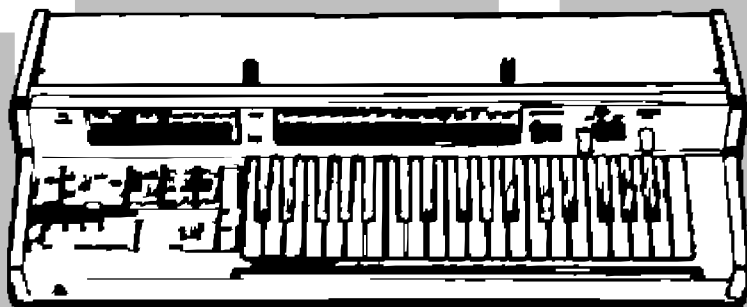


K770-KBD

MIDI Interface for
Korg 770 / 700S / 900PS Keyboard

Model 8-430
Version 1.0



Installation Manual for Korg 900PS



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1 GENERAL INFORMATION

K770-KBD MIDI interface controls VCO and GATE generator of the Korg 900PS synthesizer. Simplified block schematics of the interface installation in the instrument shows fig. 1.1.

The interface board looks very similarly for Korg 770, 700S, 900PS and M500 but there are a differences in some components. It is recommended to check if you have the correct model. The instrument model identification label on the interface board (see fig. 1.2) specifies the Korg instrument type: K770 is interface for Korg 770, 700S and 900PS, KM500 is interface for Korg M500 Micropreset.

The interface firmware can be revised. Actual version of the firmware is printed on the identification label on the interface's processor (see fig. 1.2). It is also possible to read the actual version of firmware from the interface by MIDI System Exclusive message.

1.1 MIDI INTERFACE KIT PARTS

MIDI interface kit contents all necessary parts for installation incl. all support and coupling elements. The delivery also includes both installation and operation manuals in printed form. Please check if the delivery is complete before the installation (see fig. 1.1.1).

The K770-KBD interface kit delivery contents:

- (1) MIDI Interface board
- (2) 2x DIN-5 socket with cable
- (3) Bunched cables for power supply
- (4) Bunched cables with button and LED
- (5) Bunched cables of keyboard control signals
- (6) Coupling elements (LED holder, screws, nuts, washers, insulation tube and tightening strips)
- (7) Owner's and Installation manuals in printed form

Figure 1.1 – Connection to instrument circuits

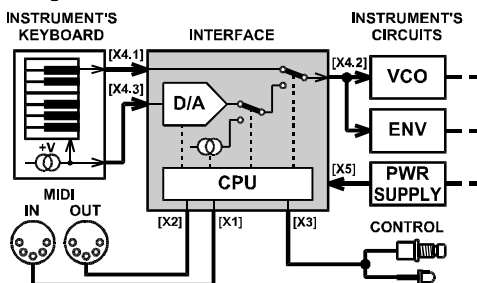


Figure 1.2 – Identification labels

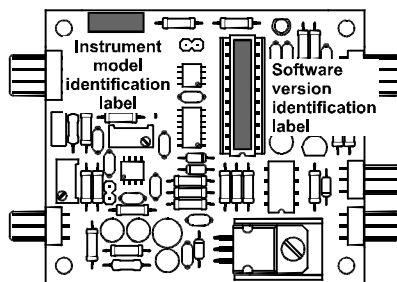
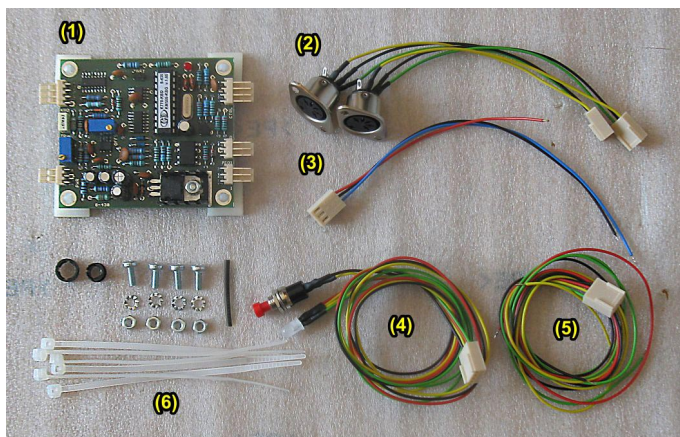


Figure 1.1.1 – Parts of the interface kit



2 MIDI INTERFACE INSTALLATION

Mounting the interface in the Korg 900PS synthesizer is very easy. If you follow the instructions from this manual, there should be no major problems during the installation. The interface installation procedure is thoroughly described in the following chapters. Please follow these instructions accurately to avoid any damage of the instrument.



Attention! Disconnect the instrument from the mains prior to the installation. There is a risk of the electric shock!



Attention! Observe precautions for handling electrostatic discharge sensitive devices!



The producer is not responsible for any eventual mechanical or electrical damage of the Korg instrument caused by the infringement of the described installation procedure or by careless manipulation during the installation of the MIDI interface!



It is recommended to calibrate the instrument accordingly to the instructions in service manual of the instrument prior the interface installation. This ensures trouble-free operation of the interface.

2.1 OPEN THE INSTRUMENT

Please keep all original screws and washers removed during the instrument opening procedure described in paragraphs below. They will be used again after the MIDI kit installation is finished.

a) Unscrew four self-tapping screws on the bottom side of the instrument (fig. 2.1.1). Then remove the front panel - cover under the instrument's keyboard (fig. 2.1.2).

b) Unscrew the nut holding the cable of touch sensor on the front panel and remove the cable so that it is not damaged during the next steps (fig. 2.1.2).

Figure 2.1.1

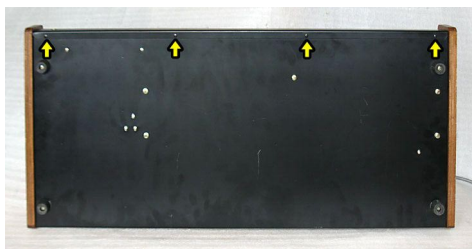


Figure 2.1.2



Figure 2.1.3



Figure 2.1.4



- c) Unscrew eight screws (two metric and six self-tapping) from top part of the instrument cover (fig. 2.1.3). Then remove the top cover.
- d) Unscrew six screws from both wood side plates (two from outer side and one from inner side on each of the side plates - fig. 2.1.4). Then remove the wood sides.
- e) Unscrew three screws on the bottom side of the instrument (fig. 2.1.5) and three screws inside the instrument (fig. 2.1.6).
- f) Unscrew four screws outside the instrument from the left and right side (fig. 2.1.7).
- g) Now, the block of instrument's control panel can be removed from the instrument - lift it up and then flip it to back. All instrument's parts and boards needed for the interface installation are now accessible (fig. 2.1.8).

Figure 2.1.5

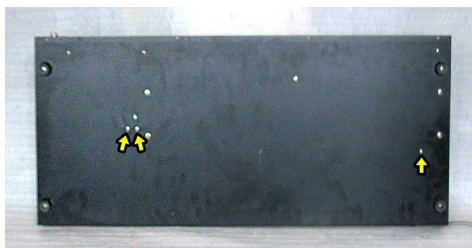


Figure 2.1.6

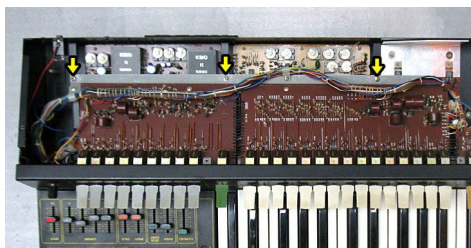


Figure 2.1.7



Figure 2.1.8



2.2 DRILLING OF HOLES FOR MIDI SOCKETS

The interface has both MIDI input and output. Only MIDI input is necessary for the basic interface operation. MIDI output has not to be installed – see chapter 3.1. Nevertheless, having both MIDI input and output (MIDI-IN and MIDI-THRU/OUT sockets) is more convenient for an easy integration in the more advanced MIDI system.

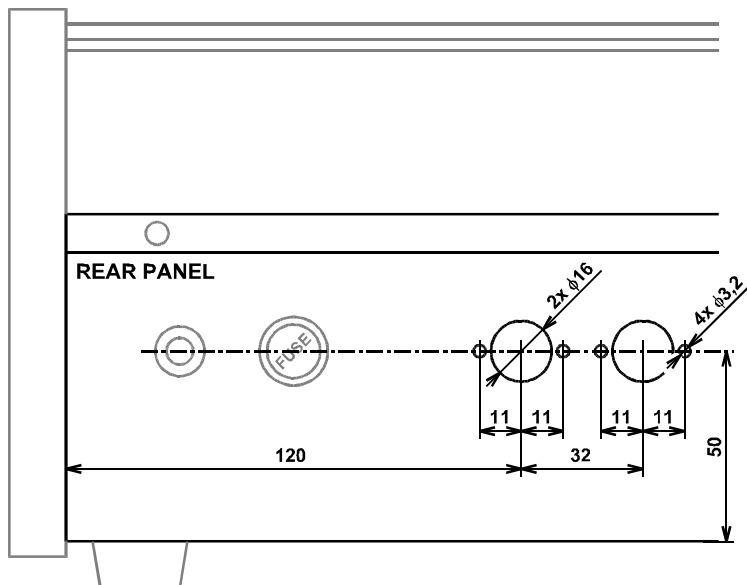
a) The suitable place for the MIDI sockets montage is on the left side of rear panel of the instrument near to fuse holder (fig. 2.2.1). You have to drill six holes to the panel.

b) Drill two holes with diameter 16 mm and four holes with diameter 3,2 mm to the rear panel of the instrument as shown on fig. 2.2.2 (all dimensions are in mm). Use sharp drills and **work carefully** so that the cover is not scratched and other parts of the instrument are not damaged!

Figure 2.2.1



Figure 2.2.2



c) Clean the edge of the holes with small rasp or tip of bigger drill from both sides of the panel after the holes are drilled.

c) **Clean all iron sawdust and raspings from the inside of the instruments**, they can cause short circuits or serious electrical damage if left inside the instrument. Please clean the instrument carefully!

2.3 MIDI SOCKETS MOUNTING

a) Pull flat connectors of MIDI cables (from the interface accessory) through 16 mm holes in the instrument's rear panel from outer side and insert DIN sockets into the holes. Both MIDI cables are identical and can be swapped.

Figure 2.3.1

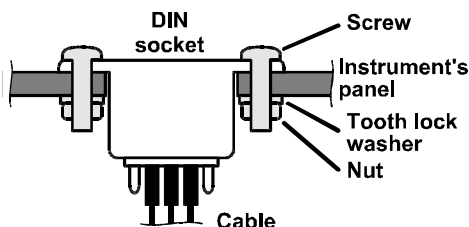


Figure 2.3.2



b) Fix DIN sockets to the drilled holes using screws, nuts and tooth lock washers from the interface accessory (fig. 2.3.1).

c) It is recommended to label the DIN sockets ("MIDI IN", "MIDI THRU/OUT" for example) with self-adhesive foil glued near the sockets (fig. 2.3.2).

2.4 DRILLING OF HOLES FOR BUTTON AND INDICATION LED

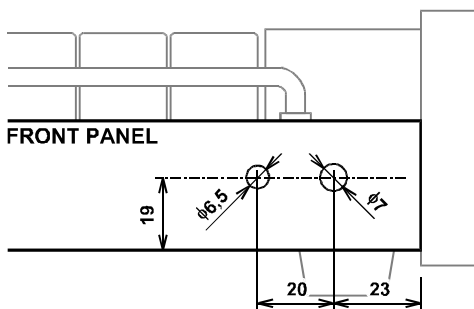
There are two control elements on the interface - button and bi-color LED. They are not necessary for the interface operation, so they need not to be installed (if you prefer to maintain the vintage status of the instrument) – see chapter 3.2. Nevertheless having both of them installed is more convenient for easier device control.

a) If you decide to install the LED and the button, the suitable place for them is on the right side of the front panel - the cover under the instrument's keyboard (fig. 2.4.1). In that case, you have to drill two holes in the panel as shown on fig. 2.4.2 (all dimensions are in mm).

Figure 2.4.1



Figure 2.4.2



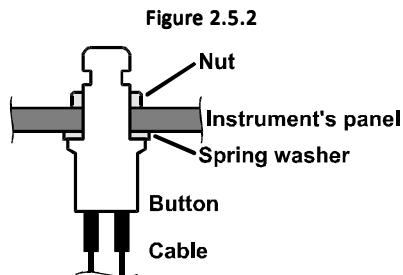
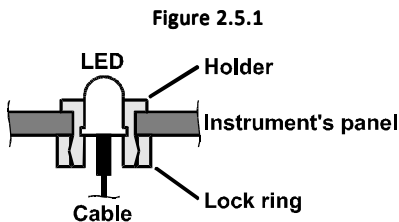
a) Drill one hole with diameter 7 mm (for RESET button) and one hole with diameter 6,5 mm (for indication LED) to the panel – see pic. 2.4.2. Use sharp drills and **work carefully** so that the cover is not scratched during the drilling!

b) Clean the edge of all holes with small rasp or with point of bigger drill after the holes are drilled.

2.5 BUTTON AND INDICATION LED MOUNTING

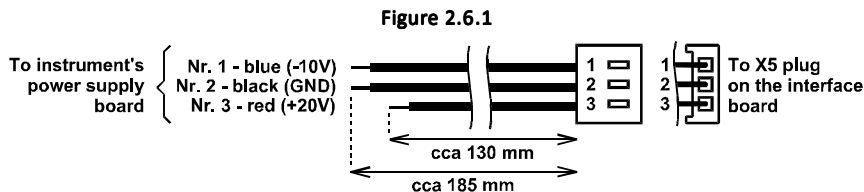
a) Insert LED holder (from the interface accessory) into 6,5 mm hole in the instrument's front panel from the outer side. Pull the lock ring of the LED holder over the supplied LED. Then insert the LED into the holder (from inner side of the instrument's panel) and fix it by the overthrust of the ring on the holder (fig. 2.5.1).

b) Insert button into 7 mm hole in the instrument's panel from inner side. Fix the button to the panel with the spring washer and nut (fig. 2.5.2).



2.6 POWER SUPPLY CABLE MOUNTING

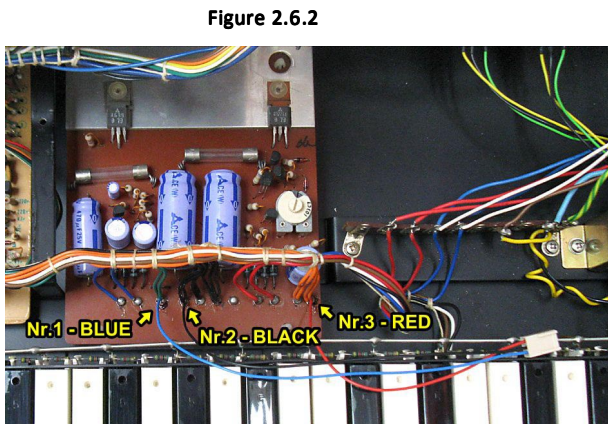
The power supply cable from the interface accessory is fitted with 3-pin flat connector (fig. 2.6.1). It is advisable to shorten wires of this cable bunch to the required lengths as shown on fig. 2.6.1¹. Wires of the cable bunch must be connected to several pads at the instrument's power supply board (fig. 2.6.2).



a) Solder the red wire Nr. 3 "+20V" to "+Vcc" pad on the instrument's power supply board (fig. 2.6.2). Two orange wires of original bunched cables are already soldered here.

b) Solder the black wire Nr. 2 "GND" to "GND" pad on the instrument's power supply board (fig. 2.6.2). Two black wires of original bunched cables are already soldered here.

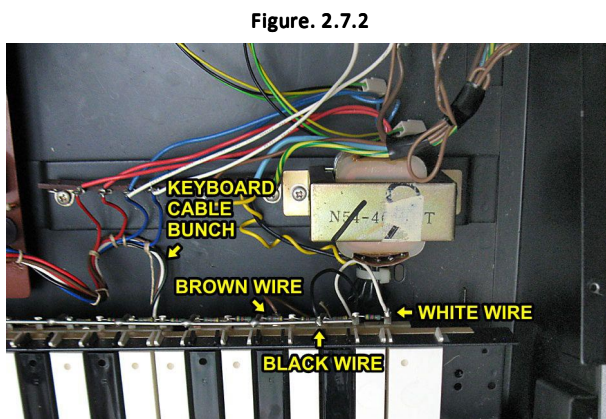
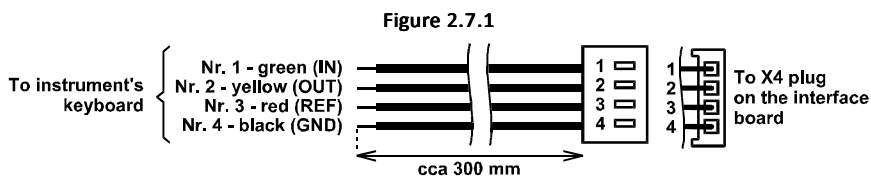
c) Solder the blue wire Nr. 1 "-10V" to "-Vee" pad on the instrument's power supply board (fig. 2.6.2). Two green wires of the original bunched cables are already soldered here.



¹ The delivered power supply cable is universal for all 770, 700S and 900PS instruments so its original length does not meet the 900PS exactly.

2.7 KEYBOARD CONTROL SIGNALS CABLE MOUNTING

The keyboard control signals cable from the interface accessory is fitted with 4-pin flat connector (fig. 2.7.1). It is advisable to shorten all wires of this cable bunch to the required length (cca 300 mm) as shown on fig. 2.7.1². Wires of the cable bunch must be connected to the instrument's keyboard and VCO (KLM22) board (fig. 2.7.2 and fig. 1.1).



- a) Unsolder the white wire (leads from the KLM22 board) from soldering lug on the instrument's keyboard (fig. 2.7.3).
- b) Place heat-shrink insulation tube ϕ 2 mm (from the interface accessory) on yellow wire Nr. 2 "OUT" of the keyboard control signals cable and solder the yellow wire to white wire freed from the soldering lug (fig. 2.7.4).

Figure 2.7.3

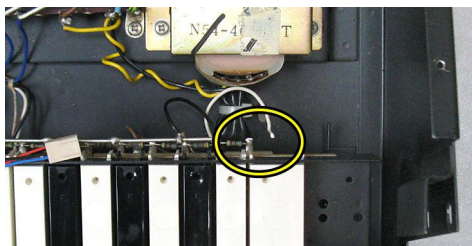
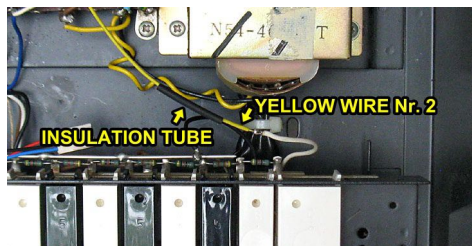


Figure 2.7.4



- c) Isolate the connection with the insulation tube and heat it (with a hot-flue pistol for example) until it shrinks tightly to the cables.

² The delivered keyboard cable is universal for all 770, 700S and 900PS instruments so its original length does not meet the 900PS exactly.

- d) Solder green wire Nr. 1 "IN" of the interface cable to the soldering lug on the instrument's keyboard (fig. 2.7.5).
- e) Solder red wire Nr. 3 "REF" of the interface cable to lug on the instrument's keyboard where a brown wire is already soldered (fig. 2.7.6). Work carefully – the soldering lug is less accessible (under a resistor).
- f) Solder black wire Nr. 4 "GND" of the interface cable to thick wire (common bus) of the instrument's keyboard – to pad where a black wire is already soldered (fig. 2.7.6).

Figure 2.7.5

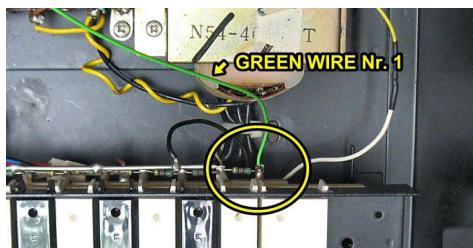
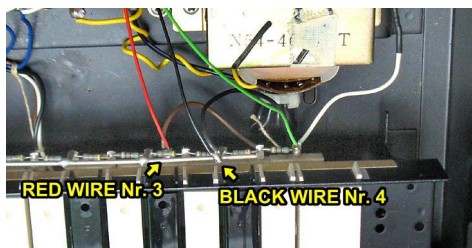


Figure 2.7.6



2.8 THE INTERFACE BOARD MOUNTING

- a) The interface board will be placed on the bottom metal cover of the instrument – to the right of the power supply board (fig. 2.8.1).
- b) Cleanse the part of rear panel inside of the instrument for the interface board placement (fig. 2.8.1). Use a chemical cleaner to remove all dirt and grease.
- c) Remove the protective foil from the self-adhesive supports of the interface board (fig. 2.8.2).

Figure. 2.8.1

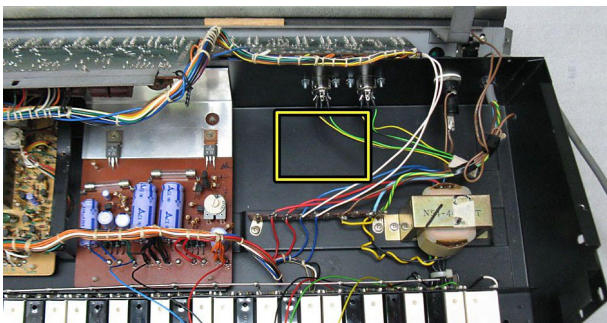


Figure 2.8.2

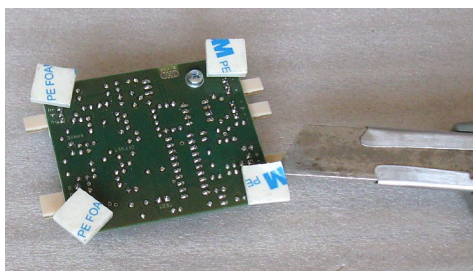
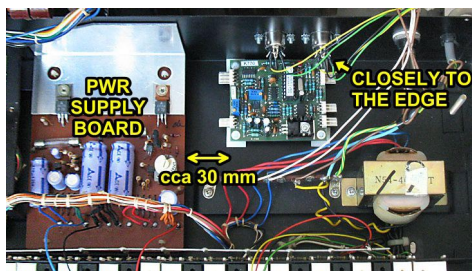


Figure 2.8.3



- d) Attach the interface board to the instrument's cover so that the board side with two connectors X4 ("KBD") and X5 ("PWR") points to the left, towards the power supply board as shown on the figure 2.8.3. Then fix the self-adhesive supports by pressing down to the cover.

- e) Plug the 3-pin connector of the bunched cables lead from the power supply board to X5 ("PWR") plug head on the interface board. Orientation of the connector is given by the connector lock so it cannot be plugged reversely (fig. 2.8.4).
- f) Plug 4-pin connector of the bunched cables lead from keyboard to X4 ("KBD") plug head on the interface board. Orientation of the connector is given by the connector lock again (fig. 2.8.4).
- g) Plug two 3-pin connectors of the MIDI cables to X1 ("I") and X2 ("O") plug heads on the interface board. Orientation of the connectors is given by the connector lock again but be sure that the connectors are not exchanged: MIDI input must be plugged to X1 head and MIDI output to X2 head (fig. 2.8.4).
- h) Pull the 4-pin connector of the bunched cables (leads from button and LED mounted on front panel) under the instrument' keyboard to inside of the instrument (fig. 2.8.5).
- i) Fix the brown cable back to the touch sensor on instrument's front panel with the original nut (fig. 2.8.5).
- j) Plug the 4-pin button and LED cable connector to X3 ("CTRL") plug head on the interface board. Orientation of the connector is given by the connector lock again (fig. 2.8.4).

Figure 2.8.4

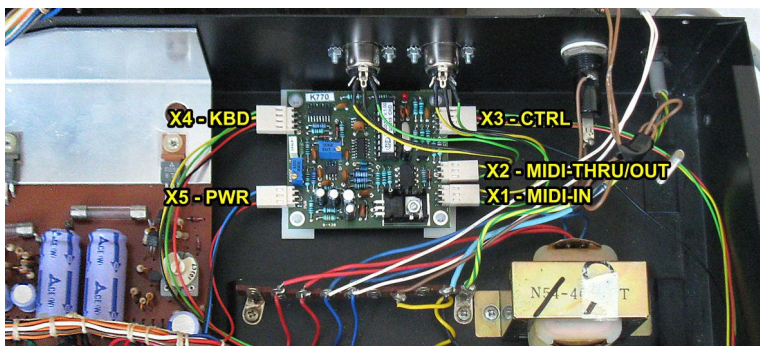
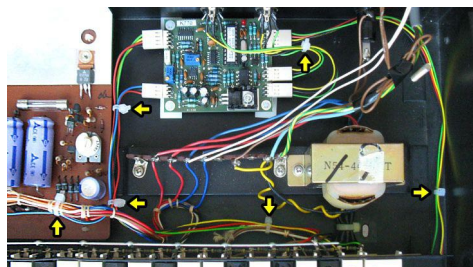


Figure 2.8.5



Figure 2.8.6



- k) Align new keyboard control cable ("KBD") and power supply cable ("PWR") and fix them together to the original cables with plastic stripes from the interface accessory. Fix also the MIDI cables and control cable (fig. 2.8.6)
- l) Place the block of instrument's control panel back to its original position (fig. 2.8.7).

Figure 2.8.7



2.9 INTERFACE ADJUSTMENT

There are two variable resistors on the interface board labeled "OFFSET" and "RANGE" (fig. 2.9.1). They must be adjusted before the interface is used. Adjustment procedure is following³:

- Connect MIDI output of your MIDI master keyboard (or PC / sequencer / DAW) to MIDI input of the interface⁴.
- Connect audio output of the instrument to a tuner or to a frequency meter.
- Set all controllers on the instrument's panels to a clear sound without any modulation:

- PITCH knob → to middle position
- HARMONICS switches → I. and II. off (upper position) / III. on (lower position)
- ATTACK/SUSTAIN switch → to **CONTROL** (lower position)
- VOLUME slider → to **10** (MAX.)
- HARMONICS sliders → 16', 8' and 2' to **0** / 4' to **10**
- ATTACK and SUSTAIN sliders → both to **0**
- REPEAT, FORTE, PITCH BEND, VIBRATO and PORTAMENTO switches → all off (middle position)
- TRAVELER slider → to **10** (fully to right)
- OCTAVE switch → to **M** (middle position)

Positions of other controllers on instrument's panel are not significant.

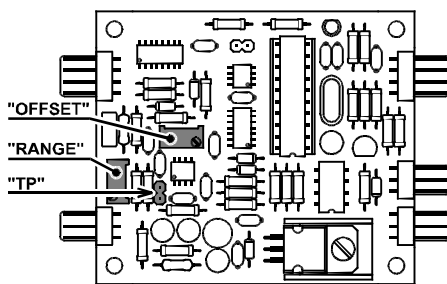
d) Plug instrument's power supply cable to a mains socket and switch the instrument on by main switch joined with the VOLUME knob. **Attention - work very carefully during whole adjustment procedure - there is a risk of electric shock!**

e) Now, the interface is in "Stand-by" mode - the interface's indication LED is off. If not, press the "RESET" button of the interface.

f) **Wait a few minutes** to stabilize the temperature of all instrument circuits.

g) Measure the voltage between pins of the "TP" jumper head (fig. 2.9.1) with a quality digital multimeter. It should be zero volts exactly. If it is not, adjust it with "OFFSET" variable resistor on the interface board (fig. 2.9.1).

Figure 2.9.1



³ It is supposed that the interface is in "Factory Reset" status before the adjustment procedure. If it is not, send the **F0 00 20 21 7F 54 50 03 7F 5A F7 [hex]** SysEx message to the interface first.

⁴ Set transmit MIDI Channel to number 1 on the master keyboard.

h) Press the C3 key on the instrument's keyboard (fig. 2.9.2) - indication bi-color LED remains off.

i) Measure the output tone frequency by the tuner (frequency meter). It should be 1047 Hz approx. Remember the measured tone frequency. Then release the C3 key.

j) Press the C3 key on the master keyboard (i.e. send MIDI Note Nr. 84 to the interface) and hold it. The indication LED will light in green.

k) Check the output tone frequency by the tuner (frequency meter) again. It must be the same as the frequency measured in paragraph i). If it is not, adjust it with "RANGE" variable resistor on the interface board (fig. 2.9.1).

l) Release the C3 key on the master keyboard. Switch the instrument off and **disconnect the power supply cable from mains socket.**



2.10 FINISHING OF THE INSTALLATION

Now assembly all instrument parts of the instrument together. It is a reverse procedure than described in chapter 2.1. Use the original screws and do not forget to place the washers to their original places.

a) Fix the block of instrument's control panel with four screws (M4) outside the instrument and three screws (M3) inside the instrument (fig. 2.10.1).

b) Fix the block of instrument's control panel with three metric screws (M3) and front panel with four self-tapping screws – all from the bottom side of the instrument (fig. 2.10.2).

Figure 2.10.1

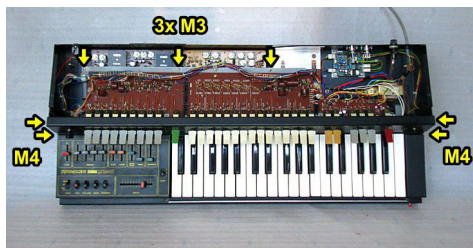
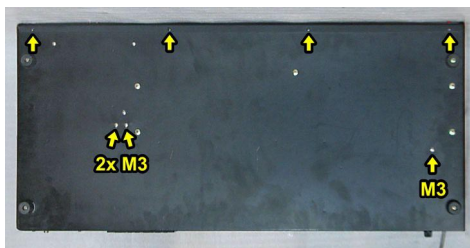


Figure 2.10.2



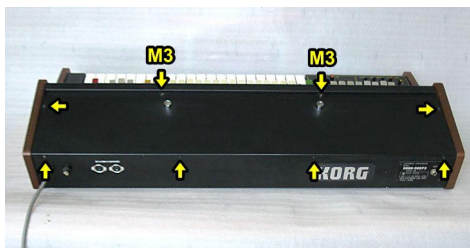
c) Fix both wood side plates to the instrument with six screws (two from outer side and one from inner side on each of the sides – fig. 2.10.3).

d) Fix the top cover to the instrument with eight screws (two metric and six self-tapping – fig. 2.10.4).

Figure 2.10.3



Figure 2.10.4



The installation of the MIDI interface kit is now finished and the Korg 900PS instrument is prepared for MIDI communication.

Please read carefully user manual of the interface before usage of modified instrument.

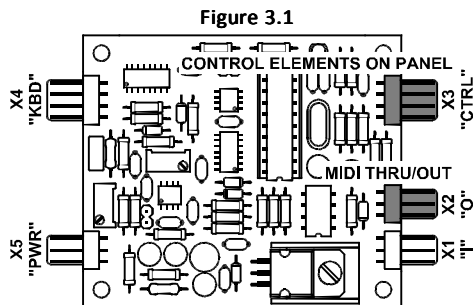
Figure 2.10.5



3 INSTALLATION TIPS

3.1 MIDI – THRU/OUT OUTPUT

K770-KBD interface has both MIDI input and output. However, only MIDI input is necessary for basic operation of the interface (i.e controlling the instrument by MIDI commands). MIDI THRU/OUT output connector need not to be installed at all. If you don't require transfer of MIDI data to another MIDI devices (THRU function) or reverse communication of the interface with host system (OUT function). In such case, X2 connector (labeled "O") on the interface board will remain unused (see pic. 3.1).

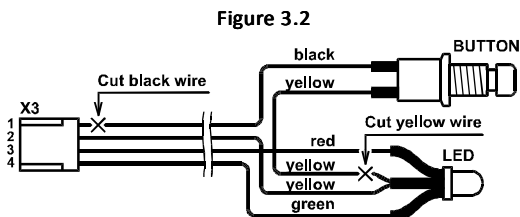


3.2 RESET BUTTON AND INDICATION LED

Installation of the reset button and indication LED isn't necessary as well. You don't need to install this bunched cables if you don't want to damage the instrument's panel by drilling. In such case, X3 connector (labeled "CTRL") will remain unused (see fig. 3.1).

It is also possible to install only the indication LED on instrument's panel. In such case, disconnect the button from bunched cables (cut-off yellow and black wires as shown on fig. 3.2).

If the button is not installed, the interface operation is unaffected. The only limitation is that the reset of the interface can be done only by turning the instrument off and on or by MIDI commands sent to the interface (see user manual of the interface).



This manual in PDF form is available at manufacturer's web pages.



KORG 770 / 700S / 900PS MIDI Interface
Model K770-KBD, Nr. 8-430, ver. 1.00
Document: 843010-2_instal

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