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# **peterson**MIDI Resource System™

## **OPERATING INSTRUCTIONS**

### **OVERVIEW**

The Peterson MIDI Resource System™ is a microprocessor controller system that will output MIDI format note on and note off data in response to key press and release data from any Peterson OrgaPlex™ or Diode Matrix relay, or most non-Peterson switching systems.

Key data for the MIDI **to** a division couplers is derived before coupling. Key data for the MIDI **on** a division” couplers is derived after coupling. Key data will default to key #25 (middle C) = MIDI Note 60.

The default mode is the non-standard (but generally accepted) Multi Mode (mode 5). Multi Mode has the advantage of recognizing different program changes on each MIDI channel, thus allowing multiple voices to be played from one keyboard. The ability to assign any keyboard to any channel with any program change number 1-128 is made possible with the optional control panel.

All MIDI commands, 31.25K baud rate, opto-isolated MIDI Input and MIDI connector pin-outs comply with MIDI Manufacturers Association (MMA) “MIDI Detailed Specification 1.0, Version 4.2 (or the most current).

There is capacity for 72 MIDI patch settable pistons or 24 MIDI patch settable stops. Either pistons or stops, but not both, must be selected at the time of installation.

Velocity or volume data can be sent in response to the organ's expression shoe(s) position(s). Expression data can be programmed to affect MIDI voices on the Solo, Swell, Great, Choir and Pedal MIDI channels from one or more shoes.

Recording organ stop control information to a MIDI sequencer is accomplished using system exclusive (sysex) codes. Up to 288 organ stop controls and 72 pistons can be encoded with this system. Compatibility of MIDI Sequence files is provided with Allen<sup>1</sup> Organs. This company has extensive libraries of prerecorded disks that can be used to play pipe organs using the MIDI Resource System™ and an optional sequencer.

A user's control panel compatible in appearance with other Peterson products is used for the MIDI Resource System™. Refer to Figure 1. This control panel includes rocker switches and LED readouts that can be used to control MIDI devices directly or to program presets.

External control functions (options) for the MIDI Resource System™ include a sustain/sostenuto control input, start/stop/continue switch inputs, Advanced Feature Control Panel, 72 preset piston inputs, 24 settable MIDI stops, set piston input, and six expression shoe inputs (one for each keyboard plus an All Swells). A lock-out input that can optionally connect to the combination action lock-out prevents setting of the presets. A MIDI Cancel input is also provided.

<sup>1</sup> Allen is a registered trademark of Allen Organ Co., Macungie, PA.

## DETAILS OF MIDI Resource System™ OPERATION

A basic MIDI Resource System™ is supplied with an output-only extension cable. The control panel is not required for basic operation. This configuration will output or send only on the default MIDI channel numbers. These are: Swell on channel 1; Great on channel 2; Choir on channel 3; Pedal on channel 4 and Solo (top of 4) on channel 5.

This arrangement allows an organist to connect a synthesizer or voice module, preset at the synthesizer to a given voice, and play this voice from any manual. If the synthesizer or voice module permits separate voices on each MIDI channel then multiple voices can be played. Multiple voice modules or synthesizers can be connected and set so each one will respond to a different channel. Consult your synthesizer or voice module instructions for details. This basic system can also be used when a record/play (sequencer) only system is desired.

Organ stop controls in each division to turn the MIDI on can be provided as MIDI **to** a division (couplers) or MIDI **on** a division (stops). Consult your organ builder/installer as to the preferred arrangement.

Certain hardware programming is available to tailor the MIDI Resource System™ to meet your needs. This programming should be done by the technician during installation, however, may be changed at any time if necessary. Please consult with your installer regarding any special needs, such as alternate channels, sustain/sostenuto and volume/velocity selection. These choices are described in more detail later in this manual.

Some optional external DC controls are available for use even with a basic MIDI Resource System™. Pistons and MIDI preset stops cannot be used since a control panel is required to program these. The available controls on a basic system are: Start, Stop, Continue, Tremolo/ Vibrato, Sustain and Transposer. Refer to the following sections for descriptions of these controls.

Options that are available on the MIDI Resource System™ include:

- Expression Shoe Inputs
- Serial Outputs (for MIDI In and Sequencer capability)
- Control Panel/Control Interface (required for preset pistons/ stops)
- Piston /Stop (Presets) Inputs
- In/Sequencer Out/Instrument Out extension cable
- Sustain/Sostenuto switch
- External Sequencer - (not manufactured by Peterson)

## DETAILS OF MIDI OPTIONS

### EXPRESSION SHOE(S)

One or more of the MIDI Resource System™'s expression (volume/velocity) inputs can be wired to the organ's expression shoe(s). If the organ has only one shoe, but expression is desired on the Choir and Swell MIDI channels, both inputs may be wired together to the one shoe. "DIP" switches set during installation will determine whether volume or velocity values are sent for a particular input. If the All Swells input is used, its value is used for all keyboards. If the All Swells and another expression input are both active, the highest value of the two for that keyboard is used. All Swells affects volume (expression) only; channels set for velocity are not affected.

A volume control change is sent after any program change(s) on the channel(s) affected, using the expression value of the manual(s) assigned to that channel. *If there are Swell and Choir expression shoes (for example), and the Choir shoe is wired to affect the Choir, Great and Pedal: it should be noted that reassigning the Swell manual to a channel used by the Choir, Great or Pedal will cause both shoes to affect that channel's expression.*

## **CONTROL PANEL**

The Control Panel option provides the ability to take advantage of the Multi Mode, MIDI Channel and MIDI Program selections (MIDI Patches), Piston and MIDI stop presets, and MIDI In features.

The operation of the readouts and switches on the control panel is as follows. Refer to Figure 1.

### **DETAILS OF MIDI CONTROL PANEL DISPLAY**

#### **PROGRAM MODE**

The general rule for Program Mode is that the values displayed are what will be programmed.

When Program Mode is turned on, "0"s are shown in the manual, channel and program number displays. This provides the opportunity to clear any pistons or stops which have been previously set, by pressing and holding the set piston and then pressing the numbered piston to be cleared. Clearing is allowed whenever both channel and program are set to "0"s.

Any key pressed will then cause that key's manual number to be displayed along with that manual's default channel number (Manual Number +8). The program number will remain zero. Channel and program numbers can now be changed, if desired, using the switches below the display windows. Subsequent key presses on the same manual, or setting these values into preset stops or pistons, will not change the values displayed.

When activating a preset stop or piston while in the Program Mode, the preset stop's or piston's values will ordinarily override and be displayed. The exception is that when Set is active, there will be no change in the display. Layered preset stops or pistons that are activated while in Program Mode will flash an "L" and then display the last values programmed. When layering new values, no "L" will be displayed unless that preset is re-activated without pressing Set.

If a preset stop or piston is activated and causes the manual number to change, then any subsequent key press on the original keyboard will change only the manual number displayed. Only the first key pressed on a new manual causes the channel and program values to read "0".

#### **USE MODE**

The general rule for the Use Mode is that the values displayed are for use with the Send button (except that the manual number may also display information about presets).

The Use Mode display will show all "0"s upon power up. Any key pressed then changes the manual number display to that keyboard's number. Program and channel numbers remain zero. Channel and program numbers can now be changed, if desired, using the switches below the display windows. Subsequent key presses on the same manual, or pressing the Send button, will not reset any of these values. Pressing the Send button transmits the values displayed, providing all three window values are valid.

Once a patch is sent on a keyboard, subsequent key presses on that keyboard will ordinarily cause the same values to be displayed again. However, if the keyboard's channel was over-written by another send or preset, channel and program values of "0" will be displayed again.

When layered presets are activated while in Use Mode, the display will show an "L" in manual and "-"s (dashes) in channel and program windows. When blank presets are activated, the display shows "0" in manual and "-"s (dashes) in channel and program windows. After pressing a key and the "send" button, if a preset is activated that changes the manual number, a subsequent key press on the original manual will restore the display to its sent values. Only the first keys press on a new manual causes the channel and program windows to display "0".

## SHOW MODE

The general rule for Show Mode is to display the values for the last control (preset piston, preset stop or send button) that was activated.

If more than one preset stop is on at a time, only the value(s) of the last one activated will be displayed. If a preset piston or preset stop has layered values (patches), the word "Layer" will be momentarily displayed when it is activated (indicating more values to follow). Then the values of each layer are displayed (in the order they will be sent). Activating a blank preset displays all "0"s. When values displayed are from the send button, all decimal points are illuminated to distinguish these values. It is helpful to know where these values are from if one or more preset stop(s) is also on. Bank Select Values are distinguished with a lower case "b" in the manual window.

## DETAILS OF MIDI CONTROL PANEL SWITCHES

1. **Off/On/ANO** - This is a 3 position rocker switch (on/off/momentary) with ANO being momentary. "Off" is off; the readouts are not lighted and all MIDI functions and modes are disabled. "On" enables all MIDI functions/modes and lights the readouts. "ANO" (All Notes Off) clears all Key Ⓞ  
data on all channels by sending ANO code and by sending each note with a velocity of zero. A  
OrgaPlex™ Serial Outputs, including stops, are also cleared. This is like a reset for use in b  
event that a MIDI note ciphers on.
2. **Prog/Use/Show** - This is a 3 position rocker switch (on/on/on). "Program" enables setting of the preset pistons/stops. The MIDI output does not respond to control panel changes until the set (or send) button is activated. The displayed settings and MIDI values will change when a preset is pushed. The up/down buttons will then start from these values. "Use" will display the current value or values from a preset and allow changing of channel and program values immediately when a preset is activated. Values adjusted using the control panel switches will only be sent when the Send button is pressed (acting as an enter key). In the Use position, if presets are layered, an "L" is displayed in the manual display. "Show" will cause readouts to display all values for the last preset pressed and disable all control panel changes. If more than one manual, channel or program value is stored on a given preset, the readouts will step through and show all values at a one per half second rate. Discrete LED's are lighted when the Program or Show functions are active. Show is also used when selecting a stop control/sequencer format. Refer to the section on "Details of MIDI Sequence Files" found later in this manual.
3. **Channel Up/Down** - This is a 3 position rocker switch (momentary/off/momentary) which increments or decrements the channel value by one per push. If pushed and held for more than 1 second, the value will change and then sequence automatically at a 4 per second rate. The range of values is normally 0-16. However, a range 0-24 can be activated with the +8 feature (See Additional Features section for more details).
4. **Program Up/Down** - This is a 3 position rocker switch (momentary/off/momentary) which increments or decrements the program value by one per push. If pushed and held for more than 1 second, the value will change and then sequence automatically at a 4 per second rate. The range of values is 0-128 and a position for Bank Select which is detailed in the Additional Features section.
5. **Send/Receive** - This is a 3 position rocker switch (momentary/off/momentary) used to select the programming of presets. With send selected (in the Program Mode) presets are programmed with the channel/program numbers to be sent out. With Receive selected (in the Program Mode) pistons and/or tabs are assigned to respond to received program numbers. Normally, both MIDI OUT (send) and MIDI IN (receive) are both active. The programming with these will be covered in more detail in the presets section. Separate LED's are lighted to indicate if the Send or Receive function is active. Both these LED's are off when in Use Mode. Send/Receive is also used to increase/decrease the bank values.
6. **Tuning** - This is an analog rotary potentiometer that will send MIDI Pitch Bend values. The center is calibrated to A=440. Turning the knob clockwise tunes the synthesizer sharp and turning it counter clockwise tunes it flat. The range is approximately +/- 35 cents (hundredths of a semitone). This is used to tune the synthesizer or voice module to the pipes. Note: Some voice modules and/or synthesizers do not respond to pitch bend but may be tunable at the device. Refer to the manual of your particular device.
7. **Program Readout** - This is a 2-1/2 digit 7 segment LED display for current program value 1-128;

(1-128 = MIDI 0-127). The value displayed will be from the last preset, up/down button press or received program value. In the Show Mode the program value for each channel, if more than one, will be displayed in an automatic step fashion. The current "bank" 1 -128 is displayed between 1 and 128 (the Bank Select feature is covered later). The 0 in this display is used when clearing MIDI preset pistons.

8. **Channel Readout** - This is a 1-1/2 digit 7 segment LED display. The channel number displayed shows the most current channel value 0-16 (0 = Omni (all channels); 1-16 = MIDI 0-15), from the last preset, up/down button press or received channel number. The 0 is also used when clearing MIDI preset pistons.
9. **Manual Readout** - This is a 1 digit 7 segment LED display. In the Show Mode the Manual value (1-7) shows the most current value from the last preset. The values displayed are as follows: 1=Swell, 2=Great, 3=Choir, 4=Pedal, 5=Solo or other top-of-4th manual, 6=Antiphonal and 7=Echo. In the Program Mode the Manual value shows the last keyboard a key was played on, and is the value (manual) that will be stored in a preset (when set is activated in the Program mode). If more than one manual is being played, the first one read by the microprocessor is displayed. The manual readout also displays information about presets. If a preset is activated but has not been programmed, a zero will be displayed. If a preset is programmed with more than one channel or program number (layered), then an "L" is displayed when in the Use Mode. (The layered information indicated by the "L" can be viewed by using the Show Mode.) A lower case "b" indicates a Bank Select Value.

## PISTONS/MIDI PRESET STOPS

The Piston/Stop board (#404587) and MIDI Control Panel are required to take advantage of the piston and MIDI preset stop inputs. The operation of these presets in conjunction with the control panel is as follows:

1. **Setting** - Requires the MIDI to be on, the Prog/Use/Show to be in Program and the lock-out(s) to be off. (The Send/Receive function will default to Send when Program Mode is selected.) Displayed values are captured on a desired piston by holding the Set piston and then pressing the desired piston or turning on the desired MIDI stop. In the case of a General piston affecting more than one manual, each manual's values will have to be "layered" on (added to) the preset by adjusting the displayed values, holding the Set piston and then pressing the desired piston again. The manual value can be changed by pressing any key(s) on the desired manual. The new manual value will be displayed and settable. Multi mode allows any keyboard to have different voices (program numbers) on each channel so one manual can play more than one voice (some sound modules do not support this mode). If more than one program number is set on a particular channel the last one set will be used.

Note: It is recommended that MIDI channels 9-16 be used for sound module synthesizer voices, especially when a sequencer is used. MIDI channels 1-8 are reserved for use as control of organ only. Synthesizer sounds on these MIDI channels will not appear to respond to stop control (always on).

To clear a piston, press and hold it, and then press the MIDI Cancel piston. Cancel only clears piston or MIDI stop memories when in the Program Mode. Alternately a piston or preset can be cleared (while in Program Mode) by setting both the channel and program number displays to 0 and then pressing set and the desired piston.

Setting can also be accomplished using the "hold and set" feature. This is done by holding a piston for more than 2 seconds (in Program Mode). This automatically activates the set function. The display will momentarily blank out when Set is activated this way; do not release the piston at this time. New values are written on the release of the piston in this case, and the display will momentarily show "Set" when the piston is released.

NOTE: 24 pistons are allowed to be layered with up to a total of 16 channels each. These are normally used for General and Tutti pistons. 48 pistons are allowed to be layered with up to 2 channels each. These are normally used for Divisional pistons. All pistons have 99 memory levels available. Also see the Advanced Features section for information on assigning received program change values to pistons or stops.

If duplicate "patch" values are inadvertently attempted to be programmed (layered) on a piston, the message "dupe" is displayed. When the maximum number of allowed layers are exceeded the message "full" will be

displayed. Blank pistons are indicated by 0s being displayed in all the control panel read-outs.

Setting is not allowed if the manual, channel or program number is zero (0) or if the program number read-out is displaying the "bank" letter.

2. **Recall** - Any piston or MIDI preset stop activated will display its stored values in the control panel readouts and output those values on the appropriate MIDI channels.

Layered pistons are indicated by an "L" in the manual window when in the Use Mode. These layered values can be viewed by switching to the Show Mode. Blank pistons are indicated by "0's" in the manual, channel and program number windows when in the Use Mode.

Blank pistons/preset stops can be configured during installation to either cancel the MIDI Instrument (default) or to have no effect. Advise your installer of your preferred arrangement.

3. **MIDI Cancel** - The MIDI Cancel input will cause the MIDI to stop playing for any notes held. Also new notes will not be played until a new program number (patch) is sent. MIDI Cancel does not affect preset tabs that are on unless the MIDI Cancel is connected to the combination action General Cancel.

The MIDI Resource System powers up in a cancelled state, i.e. no key data is sent to the instrument out port until a patch change is sent. Basic systems without a control panel power up in an active state using the default channels.

If more than one piston is pushed at a time the first one that is "seen" by the microprocessor will be the active one. If the first one is then released while the second one is still held, the second will become active.

If more than one preset stop is being used and they are programmed with the same keyboard/MIDI channel, the program value of the last one activated will be used. Thus some stop changes could over-ride previous stops even though that stop is still on. However, if the over-riding stop is then canceled and the previous stop is still on, its program value is restored on its channel.

### **OrgaPlex™ SERIAL OUTPUT/ MIDI IN**

This option requires an OrgaPlex™ Serial Output board (#404590) to be installed. MIDI In data is sent to the OrgaPlex™ Serial Outputs. The OrgaPlex™ serial data is used to play the organ's keys, stops and expression. Thus a MIDI sequencer connected to the MIDI Resource System™'s MIDI In can act as a pipe organ player. See the section on "Details of MIDI Sequencing" later in this manual.

MIDI In data received from channels 1-8 are assigned to the organ specifically and cannot be reassigned. These assignments are as follows:

1. Swell keys	Solo
2. Great keys	Great
3. Choir keys	Accomp.
4. Pedal keys	Pedal
5. Solo keys (top of 4 manuals)	Bombarde
6. Antiphonal keys	Accomp. 2nd
7. Echo keys	Great 2nd
8. General controls	General controls

MIDI In data received on channels 9-16 are copied (merged) with Instrument Out channels 9-16. These channels must be used when a MIDI instrument is required with organ in a sequence. These channels may be assigned (mapped) to any keyboard as desired.

### **MIDI IN/ SEQUENCER OUT/ INSTRUMENT OUT**



Extension cables and a mounting bracket/ plate can be provided to allow the installer to mount the MIDI In/ Sequencer Out/ Instrument Out receptacles in the back of the console or under the key bed. This permits convenient access to the MIDI cables if cable swapping needs to be done.

See Figure 2 for some examples of interconnecting voice modules, a sequencer and/or a PC using the MIDI In/ Sequencer Out/ Instrument Out ports. In some cases, multiple MIDI devices may require additional "Merge" and/or "Thru" adapters to interconnect all devices. Chaining more than three MIDI devices via MIDI Thru connectors is not recommended. Accumulated delays can cause problems. If needed, "MIDI Thru" boxes that provide multiple outputs are available. Additional information on interconnecting MIDI devices may be found in the instruction manuals of the MIDI devices you are using.

Typically the sequencer's output port connects to the MIDI Resource System In port. Optionally a remote MIDI keyboard's output could connect to the MIDI Resource System In port.

The MIDI Resource System Sequencer Out port connects to the input of the sequencer. Note: This output does not transmit MIDI codes for Pitch Bend, and channels 1-7 (dedicated to organ only) do not cancel with MIDI Cancel. Therefore if a MIDI Instrument were connected to this output, remote tuning would not work and channels 1-7 would play all the time.

The MIDI Resource System Instrument Out port connects to a synthesizer or sound module. Note: this output does not transmit system exclusive (Sysex) data from organ stops.

### **SUSTAIN/ SOSTENUTO**

The sustain/ sostenuto control can optionally be supplied as a "skate clamp" switch. A toe stud or similar control can also be supplied. When activated, a sustain control code (Bn 40 7Fh) is sent on all MIDI channels. If preferred, a sostenuto control code (Bn 42 7Fh) can be sent on all MIDI channels. The preferred use is programmed by the installer during set-up.

### **START/ STOP/ CONTINUE**

Pistons buttons (or other controls of the purchaser's choice) can be installed for this feature. These controls are useful for operating a MIDI sequencer or other real time MIDI device. Additional information on use of these controls with MIDI devices may be found in the manuals of the MIDI devices you are using.

### **TRANSPOSER**

This is used to transpose MIDI data to track the organ's transposer. The transposer selector switch can provide a -6 to +6 semitone range. In most installations this MIDI transposer switch is connected to the organ's transposer switch. NOTE: If the transposer switch is used when making a sequence (recording), be sure to return it to neutral for playback to prevent double transposing.

### **EXTERNAL SEQUENCER**

Sequencers manufactured by other companies are available from Peterson, or we can recommend suitable sequencers that may be purchased locally.

Refer to your sequencer's instruction manual for details of its operation and to the section of this instruction manual entitled "Details of MIDI Sequencing".

### **ADDITIONAL FEATURES**

## **BANK SELECT**

Some voice modules and synthesizers have more than 128 voices or may permit external voice memory expansion cards. Only 128 voices can be addressed by program change values. To access additional voices a bank select is used which moves the 128 program change values to another set of voices. The MIDI Resource System™ allows selecting MIDI banks 0-127. This is done by using the Program up/down button and incrementing or decrementing the program number display between 1 and 128. At this point the letter “b” (lower case) displays in the Manual window. While this is displayed, the Send and Receive buttons select the value of the bank # to be transmitted on the selected channel. Bank 0 is always activated when power is turned on. The Send and Receive buttons will automatically increment or decrement the bank value if it is pressed and held.

## **CHANNELS +8 FEATURE**

In the normal mode of operation, MIDI channels 1-16 can be mapped (assigned) to play from any keyboard to the Instrument Output port and MIDI channels 9-16 are copied to the Sequencer Output port channels 9 to 16, thus allowing MIDI Instrument(s) to be sequenced (recorded) along with the organ.

With the +8 feature active, the control panel numbers will range from 1-24, with 1-16 associated with the Instrument Out port (as above) and 17-24 being used for 9-16 of the Sequencer Out port. This would allow two MIDI instruments to be connected (one to Instrument Out and the other to Sequencer Out) with each controlled separately for a total of 24 MIDI channels for MIDI instruments. In this case, when sequencer playback (MIDI In) data from channels 9-16 is copied to Instrument Out 9-16 and Sequencer Out 9-16, care must be taken in the assignment of MIDI instruments recorded with the organ.

This feature is most useful when control of two MIDI instruments is desired. Just keep in mind which instrument the sequencer is using. If this feature is desired, the installer/ technician should be advised as a hardware change is required to enable this feature.

## **ASSIGNING “RECEIVE PROGRAM CHANGE” VALUES (Not available at this time)**

This feature is used to assign a received program change to activate stops or a piston on the organ, thus allowing a remote MIDI keyboard controller to control the organ's registration.

To assign received program numbers to pistons or stops;

- a. Select the MIDI Resource System™'s Program and Receive modes.
- b. Adjust the displayed values on the MIDI Resource System™'s control panel for the desired MIDI receive channel number and receive program number using the Channel Up/ Down and Program Up/ Down buttons.
- c. Push and hold the desired piston or turn on the desired organ stop(s) and then press the Set piston.
- d. Repeat the above process for any desired receive program values.
- e. Return the MIDI Resource System™ to the Use Mode.

The assigned program value(s), when received on the assigned MIDI In channel(s) will now activate the piston or stop control(s).

## **AUTO RESEND**

This is an exclusive feature of the Peterson MIDI Resource System . MIDI normally only transmits data at the instant of a change. Therefore, on playback of sequencer files one must rewind to the beginning of a file, before any registration changes occurred, to assure proper playback.

When enabled, the Auto Resend feature immediately re-transmits all organ data to the Sequencer Output and then at regular intervals. This permits rewinding to any place in a file on playback. Stops, expression and keys will be restored properly within the preselected time interval (selected during installation). Also, if a momentary button is used, this feature could be used to “cue” stop and expression data when starting a recording.

This can be an extremely useful feature in some applications, however, there are some drawbacks. Resending data does use more sequencer memory and disk file space. The shorter the interval is, the more memory/disk space is required. Also if percussive type sounds (piano, harp, chimes, etc.) from a synthesizer were recorded with the Auto Resend feature active, these voices may re-strike (at the resend interval) on playback. This phenomenon only occurs with synthesizer voices, not with real electrically or pneumatically operated voices. Therefore, the interval time and the use of this feature should be used judiciously. We recommend its use only with organ type sounds.

## DETAILS OF MIDI SEQUENCING

One of the many useful features of the MIDI Resource System™ is the ability to add an optional sequencer and make MIDI sequence (player) files. It should be noted, though, that not all sequencer file disks are directly interchangeable. The MIDI data contained on them is compatible but the storage format used by various sequencers is not. This is similar to the situation that a Macintosh computer disk won't work on an IBM computer and vice versa. Therefore, when exchanging MIDI files you need to know the type of sequencer the file was made on too.

Peterson offers Yamaha<sup>®</sup> MDF-3<sup>®</sup> brand MIDI Data Filers, which we have found to have adequate capacity and are relatively easy to use. The MDF-3<sup>®</sup> records data in MIDI Format 0 Files. These files are compatible with many of the newer sequencers and software now available. Also, these files can be read by a Personal Computer. It may be necessary to rename the file, though. The MDF-3<sup>®</sup> uses an extension of .X## (## indicates the song #). Many computer programs require an extension of ".MID". When MDF type files are renamed. they are .MID files.

Other sequencers vary in the amount of memory available, their features and in other ways. However, any sequencer can be used with the MIDI Resource System™. In fact, for those that want to do a lot of file swapping, more than one sequencer (of different brands) could be connected to the MIDI Resource System™. The Viscount<sup>®</sup> brand sequencer works well and provides a remote control.

In regards to sequencer (player) disk storage capacity, a 2 Sided Double Density 3.5" floppy (used with the earlier Yamaha<sup>®</sup> MDF-2<sup>®</sup> brand MIDI Data Filer ) will accommodate approximately 80,000 notes (on and off). If one assumes 120 notes played per minute (without expression changes), there would be 328 minutes or almost 5 1/2 hours of music capacity. If one continuously pumped the expression shoe and made frequent large stop changes there might only be 20 minutes of music capacity on a disk. In actual use we have found that recordings of 125 major works (each 2-15 minutes) will fit on a single disk. Another disk has been recorded with 50 hymn tunes of 2-6 minutes each. Each of these include typical registration changes and moderate use of expression. The MDF-3<sup>®</sup> offered today has double the capacity and uses 1.44M disks.

### PLAYBACK of pre-recorded sequence files:

Connect a MIDI cable from the MIDI Resource System™'s MIDI In connector to the sequencer's MIDI Out connector. Insert the MIDI sequence file disk into the sequencer and follow the instructions for that sequencer to load and play (sequence) the file(s). The MIDI Resource System™ will determine if the file is a Peterson or Allen<sup>1</sup> format and automatically adapt for stop handling. Stops must first be assigned using the desired stop list; Peterson or Allen<sup>1</sup>. See stop assignment section.

Remember that MIDI sequencers record changes (i.e. key on, key off, stop on, stop off, etc.). Therefore, be sure to start playing a file (song) from its beginning. Otherwise, stop registration changes may be missed and the organ would appear to not be playing (until the next registration change). Also see Auto Resend section.

(Yamaha<sup>®</sup>, MDF-2<sup>®</sup>, and MDF-3<sup>®</sup> are registered trademarks of Yamaha Corporation)

NOTE: Sequence files other than Peterson or Allen<sup>1</sup> Organ may not be compatible in regards to stops and expression. The key data of any sequence file will play keys, although manual assignments may be different.

If this is the case, even these files can be played by manually registering stops and re-assigning the

manual/channel assignments. Stop registrations that are incompatible can be turned off with an optional external control or the Advanced Feature Control Panel that activate the All Stops Off Feature.

**RECORDING** or making of sequence files:

Connect a MIDI cable from the MIDI Resource System™'s MIDI Sequencer Out connector to the sequencer's MIDI In connector. Insert a blank (or formatted) file disk into the sequencer and follow the instructions for that sequencer to put it into the record mode. Then select and follow the procedure for one of the following formats.

Put the sequencer in record (wait for any count down timers) then register stops (including MIDI stops), then begin playing. Also see Auto Resend section. Since organ key data is transmitted and received on MIDI channels 1-8, when recording sound module voices along with the organ be sure to use channels 9-16 for this purpose. *Bear in mind that MIDI sequencers record event changes (i.e. key on, key off, stop on, stop off, etc). Therefore, one should begin a recording session with all stops, keys, etc off. If a sequencer's "Pause-Record cueing" feature is used, remember that a key press will automatically cancel the pause and initiate recording but a stop or expression change will not.*

#### **PETERSON STOP CONTROL FORMAT** (default)

If no other action is taken, key data from the MIDI Resource System™ will be output to the sequencer and recorded in the standard note on, note off manner using the default MIDI channel assignments. *Do not re-assign manuals/channels when making "compatible" sequence files.* The organ's stop controls will be recorded using the Peterson Sysex Format.

In order for stops to match another organ's stops, the "Stop Assignment" step must have been performed. Stop Assignment will provide compatibility of stops, even between organs with different stop lists. Refer to the section of this manual for details of the Stop Assignment procedure. The Peterson "Universal Stop Assignment List (MAP)" must be used in conjunction with the Peterson Format.

For those organists who are seriously interested in exchanging sequencer (player) files with other organists, it would be a good idea to make a copy of your organ's stop list and note the assigned stop values that were used. Supplying this notated list along with the sequencer data will provide the opportunity for others to re-assign their stops for an even better match in stop registration. See description of the "Peterson Sysex Format" found near the end of this manual for greater details of how stops are handled.

#### **PETERSON DEFAULT CHANNEL ASSIGNMENTS:**

1. Swell	Solo
2. Great	Great
3. Choir	Accomp.
4. Pedal	Pd/Pd 2
5. Solo	Bombard
6. Antiphonal	Accomp 2
7. Echo	Great 2
8. Generals	

Channels 1-7 are the standard assignments for organ dedicated channels and Channels 9-16 are available for recording MIDI instruments along with the organ. Be sure to assign any desired MIDI sounds using these channels.

#### **ALLEN<sup>1</sup> ORGAN FORMAT (Not yet available)**

It is first necessary to re-assign MIDI channels to the Choir and Pedal manuals. Only these Manual/ Channel assignments should be used to maintain full compatibility. Allen<sup>1</sup> Organ channel assignments are:

<b>Classical</b>	<b>Theatre</b>
1. Swell (Base)	Great (3m) Solo (2m)
2. Great	Accomp
3. Pedal	Pedal

4. Choir	Solo (3m)
5. Solo (4th)	Accomp 2nd touch
6. 5th Manual	----
7. ----	----
8. General Pistons	General Pistons

The Allen<sup>1</sup> format is selected by turning on the Show Mode, and then pressing the Program Up and Channel Up buttons together. This selection will be confirmed by the Program number read-out displaying "all" (for Allen<sup>1</sup>). The format selection button sequence described above needs to be done at the beginning of each MIDI sequence file disk. (It does not need to be done at the beginning of each piece on that disk). Use of this format requires that the organ stops be "assigned", using the Allen<sup>1</sup> Organ Company's "Master List" of stops.

### STOP CONTROL ASSIGNMENTS

This step should be performed to prepare the MIDI Resource System™ for compatibility with the desired sequencer (recording) format. This permits pre-recorded sequences of music to be replayed using the proper stop registration. It also permits recording sequences that will then be playable on other instruments, even if their stop lists are not the same.

Turn the organ power off, then while holding down the Show, Channel Down, Program Down and Receive buttons on the control panel, turn the power back on. This puts the MIDI Resource System™ in its Assign Stops Mode. Note: normal MIDI functions do not work in this mode. Next, turn on one stop and use the Program Up/Down button to set the program number to the reference number associated with that stop from the desired stop list. Use the Channel Up/Down to set the division number in the Channel read-out. 1=Swell, 2=Great, 3=Choir, 4=Pedal, 5=Solo, 6=Antiphonal, 7=Echo and 8=generals and intermanual couplers.

Now press the Send button to store the division number and stop number for the stop that is turned on. Repeat this process for every stop control on the organ. The values assigned to a stop can be viewed by switching to Show Mode. Turn stops on, one at a time, assigned values. If "E EE EEE" is displayed when setting, an error has occurred. Usually this means more than one stop is on or the expression shoe(s) are open. When "set" is displayed the values have been written to memory. "n AS" (looks like 5) is displayed in the manual read-out when in the Show Mode of assign stops. In a similar manner, each numbered piston must be assigned to its division (Not required for Peterson format). Again use the Channel Up/ Down button and read-out to select the division. Then hold the Send button and push each piston in that division, one at a time, to store them.

After all the stops and pistons have been assigned, it is a good idea to switch to the Show Mode and examine each stop to be sure they are programmed. Any that show "- -- ----" were overwritten from a duplicate setting. Choose a new value and reprogram that stop. Finally, turn off the Assign Stops dip switch and again reset the MIDI Resource System™ by turning the organ power off and on as above, to return to normal operation.

### ADVANCED SEQUENCING

Most sequencers (hardware or software based) have many features built in that organists can put to good use. These include: Multi-Track recording capability, quantizing, scoring and editing. Multi-Track recording allows layering of data on the 16 MIDI channels which can be used, for example, to create four (or more) handed pieces or build orchestral ensembles. The quantizing can automatically align notes in synchronization with a fraction of a metronome beat. The editing can be used to fix mistakes or embellish already recorded music. Refer to the operating manual of the sequencer device you are using for details.

Also available are PC programs for scoring music played via MIDI. These programs can also be used to edit and embellish music and then sequence (replay) the altered version. Peterson distributes "Finale™" by Coda and "Cakewalk Professional™" by Twelve Tones for this purpose. Feel free to contact Peterson for more details about this software.

### Software Update & Application Notes

The most current version of MIDI Resource System™ software is now v1.68. This version was released on Feb. 16, 2000. There are two separate versions of this software for MSP and Duo-Set applications. However, all existing systems can be upgraded with the v1.68m (MSP) version. (A slow init may be experienced if the MSP

version is used in a Duo-Set™ equipped organ.)

This version has a number of improvements. The most significant changes (from v1.54 through v1.68) are:

1. A 'bug' that under some conditions would send random bank selects on power up has been fixed.
2. MIDI key data is sent to both the Sequencer Out and Instrument Out ports when there is no Control Panel & Interface (for player only systems).
3. MIDI Cancel has been fixed to not affect the organ sequencer channels.
4. Notes hanging on when multiple MIDI Preset MIDI Stops are turned on has been fixed.
5. An improvement to the MSP memory level interface has been made that makes the MIDI memory levels track under all conditions (Requires Minimum I/O #404586 Rev. J).
6. DIP switch #2 on the Minimum I/O board selects MSB bank select messages (with this off bank select is with LSB).
7. A problem of hanging notes when using a Viscount<sup>R</sup> RD70<sup>R</sup> sequencer has been fixed.
8. MIDI In data (sequencer playback) on channels 1-7 (1-4 when MIDI preset stops are used) has been blocked from going to the instrument output, thus will not play instrument voices.
9. Bank select messages can be saved on a preset piston or stop and/ or as a layer in a preset "patch".
10. The Send/Receive button will automatically increment/ decrement Prog#, for bank selects.
11. Patch allowed on sequencer channel 8 to accommodate Allen<sup>R</sup> MDS-2<sup>R</sup> Expander.
12. Bug that could cause notes to hang on (cipher) when using an Allen<sup>R</sup> MDS-2<sup>R</sup> has been fixed.
13. In Diagnostics Mode, the version number prefix changes from "du" and "SP" (for Duo-Set™ and MSP™ respectively) to "dA" and "SA" when stops have been assigned. Also, the software version number is displayed briefly during power up.
14. A problem of MIDI logical stops (35s) being left ON when the sequencer is stopped has been fixed.
15. Divisional (MIDI preset) pistons can be assigned for more "organ like" operation.
16. MIDI logical stops (35s) enable MIDI channel +8 key data even if no patch has been sent-- when MODE (DC#19) is activated.
17. A General MIDI System On message is sent during the power up sequence when BASIC CHAN (DC#20) is activated.
18. A bank select 56 is sent on power up when TRNSFR (DC#14) is activated (used with #6 for Korgs)

When the new program ICs have been installed and power is turned back on, the MIDI Resource System™ may re-initialize itself as evidenced by the control panel display counting rapidly. This depends on the version being replaced: versions prior to v1.54 may re-initialize. If this occurs, all programmed data is lost. Re-assigning stops, especially MIDI stops (to #35) must be done. Also, any patch changes that were programmed on pistons will have been lost. Therefore it is a good idea to use the Show Mode to display saved piston values and write them down so they can be re-programmed if necessary.

When changing the program ICs located on the M68K uP. board (#404585), observe the position of the ICs labeled U2 (odd) and U3 (even) and the indentation at the top. Remove the old ICs from their sockets by slipping a small screwdriver blade between the IC and its socket and carefully prying each IC out. Replace them with the new ICs being careful to observe the IC#, indentation and pin alignment. Use the IC labeled "MRS\_168M (or D) ODD" for U2 and the IC labeled "MRS\_168M (or D) EVN" for U3.

Should you have any questions or difficulty in making these changes, please feel free to contact Peterson customer service personnel for additional assistance.

## ADDITIONAL REFERENCES

For those organists interested in learning more about MIDI, how it works, how to get the most out of it and what its limitations are, there are a number of books available. One source is the International MIDI Association (IMA). The IMA carries books such as: "The MIDI Book", "MIDI: the Ins, Outs and Thrus" and "Taking the Mystery Out of MIDI". The IMA can be reach at: 5316 West 57th Street, Los Angeles, CA. 90056, or by phone at (310) 649-6434. Similar books are available at local music stores and bookstores.

## MIDI IMPLEMENTATION DETAILS of the MIDI Resource System™

1. See "MIDI Implementation Chart" (located later in this manual) for additional information.
2. "Running status" is used whenever possible to reduce MIDI "overhead". A timer is used to re-assert status bytes after 3 seconds if no new key on/off data is detected.
3. If velocity keying is not implemented a velocity value 40H is sent for Note On.
4. Note Off data uses Note On - Velocity 0 (9n 00h) for Note Off to avoid changing status. Key Off codes (8n h) are recognized.
5. Pitch Bend (En DD DDh) is transmitted when the tuning pot on the Control Panel is changed.
6. Control change (Bn 07h) is transmitted for expression shoe changes on the MIDI channel(s) that a particular shoe is to affect. Note: alternately expression shoe data can be sent as a velocity value for note on.
7. Control change (Bn 64h or Bn 66h) is transmitted on all channels for sustain or sostenuto.
8. Program changes (Cn DDh) 0-127 are transmitted and can be user defined on receive.
9. Sysex (ID# 00 00 57) is used for Peterson format organ stop control data. See section on "Description of Peterson Sysex Format" for details.
10. All Notes Off - Follows MMA recommended procedures (see Pages 30 and 59) of MIDI 1.0 Detailed Specification.
11. The Basic Channel for receiving Mode Messages is channel #1. This can be re-assigned by the user.
12. Multi Mode allows each MIDI channel to be polyphonic and have its own voice(s) controlled by program change commands.
13. There are five 16' and five 4' MIDI preset stops for which the note data is offset by one octave (up for 4' - down for 16').
14. Instrument output port excludes sysex data. Key on/off data is inhibited by MIDI Cancel until a new program ("patch") change is transmitted.
15. Sequencer Out port filters trem/vibrato data, pitch bend data and MIDI Cancel has no effect on key on/off data for channels 1-8.
16. Tremolo control transmits MIDI code Cn 5C FFh and control 99/98 sequence to send Allen tremolo codes.
17. Bank select transmits Cn 00 MSB, 20 LSB sequence. (LSB values 0 - 127 used)

# MIDI IMPLEMENTATION CHART

MODEL: PETERSON MIDI Resource System™ Version: V1.68 Date: 2-16-2000

FUNCTION	TRANSMITTED	RECOGNIZED	REMARKS
<b>DEFAULT CHANNEL</b>	1=Sw 2=Gt 3=Ch 4=Pd 5=So (4th) 6=Antiphonal 7=Echo 9-16 Mappable	1=Sw 2=Gt 3=Ch 4=Pd 5=So (4th) 6=Antiphonal 7=Echo 9-16 Mappable	User Configurable
<b>MODE</b>	Yes	Yes	Modes supported: 1, 3, Multi
<b>NOTE NUMBER</b>	24-108	24-108	
<b>VELOCITY</b> Note On	Yes	No	User selected. Sent
Note Off	No	No	instead of (expression) Master Volume
<b>AFTER TOUCH</b> Keys	No	No	
Channels	No	No	
<b>PITCH BEND</b>	Yes	No	
<b>CONTROL CHANGE</b> 0	Yes	No	
7	Yes	Yes	Ch.1=Sw Ch.2=Gt Ch.3=Ch Ch.4=Pd Ch.5=So
32	Yes	No	
64	Yes	No	User Selected
66	Yes	No	User Selected
92	Yes	No	
98	Yes	Yes	Stop Control
99	Yes	Yes	Stop Control
<b>PROGRAM CHANGE</b>	0-127	0-127	
<b>SYSTEM EXCLUSIVE</b>	Yes	Yes	Sysex ID # 00 00 57h Note 1
<b>SYSTEM COMMON</b> Song Position	No	No	
Song Select	No	No	
Tune	No	No	
<b>SYSTEM REAL TIME</b>			
Local On/Off	No	No	
All-Notes-Off	Yes	Yes	
Active Sense	No	No	
Reset	No	No	
Start	Yes	No	
Stop	Yes	No	
Continue	Yes	No	

**Notes:**

1. Also recognize Allen<sup>1</sup> Organ sysex ID # 00 00 35h
2. MIDI channels 17-24 optionally available using sequencer output port.

Mode 1: Omni On, Poly      Mode 2: Omni On, Mono  
 Mode 3: Omni Off, Poly    Mode 4: Omni Off, Mono

<sup>1</sup> Allen is a registered trademark of Allen Organ Co., Macungie, PA.



## DESCRIPTION OF PETERSON SYSEX FORMAT (Peterson's SYSEX ID = 00 00 57h)

### OVERVIEW

Stop controls are handled with the MIDI System Exclusive (Sysex) code and ID#. The data following the Sysex/ID codes consist of a Device ID (allowing for future sysex features), at least one Stop Group Code (explained below) followed by Stop Control Data bytes. Individual stop changes are handled with a single Stop Control Group. As many groups of Stop Control Data are used as required to cover the full stop list of an organ. Stop Control Groups must always be the 5 byte (stop group code + 4 data bytes) block but can be truncated with an EOX (End Of Exclusive). This allows changing manuals and/or jumping groups on the fly.

The MIDI controller will check for key on/off activity between Stop Control Groups and handle that key data before finishing stop data. If there is key data activity an End Of Exclusive (EOX) is sent, then the required status byte and data for those keys. The Sysex is returned to in the normal way to finish stop controls if needed.

A single Stop Group Code/ Stop Control Data block consists of a 5 byte header, a Stop Group Code, 4 data bytes and an EOX byte. This is a total of 11 bytes which requires 3.52 mS. Additional Stop Group Code/Data blocks could follow without re-sending the header if no keys need to be handled and would take 1.6 mS. each. A general piston on a combination action of a large 3 manual organ may require 14-16 Stop Group Code/Data blocks (to handle 100 stops) which would take 25.9 - 29.1 mS. A stop registration change such as this would produce no noticeable delay. Sending 10 key changes (on and off) between these stop groups would cause a 42.2 mS delay from the 1st to the last stop, but only 13.1 mS. delay in the keys.

### STOP GROUP CODE DEFINITION

The Stop Group Code is a prefix to Stop Control Data bytes and identifies which manual (division) and subgroup the stop data belongs with. This byte will always have a 0 in the Most Significant Bit (MSB). The next 4 bits will identify a subgroup of the stop bit map. This provides 16 subgroups. The 3 Least Significant Bits (LSB) will identify the manual (division). The manual numbers match the default assignments (1 = Sw., 2 = Gt., etc.).

A Stop Group Code precedes each 4 byte data group (block) of stop data. This permits 16 subgroups times 28 stop bits (7 bits X 4 bytes) = 448 stops maximum per division.

The Stop Group Code byte format is as follows:

Ossssmmm

ssss = subgroup permitting 16 subgroups

mmm = manual (division) permitting 8 that match the default manual (division) assignments

Note: The subgroup can also be thought of as a group offset value.

### STOP CONTROL DATA DEFINITION

The stop control data bytes will always have a zero (0) in the MSB to distinguish them as data bytes. Each of the remaining 7 bits represents one stop (stop position). This provides 7 stops per byte for a total of 28 stops (positions) per 4 byte block. The individual bit values will be: 1 = on; 0 = off. These bits represent a bit map of the "Peterson Universal Stop List (Map)". Physical stops read in the stop input matrix will be assigned a position in this (logical) map.

Only the blocks and data bytes in which a stop change occurred need to be sent. If a stop change occurred on Universal Stop #63 of a particular division only the first 2 bytes of the 3rd block needs to be sent. Groups can only be truncated by an EOX. When a block is truncated it will be assumed that no change occurred in the remaining bytes.

Example: 7. 0.07 4' Octave (Principal)

#### LEGEND

7. = Assigned (logical) number  
0 = Stop Subgroup  
07 = 7th bit (of 1st byte)  
4' = The Pitch  
Octave = Stop Name  
(Principal) = Alternate stop name(s)

Hence, the Great 4' Octave would be coded (in hex) as:

F0 00 00 57 01 ; Begin Sysex, ID, device ID  
01 01 00 00 00 F7 ; Subgroup code, data to turn stop on, EOX.

F0 00 00 57 01 ; Header  
01 00 00 00 00 F7 ; would then turn it off.

A code of:

F0 00 00 57 01 ;  
09 01 26 07 78 ; turns on 11 great stops, one per true bit.  
11 10 F7 ; note the next subgroup code for the next  
; group of data & group truncated by EOX

A code of:

F0 00 00 57 01 ;  
00 01 02 04 08 ; turns on 4 swell stops  
30 00 00 C0 0A ; jumps groups & does 4 more swell stops  
0A 20 10 0F 0D F7 ; then switches manuals & does 9 choir stops

### PETERSON UNIVERSAL STOP LIST (MAP)

Each physical organ stop control will have a pre-assigned stop name and pitch from the Peterson "Universal Stop List (MAP)". The stops on any particular organ will be assigned to their corresponding logical bit in the appropriate division stop group, thus making MIDI files interchangeable between organs of any size and stop list. Even files made on a theater organ could be used on a classical organ or vice versa.

Most frequently used stop controls/ pitches will be in the first (0) stop subgroup and the least used will be in the 8th subgroup. Subgroups 9-11 are used for "Fast Config." assignments. Subgroups 12-16 would be used for unique stops/controls that would not likely translate to any other organ specification. Consult Peterson on the use of these un-assigned subgroups to avoid conflicts in compatible files. Channel 7(8) is reserved for encoding general couplers and piston data. A means of masking and/or disabling the piston data should be provided as piston changes are not likely compatible from organ to organ. Piston bits should only be used if compatibility is not required and where visual (or mechanically moving) stop control from a combination action is desired or from an assigned receive program change. An alternate method of encoding/decoding pistons (as stops) using subgroups 12-16 is preferred.

The Universal Stop List (MAP) begins below and is broken down by subgroups showing prioritizing. There are currently 207 stop controls with 296 stop names (including alternates) provided for in this list. These utilize 8 subgroups. Additional stop controls and/or alternate names can be added. There are 17 un-assigned bits in the 1-8 subgroups and most of the bits in subgroups 12-16 for this purpose. Bear in mind that this list is re-used for

each of 7 divisions, so a 1358 stop organ could be accommodated.  
 An example/ legend is provided at the beginning of the "Universal Stop List (MAP)" below that explains the format used.

**PETERSON "UNIVERSAL STOP LIST (MAP)"**

Example: 65. 2.09 8' DULCIANA (AEOLINE)

**LEGEND**

65 = Assignment number  
 2 = Stop Subgroup  
 09 = Second bit of 2nd byte  
 8' = Pitch  
 DULCIANA = Stop name  
 (AEOLINE) = Alternate stop name(s)

143.	5.03	64'	GRAVISSIMA
142.	5.02	32'	OPEN DIAPASON (FLUTE OUVERTE)
141.	5.01	32'	PRINCIPAL
136.	4.24	32'	CONTRA VIOLONE
95.	3.11	32'	CONTRA BOURDON
135.	4.23	32'	CONTRA BOMBARDE (DIAPHONE)
134.	4.22	32'	CONTRA FAGOTTO
54.	1.26	32'	RESULTANT
96.	3.12	16'	OPEN DIAPASON (DIAPHONIC DIAPASON, FLUTE OUVERTE)
10.	0.10	16'	PRINCIPAL (MONTRE)
128.	4.16	16'	CONTRA BASS
129.	4.17	16'	VIOLONE
11.	0.11	16'	BOURDON (SUBBASS, TIBIA CLAUSA)
97.	3.13	16'	GEMSHORN (SPITZFLUTE)
98.	3.14	16'	GAMBA
12.	0.12	16'	LIEBLICH GEDACKT
99.	3.15	16'	QUINTATON (ROHR BOURDON)
130.	4.18	16'	BOMBARDE (OPHECLIEDE)
131.	4.19	16'	TROMBONE (POSAUNE, DIAPHONE)
137.	4.25	16'	TUBA
13.	0.13	16'	FAGOTTO (BASSON, HAUTOBOIS, OBOE, OBOE HORN)
14.	0.14	16'	TRUMPET (TROMPETTE)
132.	4.20	16'	DULZIAN (CLARINET)
133.	4.21	16'	TROMPETTE-EN-CHAMADE
219.	7.23	16'	SAXOPHONE
220.	7.24	16'	BRASS TRUMPET
221.	7.25	16'	ENGLISH POST HORN
108.	3.24	16'	VOX HUMANA
109.	3.25	16'	RESULTANT
100.	3.16	10 2/3'	GROSS QUINTE
113.	4.01	8'	STENTORPHONE (GRAND DIAPASON, DIAPHONIC DIAPASON)
57.	2.01	8'	OPEN DIAPASON (1st OPEN DIAPASON)
1.	0.01	8'	PRINCIPAL (2nd OPEN DIAPASON)
58.	2.02	8'	GEIGEN PRINCIPAL (3rd OPEN DIAPASON, VIOLIN DIAPASON)
59.	2.03	8'	FLUTE MAJOR (GROSS FLUTE, SOLO TIBIA CLAUSA, TIBIA CLAUSA)
2.	0.02	8'	BOURDON (2nd FLUTE)

60.	2.04	8'	FLUTE HARMONIQUE (CONCERT FLUTE, MELODIA, HOHLFLUTE)
61.	2.05	8'	GEDACKT (STOPPED DIAPASON, CHIMNEY FLUTE, ROHRFLUTE)
62.	2.06	8'	QUINTADE (QUINTADENA)
3.	0.03	8'	VIOLA (VIOL DA GAMBA, VIOL D. ORCHESTRE, GEMSHORN)
4.	0.04	8'	VIOLA CELESTE (GEMSHORN CELESTE)
63.	2.07	8'	SALICIONAL
64.	2.08	8'	VOIX CELESTE
114.	4.02	8'	FLAUTO DOLCE (ERZAHLER)
115.	4.03	8'	FLUTE CELESTE (ERZAHLER CELESTE)
65.	2.09	8'	DULCIANA (AEOLINE)
116.	4.04	8'	UNDA MARIS (AEOLINE CELESTE)
66.	2.10	8'	TUBA (TROMBA, HARMONIC TUBA, TUBA MIRABILIS)
5.	0.05	8'	TRUMPET (TROMPETTE, CORNOPEAN, BRASS TRUMPET)
6.	0.06	8'	OBOE (FAGOT, HAUTOBOIS, BASSON, ORCHESTRAL OBOE, OBOE HORN)
67.	2.11	8'	HARMONIC TRUMPET (TROMPETTE HARMONIQUE)
68.	2.12	8'	FRENCH HORN (CORNO DI BASSETTO, COR D' ORCHESTRE)
117.	4.05	8'	ENGLISH HORN (COR D' ANGLAIS)
69.	2.13	8'	CLARINET (KRUMMHORN, CROMORNE)
70.	2.14	8'	VOX HUMANA (VOIX HUMAINE)
118.	4.06	8'	TROMPETTE-EN-CHAMADE (TROMPETTE REAL, FANFARE TRUMPET)
159.	5.19	8'	ENGLISH POST HORN
160.	5.20	8'	KRUMMET (KRUMMHORN, KORNET)
161.	5.21	8'	SERPENT
162.	5.22	8'	MUSETTE
163.	5.23	8'	SOLO VOX HUMANA
164.	5.24	8'	SAXOPHONE (BRASS SAXOPHONE)
165.	5.25	8'	KINURA
71.	2.15	5 1/3'	QUINT
119.	4.07	5 1/3'	QUINT TROMPETTE
7.	0.07	4'	OCTAVE
72.	2.16	4'	PRINCIPAL
73.	2.17	4'	PRESTANT
110.	3.26	4'	GEIGEN OCTAVE
8.	0.08	4'	CHIMNEY FLUTE (ROHR FLUTE, KOPPEL FLOTE)
74.	2.18	4'	GEDACKT (BOURDON, TIBIA)
75.	2.19	4'	SPITZ FLUTE (SPITZ PRINCIPAL, GEMSHORN)
76.	2.20	4'	OPEN FLUTE (NACHTHORN, WALDFLOTE)
77.	2.21	4'	HARMONIC FLUTE (FLUTE TRAVERSO, ZAUBERFLOTE, CONCERT FLUTE)
120.	4.08	4'	FUGARA (VIOLINA)
78.	2.22	4'	SALICET
121.	4.09	4'	CELESTE
79.	2.23	4'	GAMBETTE
122.	4.10	4'	CELESTINA
80.	2.24	4'	DULCET
123.	4.11	4'	CELESTE
85.	3.01	4'	HARMONIC TUBA (HARMONIC CLARION)
9.	0.09	4'	CLARION
86.	3.02	4'	CHALUMEAU (ROHR SCHALMEI)
87.	3.03	4'	OBOE (FAGOT, HAUTOBOIS)
124.	4.12	4'	TROMPETTE EN CHAMADE
125.	4.13	3 1/5'	GROSS TIERCE
23.	0.23	2 2/3'	QUINTE (TWELFTH)
88.	3.04	2 2/3'	NAZARD
21.	0.21	2'	PRINCIPAL (FIFTEENTH)
89.	3.05	2'	SPITZ FLUTE (SPITZ PRINCIPAL)

22.	0.22	2'	BLOCK FLUTE (PICCOLO)
90.	3.06	2'	HARMONIC PICCOLO
126.	4.14	2'	KORNET
24.	0.24	1 3/5'	TIERCE (TERZ)
29.	1.01	1 1/3'	QUINT (LARIGOT)
127.	4.15	1 1/7'	SEPTIEME
91.	3.07	1'	SIFFLOTE (FIFE)
145.	5.04	2/3'	QUINT
146.	5.05		HARMONICS
147.	5.06		FULL MIXTURE
30.	1.02		FOURNITURE
31.	1.03		SHARFF
92.	3.08		CYMBAL
147.	5.07		ACUTA
32.	1.04		SESQUIALTERA
93.	3.09		CORNET
94.	3.10		SEPTERZ
53.	1.25		II MIXTURE
25.	0.25		III MIXTURE
26.	0.26		IV MIXTURE
20.	0.20		TREMULANT I-FAST (PRIMARY OR FIRST)
148.	5.08		TREMULANT II-SLOW
171.	6.03		TREMULANT MAIN A
172.	6.04		TREMULANT MAIN B
173.	6.05		TREMULANT TIBIA
174.	6.06		TREMULANT VOX
175.	6.07		TREMULANT BRASS
176.	6.08		TREMULANT REEDS
187.	6.19		GLOCK RE-IT
188.	6.20		XYLO RE-IT
189.	6.21		MARIMBA RE-IT
15.	0.15	16'	SUB COUPLER
16.	0.16	8'	UNISON COUPLER (UNISON OFF)
194.	6.26	5 1/3'	QUINT COUPLER
17.	0.17	4'	OCTAVE COUPLER
37.	1.09	16'	SOLO TO X
38.	1.10	8'	SOLO TO X
194.	6.26	5 1/3'	SOLO TO X
39.	1.11	4'	SOLO TO X
40.	1.12	16'	SWELL TO X
41.	1.13	8'	SWELL TO X
42.	1.14	4'	SWELL TO X
43.	1.15	16'	GREAT TO X
44.	1.16	8'	GREAT TO X
45.	1.17	4'	GREAT TO X
46.	1.18	16'	CHOIR TO X
47.	1.19	8'	CHOIR TO X
48.	1.20	4'	CHOIR TO X

222.	7.26		PEDAL TO X
152.	5.12		ECHO ON X
153.	5.13		ANTIPHONAL ON X
154.	5.14		POSITIV ON X
34.	1.06	16'	MIDI TO X
35.	1.07	8'	MIDI TO X (MIDI ON/OFF)
36.	1.08	4'	MIDI TO X
49.	1.21	16'	MIDI "A"
50.	1.22	16'	MIDI "B"
102.	3.18	16'	MIDI "C"
103.	3.19	16'	MIDI "D"
18.	0.18	8'	MIDI "A"
19.	0.19	8'	MIDI "B"
104.	3.20	8'	MIDI "C"
105.	3.21	8'	MIDI "D"
51.	1.23	4'	MIDI "A"
52.	1.24	4'	MIDI "B"
106.	3.22	4'	MIDI "C"
107.	3.23	4'	MIDI "D"
81.	2.25	8'	MIDI MELODY
82.	2.26	4'	MIDI MELODY
83.	2.27	16'	MIDI BASS
84.	2.28	8'	MIDI BASS
155.	5.15		MANUAL TRANSFER
156.	5.16		ALL SWELLS TO SWELL
157.	5.17		BASS COUPLER
158.	5.18		MELODY COUPLER
169.	6.01		PIZZICATTO COUPLER
170.	6.02		SOSTENUTO
181.	6.13	16'	PIANO
182.	6.14	8'	PIANO
183.	6.15	4'	PIANO
184.	6.16		PIANO SUSTAIN
215.	7.19		REMOTE ORGAN ON/OFF
216.	7.20		REMOTE CONSOLE ON/OFF
217.	7.21		LOCAL ORGAN ON/OFF
218.	7.22		LOCAL CONSOLE ON/OFF
33.	1.05		CHIMES
149.	5.09		HARP
150.	5.10		CELESTA
151.	5.11		CARILLON
185.	6.17		TOWER CHIMES
177.	6.09		MARIMBA HARP
178.	6.10		CHRYSOLOGLOTT
179.	6.11		XYLOPHONE
180.	6.12		GLOCKENSPIEL
186.	6.18		TUNED SLEIGH BELLS
101.	3.17		ZIMBELSTERN
179.	6.23		GONG
180.	6.24		TRIANGLE
212.	7.16		SLEIGH BELLS
200.	7.04		CRASH CYMBAL
201.	7.05		TAP CYMBAL
202.	7.06		BRUSH CYMBAL

214.	7.18	FINGER CYMBAL
203.	7.07	SNARE DRUM
199.	7.03	BASS DRUM
204.	7.08	SNARE DRUM ROLL
205.	7.09	TOM TOM
206.	7.10	TYMPANI
207.	7.11	TAMBORINE
208.	7.12	CASTINETS
209.	7.13	CHINESE BLOCK
210.	7.14	WOOD BLOCK
211.	7.15	SAND BLOCK
197.	7.01	STEAMBOAT WHISTLE
198.	7.02	BIRD WHISTLE
190.	6.22	SIREN
213.	7.17	GLADSTONE AFTERBEAT
225.	8.01	SWELL SHADE 1
226.	8.02	SWELL SHADE 2
227.	8.03	SWELL SHADE 3
228.	8.04	SWELL SHADE 4
229.	8.05	SWELL SHADE 5
230.	8.06	SWELL SHADE 6
231.	8.07	SWELL SHADE 7
232.	8.08	SWELL SHADE 8
233.	8.09	SWELL SHADE 9
234.	8.10	SWELL SHADE 10
235.	8.11	SWELL SHADE 11
236.	8.12	SWELL SHADE 12
237.	8.13	SWELL SHADE 13
238.	8.14	SWELL SHADE 14
239.	8.15	SWELL SHADE 15
240.	8.16	SWELL SHADE 16
241.	8.17	SWELL SHADE 17
242.	8.18	SWELL SHADE 18
243.	8.19	SWELL SHADE 19
244.	8.20	SWELL SHADE 20
245.	8.21	SWELL SHADE 21
246.	8.22	SWELL SHADE 22
247.	8.23	SWELL SHADE 23
248.	8.24	SWELL SHADE 24
249.	8.25	SWELL SHADE 25
250.	8.26	SWELL SHADE 26
251.	8.27	SWELL SHADE 27
252.	8.28	SWELL SHADE 28

The following is a duplicate “Universal Stop List (MAP)” that has been sorted by its assignment (sysex subgroup) numbers. Use for checking assigned stops.

1.	0.01	8'	PRINCIPAL (2nd OPEN DIAPASON)
2.	0.02	8'	BOURDON (2nd FLUTE)
3.	0.03	8'	VIOLA (VIOL DA GAMBA, VIOL D. ORCHESTRE, GEMSHORN)
4.	0.04	8'	VIOLA CELESTE (GEMSHORN CELESTE)
5.	0.05	8'	TRUMPET (TROMPETTE, CORNOPEAN, BRASS TRUMPET)
6.	0.06	8'	OBOE (FAGOT, HAUTOIS, BASSON, ORCHESTRAL OBOE, OBOE HORN)
7.	0.07	4'	OCTAVE
8.	0.08	4'	CHIMNEY FLUTE (ROHR FLUTE, KOPPEL FLUTE)
9.	0.09	4'	CLARION
10.	0.10	16'	PRINCIPAL (MONTRE)
11.	0.11	16'	BOURDON (SUBBASS, TIBIA CLAUSA)
12.	0.12	16'	LIEBLICH GEDACKT
13.	0.13	16'	FAGOTTO (BASSON, HAUTOIS, OBOE, OBOE HORN)
14.	0.14	16'	TRUMPET (TROMPETTE)
15.	0.15	16'	SUB COUPLER
16.	0.16	8'	UNISON COUPLER (UNISON OFF)

17.	0.17	4'	OCTAVE COUPLER
18.	0.18	8'	MIDI A
19.	0.19	8'	MIDI B
20.	0.20		TREMULANT I-FAST (PRIMARY OR FIRST)
21.	0.21	2'	PRINCIPAL
22.	0.22	2'	BLOCK FLUTE (PICCOLO)
23.	0.23	2 2/3'	QUINTE
24.	0.24	1 3/5'	TIERCE (TERZ)
25.	0.25	III	MIXTURE
26.	0.26	IV	MIXTURE
27.	0.27		
28.	0.28		
29.	1.01	1 1/3'	QUINTE (LARIGOT)
30.	1.02		FOURNITURE
31.	1.03		SHARFF
32.	1.04		SESQUIALTERA
33.	1.05		CHIMES
34.	1.06	16'	MIDI TO X
35.	1.07	8'	MIDI TO X (MIDI ON/OFF)
36.	1.08	4'	MIDI TO X
37.	1.09	16'	SOLO TO X
38.	1.10	8'	SOLO TO X
39.	1.11	4'	SOLO TO X
40.	1.12	16'	SWELL TO X
41.	1.13	8'	SWELL TO X
42.	1.14	4'	SWELL TO X
43.	1.15	16'	GREAT TO X
44.	1.16	8'	GREAT TO X
45.	1.17	4'	GREAT TO X
46.	1.18	16'	CHOIR TO X
47.	1.19	8'	CHOIR TO X
48.	1.20	4'	CHOIR TO X
49.	1.21	16'	MIDI "A"
50.	1.22	16'	MIDI "B"
51.	1.23	4'	MIDI "A"
52.	1.24	4'	MIDI "B"
53.	1.25	II	MIXTURE
54.	1.26	32'	RESULTANT
55.	1.27		
56.	1.28		
57.	2.01	8'	OPEN DIAPASON (1st OPEN DIAPASON)
58.	2.02	8'	GEIGEN PRINCIPAL (3rd OPEN DIAPASON, VIOLIN DIAPASON)
59.	2.03	8'	FLUTE MAJOR (GROSS FLUTE, SOLO TIBIA CLAUSA, TIBIA)
60.	2.04	8'	FLUTE HARMONIQUE (CONCERT FLUTE, MELODIA, HOHLFLUTE)
61.	2.05	8'	GEDACKT (STOPPED DIAPASON, CHIMNEY FLUTE, ROHRFLUTE)
62.	2.06	8'	QUINTADE (QUINTADENA)
63.	2.07	8'	SALICIONAL
64.	2.08	8'	VOIX CELESTE
65.	2.09	8'	DULCIANA (AEOLINE)
66.	2.10	8'	TUBA (TROMBA, HARMONIC TUBA, TUBA MIRABILIS)
67.	2.11	8'	HARMONIC TRUMPET (TROMPETTE HARMONIQUE)
68.	2.12	8'	FRENCH HORN (CORNO DI BASSETTO, COR D' ORCHESTRE)
69.	2.13	8'	CLARINET (KRUMMHORN, CROMORNE)
70.	2.14	8'	VOX HUMANA (VOIX HUMAINE)
71.	2.15	5 1/3'	QUINT
72.	2.16	4'	PRINCIPAL
73.	2.17	4'	PRESTANT
74.	2.18	4'	GEDACKT (BOURDON, TIBIA)
75.	2.19	4'	SPITZ FLUTE (SPITZ PRINCIPAL, GEMSHORN)
76.	2.20	4'	OPEN FLUTE (NACHTHORN, WALDFLOTE)
77.	2.21	4'	HARMONIC FLUTE (FLUTE TRAVERSO, ZAUBERFLOTE, CONCERT FLUTE)



78.	2.22	4'	SALICET
79.	2.23	4'	GAMBETTE
80.	2.24	4'	DULCET
81.	2.25	8'	MIDI MELODY
82.	2.26	4'	MIDI MELODY
83.	2.27	16'	MIDI BASS
84.	2.28	8'	MIDI BASS
85.	3.01	4'	HARMONIC TUBA (HARMONIC CLARION)
86.	3.02	4'	CHALUMEAU (ROHR SCHALMEI)
87.	3.03	4'	OBOE (FAGOT, HAUTOIS)
88.	3.04	2 2/3'	NAZARD
89.	3.05	2'	SPITZ FLUTE (SPITZ PRINCIPAL)
90.	3.06	2'	HARMONIC PICCOLO
91.	3.07	1'	SIFFLOTE (FIFE)
92.	3.08		CYMBAL
93.	3.09		CORNET
94.	3.10		SEPTERZ
95.	3.11	32'	CONTRA BOURDON
96.	3.12	16'	OPEN DIAPASON (DIAPHONIC DIAPASON, FLUTE OUVERTE)
97.	3.13	16'	GEMSHORN (SPITZFLUTE)
98.	3.14	16'	GAMBA
99.	3.15	16'	QUINTATON (ROHR BOURDON)
100.	3.16	10 2/3'	GROSS QUINTE
101.	3.17		ZIMBELSTERN
102.	3.18	16'	MIDI "C"
103.	3.19	16'	MIDI "D"
104.	3.20	8'	MIDI "C"
105.	3.21	8'	MIDI "D"
106.	3.22	4'	MIDI "C"
107.	3.23	4'	MIDI "D"
108.	3.24	16'	VOX HUMANA
109.	3.25	16'	RESULTANT
110.	3.26	4'	GEIGEN OCTAVE
111.	3.27		
112.	3.28		
113.	4.01	8'	STENTORPHONE (GRAND DIAPASON, DIAPHONIC DIAPASON)
114.	4.02	8'	FLAUTO DOLCE (ERZÄHLER)
115.	4.03	8'	FLUTE CELESTE (ERZÄHLER CELESTE)
116.	4.04	8'	UNDA MARIS (AEOLINE CELESTE)
117.	4.05	8'	ENGLISH HORN (COR D' ANGLAIS)
118.	4.06	8'	TROMPETTE-EN-CHAMADE (TROMPETTE REAL, FANFARE TRUMPET)
119.	4.07	5 1/3'	QUINT TROMPETTE
120.	4.08	4'	FUGARA (VIOLINA)
121.	4.09	4'	CELESTE
122.	4.10	4'	CELESTINA
123.	4.11	4'	CELESTE
124.	4.12	4'	TROMPETTE EN CHAMADE
125.	4.13	3 1/5'	GROSS TIERCE
126.	4.14	2'	KORNET
127.	4.15	1 1/7'	SEPTIEME
128.	4.16	16'	CONTRE BASS
129.	4.17	16'	VIOLONE
130.	4.18	16'	BOMBARDE (OPHECLIEDE)
131.	4.19	16'	TROMBONE (POSAUNE, DIAPHONE)
132.	4.20	16'	DULZIAN (CLARINET)
133.	4.21	16'	TROMPETTE-EN-CHAMADE
134.	4.22	32'	CONTRA FAGOTTO
135.	4.23	32'	CONTRA BOMBARDE (DIAPHONE)
136.	4.24	32'	CONTRA VIOLONE
137.	4.25	16'	TUBA
138.	4.26		
139.	4.27		

140.	4.28		
141.	5.01	32'	PRINCIPAL
142.	5.02	32'	OPEN DIAPASON (FLUTE OUVERTE)
143.	5.03	64'	GRAVISSIMA
144.	5.04	2/3'	QUINT
145.	5.05		HARMONICS
146.	5.06		FULL MIXTURE
147.	5.07		ACUTA
148.	5.08		TREMULANT II-SLOW
149.	5.09		HARP
150.	5.10		CELESTA
151.	5.11		CARILLON
152.	5.12		ECHO ON X
153.	5.13		ANTIPHONAL ON X
154.	5.14		POSITIV ON X
155.	5.15		MANUAL TRANSFER
156.	5.16		ALL SWELLS TO SWELL
157.	5.17		BASS COUPLER
158.	5.18		MELODY COUPLER
159.	5.19	8'	ENGLISH POST HORN
160.	5.20	8'	KRUMMET
161.	5.21	8'	SERPENT
162.	5.22	8'	MUSETTE
163.	5.23	8'	SOLO VOX HUMANA
164.	5.24	8'	SAXOPHONE (BRASS SAXOPHONE)
165.	5.25	8'	KINURA
166.	5.26		
167.	5.27		
168.	5.28		
169.	6.01		PIZZICATO COUPLER
170.	6.02		SOSTENUTO
171.	6.03		TREMULANT MAIN A
172.	6.04		TREMULANT MAIN B
173.	6.05		TREMULANT TIBIA
174.	6.06		TREMULANT VOX
175.	6.07		TREMULANT BRASS
176.	6.08		TREMULANT REEDS
177.	6.09		MARIMBA HARP
178.	6.10		CHRYSOLGLOTT
179.	6.11		XYLOPHONE
180.	6.12		GLOCKENSPIEL
181.	6.13	16'	PIANO
182.	6.14	8'	PIANO
183.	6.15	4'	PIANO
184.	6.16		PIANO SUSTAIN
185.	6.17		TOWER CHIMES
186.	6.18		TUNED SLEIGH BELLS
187.	6.19		GLOCK RE-IT
188.	6.20		XYLO RE-IT
189.	6.21		MARIMBA RE-IT
190.	6.22		SIREN
191.	6.23		GONG
192.	6.24		TRIANGLE
193.	6.25	5 1/3'	QUINT COUPLER
194.	6.26	5 1/3'	SOLO TO X
195.	6.27		
196.	6.28		
197.	7.01		STEAMBOAT WHISTLE
198.	7.02		BIRD WHISTLE
199.	7.03		BASS DRUM
200.	7.04		CRASH CYMBAL
201.	7.05		TAP CYMBAL

202.	7.06		BRUSH CYMBAL
203.	7.07		SNARE DRUM
204.	7.08		SNARE DRUM ROLL
205.	7.09		TOM TOM
206.	7.10		TYMPANI
207.	7.11		TAMBOURINE
208.	7.12		CASTANETS
209.	7.13		CHINESE BLOCK
210.	7.14		WOOD BLOCK
211.	7.15		SAND BLOCK
212.	7.16		SLEIGH BELLS
213.	7.17		GLADSTONE AFTERBEAT
214.	7.18		FINGER CYMBAL
215.	7.19		REMOTE ORGAN ON/OFF
216.	7.20		REMOTE CONSOLE ON/OFF
217.	7.21		LOCAL ORGAN ON/OFF
218.	7.22		LOCAL CONSOLE ON/OFF
219.	7.23	16'	SAXOPHONE
220.	7.24	16'	BRASS TRUMPET
221.	7.25	16'	ENGLISH POST HORN
222.	7.26		PEDAL TO X
223.	7.27		
224.	7.28		
225.	8.01		SWELL SHADE 1
226.	8.02		SWELL SHADE 2
227.	8.03		SWELL SHADE 3
228.	8.04		SWELL SHADE 4
229.	8.05		SWELL SHADE 5
230.	8.06		SWELL SHADE 6
231.	8.07		SWELL SHADE 7
232.	8.08		SWELL SHADE 8
233.	8.09		SWELL SHADE 9
234.	8.10		SWELL SHADE 10
235.	8.11		SWELL SHADE 11
236.	8.12		SWELL SHADE 12
237.	8.13		SWELL SHADE 13
238.	8.14		SWELL SHADE 14
239.	8.15		SWELL SHADE 15
240.	8.16		SWELL SHADE 16
241.	8.17		SWELL SHADE 17
242.	8.18		SWELL SHADE 18
243.	8.19		SWELL SHADE 19
244.	8.20		SWELL SHADE 20
245.	8.21		SWELL SHADE 21
246.	8.22		SWELL SHADE 22
247.	8.23		SWELL SHADE 23
248.	8.24		SWELL SHADE 24
249.	8.25		SWELL SHADE 25
250.	8.26		SWELL SHADE 26
251.	8.27		SWELL SHADE 27
252.	8.28		SWELL SHADE 28
253.	thru	448.	UN-ASSIGNED

## DEFINITIONS (Glossary of terms)

**ANO (All Notes Off)** - MIDI command(s) that transmits note off data.

**Bank (Memory Bank)** - Memory (data) storage area.

**Basic Channel** - MIDI channel that receives Mode Messages.

**Channel (MIDI Channel)** - One of 16 multiplexed data communication paths.

**Control Change** - MIDI command(s) that affect a voice module's or synthesizer's control parameters.

**Controller** - Device that transmits (sends) control commands.

**Default** - Values or parameters used in the absence of user input.

**EOX (End of Exclusive)** - Returns data handling from a manufacturer's exclusive format to standard MIDI format.

**File** - Arrangement of related memory data in storage or on disk.

**Format** - Specific type of processing used.

**Layer** - One of several levels of information (data).

**MAP** - Detailed arrangement (placement) of data.

**Memory Dump** - Downloading (transferring) data from memory.

**Merge(r)** - Combining of data from two or more sources.

**MIDI (Musical Instrument Digital Interface)** - Equipment designed for exchanging information (musical notes, voice changes, expression, etc.) between different musical instruments.

**MIDI Thru** - Output that provides the same data as received in MIDI In.

**Mode** - A manner of usage.

**Omni** - A MIDI mode in which all channels are interpreted as one.

**Patch** - Means of producing or bringing together various parameters.

**Pitch Bend** - Method of altering the pitch (frequency) of a tone generating device.

**Port** - Term for data inputs and outputs.

**Program Change** - Synonymous with voice or registration change.

**Real Time** - Happening in actual true time, not delayed or altered in time from its occurrence.

**Running Status** - Repeating of status messages is not required thus reducing transmitted data.

**Sequencer** - Device that records and replays (data) events for the purpose of reproducing a performance.

**Sound Module/Synthesizer** - Device that generates tones in response to MIDI data (musical notes, voice changes, expression, etc.).

**Sysex (System Exclusive)** - Format exclusively used by a manufacturer to handle NON-MIDI data/functions.

## SOFTWARE LICENSE AGREEMENT and WARRANTY

The MIDI Resource System software (firmware) and documentation are owned by PETERSON ELECTRO MUSICAL PRODUCTS, Inc. and are protected by United States copyright laws and international treaty provisions. Therefore, you must treat the MIDI Resource System software (firmware) like any other copyrighted material.

You must not copy the software or written materials accompanying the software. The software (firmware) must not be used in any device other than the MIDI Resource System hardware that it was intended for. You may not reverse engineer, decompile, or disassemble the MIDI Resource System software (firmware).

PETERSON ELECTRO-MUSICAL PRODUCTS, Inc. grants the use of its MIDI Resource System software (firmware) in the MIDI Resource System hardware that it was supplied with.

PETERSON ELECTRO-MUSICAL PRODUCTS, Inc. warrants the physical media (EPROM) in which the MIDI Resource System software is contained to be free from defects and shall replace any such defective media free of charge.

PETERSON ELECTRO-MUSICAL PRODUCTS, Inc. further agrees to provide any licensee of its MIDI Resource System software (firmware) with any updated version(s) of the MIDI Resource System software for a period of one year. This upgrade agreement applies to the software (firmware) only and does not include shipping or installation costs and further requires the return of the software (firmware) that is being replaced.

## **WARRANTY**

Effective October 1, 1987

Peterson warrants the equipment that it manufactures to be free from defects in material or workmanship under normal use for a period of ten(10) years from the date of the original shipment to the buyer unless otherwise specified in writing. (See exceptions to 10 Year Warranty). Peterson's sole obligation under this warranty shall be that upon the return of goods to the Peterson factory, transportation charges prepaid, Peterson will at its option repair or replace any equipment which it deems to contain defective material or workmanship and will return the repaired or replaced equipment to buyer, transportation charges prepaid. Peterson shall have the sole right upon inspection of any item of equipment or part thereof, to determine whether or not the defect is covered by the terms of this warranty.

Peterson will also warrant all of its equipment in a particular installation against indirect lightning strikes. If the installation is considered as a high risk to lightning strikes it is required that certain precautionary installation procedures be followed. These procedures will be specified in writing by Peterson. It is the responsibility of the buyer to check with Peterson prior to the installation as to whether the installation is considered a high risk. This warranty is not valid in the case of direct lightning strikes. Peterson considers a lightening event to be direct strike when the building's structure or electrical power system (such as electrical wiring, electrical panel, motors, etc.) is physically damaged by lightening. Peterson reserves the right to inspect the installation site, and Peterson's determination as to whether the proper installation procedures were followed will be final. Peterson's sole obligation under the lightening warranty provisions will be the same as its standard warranty terms.

Peterson's warranty shall not apply to any equipment, or part thereof, which has been repaired by others in such a manner that does not conform with the Peterson standard for quality and/or workmanship, or which has been improperly used, abused, altered, damaged, subjected to accident, flood, fire or acts of God; or on which any serial numbers have been altered, defaced or removed. Peterson will not be responsible for any dismantling, reassembly or reinstallation charges. This warranty is in lieu of any other warranties expressed or implied, including, without limitations, warranty for merchantability and fitness for a particular purpose as well as all other representations made to the purchaser. No person is authorized to give any other warranties or to assume any other liabilities on behalf of Peterson unless made or assumed by Peterson in writing. Peterson will not be liable for any special, indirect, incidental or consequential damages claimed in connection with any rescission of the agreement by the buyer.

Peterson's warranty does not include the Yamaha MDF-2, MDF-3, or any other third party sequencer(s). These devices are covered by their manufacturer's warranty.

Peterson's warranty, as here in above set forth, shall not be enlarged, diminished or affected by, and no obligations or liability shall arise or grow out of, Peterson's rendering of technical advice or service in connection with buyer's order of goods furnished hereunder. The warranty gives you specific legal rights, which may vary from state to state.

## **SUPPORT POLICY**

Peterson Electro-Musical Products, Inc. will provide any necessary and reasonable telephone support to aid in the sales, installation, set up/configuration, operation and servicing of the MIDI Resource System. This support extends to the interface with diode matrix relays, OrgaPlex switching systems, MSP-1000J and Duo-Set combination actions manufactured by Peterson. This also includes software/operating questions beyond the scope of the manuals.

We are not able to support other manufacturers' equipment, which may be connected to the MIDI Resource System. To the extent that we are familiar with another manufacturer's equipment, we will do our best to advise on its use with our MIDI interface system. However, due to the large number of MIDI synthesizers, sound modules, sequencers, patch bays, etc. on the market, we cannot support or answer questions on these devices or on their interconnection. We recommend that you direct questions to the manufacturer or distributor of the product of interest.

Note: The Peterson MIDI Resource System conforms to the MIDI Manufacturers Association, MIDI 1.0 Specification, Version 4.2 and will operate properly with other equipment that conforms to this specification (or earlier versions). Some equipment that conforms to this specification nevertheless may not recognize certain MIDI messages such as "Pitch Bend", Master Volume (expression), Sustain, Tremolo, Bank Select, etc..