

MSX

Memory mapper

With SIMMS 256k to 4 Mb

2001, Jean-Piere Dubois a.k.a. Jipe

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Please check the following:

- **connect pin 11 of u8 74ls30 to +5v**
- **add two capacitors of 10µf direct to the simm connector pin 1 – 9 and pin 22 - 30 (warning polarity)**
- **change 74ls157 for 74als157 because i have not 74157 of 74f157**

Send an email to HansO if you want the original GIF files!

Please read the whole document!

Converted to PDF by HansO, 2001

Construct a memory mapper with common SDRAM simms.

See circuit diagram and print layout (double sided) and component layout on the following pages..

The size of the board is: Width 102.5mm Length 115mm.

Cartridge has the same dimensions as Sony HBI-V1 or original DOS 2 ASCII.

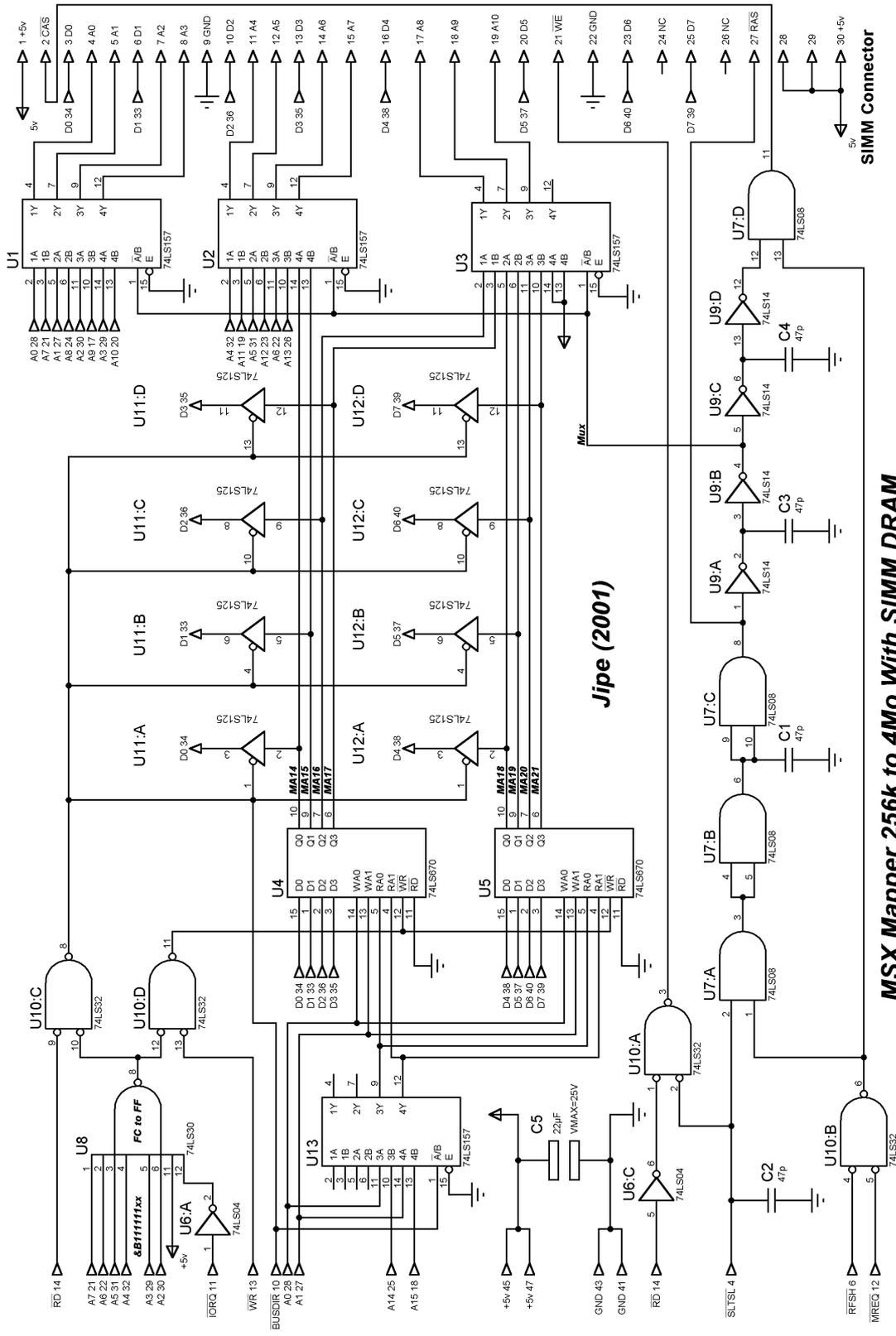
BILL OF MATERIALS

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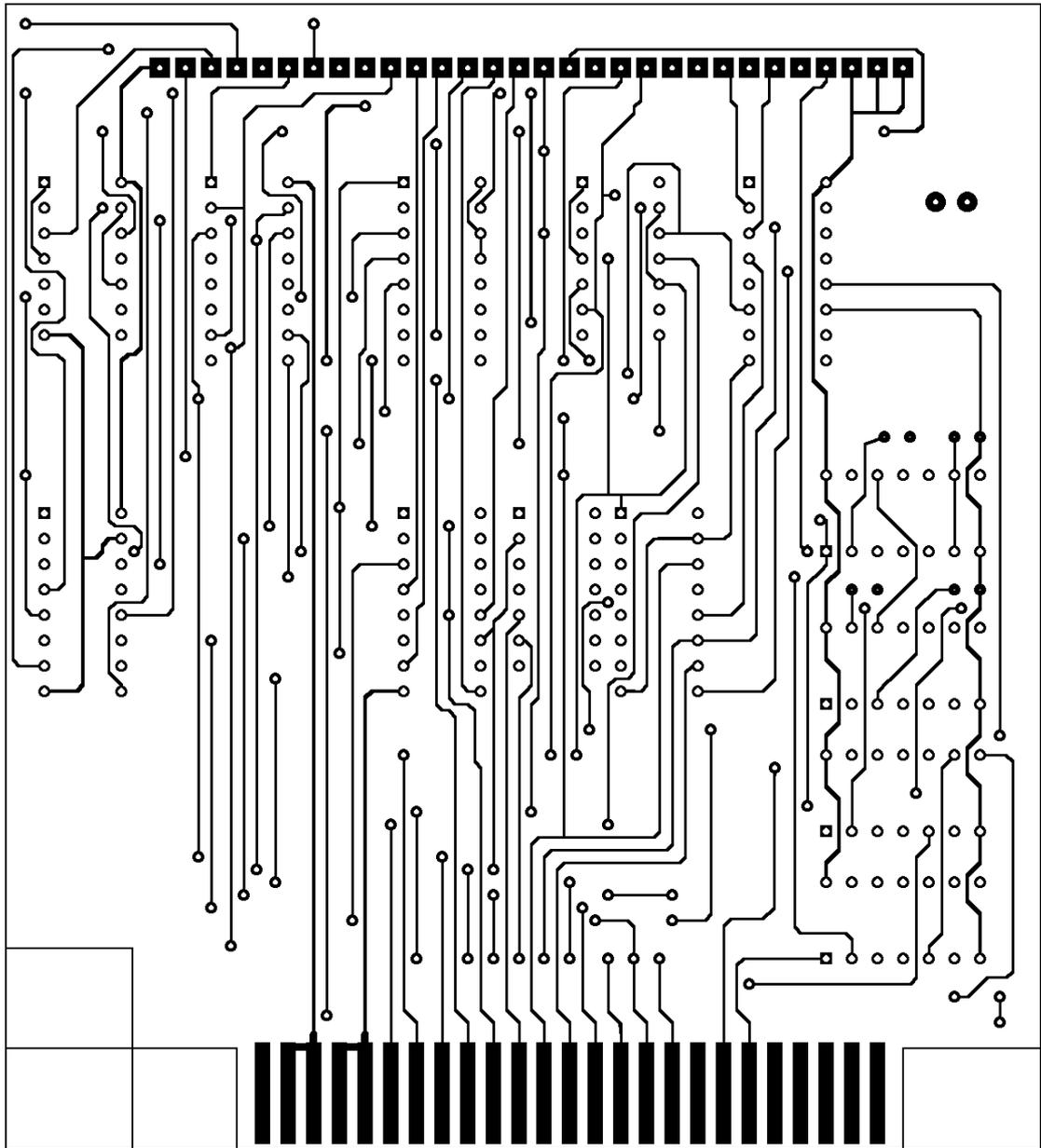
QTY	PART-REFS	VALUE
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Capacitors		

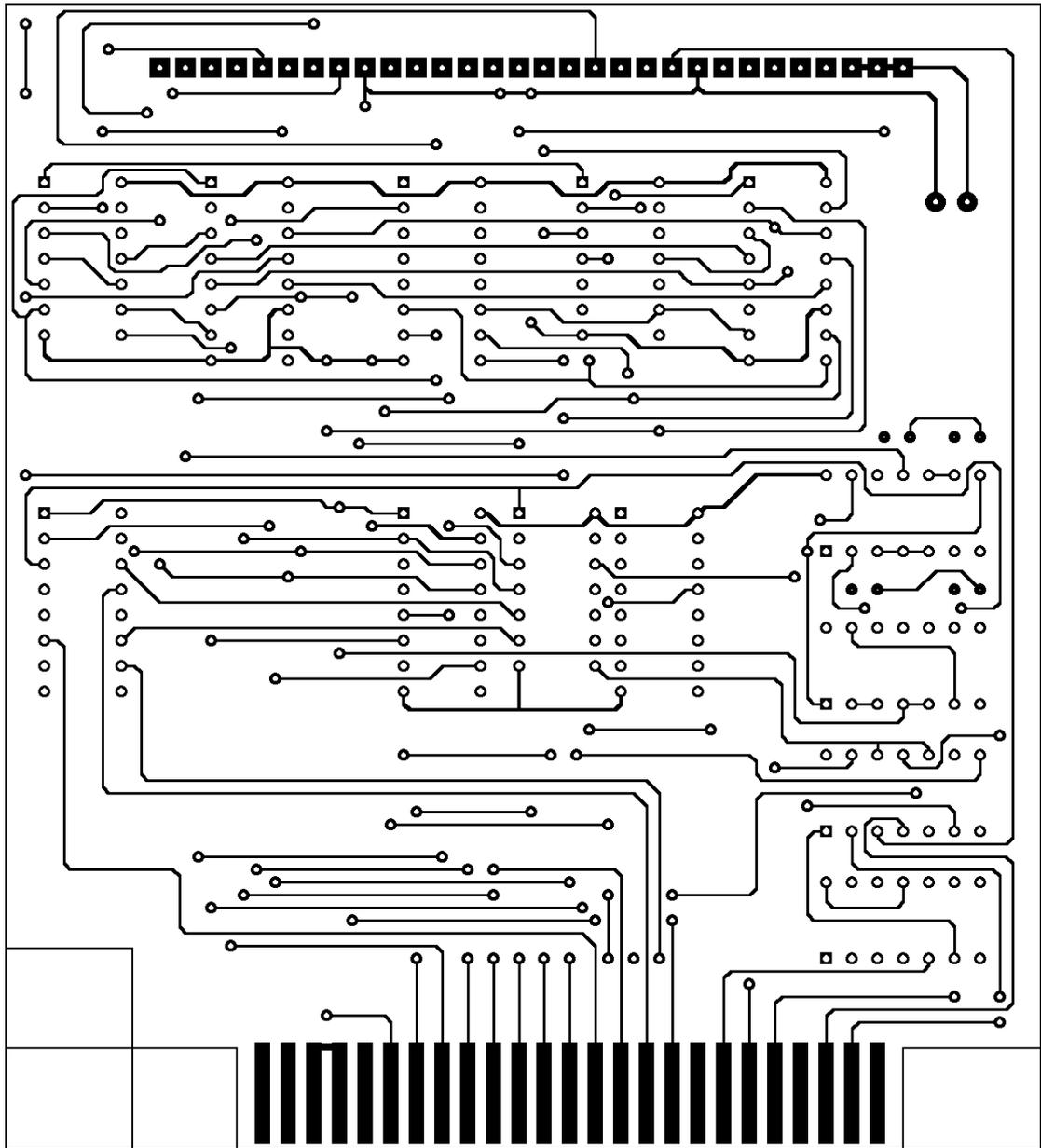
4	C1,C2,C3,C4	47p
1	C5	22µF
Integrated Circuits		

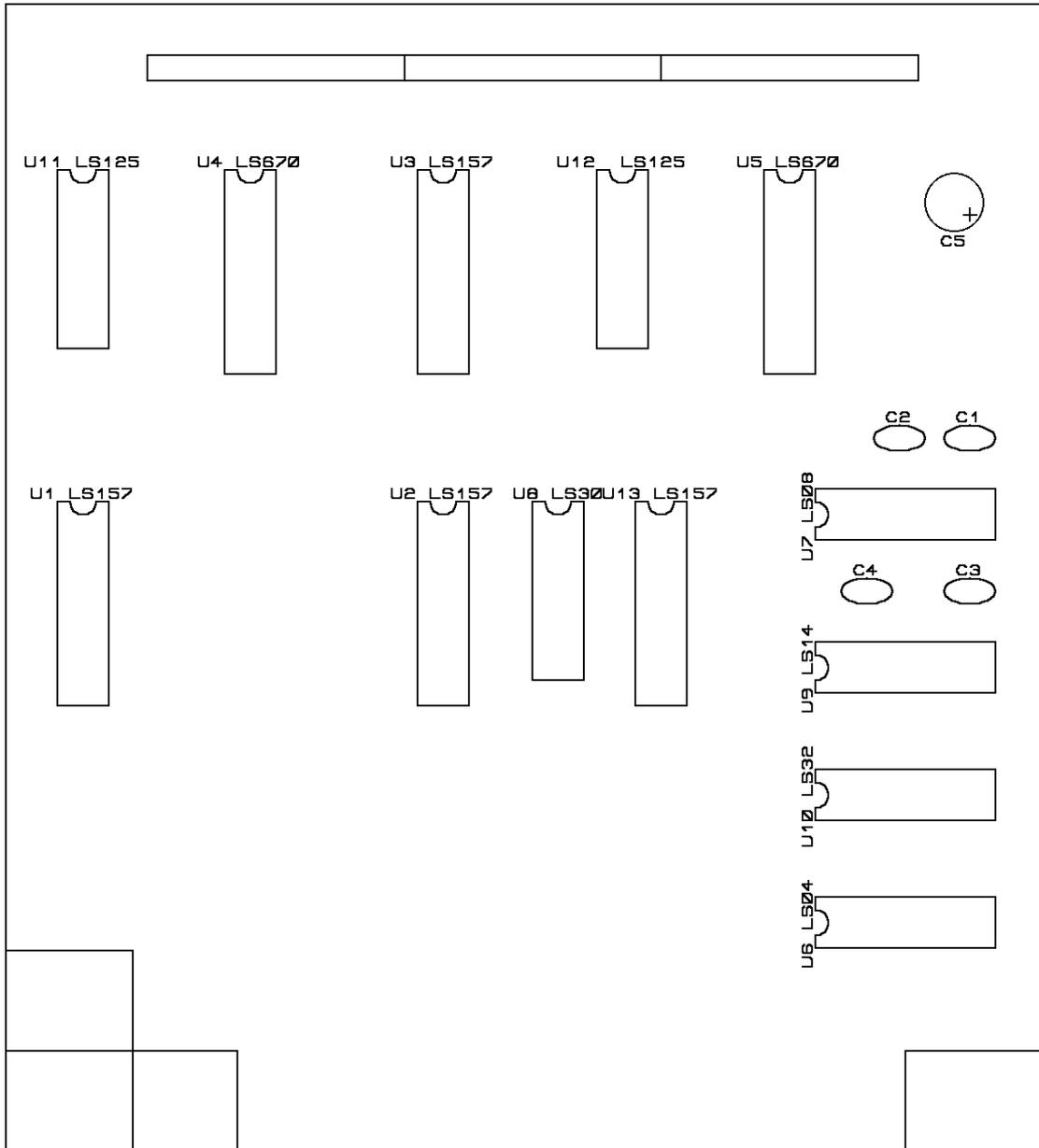
4	U1,U2,U3,U13	74LS157
2	U4,U5	74LS670
1	U6	74LS04
1	U7	74LS08
1	U8	74LS30
1	U9	74LS14
1	U10	74LS32
2	U11,U12	74LS125



MSX Mapper 256k to 4Mo With SIMM DRAM







Discussion on Usenet:

sorry
 i have missing to connect pin 11 of u8 74ls30 to +5v
 try connect and reply if working
 Jipe

Whats the problem with this mapper ?
 The schematics are right only it is designed for 4MB and not less.
 If you want to build a mapper with 1 MB you have to change
 the schematics.

The principles are :

For 1 MB with a 3 chip PC SIMM you have to create
 multiplexed adresslines L0 to L9 for the dynamic RAM
 These lines can created by multiplexing (with a 74LS157)

A0 - A8 = L0
A1 - A9 = L1
A2 - A10 = L2
A3 - A11 = L3
A4 - A12 = L4
A5 - A13 = L5
A6 - MA14 = L6
A7 - MA15 = L7
MA16 - MA17 = L8
MA18 - MA19 = L9

MapperAdresslines can be created by the 74LS670's with the Datalines

D0 - MA14
D1 - MA15
D2 - MA16 = 128 kb
D3 - MA17 = 256 kb
D4 - MA18 = 512 kb
D5 - MA19 = 1024 kb

For every used dataline you have to backannotate every dataline separate with a buffer (for example) 74LS125 or 74LS367
Do not create more backnotations with datalines than used.

The 74LS670 is used because it is a 4 x 4 register chip
In MSX terms : the mapper is found at adres &HFC to &HFF (4 addresses)
The first 74LS670 is used for D0 to D3 (4 bits)
The second 74LS670 is used for D4 to (expandable) D7 (also 4 bits)
For the adres &HFC can map maximum 256 bloks of 16 kb (also for the
adreses &HFD to &HFF)
thats 256 x 16 kb = 4096 kb

At adres &HFC you can switch the memory blok for page 0 (&H0000 - &H3FFF)
At adres &HFD you can switch the memory blok for page 1 (&H4000 - &H7FFF)
At adres &HFE you can switch the memory blok for page 2 (&H8000 - &HBFFF)
At adres &HFF you can switch the memory blok for page 3 (&HC000 - &HFFFF)

(small detail)

Due refreshing you have to blok the #write of the memorychip
because if you don't do that it will be written with testbits in a few
seconds.
Here you can use a 74LS00 for it.

Hans Oranje

Even when going to build the 4 MB mapper you will get some problems
with some MSX programs.
Some programmers (even the japanese) made some mistake with counting the
memorybloks.
Thats why i never make memory mappers above the 2 MB.
2048 kb is more than enough for all MSX programs.

Hans Oranje

the mapper work with 1Mo simm and 4Mo simm
on turbo-r no problem (the mapper is not primary memory)
on 8280 modif 2+ the mapper works in primary mapper with dos 2.30
but scratch if long time using (the screen is ok but no move)
on 8235 with internal memory desolded the mapper work but
scratch in 10 mn of time

i thing the capacitor for make ras cas and refresh not adapted for msx2
the only solution is make a internal mapper in msx2
i have upgraded 8235/19 to 1Mo simm and no problem
i have a 8280 2+ with 4Mo simm and i work perfectly all day with mega-scsi
and mo

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Jipe

Strange world of simm memory by Jipe

because jipemapper have conflict with some simm memory i testing a lot of
different memory i have
horror a little work and another bug in the time
i read concensious desing and pcb layout considerations for dynamic memories
interfaced
to the z80 cpu writing by Tim Olmstead in 96 and send me by JP Grobler one
year ago
is not easy for me because the english language is not my favorite passion
(it's msx sure)

i have added two capacitors of 10µf direct to the simm connector pin 1 - 9
and pin 22 - 30 (warning polarity)

a lot of memory work with this but again bug

i change 74ls157 for 74als157 because i have not 74157 of 74f157 (writing in
document)

M I R A C L E

all simm 4mo and 1mo are working
!!!!!! except a toshiba 1mo 9bits with chips TC511002AJ-80 !!!!!!!
all simm 256k 8bits or 9bits don't work sorry

list of simm i have tested with my mapper

4 mo 9 chips Nec	424100-70
Samsung	KM41C4000BJ-6
1 mo 3 chips Siemens	HYB514400BJ-70
Eagle	EM4644NJ-7
Goldstar	GM71C4400AJ-70
1 mo 9 chips Nec	421000-70
Nec	421000-10
Siemens	HYB51000AJ-70
Siemens	HYB51000AJ-80
T.I.	TMS4C1024DJ-80
T.I.	TMS4C1024DJ-10
Fairchild	81C1000-80

Samsung KM41C1000BJ-7
Samsung KM41C1000BJ-8
Motorola MCM511000AJ-70
Intel T21010-08
MT 4C1024DJ-8
Vitellic V53C1002AJ-80

Mode of testing : 8235 with internal memory removed to be sure i work in external mapper

Vampire killer in slot (because demo stopped if memory is no good)

Power on and let a good time
if working after one hour mapper is done
if screen no move after one hour problem

with the toshiba no work screen is black (no msx scroll) no wait one hour!!!

the order of a0 a13 ma14 ma15 no change working of mapper (i try it because i think 256k work also but)