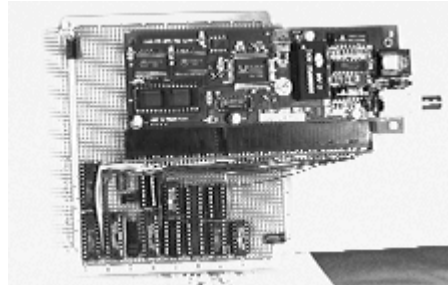# Ethernet LAN board very suspicious

(Sun May 10, 2000 Last Updated Edition) September 1, 1997

[# 1 prototype](#)

Only substrate that is suspicious, such as the implementation of this joke is the guy LAN board of rumor in the streets.

Has published information on this page seems to be making would be the minimum required. To production, you need some knowledge of the hardware. Since the circuit configuration is simple, the difficulty of the circuit as it is low, the novice may be difficult.
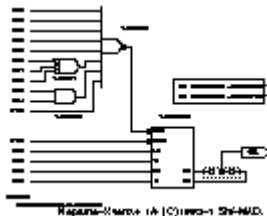
Circuit is now Ver 0.4. This is something from v0.3, aiming at more stable operation, do you really stable is a mystery (~O~i).

- NO WARRANTY -

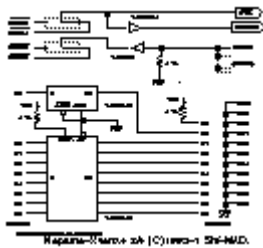Etc. with respect to damage caused by this circuit, so I will not know anything, please understand.

Corner takeaway circuit diagram

After you click, will appear larger circuit diagram, please save it properly.
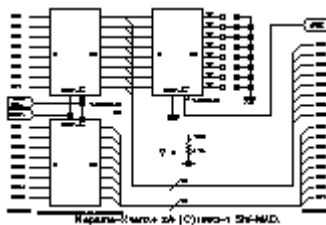

Around the address decoder

Ver0.3:: Changes logical integrity (there is no circuit change)
another figure-AS Decode: ver0.4. Additional memory space occupation selection.
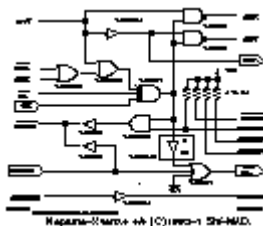
And address bus buffer around the interrupt request

Ver0.3:: Changes logical integrity (there is no circuit change)
ver0.4: IRQ parallelization, such as (by choice).

Generation around the buffer data bus and the interrupt vector

Was to not use IDDIR: ver0.3 terminal modification of the notation: ver0.2: Changes

Around the bus bridge

Etc. change around the Read / Write: ver0.4 consistent and logical alternative to creating IDDIR: ver0.3 by Resistance to recognize the bus width: ver0.2: Changes.

Terminal sequence of the ISA bus also want to know?

Terminal layout was used in the NE2000 clone

Placement and a brief description of the ISA bus terminal

Also want to know the pinout of the expansion slots X68k?

[A brief description of the expansion slots and terminal arrangement X680x0](#)

Will not try to manufacture

Is as in (?) Or parts of this production, NE2000 is (clone), I at "Fasutobakku" of AT compatible machine parts shop in Nihonbashi in Osaka □ summer of 1995 , were purchased (without tax) 3980 yen. Is cheap. Will now be cheaper to buy.

Well, it is attention. May not be available (clone) NE2000 all.

- ISA bus to the first condition of [signal-SBHE](#) only to those not using. This is 68 - is due to ISA bus bridge circuit simplification of <>.
- As a second condition, but little overlap and the first condition, please note the use of the ISA bus of the NE2000-compatible signal. In NE2000 compatible you are using a non-terminal signal that is supported by the current circuit, may not work is large. Possible if unsupported signal is present in a terminal input signal to the NE2000, does not work in particular is very large.
- As a third condition, please note the size of the NE2000 card. Too large, not even fit into the expansion slot 68 is free, you will not fall further.

  Anyway, the current [list of NE2000 clones are sure behavior](#) is.

This circuit has been designed to use as between 200h ~ 3FFh I / O address is NE2000, for the convenience of compatibility for up to (v0.3 software for the convenience of the ^ ^ ;), the beginning It is recommended to be set to 300h. In addition, the interrupt is a case of people who have parallel wiring, which may also select the the problem is (probably), if the wiring of only IRQ10, IRQ10 should be set to interrupt the NE2000 as well as up to v0.3 There is.

I hope if it is a set of NE2000 is more than I bought, we are more and perhaps different settings, settings for NE2000 will be required. By NE2000, but can also include pin jumper settings more often than not, will have to be performed by the included configuration program.

Therefore, I do not truly sorry, friends and I use your AT compatible machine (such as ~O~i) relatives, neighbors, shop, please do the settings as described above. However, "I, such as renting a hand of compatible machine. AT ~A'm devoted X68000, ~A ~A! (NE2000 is I'm a part of AT compatible machine but) I do not like the person" What, the changes of the circuit board It is possible to meet the desire and, by changing the driver software, (the worry ^ ^ ;).

Were added to the selected memory space occupied in the "around the address decoder" circuit diagram. Select the Y1 and Y0 in the jumper. Respectively, will occupy the following address.

- Y0: ECE000h ~ ECE3FFh
- Y1: ECE400h ~ ECE7FFh

However, so far, so do not be supported by software, please choose a "Y0".

How that is installed in the accelerator system 68 Excellent Please note the address of the excellent occupancy. The default setting is excellent address and occupancy overlap Neptune-X, but it does not work.

In addition, those who are mounted on a 68 Jupiter-X β version, please make the changes of the supposititious of DMAC address.

It is often said that in general, please do not waste at a bypass capacitor. ISA bus, because very few ground pins, the ground line will be unstable and not decrease the source impedance. Power supply to the ISA bus is performed by a thicker wire, Please keep reinforced with aluminum electrolytic capacitors and tantalum electrolytic capacitor.

The circuit diagram, the power supply to the ISA bus was not written, please be careful.

[Take a look (for v0.3) example of the arrangement of the parts](#)

Parts list

If you will be able to manufacture parts such as the following. Trick is to produce on the cheap, of course, also be changed to equal parts on hand.

```
NE-2000 clone × 1 LAN card for AT compatible machine

TTL IC
74AS00 × 1
74ALS04 × 1
74LS06 × 1
74ALS08 × 1
74AS27 × 1
74ALS30 × 1
74ALS138 × 1
74LS243 × 1
74LS245 × 2
74ALS245 × 2

× 1 set resistance element resistance 4.7KΩ8
About 4.7KΩ × 7 capacitor (for bypass capacitor)
```

```
 Other suitably setting pin interrupt vector 10μF aluminum
electrolytic capacitor of two or more suitably about 12 Multilayer
Ceramic Capacitors 0.1μF
 Appropriate amount of wire for the wiring connector pieces suitably
fixed substrate 1 ISA bus ISA bus connector X68000 one universal
board for an appropriate amount of address setting pin occupancy pin
interrupt level setting
```

Parts cost more than is (or lately There is also a 1,980 yen) 3980 yen, 3500 yen because it is less than the substrate, even though it puts the parts after, can be manufactured at less than 10,000 yen is NE2000. There will likely be on hand if more parts are related to hard, you can make more cheaply. Do not include the expansion slot, if you take a bus from the internal X68000, so Kechire the substrate generation, hopefully, will allow production of less than 5,000 yen.

I did not see When I was created, it sells the ISA bus connector, I pull out the connector picked up the 98 ancient of disposal from the dump, the school was attached to the expansion slot Te was used. Expansion slot 50 pin 98 column 2 is the same as 68, ISA bus, so considered as a two-column except that pin 49 is divided into two, with the slot connector on the 98 jigsaw, cut into two Te can be used. Ah ... are stingy connector for generations, in this poverty.

Operation check program board

Anyway, check whether it can successfully interrupt settings, incidentally, is a program that tests and registers the DP8390, to test the buffer RAM of the NE2000 also, what are memory mapping board. The test method, but using the method or reference to the source of Linux, was obtained by disassembling the setup program that comes with the NE2000 clone.

[Simple to take your board Checker V0.07](#)

Really, try to also or loop-back test, I would like to check whether there is an error in the circuit configuration, because it was plagued by operating NE2000 clone, that it does not work with 16-bit bus width, of the mystery, Was a not have time was. But, thankfully, san Nokubi, was sure to create a program than loopback test. Thanks, thanks.

[Neptune-X loopback test program (link)](#)

Resource for software development

For simplification of the ISA bus bridge, memory mapping has become a little special. Of around here, special circumstances as a separate software development documentation, and will summarize how the hope that it will be necessary, such as who does not ....

Incidentally, in the circuit of this board will occupy (up from 0xECE400 0xECE7FF or) until 0xECE3FF from 0xECE000, the I / O space mapping. If the 300h I / O address of NE2000, is mapped from (0xECE600 or) 0xECE200. When you dump in the debugger, you'll see. In addition, the interrupt vector number is set to F9.

Nihonbashi was around before (about the winter of 1995), asking for documentation Zutto. Sankyo also also also techno-based J & P also digit of Nihonbashi also Kyoritsu article ... DP8390 ... was not. It can not be helped, we would use the disassembly of the program that comes with the NE2000 clone. Fu ... Fufufu cent, as usual, the assembler of the system is dirty ... 86.

Feelings then, that ... maybe you've seen the website of National Semiconductor Corporation. Then, why is not there! DP8390 family of materials (of course, English). Therefore, Iloilo, come down, and you have a view, with register settings, like there is apparently 68000 mode. In short, the system that make it 68,000 and the upper byte of the data, a sequence of low-order byte, welcome feature. If you know this, the data buffer around, but did not replace the high and low bytes ....
However, it is scary, NE2000 clone, but has put a chip compatible suspicious, is that, you do not know the DP8390-Core of this chip, whether fully compatible. Natural (^ ^ ;) I have is a chip based on the use of compatible machines AT, were considered the possibility I do not support system features that make it perhaps 68,000. So, I decided to change the circuit is not performed.

So, [National Semiconductor](#) 's go to see.

Circuit change history

- Changes from v0.1 to v0.2

  3/4 circuit diagram, and IODIR, but had become a signal from the X68k, this is a mistake of IDDIR.
  Mr. Nakao of Hokuriku tip, and thank you pointed out.

  4/4 schematic,-IOCS16 was to pull up the terminal. This is, NE2000 clone was purchased for my, or 16-bit, since it was to determine whether the 8-bit look at this terminal. This is described separately.

  After, but not a fixed point, by NE2000 clone, you may not take interrupts correctly. In such a case, please try changing to pull up the pull-down of the output of the IRQ10.

- Changes from v0.2 to v0.3

  Was the logical integrity on the notation for the entire circuit.
  In addition, because of the different signal timing etc. IDDIR such as X68000 X68030, was to not use. Just change the wiring. There is no change in number of gates used.

- Changes from v0.3 to v0.4

  Changes were made to the aim of more stable operation, mainly as follows:.

  - Ensure in-IOCHRDY when writing the final time
  - Time-to-negate-IOW from the end of write cycle
  - -IOW time to ensure data bus buffer from negated OFF

  Because there is such as changing the part number and family of TTL-IC, the parts please be careful.

  - Change in the 74ALS05 74LS06
  - Each 74ALS00, 74ALS27 people, change to 74AS00, 74AS27
  - Change to direct connection via a pull-up resistor from +5 v, the fixed level H

people who have created the v0.3 can expect more stable operation, the following simple changes.

- Each ... 74ALS00, 74ALS08 if we only replace parts, change to 74AS00, 74AS08
- ALS27 of the inputs are generated by the fourth-DG circuit diagram ... v0.3 If you also change the circuit, the LS243 has extra sandwich at the address bus buffer the signal that it is coming from ALS08.
-

NE2000 clone, bus width for auto-detection

The board has created a recognition program, there was concern that it was. There is a recognized child bus width of 15 bytes and the first two bytes of the 14-th byte of the EEPROM. 2 bytes If this is the case of 8-bit bus width 42h, 57h is the width of both 16-bit bus. The initial stage of development, I have created a program operation check by referring to the source of Linux, the source of Linux, and ". Become 57h", but it was written, could not be obtained only 42h also how the other. At that time, because there was no documentation for NE2000, the meaning of the two bytes does not know, or deficiencies in the designed circuit, and if there is going on is subtracted from the difference in timing behavior, I suspected many, the cause It was unable to identify.
I was recently looking at the documentation for DP8390 family, has been dropped from National Semiconductor, have written about NE2000, thanks to that, the meaning of this was found to 2 bytes.

If 42h is an 8-bit data bus width is physical, it was a case of 57h meaning is said to be 16 bit.

When this was found was a little impatience. In the application documentation of Nashosemi, it seems, I was watching the power supply pins (with smaller) connector

of the portion is extended with the AT bus, In short, AT "? I be recognized as an 8-bit wide," Why , that is not part of the signal is detected that has been expanded.

With reference to this case, I tried to examine the NE2000 was purchased for me. Then,-IOCS16 is so suspicious. Originally, this pin is the output from the card should be, because of the open collector output, your motherboard is pulled up, this pin, it has been in peacetime is H level. Based on this, and take a look at the NE2000 clone, for some reason,-IOCS16 However, it has been pulled down by a 27KΩ. What I feel I will be Right, and it. It becomes H level L level, if this pin is released,-IOCS16 if it is connected to. Therefore, as a pull up resistor to this terminal, were added to the resistance. And, I checked in the program, we were able to detect the 57h indicate the 16-bit bus.

The problem here is that has the ability to automatically detect the data bus width like this, are being implemented in any manner that may differ depending on the card. By chance, NE2000 clones were my purchase, but has taken such a detection method described above, in the other cards, I do not know what happens. Therefore, if you detect is 42h. Please consult the various terminals of the part that is extended with AT.

However, NE2000, but I think for the AT bus, I would assume if it has been inserted into the XT bus why. What there is to it for the XT bus ... NE1000.

Reference, such as

Publication CQ "research hardware compatible PC / AT" March 1995 issue of transistor technology

Publication CQ "68,000 applied research from the foundation," October 1988 issue of transistor technology

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 National Semiconductor DP8390 family a lot of material



 IC DATA BOOK 1995 / for Fujitsu semiconductor device control network
communication



 All schematic Nenetto Mercury unit V3
 Publishing TCP / IP CQ Open Design No.3 and Ethernet
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And much more