

INTERMIDI

Organ MIDI Converter System

Installation Packet

for

Service Technicians, Music Retailers and Manufacturers

Multi-Channel Multi-Manual Version

**InterMidi, Inc.
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Carson, WA 98610-0775**

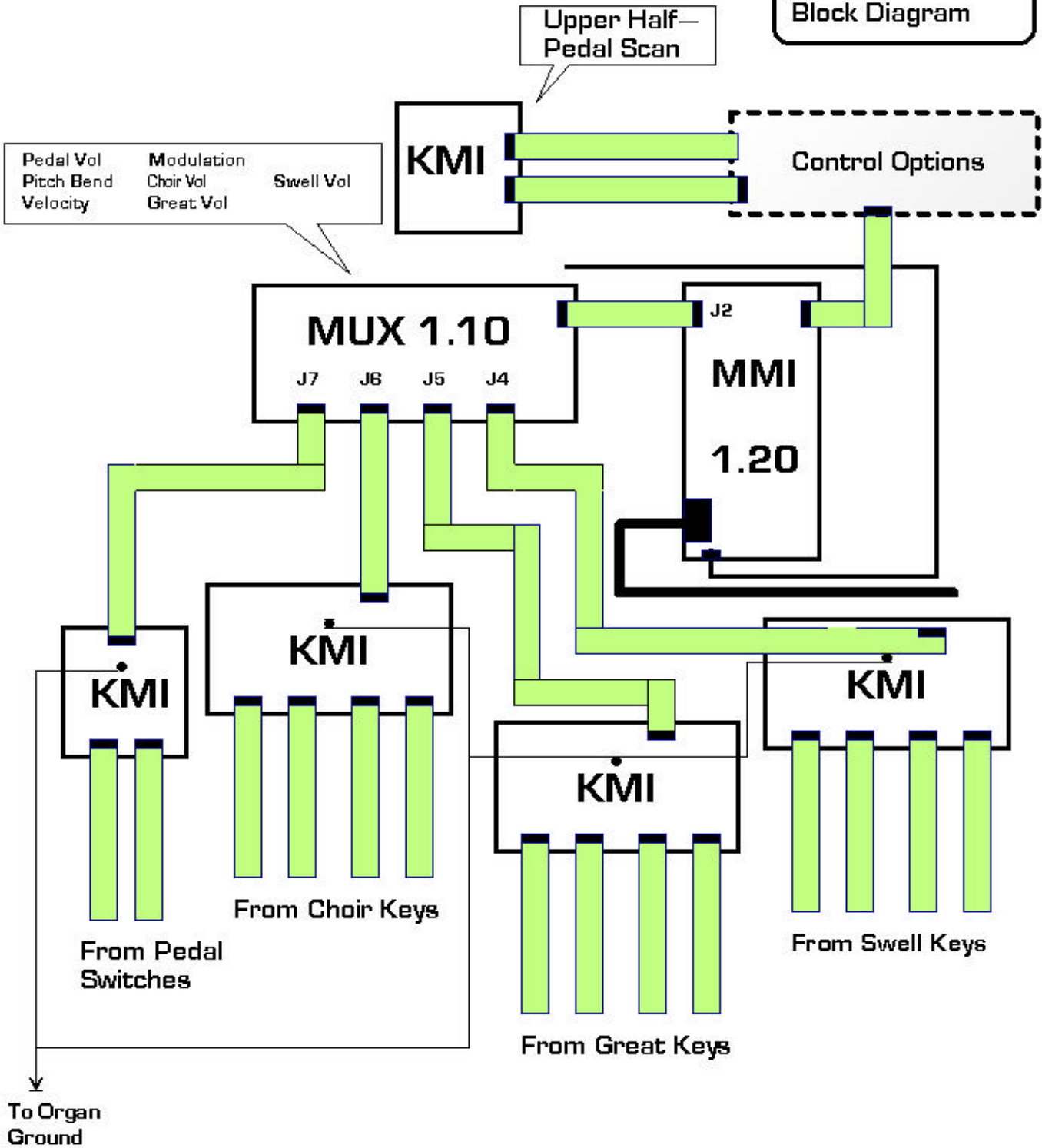
more than a decade of service to the industry

Installation Notes - MIDI Conversion Assembly - (Positive 5-30V Key Buss)

1. Solder a piece of hookup wire from the Ground (GND) pad hole on the KMI -2.00 board to the minus (-) side (not the buss) of the organ keyboard BUSS power source. A hole marked DGND is for special purposes and is to be left vacant.
2. There is a small screw holding the heat sink in place in the CPU board. This can become uncomfortably warm to the touch, but this is a common trait of Linear Regulators. Use four soft rubber grommets under the screw holes when mounting the CPU and KMI boards in the organ console will keep them from direct contact with the console interior.
3. **Always use only the U.L. power supply supplied with the unit. Otherwise, damage may result. Always be sure the 3.5mm power plug has been inserted in the small power jack on the CPU board before energizing CPU power supply.**
4. A coil of 16-conductor ribbon cables is included for each manual and for the Pedal Division. At a minimum of 12 feet in length and double-ended, these cables are meant to be sheared in half or in any **uneven** division your job planning may dictate in view of keyboard length, pc board position, etc. **All cables are tested for opens and shorts via InterMidi's hi-speed computer tester.**
5. The 62nd, 63rd and 64th ribbon wire conductors for the Swell (top) manual, if momentarily fed the same buss supply as the key switches, will, on a single basis, transmit MIDI program numbers 1, 2 and 3. If unused, please tape the ends. If connected to the optional Control Panel equipped with a diode matrix, or, simply to the optional Diode Matrix PCB (DM 1002), 7 different program numbers can be transmitted. The accompanying system block diagram **(Figure 1.)** shows each board's connection.

INTERMIDI

Multi-Channel
MIDI System
Block Diagram



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FIGURE 1.

6. **Do not expose the CPU board to any electrical potentials, including static electricity.**
7. Use the single long ribbon wire packed with the unit to engage/disengage the AUX PORT (J5) FEATURES. The optional Control Panel provides these switches for you and its own ribbon cable connects to the auxiliary input of the CPU board.
8. If there are technical questions concerning installation/operation of the unit, call InterMidi, Inc. on 509-427-7999, or you may reach the FAX on 509-427-7277.

Installation Notes - MIDI Conversion Assembly - Connections to MUX PCB

1. The MUX PC Board is equipped with a pair of 5V DC power wires terminated at the distant end for connection to the CPU Board. **Observation of POLARITY is extremely critical to avoid frying parts!** The positive terminal on the CPU is closest to the MIDI Jack while the negative is closest to the 7805 Regulator. **RECHECK!! The connector is polarized to assist you. Do not force it on wrong**
2. The ribbon cable generally left connected to the MUX during shipment is to be connected to the input jack J2 on the CPU Board observing PIN 1 to PIN 1 convention.
3. Connect each KMI Opto Interface Board (usually $\frac{1}{2}$ for the Pedal) to its appropriate input header:

Swell (also 3-channel layered version w/MAPPER)	to J4
Great	to J5
Choir	to J6
Pedal	to J7

Observe PIN 1 (RED) to PIN 1 conventions!

4. If external potentiometers are used, connect them to the duplicate pad holes, Refer to **schematic 1.**, attached. In some cases, e.g., pitch, modulation, etc. you will want to carefully snip away the pots soldered into the board.
5. If variable voltage input will be used instead of pots, **CALL INTERMIDI for details!** For example, there are catastrophic consequences to applying greater than five (5) volts or negative voltages.
6. If the six second powerup delay option is desired, apply voltage to Pedal Upper input 33..

Eight-position DIP Switch - CPU Board - PRESET MEMORY MAPPER tm VERSION

- 1 Enables Controller 92 as TREMOLO Message for EXL-150 European Pipe Organ Tone Module
- 2 (VACANT)
- 3, 4 Channel Set Select Bits: 00=1-4, 10=5-8, 01=9-12, 11=13-16
- 5 Changes function of Ctrl Pnl switch 7 (top) - All swells to Swell (OFF) versus **MIDI-MEZZO tm** (ON).
- 6 ON enables "tuning shift" feature (pipe organ use)

7, 8 With 7 OFF, dynamics/velocity level for all channels is controlled by A/D input 5 (J15). With 7 ON, the dynamics/velocity level is controlled via Swell Volume A/D input 1 (J16). See Pedal Upper Switch 50 description for reversibility. Switch 8 OFF causes system to work as a normal four-channel, multi-manual system with usual standard real-time couplers. With switch 8 ON, the system is configured as a three-channel, layered system with non-standard (alternate) couplers.

Auxiliary Input Port - MUX REV Features input ribbon cable - CPU J5

Conductor No.	Switch Req'd	FEATURE/FUNCTION
(1,2)	SPST - normal open (home=closed)	MIDI On/Off - Swell (1st Ch)
(3,4)	SPST - normal open	Bank A/B Program Change
(5,6)	MOM SP - normal either	SUSTAIN - Swell
(7,8)	SPST - normal open	TREM/VIB ON - Swell (1st Ch)
(9,10)	SPST - normal open	All swells to Swell OR MIDI- MEZZO tm for SWELL (CPU DIP switch 5 dependent)
(11,12)	MOM SP - normal open	NOTE-BUSTER tm
(13,14)	MOM SP - normal open	UNPOSER tm
(15,16)	MOM SP - normal open	TRANSPOSE (hold & set)

Note: Ribbon cable supplied for FEATURES is Gray, with edge stripe for conductor number 1.

FEATURES DESCRIPTION - Optional CONTROL PANEL - MUX VERSION

General

The **InterMidi** Custom **MIDI** Converter Control Panel offers a number of useful controls to the musician and gives a bright red digital LED display of the selected **MIDI** Patch/Program number currently in use.

Specific Features

From left to right, the top row of push-button switches activate feature control, as follows:

MIDI ON/OFF - a maintained/locking switch which toggles **MIDI** transmission ON/OFF for Swell (generally Channel 1) Division.

BANK A/B - a maintained/locking switch which, when locked in, causes **MIDI** transmission of the Program Change Selections (described below) to range from 8 through 14 (BANK B) instead of 1 through 7 (BANK A). Functions "globally".

Transpose - a hold and set momentary switch which, while depressed, causes a single key played to reference the **MIDI** to a transposed step. It functions with reference to Middle C and will respond anywhere within plus or minus a full octave.

NOTE-BUSTER tm - a momentary switch which clears any stuck **MIDI** notes (ciphers) intelligently.

UN-POSER tm - restores transpose to normal from any prior offset via a momentary push of the switch.

Modulation ON/OFF - allows tremulant/vibrato on/off through this maintained/locking push-button switch for the Swell (Channel 1) Division.

Note -this is a "patch/program/parameter dependent" feature. If the receiving **MIDI** tone unit isn't set to receive **modulation** either globally or for the given selected patch/program, then the switch will cause absolutely nothing to happen.

ALL SWELLS to SWELL

Causes J16 on MUX to function for all four channels instead of merely the SWELL Division.

Program Change Features

From left to right, the momentary push-button switches select via **MIDI** channels 1 through 4 (or, 5-8, 9-12, 13-16) patch/program numbers one through seven (or, eight through fourteen in Bank B mode), on a one-touch basis.

A bright red LED digital display shows the latest selection. (Program 1 through 7 only – **not** alternate Banks A/B)

LED display indicates **ZERO** on powerup, alerting the musician to the need to make a selection.

Closing a switch for pedal upper 46 (see following) then pressing one of these switches causes an offset to another group of fourteen Presets. See also 47. With the Primary Level and Seven Offset Levels, total combinations are 112.

Sustain Feature

A set of wire solder holes is provided to connect a foot switch or toe stud to cause the on/off transmission of the **MIDI** sustain message for the Swell (Channel 1) Division.

FEATURES NOT ACCESSIBLE VIA CONTROL PANEL OR CPU DIP SWITCH

62 & 63 OPTO INPUTS FOR GREAT AND CHOIR - SWITCHES ARE OF MAINTAINED VARIETY

- | | | |
|-----|--|---|
| 62: | MIDI ON = VOLTAGE TO OPTO INPUT 62 | (Special Home Organ software reverses 62 sense, as does PIPESNTH software; see Pedal 62 below) |
| | MIDI OFF = NO VOLTAGE TO OPTO INPUT 62 | |
| 63: | MODULATION OFF = NO VOLTAGE TO OPTO INPUT 63 | |
| | MODULATION ON = VOLTAGE TO OPTO INPUT 63 | |

A/D INPUTS on MUX BOARD (Variable Resistance or Voltage Inputs)

- | | |
|-----------------|-----|
| 1: SWELL VOLUME | J16 |
| 2: GREAT VOLUME | J15 |

3: CHOIR VOLUME	J14
4: MODULATION INTENSITY (FOR ALL KIDS WITH MOD ON)	J13
5: DYNAMICS/VELOCITY	J18
6: TUNING SHIFT (ENABLED BY DIP SW NUMBER 6)	J19
7: PEDAL VOLUME	J20
8: (UNASSIGNED)	

NOTE 1: SWELL (VOLUME) INPUTS ARE 0 TO 5V – 5V BEING FOR MAX. VOLUME. ORGAN INPUTS **GREATER THAN 5V MUST BE VOLTAGE-DIVIDED** SUCH THAT VOLTAGE INTO A/D NEVER EXCEEDS 5V. (NO NEGATIVE VOLTAGES!)

NOTE 2: TUNING SHIFT IS ZERO AT ABOUT 2.5 VOLTS IN. 2.5V TO 0V SHIFTS PITCH DOWN. 2.5V TO 5V SHIFTS PITCH UP.

CONTROL INPUTS FROM PEDAL UPPER 32 KMI OPTO PC BOARD (33-64) INPUTS

PEDAL UPPER #	FEATURE	SWITCH TYPE
64	VACANT	
63	PEDAL MODULATION/TREMOLO	MAINTAINED
62	PEDAL MIDI ON (OFF)	MAINTAINED
61	SWELL MIDI TO GREAT	MAINTAINED
60	CHOIR MIDI TO GREAT	MAINTAINED
59	SWELL MIDI TO PEDAL	MAINTAINED
58	GREAT MIDI TO PEDAL (ALT: TO SWELL)	MAINTAINED
57	CHOIR MIDI TO PEDAL (ALT: TO SWELL)	MAINTAINED
56	PEDAL OFFSET - DOWN ONE OCTAVE	MAINTAINED
55	SYNTH ON/OFF, SW CH, TCOP ™ System	MAINTAINED
54	SYNTH ON/OFF, CH CH, TCOP ™ System	MAINTAINED
53	SYNTH ON/OFF, GR CH, TCOP ™ System	MAINTAINED
52	SYNTH ON/OFF, PD CH, TCOP ™ System	MAINTAINED
51		VACANT
50	DYNAMICS TO SWELL SHOE	MAINTAINED
49-48		VACANT
47	CANCEL PROG/PRESET "LEVEL" OFFSET	MOMENTARY
46	PROGRAM/PRESET "LEVEL" OFFSETTER	MOMENTARY
45	PROGRAM/PRESET CHANGE - PEDAL ONLY	MOMENTARY
44	PROGRAM/PRESET CHANGE - CHOIR ONLY	MOMENTARY
43	PROGRAM/PRESET CHANGE - GREAT ONLY	MOMENTARY
42	PROGRAM/PRESET CHANGE - SWELL ONLY	MOMENTARY
41	PROGRAM/PRESET CHANGE - GENERAL	MOMENTARY
40	PEDAL LOCKOUT - DYNAMICS	MAINTAINED
39	CHOIR LOCKOUT - DYNAMICS	MAINTAINED
38	GREAT LOCKOUT - DYNAMICS	MAINTAINED
37	SWELL LOCKOUT - DYNAMICS	MAINTAINED
36		VACANT
35	RE-INITIALIZE PRESET MEMORY MAP	MOMENTARY
34	ENGAGE PRESET MEMORY MAPPER SYSTEM	MAINTAINED
33	6 SEC POWERUP INITIALIZATION DELAY	MAINTAINED

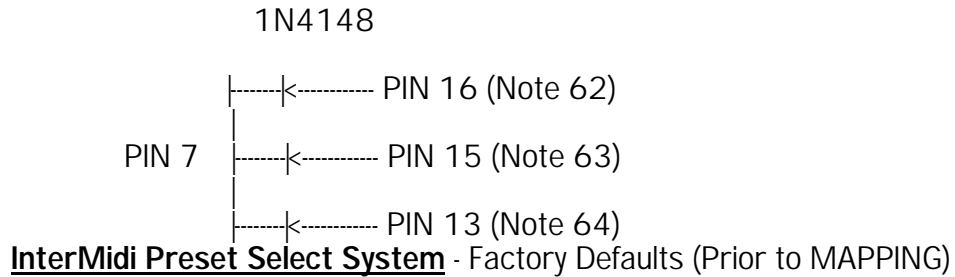
MUX-MIDI™ hookups to activate additional divisions without keyboards

Pin 7 is COMMON (Cathode) strobed LOW

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Pin 13 = 64      }
                  }
Pin 15 = 63      } Anode Side
                  }
Pin 16 = 62      }
    
```

NOTE: Always use 1N4148 switching diodes or equivalent.



Level	"A" Bank	"B" Bank	Preset No.	(HEXADECIMAL)
0 (Default/Powerup Level & Offset Cancel Level)	1-7	1-7	1-7 8-14	000h-006h 007h-00Dh
1	1-7	1-7	15-21 22-28	etc. etc.
2	1-7	1-7	29-35 36-42	etc. etc.
3	1-7	1-7	43-49 50-56	etc. etc.
4	1-7	1-7	57-63 64-70	etc. etc.
5	1-7	1-7	71-77 78-84	etc. etc.
6	1-7	1-7	85-91 92-98	etc. etc.
7	1-7	1-7	99-105 106-112	etc. 06Ah-070h

Level 0 is Powerup Default Level and Cancel Preset Offset Level.

Optional PRESET MEMORY MAPPER™ System - Multi Manual/Channel

Example of PRESET MAPPING]

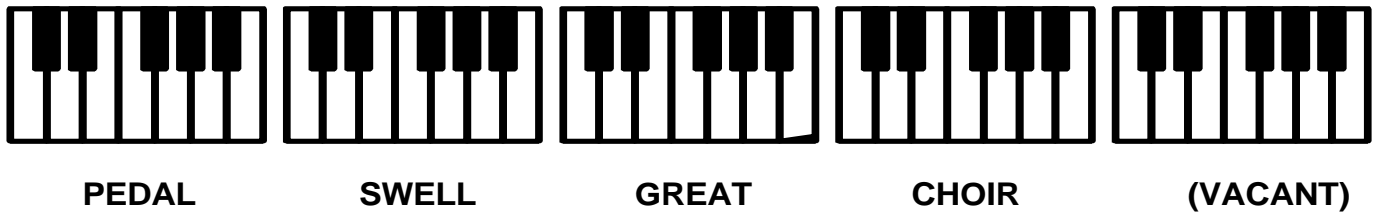
Trial Example = Preset 112 for Channel 1 (Swell), Preset 3 for Channel 2 (Great), Preset 75 for Channel 3 (Choir) and Preset 101 for Channel 4 (Pedal), **to be set for MIDI Preset Select Switch 3.**

FOLLOW THESE STEPS:

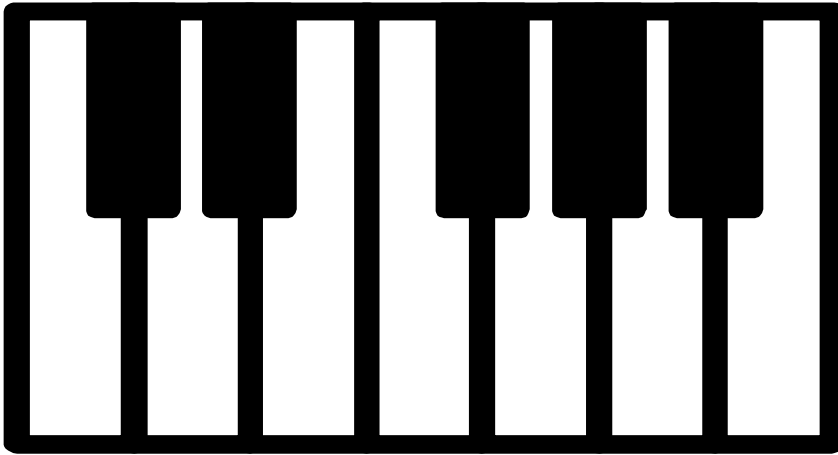
1. Engage MAPPER switch (comes from MUX J7, pins 3 & 4, or Pedal Upper 34)
2. Press MIDI Preset Select Switch number 3.
3. Refer to keyboard diagram below and begin data entry at left-most octave using the Channel 1 (Swell) Manual.
4. Press keys to enter the Pedal (Channel 4) number in this sequence: C# once (Start), F# once (enters a "1" in the hundreds digit), G# --- **omit** --- to enter a **zero** in the tens digit and A# twice (enters a "2" in the units digit) and D# once (Stop/Accept). If you wish data entry confirmation, press D natural.
5. Press keys to enter the Swell Preset number in the second octave in this sequence: C# (Start), F# (enters a "1" in the hundreds digit), G# (enters a "1" in the tens digit) and A# twice (enters a "2" in the units digit) and D# (Stop). If you wish data entry confirmation, press D natural.
6. Repeat the process in each required octave for each division's data, tapping the F#, G# and A# keys the correct number of times corresponding to the hundreds, tens and units digits respectively.

7. Disengage the MAPPER switch.
8. Try depressing the General MIDI Preset switch 3, and note that you have set your multi-timbral synth/sampler to this grouping of four Presets.
9. Starting with step 2 above, and selecting a new Preset Select Switch, you may "map" all of your Presets following the same general rules for data entry. Memory will be retained even with no power on.
10. Disengage the MAPPER switch.
11. Try depressing the MIDI Preset Select Switch(es) you have programmed and note that you have set your synth/sampler to this custom set of Presets.

DIAGRAM SHOWING THE "MAP" OF THE SWELL KEYBOARD FOR DATA ENTRY



DETAILS WITHIN A GIVEN OCTAVE



- Notes: 1) A zero is placed into memory for a given digit by omission. A "no change" for a given division is placed in memory during the data entry steps by simply keying the C# followed immediately by D#.
- 2) Audible feedback of zeros is by means of a rapid double staccato strike of the tone.
- 3) You may, at your and your organ technician's option have installed a LEVEL Set and LEVEL O switch. With these switches, you may offset to 7 additional Memory Levels by depressing and holding the LEVEL Set switch then depressing any of the 7 pistons. To return to the zero (non-offset) level, simply depress LEVEL O. None of these levels selected will themselves cause a MIDI Program(s) to be sent. You must subsequently depress a piston.

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