Organ MIDI computer

BERIO T-ORGAN
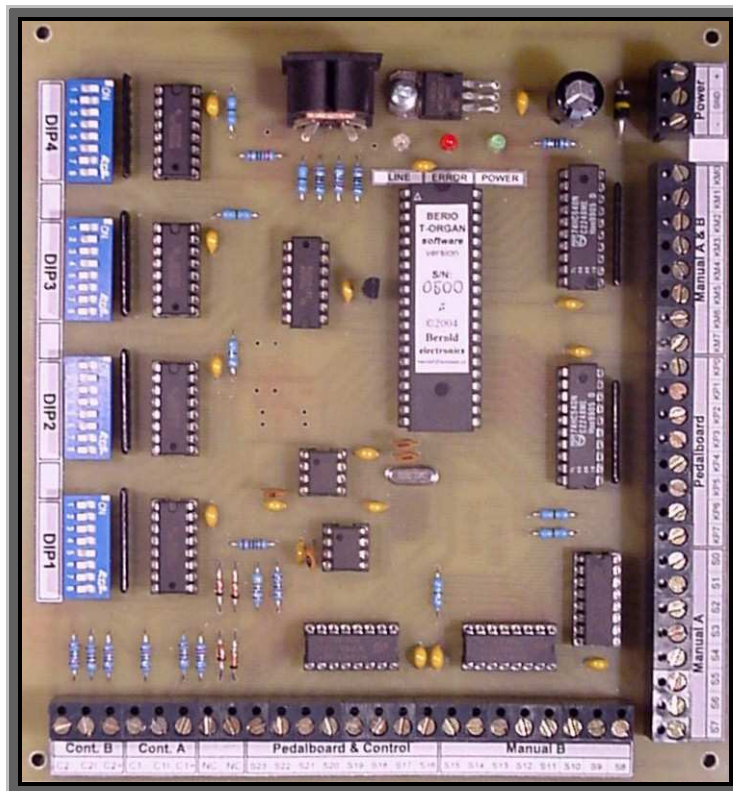
Installation instructions and user manual.

❖

Content

Berio **T-ORGAN** = module, which adds MIDI output to your organ system with two manuals and pedalboard. This solution allow you to generate organ sound by electronic way (with using of electronic keyboard or a PC), therefore entire large organ may fit in your flat. Pipes are not necessary, complicated coupler's mechanics are not necessary too. This all make microprocessor located at Berio T-ORGAN module system board. Only one thing must be created: one contact under every keypad in keyboard and under every pedal in pedalboard.

Main features:

♦ module is intended for built-into organ system with two manuals, pedalboard and control panel (piston switches...)

♦ MIDI data generated by one manual, second manual, pedalboard and control panel are transmitted at another MIDI channel.

♦ module provide organ couplers in electronic way. Couplers within manuals, between manuals, between manuals and pedalboard; couplers straight or transposed.

♦ two continuous controllers (simple potentiometers) may be connected to system board (expression - crescendo, tremolo, modulation wheel, foot pedal)

♦ in case, when control panel not used, third manual may be connected instead

♦ functional pedal support: Sustain, Legato, Sustenuto, Soft pedal for main and secondary manual

♦ remote change of organ voice capability (with using Program Change messages, General MIDI standard)

♦ transpose of all manuals and pedalboard

♦ demo song

♦ "panic" function

Detailed characteristics:

♦ **main manual (HW)** - up to 64 keypads may be connected to the module

♦ **secondary manual (RP)** - up to 64 keypads may be connected to the module

♦ **pedalboard** - up to 32 pedals may be connected to the module

♦ **functional pedals** - up to 8 functional pedals may be connected to the module. Pedals are divided into two groups. One group is channel-related to the main manual, second group is channel-related to the secondary manual. There are pedals in each group: Sustain, Legato, Sustenuto and Soft pedal. Pedals are wired as extension of pedalboard diode matrix. Number of functional pedals may be increased in future.

♦ **control panel ("piston switches")** - up to 64 control switches or buttons may be connected to system board. Their functionality is described below in detail (see table). Generally, they may be working in two modes: **keyboard mode** or **control mode**. Mode selection is provided via one DIP switch located at system board.

  ♦ *keyboard mode* - switches functionality is the same as switches in some keyboard manual: when keypads (or switches) are pressed or released, standard NoteOn/NoteOff messages are sent to MIDI line. NoteOn/NoteOff messages may be interpreted in connected MIDI device as ordinary notes, or (when connected MIDI device is a PC) as any command for software in PC. This may be used e.g. for couplers provided by PC or for any additional effects (remote control of PC).

  ♦ *control mode* - in this mode, control switches provide control of T-ORGAN module function: enable or disable couplers, change organ voice, transpose of manuals with respect to other manual or pedalboard,

transpose entire organ at once, etc. One switch has "panic" functionality: module terminates all notes immediately. Detailed description of control switches functionality is described below in table.

♦ **Continuous controllers.** Two continuous controllers (e.g. expression, modulation wheel etc.) may be connected to the system board. Controller A is channel-associated to the main manual, controller B is channel-associated to secondary manual. Channel-associated means, that data generated by continuous controller are sent at the same MIDI channel as data generated by appropriate manual performance.

Continuous controllers generates not only "ON" and "OFF" messages (as in case of functional pedals, e.g. Sustain), but generates little controller value change messages continuously, when some change of controller element occurs (e.g. modulation wheel position changed, continuous pedal position changed). In real, continuous controller of Berio T-ORGAN module is realized by simple potentiometer, usually with linear resistance characteristics.

Potentiometer is connected directly to T-ORGAN system board via three wires. No any other components or power supplies are necessary. Berio T-ORGAN module is able to transmit data of one of the following MIDI controllers: Expression, Tremolo, Foot Pedal or Modulation wheel. Used controller is selected by DIP switches located on system board. In the same way, continuous controllers may be enabled or disabled by appropriate DIP switch. In case when continuous controller not used (potentiometer were not connected), it should be disabled.

♦ **Transpose.** It is possible to transpose both manuals and pedalboard. Main manual, secondary manual and pedalboard may be transposed independently, but over whole octave only (four octave range). Entire organ system may be transposed too, it is possible over half-tones (16 half-tones, so that more than one octave). Both types of transpose should be selected prior to system startup by DIP switches on the system board. Transpose may be changed during play too. For this purpose are intended some switches in control panel. For detailed information see Control panel description table below.

♦ **Velocity.** Berio T-ORGAN is intended for organ system, where velocity not sensed usually. However, MIDI communication protocol requires velocity to be defined. Therefore, all MIDI data generated by module T-ORGAN has default velocity value "forte" (MIDI nr. 64) in compliance with MMA recommendations. If you need, T-ORGAN module is able to change this velocity value to "forte fortissimo" (MIDI nr. 127) level. Velocity level is selected by one DIP switch at system board. For detailed description see DIP function table below.

♦ **MIDI channels.** Berio T-ORGAN module is able to generate MIDI data at four MIDI channels simultaneously:

   ♦ main manual channel (manual A, HW),
   ♦ secondary manual channel (manual B, RP),
   ♦ pedalboard channel
   ♦ control panel channel (in keyboard mode).

On these four selected channels are transmitted not only NoteON/NoteOFF messages; all related data are transmitted in these channels too. For example, in main manual channel are transmitted data generated by main manual, data generated by main manual Sustain pedal, data generated by continuous controller associated to main manual and data generated by Control panel switches for main manual voice change.

All four channels are independently selectable over full range (1 up to 16) by DIP's located at system board. For detailed description see DIP function table below.

Note: It is possible to set all four channels at the same value, it means, all generated data from both manuals, pedalboard etc. will be transmitted at one channel. This function is possible, but it is not recommended.

♦ **Panic function.** When activated, all notes are immediately terminated. This is useful function in case, when some error in your MIDI system occurs and some notes remains sounding. In high quality MIDI systems, this function not necessary. T-ORGAN module has two panic switches: first is located in extended part of pedalboard diode matrix. Second switch is located in control panel, but this is available in Control mode only.

♦ **Indication LEDs** - T-ORGAN system is equipped with three LED diodes:

  ♦ Green LED *Power* indicates that power supply of proper polarity is present.

  ♦ Red LED *Error* indicates that module is not working. When system action is proper, this LED flashes for a short time only after system reset or power up. Exception to this rule is "Demo mode", which is described in detail in relevant paragraph.

  ♦ Blue LED *Line* - indicates data flow on MIDI line. It's useful when some communication problems are being located, esp. during system installation and testing. LED Line shortly flashes after system reset or power up.

♦ **Power supply** - system board may be powered by DC voltage between 8 and 15 volts, voltage polarity must be respected. Module is delivered with power supply adaptor which allows 230 V / 50 Hz power supply.

♦ **System reset** - when system power supply is turned off and then on, regular system reset is carried out. After system reset, function of module is determined by DIP switches position only.

♦ **Input digital filtering** - for better performance, the Input digital filtering unit is implemented in the system. This unit should eliminate the surges on all keypad, pedal or other switch contacts. Keyboard state is read periodically in approx. one-millisecond intervals. State of every keypad must be repeatedly read as unchanged. Only then a MIDI message can be sent on MIDI line.

♦ **Absolute polyphony** - Berio T-ORGAN system does not restrict polyphony in any way. It means that if, in theory, all keys in all manuals and all pedals in pedalboard are pressed simultaneously, all corresponding data will be sent on MIDI line.

♦ **Demonstration song** - if three lowest keypads in main manual are pressed during start up or system reset, Berio module plays short demonstration song. While it plays, red LED *Error* comes on. When demo song has finished, LED Error goes off and system begins normal operation.

♦ **Diode matrices** - all keypads, pedals and control switches are connected to the T-ORGAN board with using diode matrices. All four diode matrices has 8x8 organization and the same wiring, the same schematic, but they are connected to other screw connectors on the system board. Therefore max. number of connectable switches (contacts, keypads, pedals...) is 4 x 8 x 8 = 256 switches. It is not necessary to be wired entire
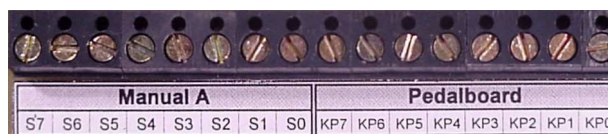
matrix always. Only used keypads may be wired, other may remains unconnected. Unconnected contact does not generate any sound, has not any function.

In case, when number of connected keypads in some manual or pedals in pedalboard is lower than nominal module keypad number, keypad contacts should be connected in order from lowest keypad to higher keypads. Some highest keypad positions then remains unconnected.

Matrix wiring is shown in schematic (see supplement).

♦ **ESD protection** - system is based on high speed CMOS technology. Protection against damages due to electrostatic discharges is assured by integrated clamp diodes on all terminals for keyboard manuals, pedalboard and control panel switches.

♦ **Generated code compatibility** - MIDI code generated by Berio T-ORGAN system should be compatible with any device made by the following manufacturers:

> 360 Systems, Ad Lib, ADA, Adams-Smith, ADB, Akai, AKG Acoustics, Alesis, Allen & Heath Brenell, Allen Organ Co., AMEK Systems & Controls, Aphex, Apple Computer, ART, Artisyn, Audio Architecture, Audio Veritrieb, Audiomatica, Avab Electronik, Axxes, Baldwin, Berold electronics, Blue Sky Logic, Bontempi/Farfisa, Breakaway Technologies, Broderbund Software, BSS Audio, CAE, Cannon Research Corporation, Casio, Clarity, Clavia Digital Instruments, CTI Audio, DDA, Digidesign, Digigram, Digital Music Corporation, DOD Electronics, Dr.Bohm/Musician International, Dream, Dynacord, Elka, E-mu Systems, Encore Electronics, Ensoniq, ETA Lighting, Euphonix, Eventide, F.B.T. Electronica, Fender, Forefront Technology, Fostex, Fujitsu Electric, Gallien Krueger, Garfield Electronics, Grey Matter, GT Electronics/Groove Tubes, Gulbransen, Harmony Systems, Hinton Instruments, Hohner, Hoshino Gakki, Hotz Instruments Technologies, IBM, IDP, InterMIDI, Intone, Inventronics, IOTA Systems, IVL Technologies, J L Cooper, Japan Victor, Jellinghaus, JEN, Jim Marshall Products, Kamiya, KAT, Kawai, Kenton Electronics, Key Concepts, KMX, Korg, KTI, Kurzweil, Lake Butler Sound Company, Larking Audio, Lexicon, Lone Wolf, Lowrey, Marquis Musi, Matsushita Communication Industrial, Matsushita Electric, Meisosha, Micon Audio Electronics, Microsoft, MIDITEMP, Midori Electronics, Moog Music, Moridaira, Music Quest, Musonix, New England Digital, Nishin Onpa, NSI Corporation, Oberheim, Opcode, Orban, Palm Tree Instruments, Passac, Passport Designs, Peavey Electronics, Perfect Fretworks, PianoDisc, PPG, Quasimidi, Rane Corporation, Real World Design, Richmond Sound Design, RJMG/Niche, Rocktron Corp., Rogers Instrument Corp., Roland, S&S Research, Sequential Circuits, SIEL, Solid State Logic, Solton, Sony, Soundcraft Electronics, Soundtracs, Southern Music Systems, Southworth, Spatial Sound/Anadi Inc, Spectrum Design & Development, Stepp, Strand Lighting, Studer-Editech, Suzuki Musical Instrument Mfg., Synthaxe, TC Electronic, TEAC, The Software Toolworks, Trident, Twister, Uptown, Voce, Voyce Music, Voyetra/Octave Plateau, Waldorf Electronics, Warner New Media, Waveframe, Wersi, Yamaha, Yes Technology, Zero 88 Lighting, Zeta Systems a Zoom.

 MIDI systems of other manufacturers are probably compatible too, but this compatibility is not guaranteed.

♦ **Installation recommendations** - system should be located into the keyboard part of organ system. Wire length between manual keypad contact, control panel switches and Berio T-ORGAN system board should be as short as possible. Wire length between pedalboard (incl. extented part of pedalboard matrix) may be longer. Wires to the Continuous controller potentiometers should be realized by shielded cable, where shielding should be connected to doubled GND screw connector. All the wires must not be grounded, connected to power supply or connected to each other.

♦ **Mechanical data:**

  ♦ Dimensions: 155 mm x 166 mm x 25 mm (6.10" x 6.54" x 1")

  ♦ Weight: 190 g (6.79 ounce)

♦ **Temperature range:** Module is intended for indoor use, therefore recommended temperature range is 0 up to +70 degree Celsius.

♦ **Guarantee:** 2 and half of year (30 months)

DIP switches functional description:

There are four octal DIP switches located at Berio T-ORGAN system board (see picture below). They are marked from DIP1 to DIP4. Detailed function of every switch is described below. System should be in shutdown state (without power supply) when DIP positions are modified.

DIP 1					
Switch nr.	Meaning	How to select one concrete channel.			
1 - 4	Main manual MIDI channel select (main manual = manual A = HW)	Switch positions			MIDI channel
		nr.1	nr. 2	nr. 3	nr. 4	
		OFF	OFF	OFF	OFF	1
		ON	OFF	OFF	OFF	2
		OFF	ON	OFF	OFF	3
		ON	ON	OFF	OFF	4
		OFF	OFF	ON	OFF	5
		ON	OFF	ON	OFF	6
		OFF	ON	ON	OFF	7
		ON	ON	ON	OFF	8
		OFF	OFF	OFF	ON	9
		ON	OFF	OFF	ON	10
		OFF	ON	OFF	ON	11
		ON	ON	OFF	ON	12
		OFF	OFF	ON	ON	13
		ON	OFF	ON	ON	14
		OFF	ON	ON	ON	15
		ON	ON	ON	ON	16
5 - 8	Secondary manual MIDI channel select (secondary manual = manual B = RP)	Switch positions			MIDI channel
		nr.5	nr. 6	nr. 7	nr. 8	
		OFF	OFF	OFF	OFF	1
		ON	OFF	OFF	OFF	2
		OFF	ON	OFF	OFF	3
		ON	ON	OFF	OFF	4
		OFF	OFF	ON	OFF	5
		ON	OFF	ON	OFF	6
		OFF	ON	ON	OFF	7
		ON	ON	ON	OFF	8
		OFF	OFF	OFF	ON	9
		ON	OFF	OFF	ON	10
		OFF	ON	OFF	ON	11
		ON	ON	OFF	ON	12
		OFF	OFF	ON	ON	13
		ON	OFF	ON	ON	14
		OFF	ON	ON	ON	15
		ON	ON	ON	ON	16

DIP 2					
Switch nr.	Meaning	How to select one concrete channel.			
1 - 4	Pedalboard MIDI channel select	Switch positions			MIDI channel
		nr.1	nr. 2	nr. 3	nr. 4	
		OFF	OFF	OFF	OFF	1
		ON	OFF	OFF	OFF	2
		OFF	ON	OFF	OFF	3
		ON	ON	OFF	OFF	4
		OFF	OFF	ON	OFF	5
		ON	OFF	ON	OFF	6
		OFF	ON	ON	OFF	7
		ON	ON	ON	OFF	8
		OFF	OFF	OFF	ON	9
		ON	OFF	OFF	ON	10
		OFF	ON	OFF	ON	11
		ON	ON	OFF	ON	12
		OFF	OFF	ON	ON	13
		ON	OFF	ON	ON	14
		OFF	ON	ON	ON	15
		ON	ON	ON	ON	16
5 - 8	Control panel MIDI channel select ("piston switches")	Switch positions			MIDI channel
		č.5	č. 6	č. 7	č. 8	
		OFF	OFF	OFF	OFF	1
		ON	OFF	OFF	OFF	2
		OFF	ON	OFF	OFF	3
		ON	ON	OFF	OFF	4
		OFF	OFF	ON	OFF	5
		ON	OFF	ON	OFF	6
		OFF	ON	ON	OFF	7
		ON	ON	ON	OFF	8
		OFF	OFF	OFF	ON	9
		ON	OFF	OFF	ON	10
		OFF	ON	OFF	ON	11
		ON	ON	OFF	ON	12
		OFF	OFF	ON	ON	13
		ON	OFF	ON	ON	14
		OFF	ON	ON	ON	15
		ON	ON	ON	ON	16

DIP 3					
Switch nr.	Meaning	How to set one concrete position.			
1 - 2	Default octave transpose position. Secondary manual (B, RP).	Switch positions			Posi-tion[1]
		nr. 1		nr. 2	
		OFF		OFF	C_2
		ON		OFF	C_1
		OFF		ON	C
		ON		ON	c
3 - 4	Default octave transpose position. Main manual (A, HW).	Switch positions			Posi-tion[1]
		nr. 3		nr. 4	
		OFF		OFF	C_2
		ON		OFF	C_1
		OFF		ON	C
		ON		ON	c
5 - 8	Default half-tone transpose position of entire organ system. This half-tone position is "added" to "octave position" of each manual and pedalboard.	Switch positions				Posi-tion[2]
		nr.5	nr. 6	nr. 7	nr. 8	
		OFF	OFF	OFF	OFF	C
		ON	OFF	OFF	OFF	C#
		OFF	ON	OFF	OFF	D
		ON	ON	OFF	OFF	D#
		OFF	OFF	ON	OFF	E
		ON	OFF	ON	OFF	F
		OFF	ON	ON	OFF	F#
		ON	ON	ON	OFF	G
		OFF	OFF	OFF	ON	G#
		ON	OFF	OFF	ON	A
		OFF	ON	OFF	ON	A#
		ON	ON	OFF	ON	H
		OFF	OFF	ON	ON	c
		ON	OFF	ON	ON	c#
		OFF	ON	ON	ON	d
		ON	ON	ON	ON	d#

[1] "position" means note of lowest keypad. In case, when is necessary to sound lowest keypad in the manual by "c[1]" note, entire organ system may be additionally transposed over one octave up through half-tone transposition.

[2] "position" means note of lowest keypad or pedal

DIP 4			
Switch nr.	Meaning	Switch position meaning.	
1	Control panel mode.	OFF	keyboard mode[3]
		ON	control mode (couplers etc.)
2	Generated data velocity level.	OFF	"forte" level (MIDI 64)
		ON	"forte fortissimo" level (MIDI 127)
3	Continuous controller B enable (associated to secondary manual)	OFF	disabled
		ON	enabled
4	Continuous controller A enable (associated to main manual)	OFF	disabled
		ON	enabled

5 - 6	Continuous controller type select	Switch positions		Transmitted controller
		nr.5	nr. 6	
		OFF	OFF	Expression (cresc.)
		ON	OFF	Tremolo
		OFF	ON	Foot Pedal
		ON	ON	Modulation Wheel

7 - 8	Default octave transpose position. Pedalboard.	Switch positions		Position[4]
		č.7	č. 8	
		OFF	OFF	C_2
		ON	OFF	C_1
		OFF	ON	C
		ON	ON	c

[3] transpose position of Control panel switches (when working in keyboard mode) is the same as main manual (manual A) position after system startup.

[4] "position" means note of lowest pedal in pedalboard

Main manual (A, HW) - keypads function

Main manual (A, HW)	
Switch (keypad)	Function
S0 - S63 (64 switches)	Ordinary main manual keypads, no alternate function.

Switches (keypads) labels correspond to diode matrix schematic.

Secondary manual (B, RP) - keypads function

Secondary manual (B, RP)	
Switch (keypad)	Function
S64 - S127 (64 switches)	Ordinary secondary manual keypads, no alternate function.

Switches (keypads) labels correspond to diode matrix schematic.

Control panel ("pistons") - switches function

Control panel ("pistons") in keyboard mode	
Switch (keypad)	Function
S0 - S63 (64 switches)	Ordinary (third) manual keypads.

Switches (keypads) labels correspond to diode matrix schematic.

Control panel ("pistons") in control mode	
Switch (keypad)	Function
	Couplers
S0	Straight coupler RP -> HW. Play at main manual is straight transferred to secondary manual.
S1	Straight coupler HW -> Pedalboard. Play at pedalboard is straight transferred to main manual.
S2	Straight coupler RP -> Pedalboard. Play at pedalboard is straight transferred to secondary manual.
S3	SuperCoupler SuperHW->HW. Play at main manual is played at main manual again, but over one octave higher.
S4	SubCoupler SubHW->HW. Play at main manual is played at main manual again, but over one octave lower.
S5	SuperCoupler SuperRP->HW. Play at main manual is played at secondary manual too, but over one octave higher.
S6	SubCoupler SubRP->HW Play at main manual is played at secondary manual too, but over one octave lower.
S7	SuperCoupler SuperRP->RP Play at secondary manual is played at secondary manual again, but over one octave higher.
	Couplers
S8	SubCoupler SubRP->RP Play at secondary manual is played at secondary manual again, but over one octave lower.
S9	Inverse coupler Pedalboard->HW. Only the lowest note of main manual play is played in pedalboard too.
S10	---
S11	---
S12	---

Control panel ("pistons") in control mode	
Switch (keypad)	Function
S13	---
S14	---
S15	---
Couplers	
S16	---
S17	---
S18	---
S19	---
S20	---
S21	---
S22	Unison off HW Main manual basic note disable. This function, when activated, turn off basic note of pressed keypad. All active couplers are unaffected. Note: When this function is activated and no any coupler is active, no sound (no data) is generated by main manual.
S23	Unison off RP Secondary manual basic note disable. This function, when activated, turn off basic note of pressed keypad. All active couplers are unaffected. Note: When this function is activated and no any coupler is active, no sound (no data) is generated by secondary manual.
Manual A (HW) Program change (voice change)[5]	
S24	Program change 17 - Drawbar Organ
S25	Program change 18 - Percussive Organ
S26	Program change 19 - Rock Organ
S27	Program change 20 - Church Organ
S28	Program change 21 - Reed Organ
S29	Program change 22 - Accordian
S30	Program change 23 - Harmonica
S31	Program change 24 - Tango Accordian
Manual B (RP) Program change (voice change)[5]	
S32	Program change 17 - Drawbar Organ
S33	Program change 18 - Percussive Organ
S34	Program change 19 - Rock Organ
S35	Program change 20 - Church Organ
S36	Program change 21 - Reed Organ
S37	Program change 22 - Accordian
S38	Program change 23 - Harmonica
S39	Program change 24 - Tango Accordian
Pedalboard Program change (voice change)[5]	
S40	Program change 17 - Drawbar Organ
S41	Program change 18 - Percussive Organ
S42	Program change 19 - Rock Organ
S43	Program change 20 - Church Organ
S44	Program change 21 - Reed Organ
S45	Program change 22 - Accordian
S46	Program change 23 - Harmonica
S47	Program change 24 - Tango Accordian
Transpose[6]	
S48	Manual A - one octave down
S49	Manual A - one octave up
S50	Manual B - one octave down
S51	Manual B - one octave up
S52	Pedalboard - one octave down

Control panel ("pistons") in control mode	
Switch (keypad)	Function
S53	Pedalboard - one octave up
S54	Entire organ system - one half-tone down
S55	Entire organ system - one half-tone up
S56	---
S57	---
S58	---
S59	---
S60	---
S61	---
S62	---
S63	Panic function.

Switches (keypads) labels correspond to diode matrix schematic.

Main manual = manual A = HW.
Secondary manual = manual B = RP.

All couplers are active when appropriate contact (switch, keypad) is turned ON (connected). Coupler is inactive when switch is turned OFF (disconnected).

Program change messages are sent at the moment when keypad is pressed (contact connected). When keypad is released, no any message is transmitted.

[5] Program change messages and musical instrument voices are noted in accordance with General MIDI standard (GM). If your musical instrument does not complain GM standard, voice assign may be other.
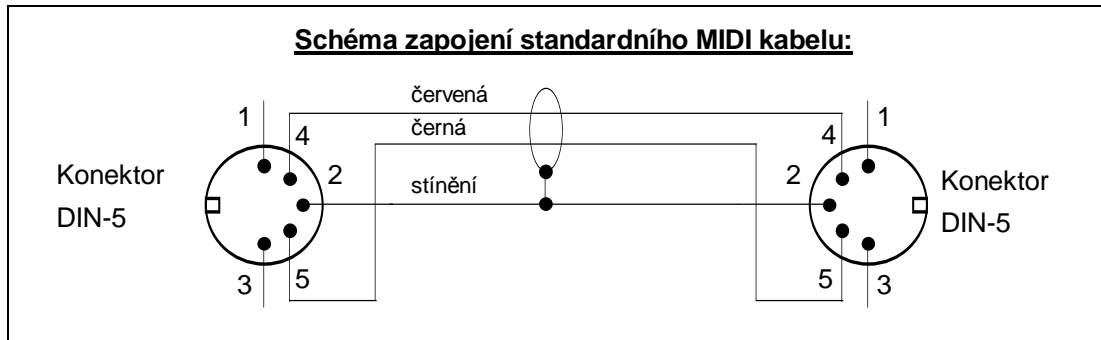
[6] All transpose changes made by Control panel switches are valid until T-ORGAN system shutdown. After next startup, all transpose positions are defined by DIP switches positions on system board.

Pedalboard - pedals (switches) function

Pedalboard	
Switch (keypad)	Function
S0 - S31	Ordinary pedalboard pedals (keypads), no alternate function.
S32	---
S33	---
S34	---
S35	---
S36	---
S37	---
S38	---
S39	---
S40	---
S41	---
S42	---
S43	---
S44	---
S45	---
S46	---
S47	---
Functional pedals	
S48	Sustain pedal channel-associated to manual A.
S49	Sustain pedal channel-associated to manual B.
S50	Sustenuto pedal channel-associated to manual A.
S51	Sustenuto pedal channel-associated to manual B.
S52	Soft pedal channel-associated to manual A.
S53	Soft pedal channel-associated to manual B.
S54	Legato pedal channel-associated to manual A.
S55	Legato pedal channel-associated to manual B.
S56	---
S57	---
S58	---
S59	---
S60	---
S61	---
S62	---
S63	Panic function.

Switches (keypads) labels correspond to diode matrix schematic.

Standard MIDI cable schematic

Schéma zapojení standardního MIDI kabelu:

červená
černá

Konektor
DIN-5

1   4

2

stínění

4   1

2

Konektor
DIN-5

3   5

5   3

Vocabulary: červená = red; černá = black; stínění = shielding, konektor = connector

Connecting standard MIDI-OUT DIN connector to the "gameport" of sound card.

**Computer Sound Card Game Port to Standard MIDI Connector**
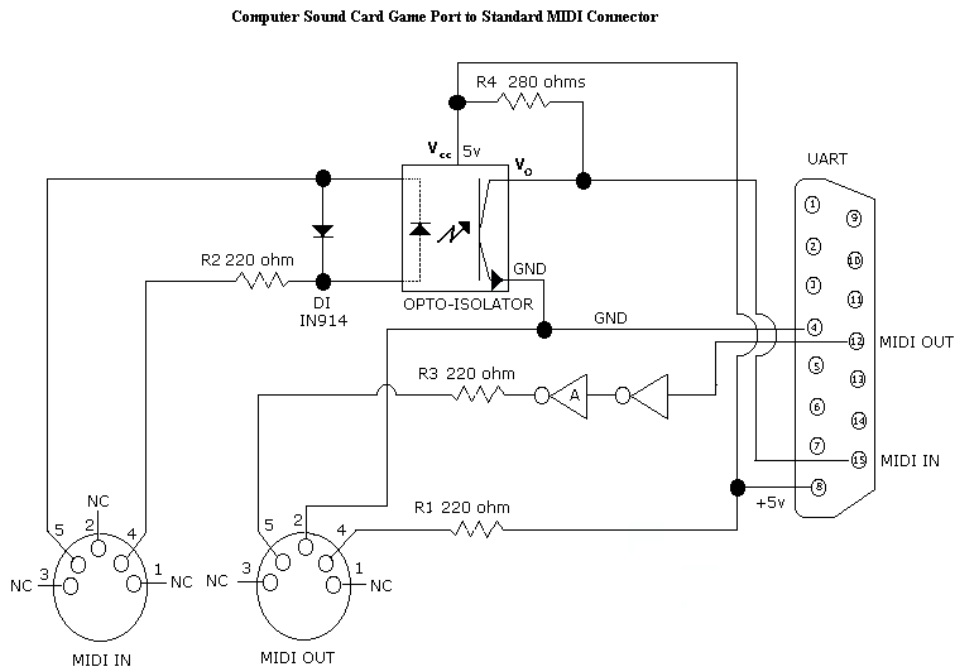
Notes:
1. Optocoupler is 6N137 type or equivalent.
2. Used resistors have tolerance 5% (or better).
3. "A" inverter may be realized by suitable IC (e.g. 74HC04) or transistor.
4. Pin No. 2 of MIDI IN connector can't be connected to ground of Soundcard.
NC = not connected

Main (A) and secondary (B) manual diode matrix schematic and connection of matrix to T-ORGAN system board
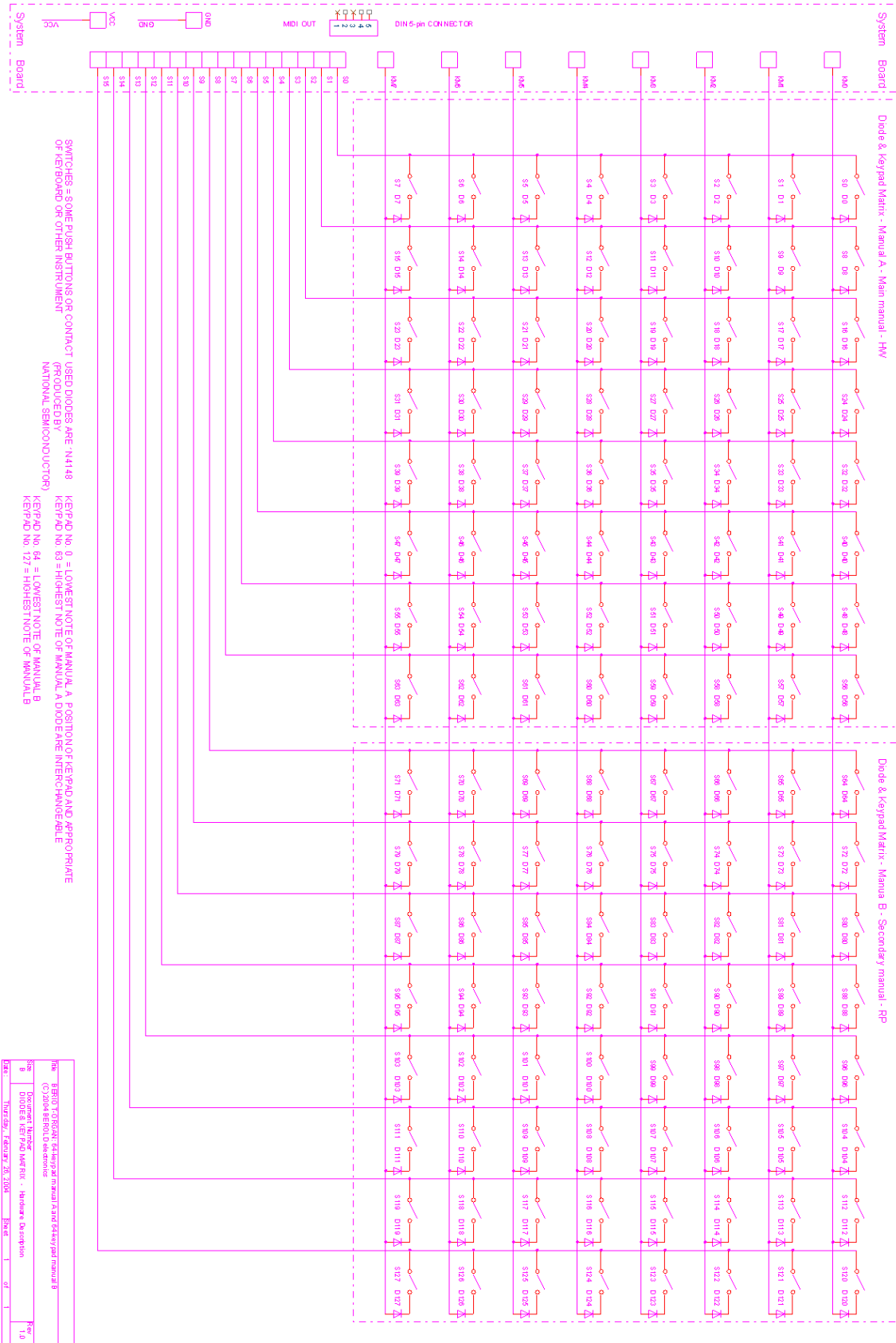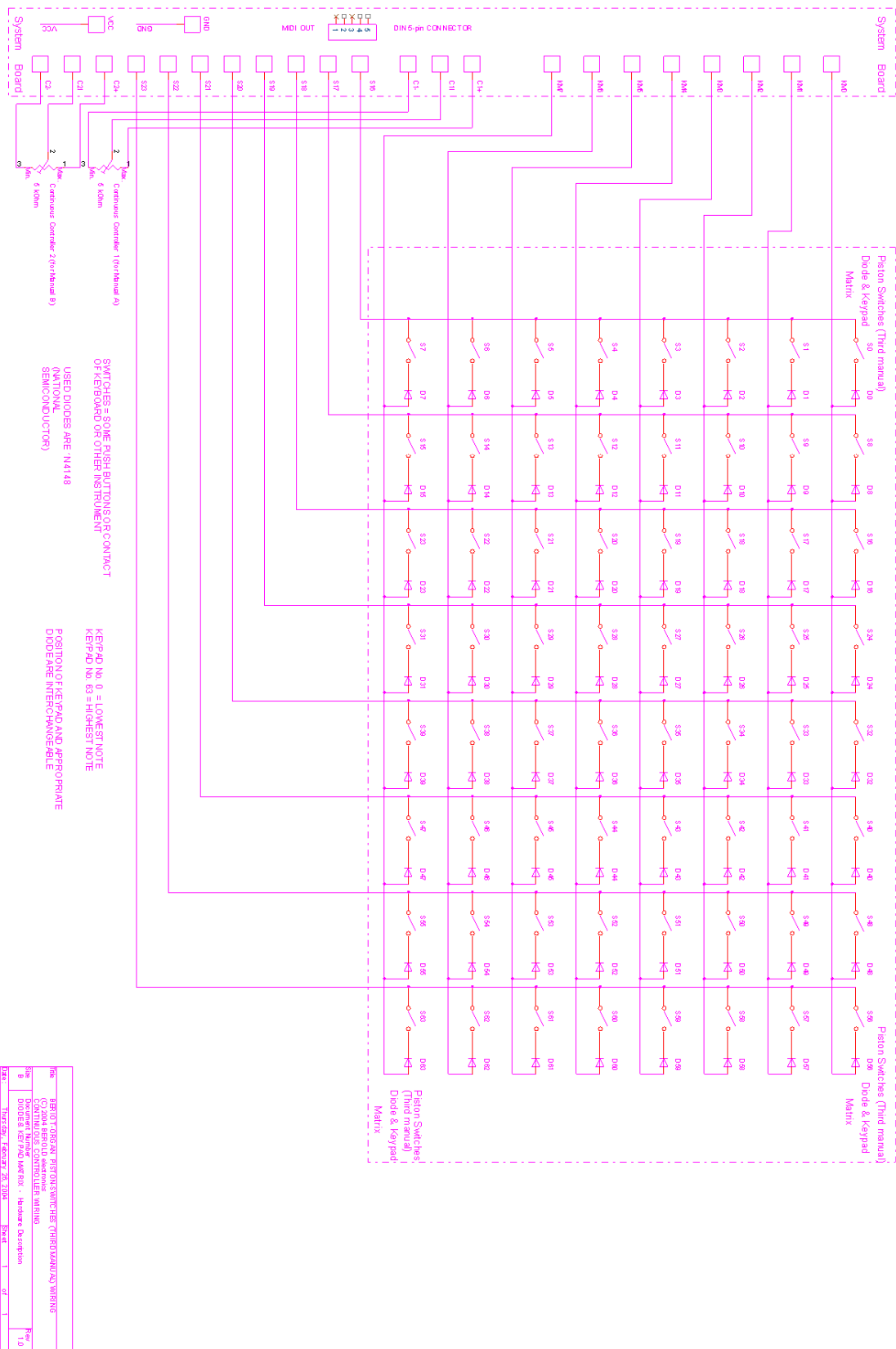
Pedalboard diode matrix schematic and connection of matrix to T-ORGAN system board
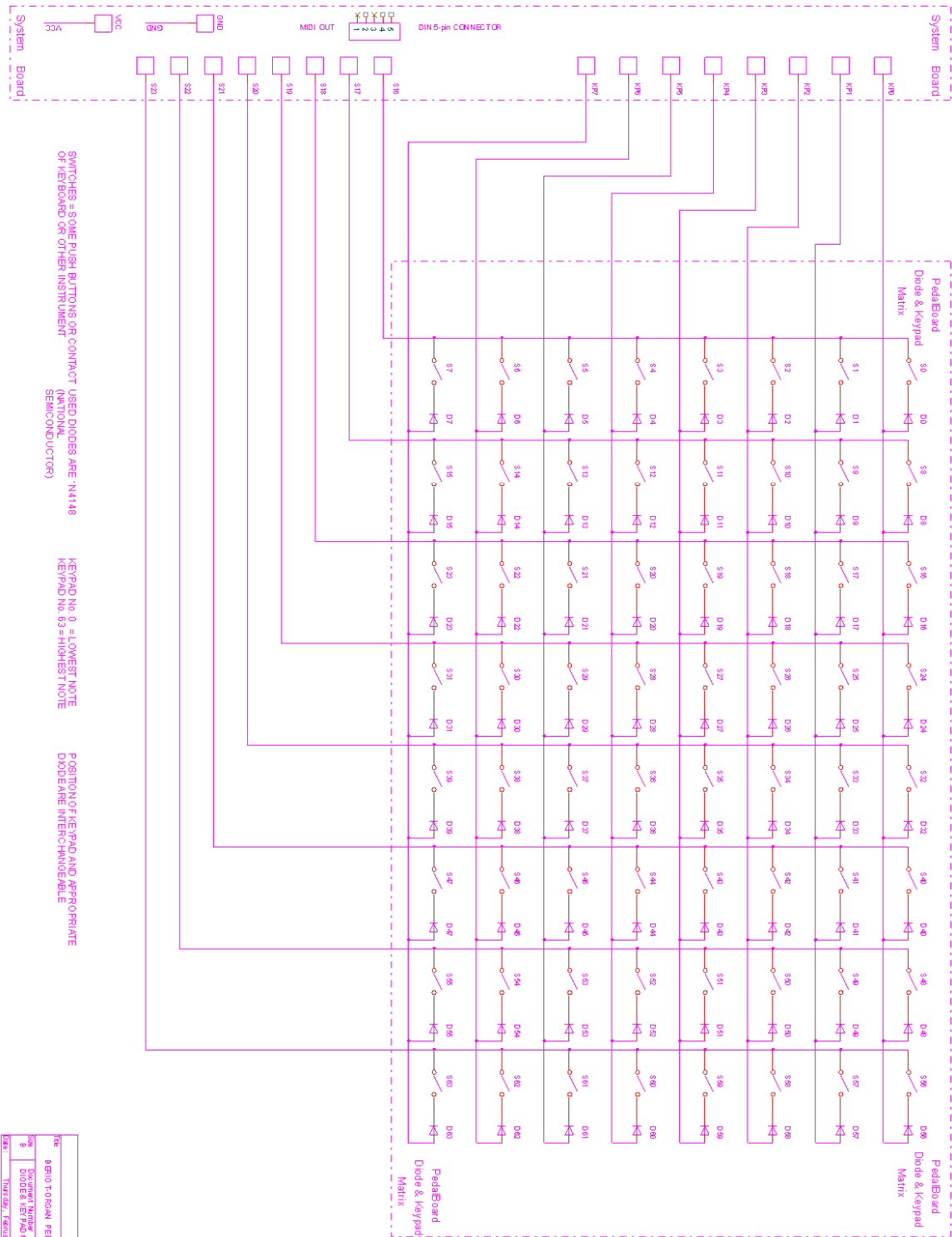
Control panel ("piston switches") diode matrix schematic, connection of matrix to T-ORGAN system board and continuous controllers wiring.

MIDI implementation chart

```
BERIO T-ORGAN [Organ MIDI computer]                Date: 12-Mar-2004
MODEL: BERIO T-ORGAN                                Version: 1.0
```

MIDI Implementation Chart

Function...		Transmitted	Recognized	Remarks
Basic	Default	1 - 16	x	determined by DIP's
Channel	: Changed	1 - 16	x	
	Demo	1	x	
Note Number		0 - 127	x	
Velocity	: Note ON	64, 127	x	determined by DIP
	Note OFF	64, 127	x	determined by DIP
After	Key's	x	x	
Touch	Ch's	x	x	
Pitch Bender		x	x	
	1	o	x	Modulation Wheel (MSB)
	4	o	x	Foot Pedal (MSB)
	7	x	x	Volume (MSB)
	11	o	x	Expression (MSB)
	64	o	x	Damper/Sustain pedal
	65	x	x	Portamento
Control	66	o	x	Sustenuto pedal
Change	67	o	x	Soft pedal
	68	o	x	Legato pedal
	69	x	x	Soft 2 pedal
	92	o	x	Tremulo level
	120	x	x	All sounds off
	121	x	x	Reset all controllers
	123	x	x	All notes off
Program Change		o 17 - 24	x	Organ voices according to General MIDI standard
System Exclusive		x	x	
	Song pos.	x	x	
Common	: Song sel.	x	x	
	Tune req.	x	x	
System	: Clock	x	x	
Real time	: Reset	x	x	
	Active sense	x	x	

```
Note:
x : No
o : Yes
```

Producer contact

Orders for all types of modules Berio MIDI (incl. T-ORGAN)

are accepted and repairs are carried out by

Accordion Center Jiri Koucky

http://www.akordeoncentrum.cz/

Order via e-mail: berio@akordeoncentrum.cz

Fricova 75

251 65 Ondrejov u Prahy

Czech republic, European Union.

Business identification number: 125 27 921.

Commissions may be sent via post too.

Technical questions will be answered at berio@akordeoncentrum.cz.

Berio MIDI modules at the Internet:

http://www.beriomidi.info/ in Czech language

http://www.beriomidi.info/eng/ in English language

On this website may be offered software upgrades.