

# T.O.S.

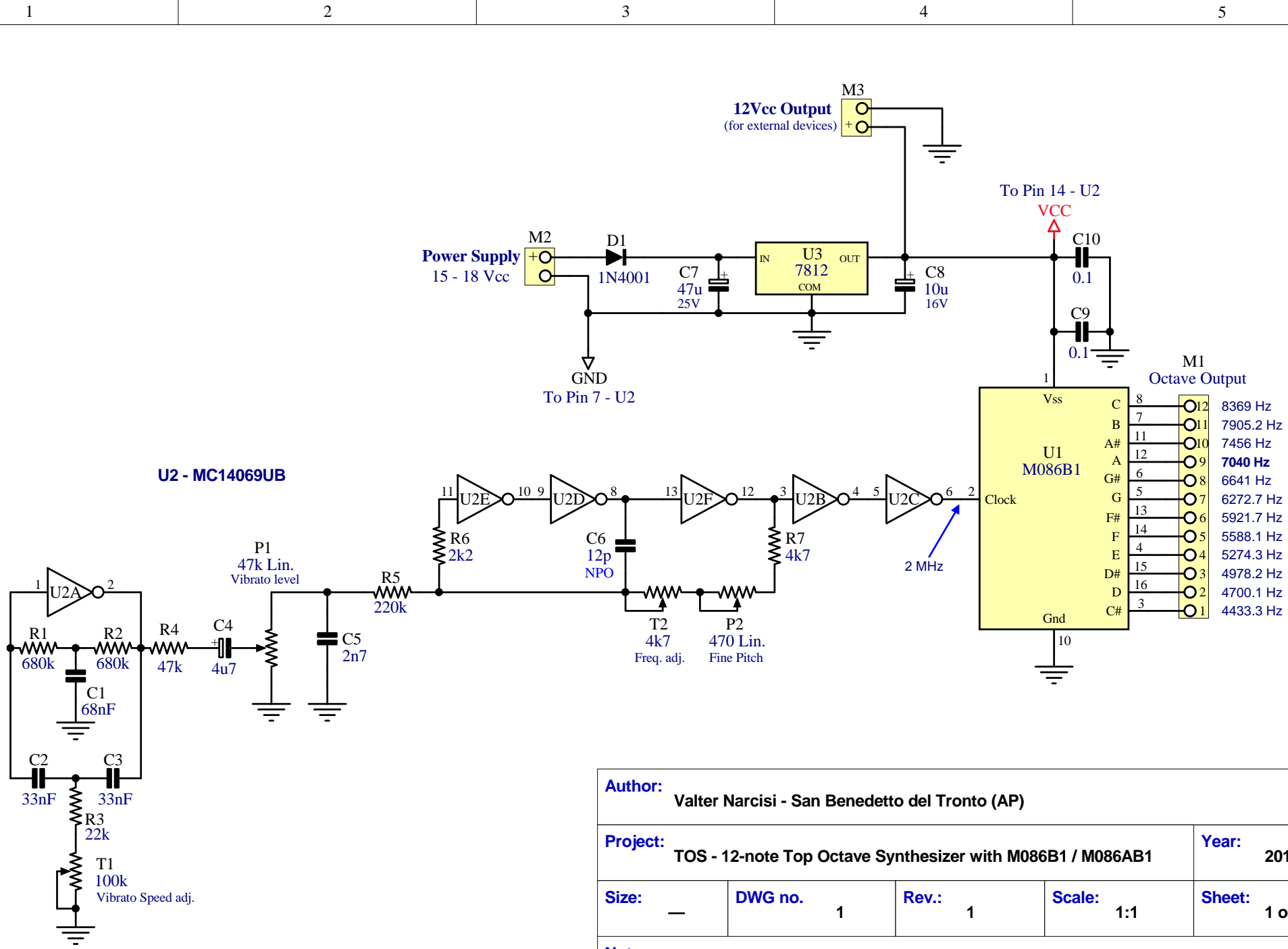
## 12-note Top Octave Synthesizer

*with M086B1 integrated circuit*



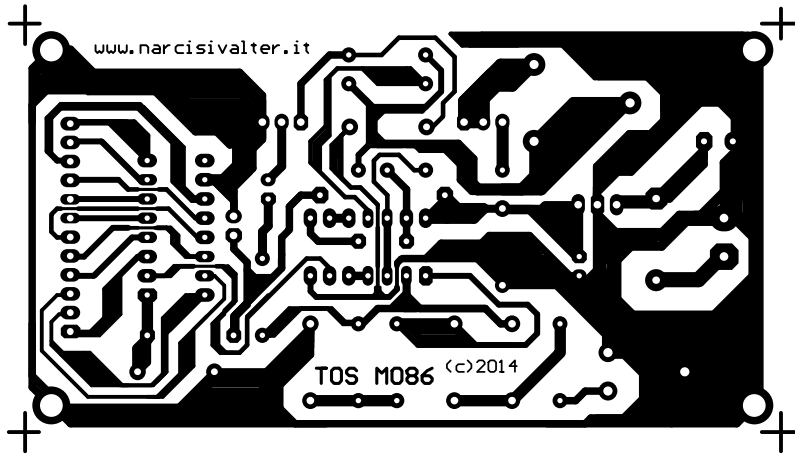
### SERVICE MANUAL (rev. 2)



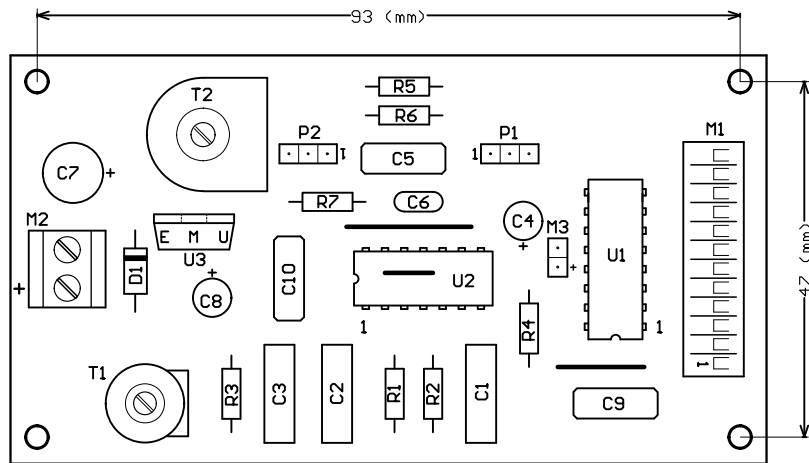


<b>Author:</b> Valter Narcisi - San Benedetto del Tronto (AP)			
<b>Project:</b> TOS - 12-note Top Octave Synthesizer with M086B1 / M086AB1			<b>Year:</b> 2014
<b>Size:</b> —	<b>DWG no.:</b> 1	<b>Rev.:</b> 1	<b>Scale:</b> 1:1
<b>Note:</b> <a href="http://www.narcisivalter.it/progetti/tos_m086.html">http://www.narcisivalter.it/progetti/tos_m086.html</a>			<b>Sheet:</b> 1 of 1

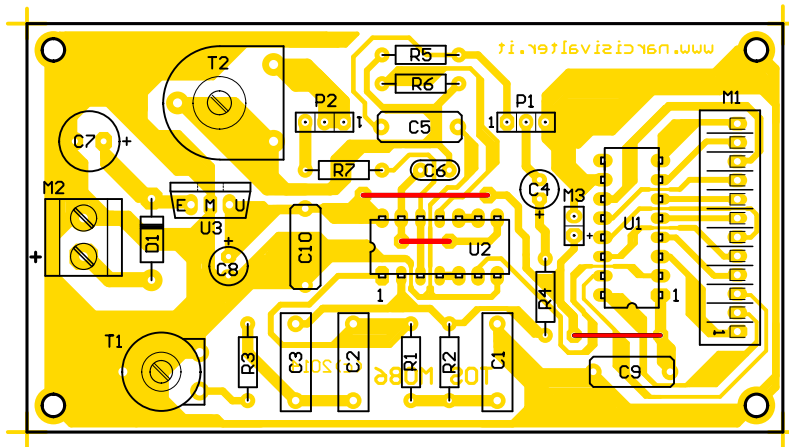
<b>TOS-M086B1 COMPONENT LIST</b>	
<b>Designator</b>	<b>Component Value</b>
C1	68nF
C2	33nF
C3	33nF
C4	4u7 - 16v
C5	2n7
C6	12p NPO
C7	47u - 25v
C8	10u - 16v
C9	0.1u
C10	0.1u
R1	680k
R2	680k
R3	22k
R4	47k
R5	220k
R6	2k2
R7	4k7
T1	100k
T2	4k7
P1	47k Lin. potentiometer
P2	470 Lin. potentiometer
D1	1N4001 or equivalent
U1	M086B1, M086NB1 or equivalent
U2	MC14069UB (CD4069)
U3	7812
M1	12 way terminal
M2	2 way terminal



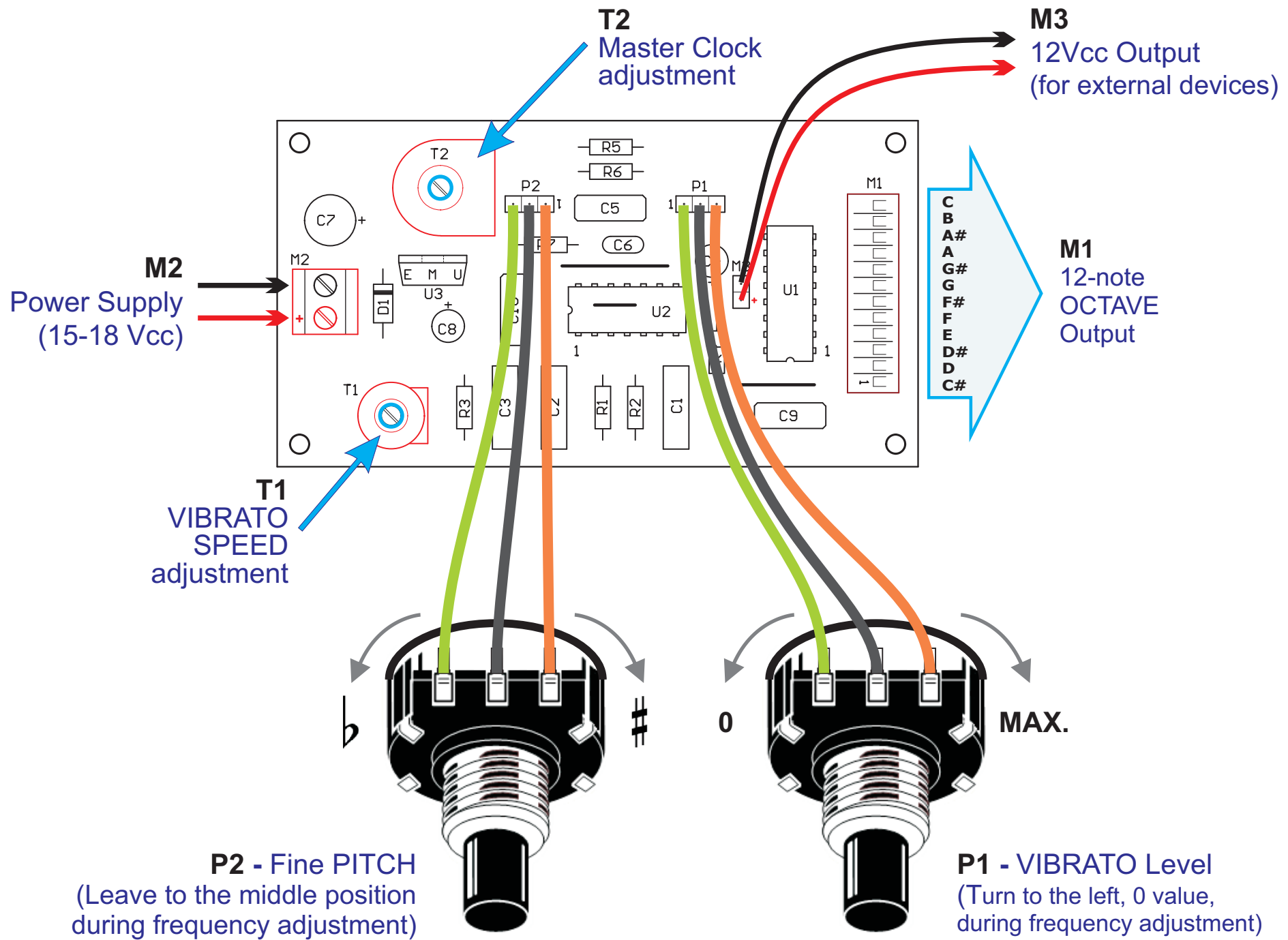
MASTER (Copper side)



PCB Layout (100x54 mm)



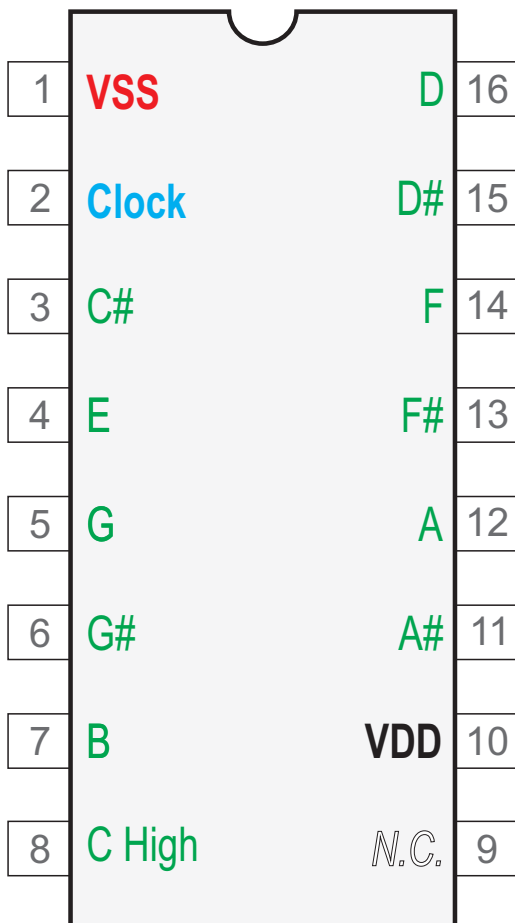
PCB Layout (100x54mm)



**STMicroelectronics**  
**M086B1**

12-note Top Octave Synthesizer  
(TOS)

Chip Package: **DIP16**  
Power Supply (typ.): **9 ÷ 15 V**  
Master Clock Input: **0,100 ÷ 4,5 MHz**  
Typical Clock Input: **2 MHz**  
Duty Cycle: **50%**



Pin No.	Note	Div.	Freq. Output	
			Clock IN 999,68 kHz	Clock IN 1999,36 kHz
3	C#	451	2216,68 Hz	4433,17 Hz
16	D	426	2346,66 Hz	4693,33 Hz
15	D#	402	2436,76 Hz	4973,53 Hz
4	E	379	2637,68 Hz	5275,36 Hz
14	F	358	2792,40 Hz	5584,80 Hz
13	F#	338	2957,63 Hz	5915,27 Hz
5	G	319	3133,79 Hz	6267,59 Hz
6	G#	301	3321,19 Hz	6642,39 Hz
12	A	284	3520,00 Hz	7040,00 Hz
11	A#	268	3730,15 Hz	7460,30 Hz
7	B	253	3951,30 Hz	7902,61 Hz
8	C	239	4182,76 Hz	8365,52 Hz



## TOS integrated circuits

13-Note Top Octave Generator		12-Note Top Octave Generator	
Integrated Circuits	Brand	Integrated Circuits	Brand
<b>S50240 - S50241</b> <b>S50243 - S50244</b>	AMI	<b>MK50242</b>	Mostek
<b>MK50240</b> <b>MK50241</b>	Mostek	<b>S50242</b> <b>S50245</b>	AMI
<b>M082B1 - M082AB1</b> <b>M083B1 - M083AB1</b>	SGS-Ates (STMicroelectronics)	<b>M086B1 - M086AB1</b> <b>M087B1</b>	SGS-Ates (STMicroelectronics)
<b>MM5891AA</b> <b>MM5891AB</b>	National	<b>AY-1-0212</b> <b>AY-3-0214</b>	General Instruments
<b>SFF5011</b>	Sescosem	<b>SFF5009</b> <b>SFF5010</b>	Sescosem
<b>SAA1030</b>	ITT	<b>TMS3616</b> <b>TMS36161</b>	Texas Instruments
<b>S2555 - S2556</b>	AMI		
<b>MM5555 - MM5556</b> <b>MM5832 - MM5833</b>	National		
<b>M8071 - LM8071</b>	Sanyo		
<p><b>The chips in RED color require a double power supply</b></p> <p><a href="http://www.narcisivalter.it/progetti/tos_m086.html">http://www.narcisivalter.it/progetti/tos_m086.html</a></p>			