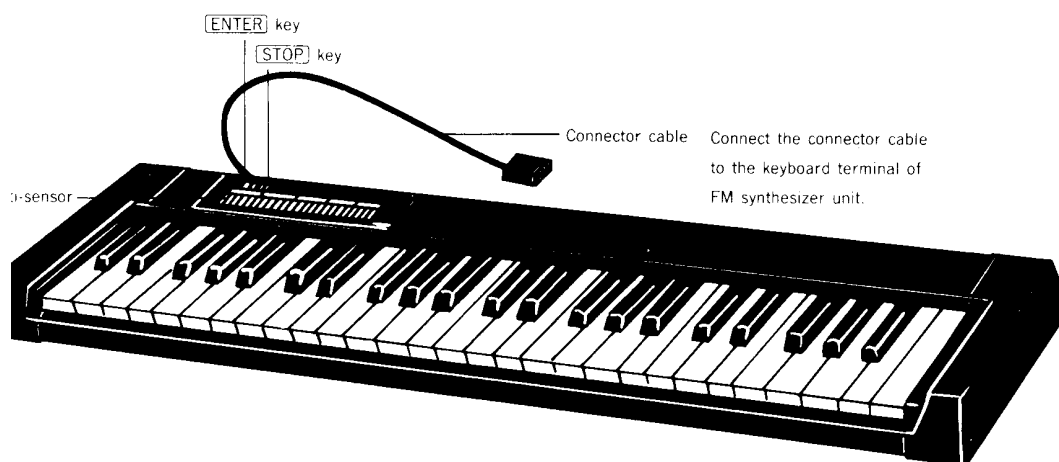# Toshiba HX- MU 901 keyboard

Technical information

Music Keyboard Unit HX-MU901

Version 1.1

By HansO, 2001
Checked and enhanced by Bas Kornalijnslijper

The information in this article is gathered by opening up a well-functioning HX-MU901 musical keyboard and checking all connections. No guarantee is given that this information is correct. You may use this information at your own risk.

1 Specification

- Musical keyboard with 49 keys
- multi sensor
- can be used with Toshiba HX- MU900 MSX music module
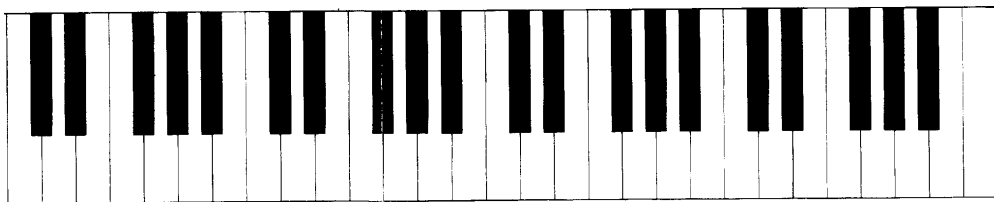- same connector as NMS1160 Philips keyboard but not compatible

2 Parts

The parts of the keyboard are:

2.1 Key print

A printed circuit underneath the keys with:

- 15 pen connector: 8 out lines, 7 in lines
- 49 switches underneath the keys
- 49 diodes
- a printed circuits that implements the matrix as shown in the circuit diagram
- 49 diodes

2.2 Multi sensor print

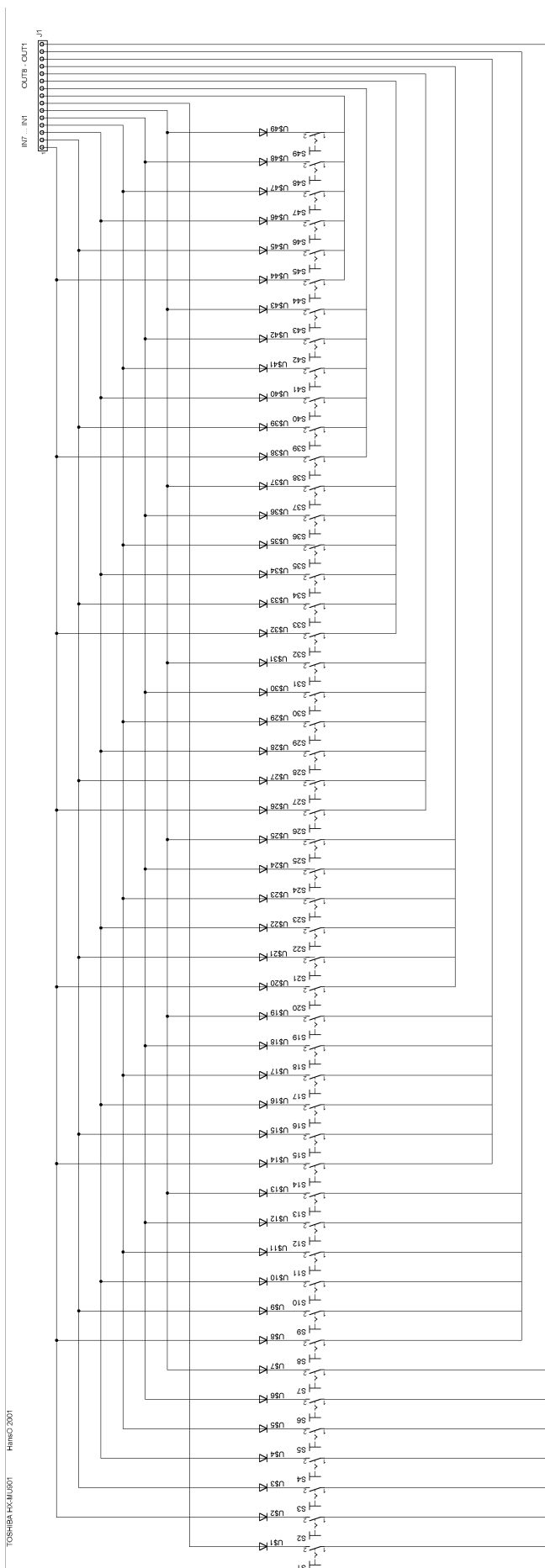A printed circuit underneath the multi sensor with wires from keyboard print to connection print at multi sensor

- Connector for in lines (7)
- Connector for out lines (8)
- Two connectors for outside wiring
- Connector for multi sensor (flexible wires)

2.3 Wiring

Wiring connects all prints and the external connector

3 Circuit diagram of key print

On the next page sthe circuit diagram is shown. Shown in landscape!

J1
OUT8 · OUT1
IN7 · IN1

U$1 S1
U$2 S2
U$3 S3
U$4 S4
U$5 S5
U$6 S6
U$7 S7
U$8 S8
U$9 S9
U$10 S10
U$11 S11
U$12 S12
U$13 S13
U$14 S14
U$15 S15
U$16 S16
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U$40 S40
U$41 S41
U$42 S42
U$43 S43
U$44 S44
U$45 S45
U$46 S46
U$47 S47
U$48 S48
U$49 S49

3

4   Block diagram of multi sensor print

To external
connector 2

1 black

Multi sensor

1

14 diodes

10 brown/white

To external
connector 1

1 red

Out lines
keyboard

8 red

7 red

In lines
keyboard

8
greenwhite

1 violet

1 green
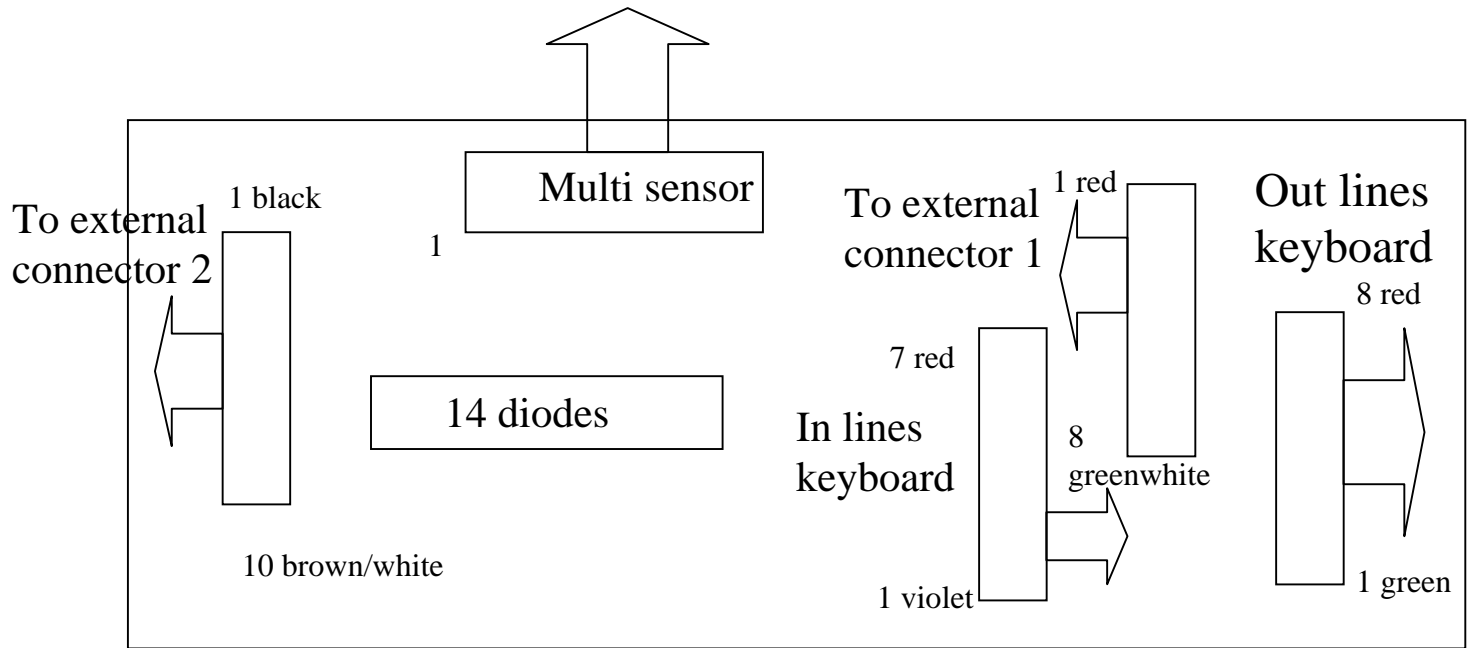
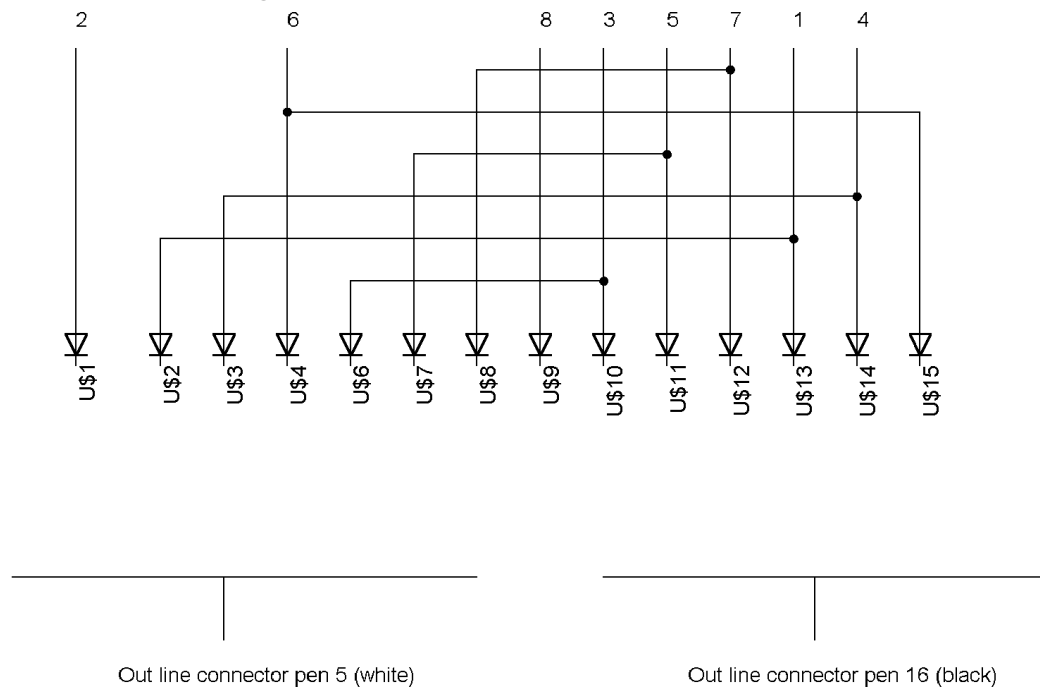# 5   Connections to multi sensor

The multi sensor is connected with a flexible 16 line wire to the multi sensor print. It shares some of the in lines as scanning matrix lines and has two separate out lines (black and white from external connector 2).

The numbering for the multi sensor connector seen from the bottom side of the print is shown in the next figure.

5.1   Circuit diagram of multi sensor

Out line connector pen 5 (white)   Out line connector pen 16 (black)

Notes:

- Numbering of the diodes is the numbering of the multi sensor connector
- Numbers at the top are the numbers of the external connector 2

6 Wiring

6.1 Key-print15 pen connector out part to multi sensor print

Connects:
- print connector out lines keyboard to
- external connector 1

Pen	Key print 15 pen connector out part	To external connector 1	Pen
1	Red	Red	8
2	Blue	Red/white	7
3	Black	Orange	6
4	White	Orange/white	5
5	Yellow	Yellow	4
6	Orange	Yellow/white	3
7	Violet	Green	2
8	Green/white	Green/white	1

## 6.2 Key print15 pen connector in line part to multi sensor print

Connects:
- Key print connector in lines part
- to external connector 2
- multi sensor

Key print	Multi sensor print	Key print15 pen connector in part	To external connector 2	
9	7	Red	Black	1
10	6	Blue	Blue	2
11	5	Black	Blue/white	8
12	4	White	Purple	7
13	3	Yellow	Light green	5
14	2	Orange	Grey	4
15	1	Violet	Light blue	3
			brown	6
			White	9
			Brown/white	10

Notes

- Pens 1 to of the external conenctor are connected via diodes to the multi sensor
- External connector pens 6, 9 and 10 are for the multi sensor, see that paragraph

6.3 External connector
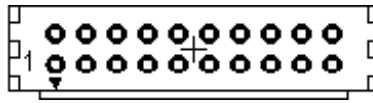
Pen		Pen	
1	Brown	2	Brown/white
3	Red	4	Red/white
5	Orange	6	Orange/white
7	Yellow	8	Yellow/white
9	Green	10	Green/white
11	Blue	12	Blue/white
13	Violet	14	Light green
15	Grey	16	Light blue
17	White	18	Pink
19	Black	20	Shielding

Notes:

These wires are not connected to the keyboard switches:

- Wire 18 (pink) is not connected in the keyboard
- Wire 20 (shielding) is only connected to the chassis

When one of the wires in the cable is broken, you can substitute the broken one with either wire 18 or 20