.



## Professional Wavetable Upgrade

Click on the **Add-On Synthesizer** box in the Mixer Setup dialog box. Click on the **OK** button.

Click here if you want to use the Professional Wavetable Upgrade



4. Click on the **Close** button to exit the drivers dialog box.

The Media Vision Mixer Setup dialog box appears. The screen shown above is set to use the Professional Wavetable Upgrade. Notice how the Synthesizer box is checked.



### Note

*Some sound card models (e.g., Jazz sound cards) may not have the Mixer Setup option available.*

5. Exit Windows.
6. Re-start Windows.

The steps below are for Media Vision software only, which includes Sound Impression. Refer to your MIDI applications documentation in order to select a MIDI device for your particular applications.

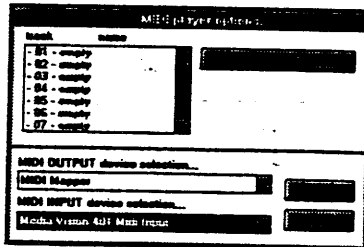
7. From the "Multimedia Tools" group click on the **Sound Impression** icon.



8. From the **Options** menu select the **Optional Add-On Synth** item. Ensure that the box has a check mark inside of it.
9. From the **Edit** menu select the **MIDI Selection**. The MIDI Selection dialog box appears.



10. Change the MIDI Output device selection to the **Media Vision MPU-401 Output**. Click on the OK button.

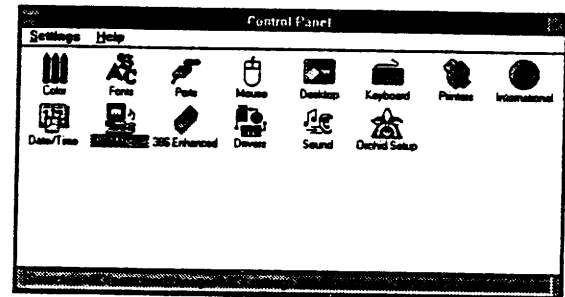


11. Click on the **OK** button to close the MIDI Player dialog box.

## Editing the MIDI Map for Recording Session

Perform the steps shown below in order to use the Professional Wavetable Upgrade with Recording Session. These steps show you how to change the MIDI Mapper application from using the Sound Card's FM synthesizer chip and to use the Professional Wavetable Upgrade instead.

1. From the **Control Panel** double-click on the MIDI Mapper icon.



2. Edit the Media Vision MIDI Map.

Select the **MVI General** selection, if it is available. Otherwise, refer to the section titled "Creating a MIDI Map," on the following pages to create a new MIDI Map.

3. Close the Control Panel.



## Creating A MIDI Map

A MIDI Map you ask? Yes, MIDI Map. A MIDI Map allows several devices, instruments and other computers to transmit and receive MIDI data to each other. These messages are actually music, but in a computer code called MIDI. MIDI stands for Musical Instrument Digital Interface.

This section shows you how to use the Control Panel's MIDI Mapper option to create a new MIDI Map for use with your Professional Wavetable Upgrade. You can also use the MIDI Mapper to edit existing key maps, patch maps, and channel mappings. The only maps you need to concern yourself with for this section are the channel maps. Windows supplies MIDI setups and channel maps for the sound devices (sound cards, synthesizers, etc.) it supports.

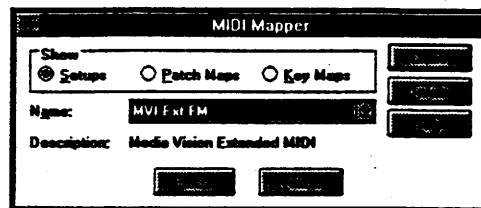
### Note

*Windows won't allow you to make changes to a MIDI Map while you have a MIDI application running.*

1. From the **Main Group**, double-click on the **Control Panel** icon.
2. Double-click on the **MIDI Mapper** icon.

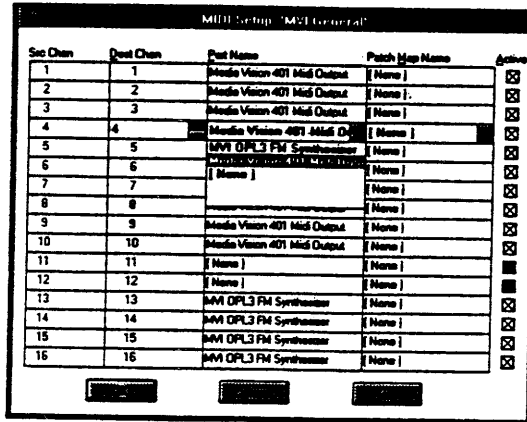
(If this icon is not present, this means a MIDI driver is not installed. Re-install your sound card software to properly install the driver). The MIDI Mapper dialog box appears.

The MIDI Mapper dialog box probably displays "MVI Ext FM." This is the FM Synthesizer driver. To use the Professional Wavetable Upgrade card, click and pull down the name field and select "MVI General."



3. Click on the **Edit** button.

The MIDI Setup dialog box appears. The Premium 3-D Sound Card setup should appear like the screen below.



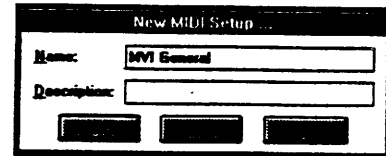
You want your changes to resemble the MIDI Setup dialog box.

4. Select **MVI General** from the selection and click on the **Close** button.

If you do not have the MVI General selection available you need to create an MVI General MIDI Map. The following steps show you how to do just that.

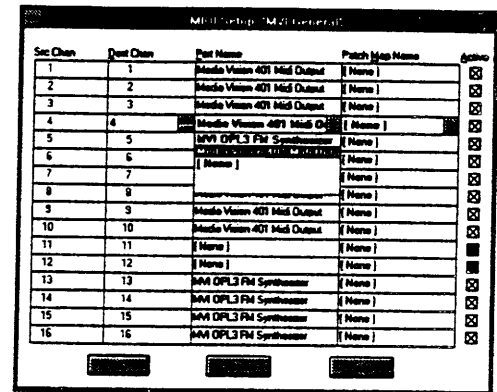
5. Click on the **New** button.

The New MIDI Setup dialog box appears.



6. Type **MVI General** in the Name box. Click on the **OK** button.

The MVI General MIDI Setup dialog box appears.



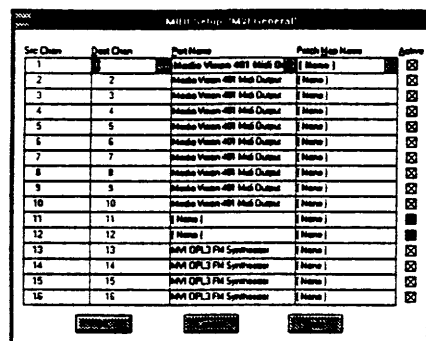


## Professional Wavetable Upgrade

Go to the third column (called Port Name) and click on the downward pointing arrow to make your selections. You can select either:

- ❖ MVI OPL3 FM Synthesizer
- ❖ Media Vision 401 MIDI Output

7. Select the **Media Vision 401 MIDI Output** selection for channels one to ten.



8. Select **MVI OPL3 FM Synthesizer** for channels 13 to 16. Channels 11 & 12 are reserved.

9. Click on the **OK** button.

10. Select **Yes** to save your new MIDI Map.

11. Click on the **Close** button to exit the MIDI Mapper.

## Sound Blaster MIDI Maps

If you have a Sound Blaster card and are using the Professional Wavetable Upgrade you will want to read this section. This section shows you how to use the Professional Wavetable Upgrade with a Sound Blaster sound card.



### Note

*Windows won't allow you to make changes to a MIDI Map while you have a MIDI application running.*

1. From the Main Group, double-click on the **Control Panel** icon.
2. Double-click on the MIDI Mapper icon.

(If this icon is not present, this means a MIDI driver is not installed. Re-install your sound card software to properly install the driver). The MIDI Mapper dialog box appears.

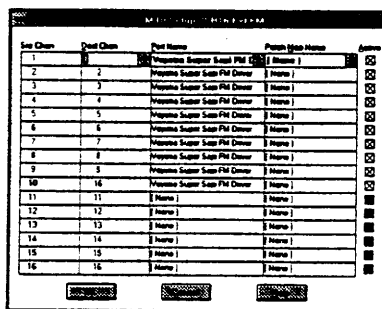


The MIDI Mapper dialog box probably displays "SB16 Ext FM." This is the FM Synthesizer driver. To use the Professional Wavetable Upgrade card, click and pull down the name field and select "SB16 Ext MIDI."



### 3. Click on the Edit button.

The MIDI Setup dialog box appears. The Sound Blaster Card setup should appear like the screen below.



You want your changes to resemble the MIDI Setup dialog box.

### 4. Select **SB16 MIDI OUT** from the selection and click on the Close button.

If you do not have the SB16 Ext MIDI selection available you need to create an SB16 Ext MIDI Map. The following steps show you how to do just that.

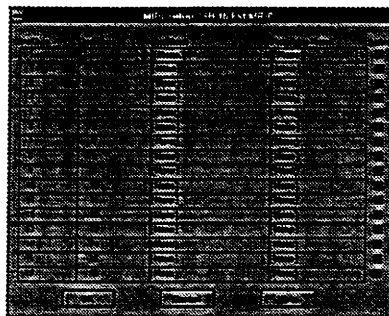
### 5. Click on the **New** button.

The New MIDI Setup dialog box appears.



### 6. Type **SB16 Ext MIDI** in the Name box. Click on the **OK** button.

The SB16 Ext MIDI dialog box appears.





Go to the third column (called Port Name) and click on the downward pointing arrow to make your selections.

7. Select **SB16 Ext MIDI OUT** for channels one to ten. Channels 11 & 12 are reserved.
8. Click on the **OK** button.
9. Select **Yes** to save your new MIDI Map.
10. Click on the **Close** button to exit the MIDI Mapper.

## MIDI Implementation Tables

The MIDI tables describe the following MIDI characteristics:

- ❖ 1. Channel Messages on page 13
- ❖ 2. RPN (Registered Parameter Number) on page 14
- ❖ 3. System Realtime Message on page 14
- ❖ 4. Universal System Exclusive Messages on page 15
  - ❖ (1) \* GM Mode On
  - ❖ (2) \* Master Volume
  - ❖ (3) \* Master Balance
- ❖ 5. System Exclusive Messages on page 16
  - ❖ (1) Program Parameter Dump
  - ❖ (2) Program Bank Map
  - ❖ (3) Program Parameters



You may never need the information described in these tables, but if you are one of those technically-oriented consumers and just has to know how things work "Behind the scenes," these tables are for you.

### RECOGNIZED RECEIVE DATA

#### 1. Channel Messages

Status	Second	Third	Description
1000 nnnn	0kkk kkkk	0xxx xxxx	*Note Off
1001 nnnn	0kkk kkkk	0000 0000	*Note Off
1001 nnnn	0kkk kkkk	0vvv 0vvv	*Note On (vv vv = 1 to 127)
1011 nnnn	0000 0000	0bbb bbbb	Bank Select MSB
1011 nnnn	0000 0001	0vvv vvv	* Modulation 1 (Pitch)
1011 nnnn	0000 0010	0vvv vvv	* Modulation 2 (VDF)
1011 nnnn	0000 0110	0vvv vvv	* Data Entry MSB (for RPN)
1011 nnnn	0000 0111	0vvv vvv	* Volume
1011 nnnn	0000 1010	0vvv vvv	* Panpot
1011 nnnn	0000 1011	0vvv vvv	* Expression
1011 nnnn	0010 0000	0bbb bbbb	Bank Select LSB
1011 nnnn	0010 0110	0vvv vvv	* Data Entry LSB (for RPN)
1011 nnnn	0100 0000	00xx xxxx	* Damper Off
1011 nnnn	0100 0000	01xx xxxx	* Damper On

### RECOGNIZED RECEIVE DATA

#### 1. Channel Messages

Status	Second	Third	Description
1011 nnnn	0100 1000	0vvv vvv	Sound Control 3 (Release Time)
1011 nnnn	0100 1001	0vvv vvv	Sound Control 4 (Attack Time)
1011 nnnn	0100 1010	0vvv vvv	Sound Control 5 (Brightness)
1011 nnnn	0101 1011	0vvv vvv	Effect 1 Depth (Reverb)
1011 nnnn	0100 1101	0vvv vvv	Effect 3 Depth (Chorus)
1011 nnnn	0110 0000	0000 0000	Data Increment (for RPN)
1011 nnnn	0110 0001	0000 0000	Data Decrement (for RPN)
1011 nnnn	0110 001x	0xxx xxxx	(Cancel RPN)
1011 nnnn	0110 0100	0000 00rr	* RPN Parameter Number LSB
1011 nnnn	0110 0101	0000 0000	* RPN Parameter Number MSB
1011 nnnn	0111 1000	0000 0000	All Sound Off
1011 nnnn	0111 1001	0000 0000	* Reset All Controllers
1011 nnnn	0111 1011	0000 0000	* All Notes Off
1011 nnnn	0111 11xx	0xxx xxxx	(All Notes Off)
1100 nnnn	0ppp pppp		* Program Change
1101 nnnn	0vvv vvv		* Channel Pressure (After Touch)
1110 nnnn	0bbb bbbb	0bbb bbbb	Bender Change



## Professional Wavetable Upgrade

nnnn = 0 - 15 : MIDI Channels 1 - 16

\* General MIDI Level 1 Messages

### RECOGNIZED RECEIVE DATA

#### 2. RPN (Registered Parameter Number)

<i>Number</i>	<i>Description</i>
00 00	*Pitch Bend Range (0 to 12)
00 01	*Fine Tuning
00 02	*Coarse Tuning (-24 to +24)

### RECOGNIZED RECEIVE DATA

#### 3. System Realtime Message

<i>Status</i>	<i>Description</i>
1111 1110	Active Sensing

**RECOGNIZED RECEIVE DATA****4. Universal System Exclusive Messages****(1) \* GM Mode On**

<i>Data</i>		<i>Description</i>
1111 0000	(F0)	System Exclusive
0111 1110	(7E)	Universal Non Realtime
0ccc cccc	(cc)	Device ID (cc = 00 or 7F)
0000 1001	(09)	General MIDI
0000 0001	(01)	GM Mode On
1111 0111	(F7)	EOX

**RECOGNIZED RECEIVE DATA****4. Universal System Exclusive Messages****(2) \* Master Volume**

<i>Data</i>		<i>Description</i>
1111 0000	(F0)	System Exclusive
0111 1111	(7F)	Universal Realtime
0ccc cccc	(cc)	Device ID (cc = 00 or 7F)
0000 0100	(04)	Device Control
0000 0001	(01)	Master Volume
0ddd dddd	(dd)	Data LSB
0ddd dddd	(dd)	Data MSB (7F/7F: Max, 00/00: Min)
1111 0111	(F7)	EOX



## Professional Wavetable Upgrade

### RECOGNIZED RECEIVE DATA

#### 4. Universal System Exclusive Messages

##### (3) \* Master Balance

Data		Description
1111 0000	(F0)	System Exclusive
0111 1111	(7F)	Universal Realtime
0ccc cccc	(cc)	Device ID (cc = 00 or 7F)
0000 0100	(04)	Device Control
0000 0010	(02)	Master Balance
0ddd dddd	(dd)	Data LSB
0ddd dddd	(dd)	Data MSB (7F/7F: Hard Right, 00/40: Centre, 00/00: Hard Left)
1111 0111	(F7)	EOX

### RECOGNIZED RECEIVE DATA

#### 5. System Exclusive Messages

##### (1) Program Parameter Dump

Data		Description
1111 0000	(F0)	System Exclusive
0100 0020	(42)	Korg ID
0011 0000	(30)	Device ID
0011 0100	(34)	AG-10 ID
0100 0000	(40)	Program Parameter Dump
0gfe dcba		MSB of Data 0-6
0aaa aaaa		Lower 7bits of Data 0
0bbb bbbb		Data 1
0ccc cccc		Data 2
0ddd dddd		Data 3
0eee eeee		Data 4
0fff ffff		Data 5
0ggg gggg		Data 6
0mnl kjih		MSB of Data 7-13
0hhh hhhh		Lower 7bits of Data 7
0000 zyxw		MSB of Data 112-115

**RECOGNIZED RECEIVE DATA****5. System Exclusive Messages****(1) Program Parameter Dump\***

<i>Data</i>		<i>Description</i>
0www wwww		Lower 7bits of Data 112
0xxx xxxx		Lower 7bits of Data 113
0yyy yyyy		Lower 7bits of Data 114
0zzz zzzz		Lower 7bits of Data 115
1111 0111	(F7)	EOX (138 bytes total)

\* This program is called by 7937th Bank(62/00), Program 97, i.e.  
Bn 00 3E 20 00 Cn 60.

**RECOGNIZED RECEIVE DATA****5. System Exclusive Messages****(2) Program Bank Map**

<i>MSB</i>	<i>LSB</i>	<i>Description</i>	<i>Examples</i>
38-39	xx	7169: GM Sound Set	Bn 00 38 20 00 Cn pp
3A-3D	xx	8192: OFF	
3E	xx	7937: GM Percussion	Bn 00 3E 20 00 Cn 00
3F	xx	8192: OFF	Bn 00 3F 20 7F Cn 7F

**RECOGNIZED RECEIVE DATA****5. System Exclusive Messages****(2) Program Bank Map**

<i>Bank</i>	<i>Value</i>	<i>Description</i>
7169	00-7F	1-128: GM Sound Set
7937	00-0F	1: GM Kit
	10-17	17: Power Kit
	18	1: GM Kit
	19	26: Analog Kit
	1A-27	1: GM Kit
	28-2F	41: Brush Kit
	30-5F	1: GM Kit
	60-6F	97: Downloaded Program
	70-7F	1: GM Kit



## Professional Wavetable Upgrade

### RECOGNIZED RECEIVE DATA

#### 5. System Exclusive Messages

##### (3) Program Parameters

No.	Parameter		Value (2's comp)
<b>&lt;OSCILLATOR&gt;</b>			
0	bit0-1: Mode		0(Single), 1 (Double), 2(Drum)
	bit3: Hold		0(Off), 1 (On)
1	OSC1 Multisound	0-117	
2	OSC1 Octave		-2-1
3	OSC2 Multisound	0-117	
4	OSC1 Octave		-2-1
5	Interval		-12-12
6	Detune		-50-50
7	Delay Start		0-99
<b>&lt;Pitch EG&gt;</b>			
8	Start Level		-99-99
9	Attack Time		0-99
10	Attack Level		-99-99
11	Decay Time		0-99

### RECOGNIZED RECEIVE DATA

#### 5. System Exclusive Messages

##### (3) Program Parameters

No.	Parameter		Value (2's comp)
12	Release Time		0-99
13	Release Level		-99-99
14	Time VelSens		-99-99
15	Level VelSens		-99-99
<b>&lt;VDF MG&gt;</b>			
16	bit0-2: Waveform	0(Tri), 1(SawUp), 2 (SawDn), 3(Sq) 4 (Random)	
	bit5: OSC1		0(Off), 1 (On)
	bit6: OSC2		0(Off), 1 (On)
17	Frequency		0-99
18	Delay		0-99
19	Intensity		0-99
<b>&lt;AFTERTOUCH&gt;</b>			
20	AT Bend Range		-12-12
21	AHT VDF Cutoff	-99-99	



**RECOGNIZED RECEIVE DATA****5. System Exclusive Messages****(3) Program Parameters**

No.	Parameter		Value (2's comp)
22	Aft VDF MG		0-99
23	Aft VDA Amp		-99-99
<b>&lt;MODULATION&gt;</b>			
24	Bend VDF Sweep		-99-99
25	Mod2 VDF MG		0-99
<b>&lt;OSC1 PITCH EG&gt;</b>			
26	OSC1 PEG Int		-99-99
<b>&lt;OSC1 PITCH MG&gt;</b>			
27	bit0-2: Waveform	0 (lin), 1 (SawUp), 2 (SawDn), 3 (Sq) 4 (Random)	
	bit7: MG KeySync	0 (Off), 1 (On)	
28	Frequency		0-99
29	Delay		0-99
30	Fade In		0-99
31	Intensity		0-99

**RECOGNIZED RECEIVE DATA****5. System Exclusive Messages****(3) Program Parameters**

No.	Parameter		Value (2's comp)
32	Freq KbdTrack		-99-99
35	AftT+Mod1 Freq		0-9
<b>&lt;VDF 1&gt;</b>			
36	VDF Cutoff		0-99
37	KbdTrack Key		0-127
38	VDF KbdTrack		-99-99
39	ODF EG Int		0-99
40	EGTime KbdTrack	0-99	
41	EGTime VelSens		0-99
42	EGInt VelSens		-99-99
<b>&lt;VDF 1 EG&gt;</b>			
43	Attack Time		0-99
44	Attack Level		-99-99
45	Decay Time		0-99
46	Break Point		-99-99
47	Slope Point		0-99

**RECOGNIZED RECEIVE DATA****5. System Exclusive Messages****(3) Program Parameters**

No.	Parameter		Value (2's comp)
48	Sustain Level		-99-99
49	Release Time		0-99
50	Release Level		-99-99
<b>&lt;VDA 1&gt;</b>			
51	OSC Level		0-99
52	KbdTrack Key		0-127
53	VDA KbdTrack		-99-99
54	VDA VelSens		-99-99
55	EGTime KbdTrack	0-99	
56	EGTime VelSens		0-99
<b>&lt;VDA 1 EG&gt;</b>			
57	Attack Time		0-99
58	Attack Level		0-99
59	Decay Time		0-99
60	Break Point		0-99
61	Slope Point		0-99

**RECOGNIZED RECEIVE DATA****5. System Exclusive Messages****(3) Program Parameters**

No.	Parameter		Value (2's comp)
62	Sustain Level		0-99
63	Release Time		0-99
<b>&lt;EG TIME MOD SW&gt;</b>			
64	VDF EGTime KbdTrack		
	bit0: Attack		0 (Off), 1 (On)
	bit1: Decay		0 (Off), 1 (On)
	bit2: Slope		0 (Off), 1 (On)
	bit3: Release		0 (Off), 1 (On)
	bit4: Attack Pol	0(+), 1(-)	
	bit5: Decay Pol	0(+), 1(-)	
	bit6: Slope Pol	0(+), 1(-)	
	bit7: Release Pol	0(+), 1(-)	
65	VDF EGTime VelSens		
	Same as 64		
66	VDA EGTime KbdTrack		
	Same as 64		



### RECOGNIZED RECEIVE DATA

#### 5. System Exclusive Messages

##### (3) Program Parameters

No.	Parameter		Value (2's comp)
67	VDA EGTime VelSens Same as 64		
<b>&lt;VDF Color&gt;</b>			
68	VDF Color Int		0-99
69	Color VelSens		-99-99
<b>&lt;KBDTRK MODE&gt;</b>			
70	bit0: VDF KT Lwr	0(Off), 1(On)	
	bit1: VDF KT Up	0(Off), 1(On)	
	bit4: VDA KT Lwr	0(Off), 1(On)	
	bit5: VDA KT Up	0(Off), 1(On)	
<b>&lt;OSC2&gt;</b>			
71-115			Same as 26-70



## Pro 3-D MIDI Implementation Chart

Function ***		Transmitted	Recognized	Remarks
<b>Basic Channel</b>	Default		1-16	
	Changed		1-16	
<b>Mode</b>	Default		3	
	Messages Altered	*****	x	
<b>Note Number:</b>	Tune Voice	*****	0-127	
			0-127	
<b>Velocity</b>	Note ON		0-9n, V=1-127	
	Note OFF		x	
<b>After Touch</b>	Key's		0	
	Ch's		x	
<b>Pitch Bender</b>			0	
<b>Control</b>	0, 32		0	Bank Select (MSB,LSB)
	1,2		0	Mod Wheel
	6, 38, 96, 97, 100, 101		0	RPN
	7		0	Volume
	10		0	Pan Pot
	11		0	Expression
	64		0	Damper
	72, 73, 74		0	Sound Control (Release, Attack, Brightness)
	91, 93		0	Effect Depth
	120		0	All Sound Off
	121		0	Reset All Controls
<b>Prog Change: True #</b>	*****		0-127	
			0-127	
<b>System Exclusive</b>			0	



<b>Function</b>	<b>Transmitted</b>	<b>Recognized</b>	<b>Remarks</b>
<b>System Common</b>	: Song Position	X	
	: Song Sel	X	
	: Tune	X	
<b>System Real Time</b>	: Clock	X	
	: Commands	X	
<b>Aux Messages</b>	: Local Note ON/OFF	X	
	: All Notes OFF	0 (123-127)	
	: Active Sense	0	
	: Reset	X	



**MEDIA VISION**

47300 Boyside Parkway  
Fremont, CA 94538  
510-770-8600

700-0762 ext A