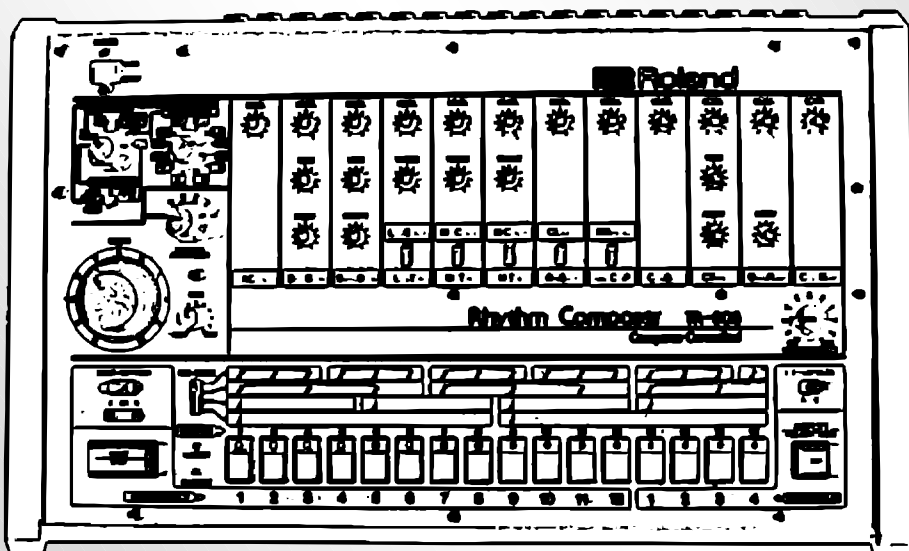


TR808-M

Roland TR-808 Rhythm Composer MIDI Interface



Model 8-448 ver. 3.30

INSTALLATION MANUAL



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This manual in PDF form is available on supplemental CD-ROM or on manufacturer's web-pages.
The CD-ROM includes also interactive installation manual with pictures with high resolution.

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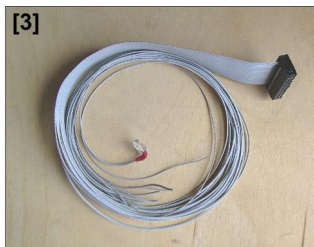
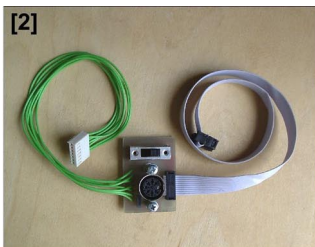
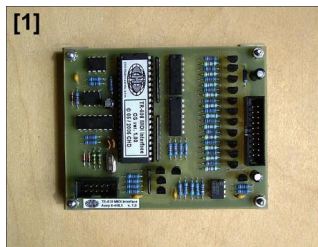
1. INTRODUCTION

The TR-808 MIDI retrofit enables your Roland TR-808 to be synchronized with other MIDI devices and work like polyphonic velocity sensitive MIDI drum expander. More over all original features of the TR-808 are not changed. The instrument can be used exactly the same way as before the interface installation.

1.1. MIDI INTERFACE KIT COMPONENTS

The TR-808 MIDI interface kit package contains all necessary components and material for the installation, including manual with detailed description of the installation procedure. The TR-808 kit package contains:

- [1] MIDI Interface main board (MAIN) including the self-adhesive supports
- [2] Synchronization terminals board (SYNC IN/OUT) including the material and cables (screws, washers and plastic stripes)
- [3] 20-core multi-cable with the connector and indication LED
- [4] Ground cable with the isolating capacitor
- [5] Special MIDI cable - reduction
- [6] CD-ROM with user and installation manuals and support software



1.2. GENERAL INSTRUCTION

Installation of all interface components is easy. There will be no major problems during the installation procedure if you follow instructions from this manual exactly.

It is not necessary to drill any holes in the vintage instrument - all changes can be replaced without visible changes. The interface can be removed and the instrument can be restored back to the original appearance at any time if necessary.

Before starting the work prepare yourself an small and medium size Phillips screwdrivers, pincers or scissors, pliers, soldering iron (with soft iron and soldering paste), electric or manual drill with the 5 mm caliber driller, knife and an universal glue.



Attention ! It is necessary to disconnect the instrument form main prior the installation, or else there is high risk of the electric shock injury !



Manufacturer is not responsible for any eventual mechanical or electrical damage to the Roland TR-808 instrument caused by violation of described installation procedure or by careless manipulation during the installation of the MIDI interface !

2. MIDI INTERFACE INSTALLATION PROCEDURE

2.1. TR-808 COVER PANEL DISASSEMBLY

a) Unscrew three screws on the front panel (pic. 1-3), three screws on the rear panel (pic. 1-1) and four screws on the top panel of the TR-808 (pic. 1-1). Do not lose the screws. They will be used again after the MIDI kit installation.

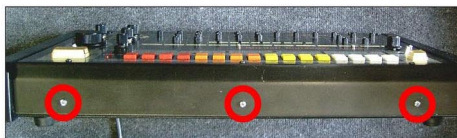
1-1



1-2



1-3



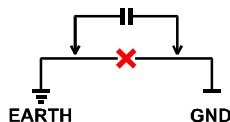
b) Carefully lift up the rear side of the TR-808 cover panel, move the entire panel approx. 2 cm towards yourself and lift up the front side and turn over the entire cover panel of the TR-808 backwards. We recommend to place it on the soft textile pad, to prevent the panel from the damage.

2.2. ELECTRIC AND MECHANIC GROUND ADJUSTMENT

Mechanic and electric grounds are directly interconnected on the TR-808. This galvanic interconnection can cause problems when connecting the TR-808 in the loudspeaker systems. Strong hum can occur in such a case. It is necessary to isolate both grounds by replacing the ground cable to eliminate these problems.

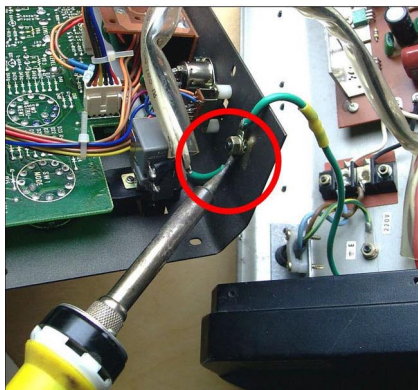
This adjustment is not required for correct MIDI interface functionality. If you do not need to isolate the electric and mechanic grounds leave this chapter out.

a) Unsolder the green ground cable, going out of the output connectors board in the front cover, from the soldering hole screwed to rear panel (pic. 2-1).

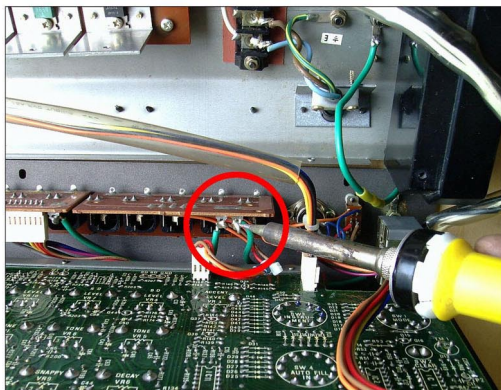


b) Unsolder the second end of the cable from the soldering pad on the output connectors board (pic. 2-2). Be very careful here, the soldering pad is badly accessible. There is a risk of the damage of the surrounding parts.

2-1



2-2



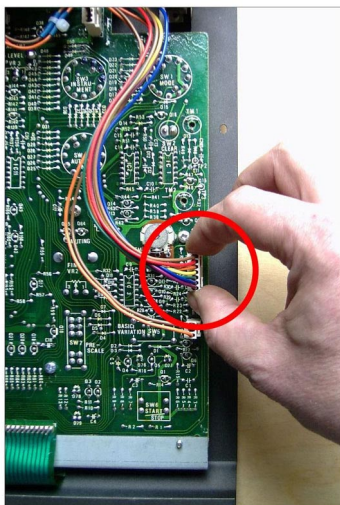
c) Unsoldered ground cable replace with the cable supplied with the MIDI kit package (part [4] of the delivery). Solder any side of the cable back to the soldering pad and the other end to the soldering lug screwed to rear panel of TR-808. Both sides of ground cable are interchangeable. They can be swapped. Be very careful when soldering on the outputs board.

2.3. "SYNC" CONNECTOR AND SWITCH REPLACEMENT

3-1



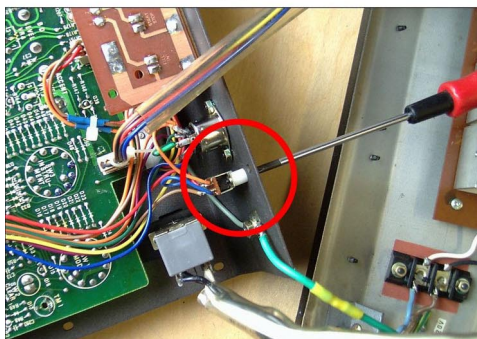
3-2



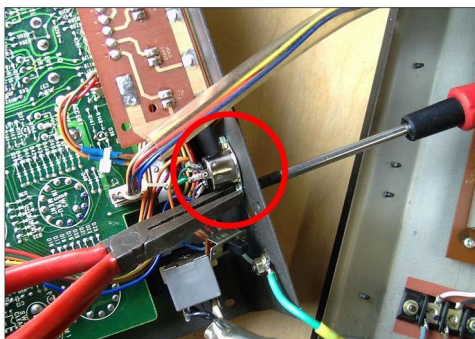
a) Use pincers or scissors to cut the plastic stripes on the cable bunch going from 7-pin and 3-pin connectors on the board in the front cover of TR-808 to the SYNC connector and switch and to the output board on the rear panel of the TR-808 front cover (pic. 3-1).

- b) Vertically pull the flat 7-pin connector to disconnect it from the TR-808 board (pic. 3-2).
 c) Unscrew two screws holding the SYNC switch on the rear panel and remove it. (pic. 3-3).
 Attention! Do not lose two supports from between the panel and switch.
 d) Unscrew two screws holding the SYNC connector on the rear panel and remove it. (pic. 3-4).
 Use the pliers to hold the nuts.

3-3



3-4



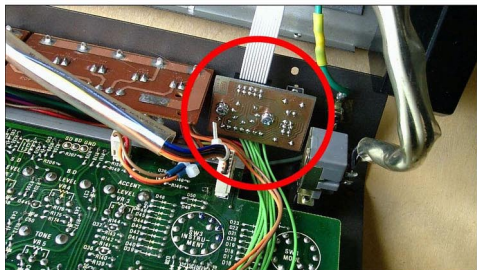
- e) Save the original cable bunch with the DIN connector, switch, screws, nuts and washers for eventual future removal of the kit and restoring the original TR-808. (pic. 3-5).

3-5



- f) Place the new interface "SYNC IN/OUT" board (part [2] of the delivery, pic. 3-6) to fit the rectangular slot for the switch in the rear panel. Screw the board to the TR-808 panel. Use two screws (part of the "SYNC IN/OUT" board, pic. 3-7). Do not forget to use washers under the screw heads to prevent the TR-808 panel from damage and scratches.

3-6

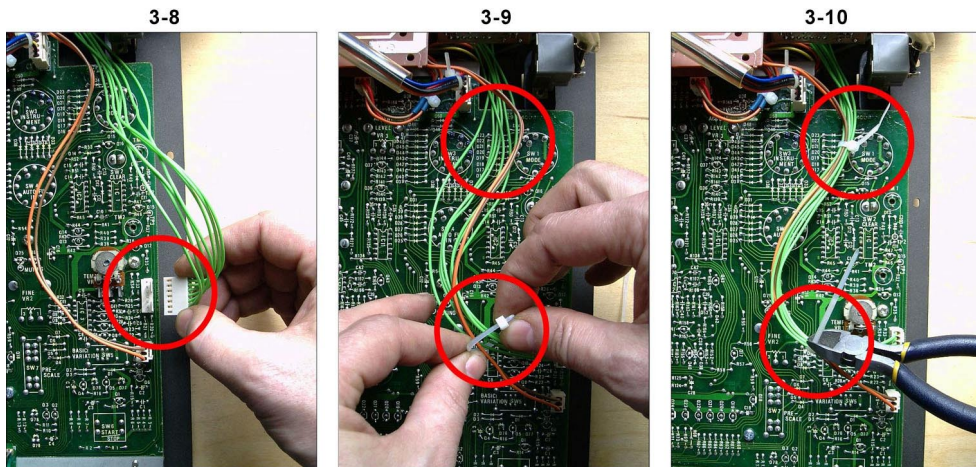


3-7



g) Push the flat 7-pin connector on the cable bunch of the "SYNC IN/OUT" board in unoccupied plug on the TR-808's main board (pic. 3-8). The connector has the lock to prevent to plug it the other way around.

h) Use the plastic strips (part of "SYNC IN/OUT" board delivery) to tie the cable bunches of 7-pin and 3-pin connectors on the TR-808 board. (pic. 3-9). Remove the ends of the stripes with pincers or scissors. (pic. 3-10).



2.4. CONNECTING THE INTERFACE CABLE TO THE TR-808 MAIN BOARD

Individual cables of the unpopulated end of the 20-core flat multi-cable (part [3] of the delivery) must be soldered to the particular pads of the TR-808's main boards. Use the micro soldering iron with sharper head. It is necessary to work carefully to not damage surrounding points on the board. Since the TR-808 is an old machine the oxidation of the soldering pads is presumable. Use the soldering paste is highly recommended for quality soldering.

Shielding cover is mounted on TR-808's main board. It is necessary to remove it before 20-core flat multi-cable montage. Then all soldering pads are accessible very well. Transistors whose leads are used are clearly marked on the board by graphical symbols. Transistors have always three leads, the middle one is always collector (C) with emitor (E) and basis (B) on its sides (pic. 4-1).

Individual cores of the flat multi-core cable are numbered from 1 to 20. Cable number 1 has different color (red). Soldering pads for individual cables on the TR-808's main board are described on the picture 4-2 and following table. Pictures 4-3 to 4-19 depict soldering pads in detail, pic. 4-20 is showing the finished connection of the cables to TR-808's board.

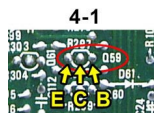
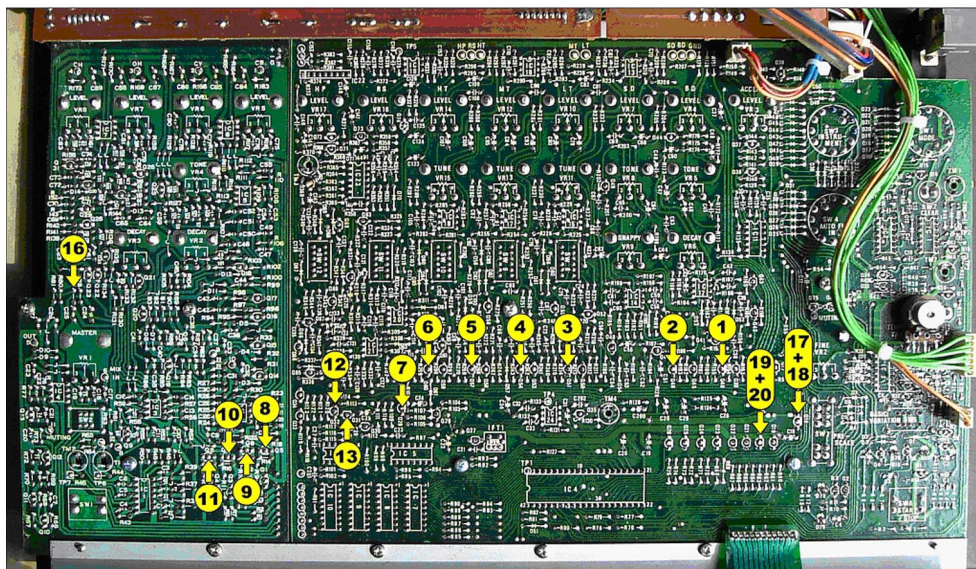


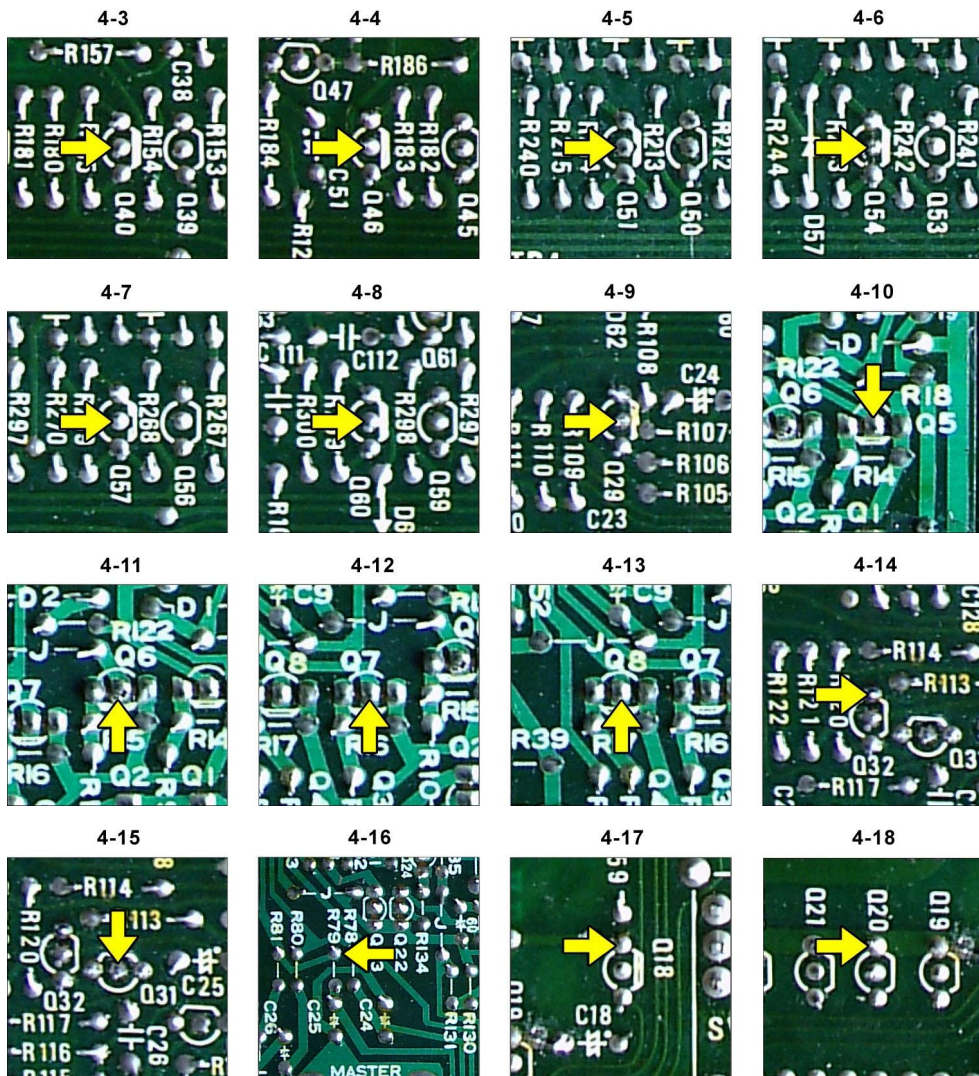
Table – Soldering pads on TR-808's boards				
Wire Nr.	Signal name	Solder pad	Pic. Nr.	Note
1	Bass Drum Trig	collector of Q40	4-3	colored wire
2	Snare Drum Trig	collector of Q46	4-4	
3	Low Tom / Low Conga Trig	collector of Q51	4-5	
4	Mid Tom / Mid Conga Trig	collector of Q54	4-6	

Table – Soldering pads on TR-808's boards (continue)

Wire Nr.	Signal name	Solder pad	Pic. Nr.	Note
5	High Tom / High Conga Trig	collector of Q57	4-7	
6	Rim Shot / Claves Trig	collector of Q60	4-8	
7	Hand Clap / Maracas Trig	collector of Q29	4-9	
8	Cow Bell Trig	collector of Q5	4-10	
9	Cymbal Trig	collector of Q6	4-11	
10	Open Hi-Hat Trig	collector of Q7	4-12	
11	Closed Hi-Hat Trig	collector of Q8	4-13	
12	Trig Lock	emitter of Q32	4-14	
13	Trig Off	collector of Q31	4-15	
14	LED – anode	none	-	see LED montage
15	LED – cathode	none	-	see LED montage
16	+15V	upper lead of resistor R79	4-16	
17	+5V	emitter of Q18	4-17	both wires 17 and 18 will be soldered to this pad
18				
19	GND	emitter of Q20	4-18	both wires 19 and 20 will be soldered to this pad
20				

4-2

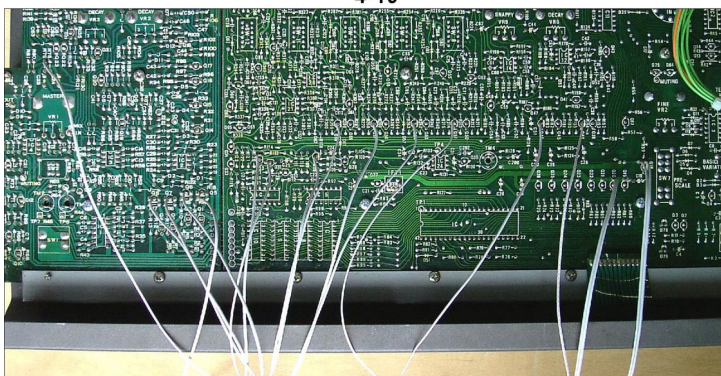




After all 18 wires are soldered and checked, shielding cover can be mounted back to TR-808's boards.

Remark: On some boards of TR-808 instrument, the components are not labeled. In that case, you can use picture of labeled boards for easier orientation in components placement. This picture is available on supplemental CD-ROM ("documentation" folder, "844833_install_brd.pdf" file).

4-19

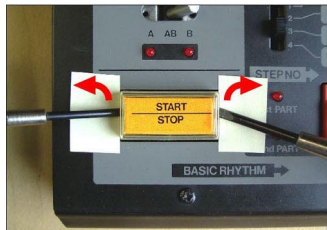


2.5. INDICATOR LED MONTAGE INTO THE "START / STOP" BUTTON

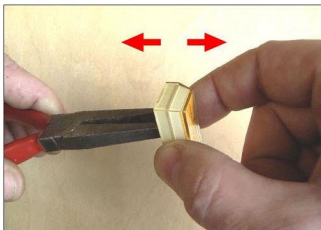
a) Turn over the front cover and pull out the "START / STOP" button cap. Use two screwdrivers if necessary. Put the carton paper or textile under the screwdrivers to prevent the damage of the TR-808 front panel (pic. 5-1).

b) The "START / STOP" button cap consists of three parts. Take off the transparent cover from the carrier part, holding the carrier part with the pliers as shown on picture 5-2. There is a paper label with the "START / STOP" legend between these two plastic parts (pic. 5-3).

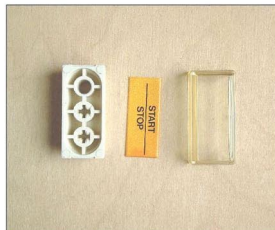
5-1



5-2



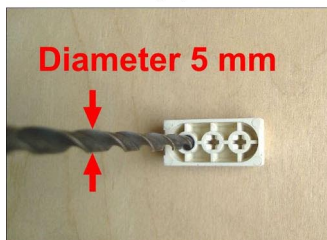
5-3



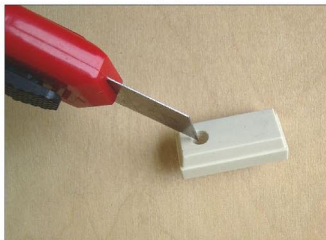
c) There are three holes underneath the carrier part. Two cross-shaped and one circular. The circular hole must be redrilled to 5 mm caliber right through (pic. 5-4). After the drilling is finished clean the hole with the knife (pic. 5-5).

d) Assemble all three parts together having the hole for LED on the left (pic. 5-6).

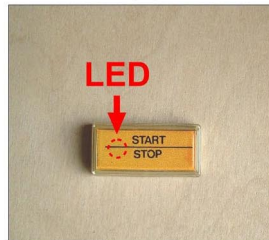
5-4



5-5



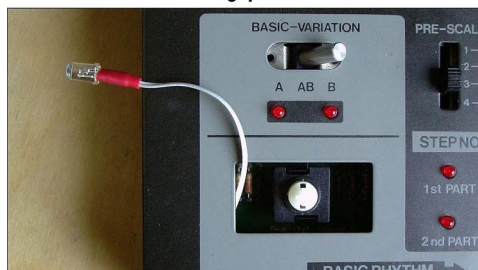
5-6



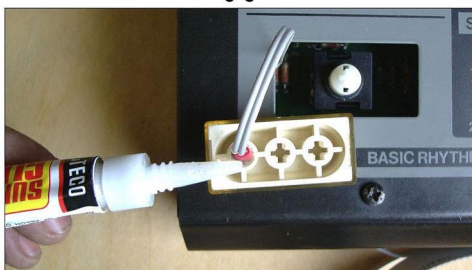
e) Pull the LED connected to the flat cable through the "START / STOP" button hole in the front cover (pic. 5-7) and insert it in the prepared hole in the "START / STOP" button. Fix the LED with the drop of the glue. (pic. 5-8).

f) Put the button cap with the LED back on the "START / STOP" button, having the LED on the left side.

5-7



5-8



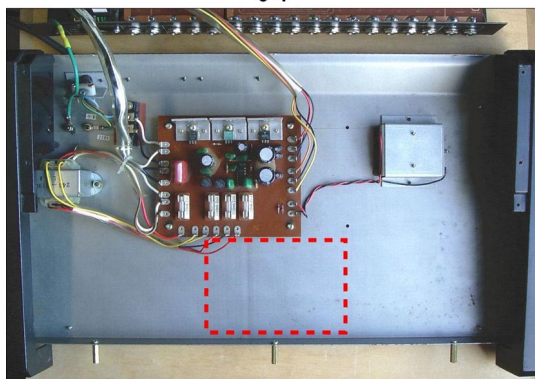
2.6. MIDI INTERFACE MAIN BOARD INSTALLATION

a) Cleanse (degrease) the lower part of the TR-808 bottom to place there the interface main board "MAIN" (part [1] of the delivery, pic. 6-1).

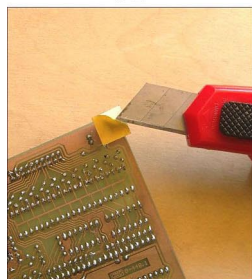
b) Remove the protective foil from the self-adhesive supports of the "MAIN" board (pic. 6-2).

c) Apply the interface "MAIN" board to the lower part of the TR-808 bottom (pic. 6-3) than fix the self-adhesive supports by pressing down (pic. 6-4).

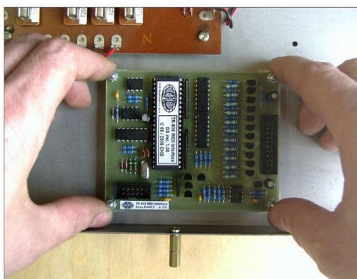
6-1



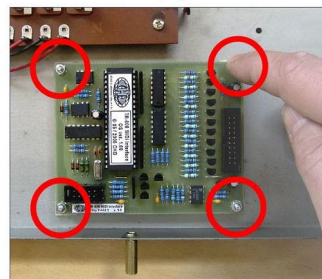
6-2



6-3



6-4

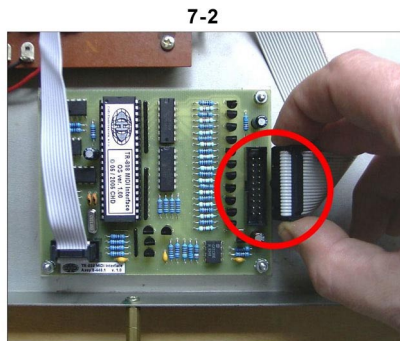
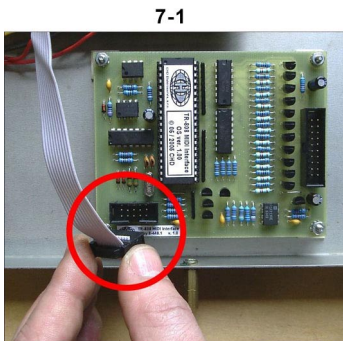


2.7. TR-808 ASSEMBLY

The TR-808 retrofit is now installed. TR-808 assembly is the last step of the installation procedure.

a) Plug the 10-pin connector going from the "SYNC IN/OUT" board in the interface "MAIN" board. The orientation of the connector is given with the connector lock (pic. 7-1).

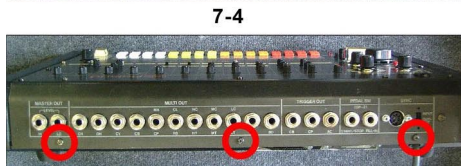
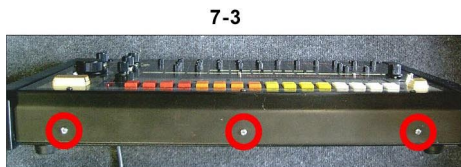
b) Plug the 20-pin connector of the multi-core cable soldered to the TR-808 board in interface "MAIN" board. The orientation of the connector is given with the connector lock (pic. 7-2).



c) Turn the front cover of the TR-808 over the bottom part and move the edge of the front cover over the supports on the front side of the bottom part.

d) Move the front cover backwards and place its rear side to fit the plastic sides of the TR-808.

e) Screw back the three screws on the front panel TR-808 (pic. 7-3), three screws on the rear panel (pic. 7-4) and four screws on the top panel (pic. 7-5).



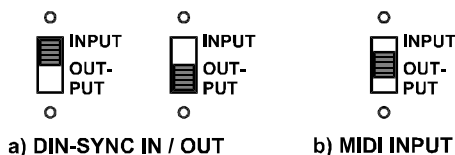
The installation of the MIDI kit is now complete and TR-808 is ready to communicate over the MIDI. Please read carefully the user manual first.

See "DAC Calibration Procedure" chapter if a malfunction occurs in triggering of TR-808's instruments via MIDI.

3. NEW FUNCTIONS OF TR-808

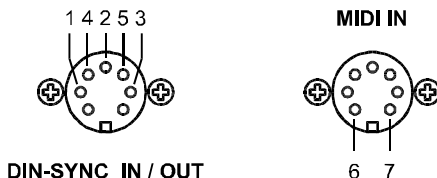
3.1. "SYNC" SWITCH

"SYNC" switch on the rear panel has now 3 positions. In the upper or lower positions, all TR-808 functions remain the same as before installation of the MIDI retrofit (DIN-SYNC OUT, DIN-SYNC IN). The middle position switches on the MIDI input.



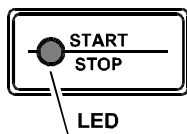
3.2. "SYNC" CONNECTOR

The 5-pin "DIN SYNC" connector on the TR-808 rear panel is replaced with 7-pin one. Pins Nr. 1 to 5 have the original functionality, new pins Nr. 6 and 7 are used for MIDI input. For the normal DIN-SYNC operation use standard 5 pin cable, same as before MIDI kit installation. For the MIDI communication (Sync switch in the middle position) please use special 7-pin MIDI cable/reduction supplied with in the TR-808 MIDI kit package.



3.3. "START /STOP" BUTTON

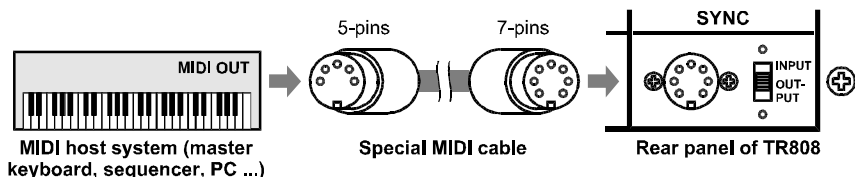
The "START / STOP" button on the TR-808 panel has the same function as on original non-retrofitted instrument. LED under the button indicates the MIDI mode ("SYNC" switch in the middle position).



3.4. CONNECTION TO MIDI SYSTEM

It is **necessary to use special MIDI cable** (part of delivery) for connection of TR-808 to MIDI system. For TR808's "SYNC" connector use the 7-pin connector side of the cable, for output from the MIDI sequencer or MIDI master keyboard the standard 5-pin side of the cable.

For proper control of TR-808 via MIDI bus, "SYNC" switch on TR-808's rear panel must be in central position and host MIDI system must be able to transmit MIDI Clock, Transport (Start, Stop, Continue), Program Change and Note-On commands.



4. DAC CALIBRATION PROCEDURE

Problem with multiple triggering of TR-808's sound generators can occur at some TR-808 drummachine – more instruments are sounding simultaneously after just one instrument is launched via MIDI command. In that case, it is necessary to calibrate outputs of the interface.

Calibration procedure can be done via special MIDI System Exclusive messages transmitted to the interface. Form of messages is :

F0 00 20 21 7F 62 30 03 dd xx F7 [hex]

where **dd** databyte is calibration constant and **xx** byte is checksum (please refer MIDI SYSTEM EXCLUSIVE COMMUNICATION manual for details about checksum calculating).

Calibration constant is set to 127 during production. If problem described above occurs, calibration constant must be decreased. Valid values of calibration constant are from 00h to 7Fh. SysEx messages for all values shows table below.

If there are some problems with multiple triggering of TR-808's sound generators after the interface installation (when calibration constant is set to 127), set lower calibration constant and then try functionality of TR-808. If problem persists, decrease calibration constant repeatedly up until all sound generators are launched correctly.

Calibration constant is stored in internal interface's memory so new value isn't lost after TR-808 is turned off and the interface will work with it during all next sessions.

Remark: The problem is caused by variability of parameters and quality of original switching transistors used in launching circuits of TR-808's sound generators – some of them have low cut-off voltage and cascade breakdown occurs when they are switched by voltage pulses from the kit. Then switching voltage pulse comes to common bus and more instruments are triggered simultaneously. Decreasing of amplitude of switching voltage pulses is processed with lower values of calibration constant. Then the cascade breakdown effect of switching transistors is eliminated and the instrument's sound generators are launched correctly.

Amplitude of switching voltage pulses is from 4 to ca 12 volts (in dependence on Velocity of MIDI note) if calibration constant is equal to 127. For calibration constant equal to 0, the amplitude is from 4 to ca 8 volts. The upper limit of amplitude of switching voltage pulses (max amplitude) is given by formula:

$$A = 0,027 \cdot c + 8,2 \text{ [V]}$$

where **A** is upper limit of amplitude in volts and **c** is calibration constant.

Table – SysEx messages for all calibration constants

Cal.	Corresponding MIDI SysEx message [hex]	Cal.	Corresponding MIDI SysEx message [hex]	Cal.	Corresponding MIDI SysEx message [hex]
127	F0 00 20 21 7F 62 30 03 7F 6C F7	84	F0 00 20 21 7F 62 30 03 54 17 F7	41	F0 00 20 21 7F 62 30 03 29 42 F7
126	F0 00 20 21 7F 62 30 03 7E 6D F7	83	F0 00 20 21 7F 62 30 03 53 18 F7	40	F0 00 20 21 7F 62 30 03 28 43 F7
125	F0 00 20 21 7F 62 30 03 7D 6E F7	82	F0 00 20 21 7F 62 30 03 52 19 F7	39	F0 00 20 21 7F 62 30 03 27 44 F7
124	F0 00 20 21 7F 62 30 03 7C 6F F7	81	F0 00 20 21 7F 62 30 03 51 1A F7	38	F0 00 20 21 7F 62 30 03 26 45 F7
123	F0 00 20 21 7F 62 30 03 7B 70 F7	80	F0 00 20 21 7F 62 30 03 50 1B F7	37	F0 00 20 21 7F 62 30 03 25 46 F7
122	F0 00 20 21 7F 62 30 03 7A 71 F7	79	F0 00 20 21 7F 62 30 03 4F 1C F7	36	F0 00 20 21 7F 62 30 03 24 47 F7
121	F0 00 20 21 7F 62 30 03 79 72 F7	78	F0 00 20 21 7F 62 30 03 4E 1D F7	35	F0 00 20 21 7F 62 30 03 23 48 F7
120	F0 00 20 21 7F 62 30 03 78 73 F7	77	F0 00 20 21 7F 62 30 03 4D 1E F7	34	F0 00 20 21 7F 62 30 03 22 49 F7
119	F0 00 20 21 7F 62 30 03 77 74 F7	76	F0 00 20 21 7F 62 30 03 4C 1F F7	33	F0 00 20 21 7F 62 30 03 21 4A F7
118	F0 00 20 21 7F 62 30 03 76 75 F7	75	F0 00 20 21 7F 62 30 03 4B 20 F7	32	F0 00 20 21 7F 62 30 03 20 4B F7
117	F0 00 20 21 7F 62 30 03 75 76 F7	74	F0 00 20 21 7F 62 30 03 4A 21 F7	31	F0 00 20 21 7F 62 30 03 1F 4C F7
116	F0 00 20 21 7F 62 30 03 74 77 F7	73	F0 00 20 21 7F 62 30 03 49 22 F7	30	F0 00 20 21 7F 62 30 03 1E 4D F7
115	F0 00 20 21 7F 62 30 03 73 78 F7	72	F0 00 20 21 7F 62 30 03 48 23 F7	29	F0 00 20 21 7F 62 30 03 1D 4E F7
114	F0 00 20 21 7F 62 30 03 72 79 F7	71	F0 00 20 21 7F 62 30 03 47 24 F7	28	F0 00 20 21 7F 62 30 03 1C 4F F7
113	F0 00 20 21 7F 62 30 03 71 7A F7	70	F0 00 20 21 7F 62 30 03 46 25 F7	27	F0 00 20 21 7F 62 30 03 1B 50 F7
112	F0 00 20 21 7F 62 30 03 70 7B F7	69	F0 00 20 21 7F 62 30 03 45 26 F7	26	F0 00 20 21 7F 62 30 03 1A 51 F7
111	F0 00 20 21 7F 62 30 03 6F 7C F7	68	F0 00 20 21 7F 62 30 03 44 27 F7	25	F0 00 20 21 7F 62 30 03 19 52 F7
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108	F0 00 20 21 7F 62 30 03 6C 7F F7	65	F0 00 20 21 7F 62 30 03 41 2A F7	22	F0 00 20 21 7F 62 30 03 16 55 F7
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99	F0 00 20 21 7F 62 30 03 63 08 F7	56	F0 00 20 21 7F 62 30 03 38 33 F7	13	F0 00 20 21 7F 62 30 03 0D 5E F7
98	F0 00 20 21 7F 62 30 03 62 09 F7	55	F0 00 20 21 7F 62 30 03 37 34 F7	12	F0 00 20 21 7F 62 30 03 0C 5F F7
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92	F0 00 20 21 7F 62 30 03 5C 0F F7	49	F0 00 20 21 7F 62 30 03 31 3A F7	6	F0 00 20 21 7F 62 30 03 06 65 F7
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88	F0 00 20 21 7F 62 30 03 58 13 F7	45	F0 00 20 21 7F 62 30 03 2D 3E F7	2	F0 00 20 21 7F 62 30 03 02 69 F7
87	F0 00 20 21 7F 62 30 03 57 14 F7	44	F0 00 20 21 7F 62 30 03 2C 3F F7	1	F0 00 20 21 7F 62 30 03 01 6A F7
86	F0 00 20 21 7F 62 30 03 56 15 F7	43	F0 00 20 21 7F 62 30 03 2B 40 F7	0	F0 00 20 21 7F 62 30 03 00 6B F7
85	F0 00 20 21 7F 62 30 03 55 16 F7	42	F0 00 20 21 7F 62 30 03 2A 41 F7		

