

# RR-net memory map & docs

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## General

RR-Net is a 10MBit networking card that is designed for the commodore C64, for use on the Retro Replay freezer cartridge. It'll also work on the Amiga with a clock-port, but it is not recommended: The card does not support IRQs, and it hardly fits mechanically. If you need network for your Amiga, use the X-Surf 2 board.

## Memory map

The memory map depends on the place where RR-Net is connected. Although RR-Net is designed for the C64, here are also the offset addresses for the Amiga. Check the corresponding hardware documentations for the carrier cards to obtain the base addresses of the clockport.

RR-Net is based on the Cirrus logic CS8900a (Crystal LAN). The chip is used in 8-bit mode, so the 8 registers of an NE2000 are spread over 16 registers in an 8-bit system. The 8-bit mode of the chip does not support IRQs (see Cirrus logic application note AN181).

Do not forget to switch on the accessory connector of the Retro Replay by setting bit 0 in \$de01. See Inside\_Replay.txt for more information.

C64 register	Amiga register	read/write	meaning
none	\$00/\$04	read-only	interrupt status queue
\$de02/\$de03	\$08/\$0c	read/write	PacketPage pointer
\$de04/\$de05	\$10/\$14	read/write	PacketPage Data (Port 0)
\$de06/\$de07	\$18/\$1c	read/write	PacketPage Data (Port 1)
\$de08/\$de09	\$20/\$24	read/write	Receive/Transmit Data (Port 0)
\$de0a/\$de0b	\$28/\$2c	read/write	Receive/Transmit Data (Port 1)
\$de0c/\$de0d	\$30/\$34	write-only	TxCMD (Transmit Command)
\$de0e/\$de0f	\$38/\$3c	write-only	TxLength (Transmit Length)

Although the Amiga makes the interrupt status queue registers available, it does not have any effect. Even if you try to activate the chip's IRQ features, it will not have any effect. The IRQ line of the chip is not wired on RR-Net

at all!

If you compare this register map to the register map in AN181, you might notice that the first and the second half of the register set is swapped. This has been done, because the accessory connector of the Retro Replay does not provide the full range of registers available on the Amiga clockport. The

first two bytes are control registers of the freezer cartridge, and this swapping moves the unnecessary register-pair (IRQ status queue) into the "invisible" area of the cartridge.

#### Endianess

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Although the chip is used in 8-bit mode, you have to know the endianness, because each register pair forms a one 16-bit register. Ethernet is big-endian by default. The chip was designed as an ISA thing, so all registers appear as little endian. In other words: The lowbyte comes first, then the highbyte.

#### MAC address

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RR-Net does not have an EEprom to store the MAC address, so it should be stored somewhere else: The flash rom of Retro Replay, the disk of the Contiki operating system by Adam Dunkels (<http://dunkels.com/adam/contiki/>), or Kickflash OS4 for the Amiga. The Mac address is only needed when transmitting packets, so it's OK if it's loaded from mass storage media when loading/starting the driver. The Mac address is NOT needed when RR-Net is just connected to other networking equipment. The LINK led might already be on, but the MAC address is only needed when something is transmitted into the network.

#### More literature

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Cirrus Logic Application note AN181: "Using the Crystal CS8900A in 8-bit mode" by James Ayres: <http://www.cirrus.com/en/pubs/appNote/an181.pdf>

Crystal LAN CS8900A Ethernet Controller Technical Reference manual AN83: <http://www.cirrus.com/en/pubs/appNote/An83-3.pdf>

The product data sheet for the CS8900A also contains software information, starting at chapter 4 (page 38): <http://www.cirrus.com/en/pubs/proDatasheet/cs8900a-4.pdf>

Application note 194: "How to program the Hash filter in the CS8900A": <http://www.cirrus.com/en/pubs/appNote/an194-1.pdf>

The FAQ about the chip: <http://www.cirrus.com/en/pubs/appNote/an205-2.pdf>

#### Fine print

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RR-Net is not designed, authorized or warranted to be suitable for use in life-support devices or systems or other critical operations. Inclusion of

the product in such applications is understood to be fully at the customer's risk.

\*\* EOF

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