
EtherLan Interface Cards

Fault-finding Guide

for dealers and support centres



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This document provides a guide to testing i3 EtherLan interface cards. Working through the *Possible Fault Check List* should enable a service engineer to determine whether a card is faulty, or whether a reported fault lies in the computer's configuration. *Recent changes in Acorn's network marketing mean that some dealers have limited experience at fault-finding on Acorn RISC OS based computers; for this reason this Guide includes some background information; this is printed in italic.*

Preliminary points

- Always turn off the computer before removing or re-installing the interface card; failing to do so is likely to damage the interface card and may damage the computer.
- For simplicity, we strongly recommend you always test cards using Acorn networking (Access+ and/or AUN/Level 4) and with EHVirtual configured off (where appropriate). These notes assume this to be the case.
- *Many tests require the issuing of * (operating system) commands. To issue such a command from the computer's desktop display, press the F12 key. This gives a prompt at the bottom of the screen. To return to the desktop press return when the cursor is on a blank line.*
- *Sample output from the EHTest command is given in the EtherLan User Guide.*

Card models:

- ❑ E100/E101/E102/AEH77: A3000 podule slot cards; can also be used in the upper podule slot in the A3020/A4000 computer.
- ❑ E200/E201/E210/E211/AEH79: A3020/A4000 network slot cards; must be used in conjunction with an external MAU which attaches to the 'D' type network connector on the rear of the computer. *Note that this is not an AUI connection.*
- ❑ E500/E501/E502/E511/E512/E513/AEH75: 'Eurocard' podule slot card, as for the A5000. Also suitable for the A300 series, A400 series, Risc PC, A7000 (if a backplane is fitted) or the external connector on the A3000. *A protective enclosure is also needed in this last case.*
- ❑ E601/E602/AEH62/AEH78: Rise PC / A7000 network slot cards.

AEHnn cards are Acorn Computers interface cards built by i3- use this check list but contact Acorn or your supplier if the card proves to be faulty. These are all 'combo' cards except for the AEH79 which is only supplied with a 10Base2 MAU.

- Ennn cards are i3 EtherLan cards; the last digit of the card number indicates the network connection:

EnnO (e.g. E100): 10Base2 only

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Enn I (e.g. E601): 10BaseT only

Enn2 (e.g. E102): `Combo' card, 10Base2 + 10BaseT

E513: Fibre optic (10BaseFL) card; also has 10BaseT connector

- An En I n card type is a later version of the corresponding EnOn card, featuring a major board revision; e.g. the E512 card is the later version of the E502 card.
- The only difference between an E210 and an E21 1 card (or between an E200 and an E201 card) is the separate MAU unit supplied for connection to the network `D' connector on the back of the computer. There have been two versions of the MAUs (both 10Base2 and 10BaseT); (the original units were metal cased, while more recent units are plastic cased and are much smaller.

Acorn networking modules

The modules required for networking (under the DCI-4 protocol stack) are:

<u>Always</u>	<u>If Access+ in use</u>	<u>If Net (AUN/Level) 4 in use</u>
Internet	Freeway	Net \$
MBufManager	ShareFS	BootNet
AUNMMsgs		NetFiler (system ROM)
EtherH		NetFS (system ROM)
		NetStatus (system ROM)

\$ In some situations the Net module may be replaced by Ned

Possible Fault Check List

1. Does the computer boot with the card installed? It may be necessary to do this test while connected to a `real' network; in some situations with old software releases a card set to operate from its 10Base2 connector will cause the computer to `hang' during booting if no network is present. We recommend you have a `T' piece and a pair of terminators as a dummy load for testing.

b. If Not: Try powering the computer on with the shift key held down. (This will prevent it trying to run a boot sequence if it is configured to auto-boot.)

If it still does not boot: Try powering the computer on:

- c. With the shift key and the * on the numeric keypad held down
- d. With the * on the numeric keypad held down.

Depending on whether or not the computer is configured to auto-boot either the first or the second of these options should start the computer into command mode (black screen with a white * prompt in the top left corner) without trying to run any boot sequence.

If none of these allows the computer to boot:

Preferably: Swap the card with a similar card in a computer which is working. Make sure you continue to test the `suspect' card, and remember to connect to a real or a dummy network. Carry out the checks detailed in Test 2 when transferring the card.

Alternatively: Perform a delete-power on of the computer and then repeat Tests 1 a to 1 d. The delete power-on resets the computer to its default configuration.

If the computer still will not boot: Make sure you have carried out the checks detailed under Test 2.

2. Try *Podules - does the card appear in the Podules list?

If it does: Do a `*Rommodules` command, look for the `Podule` lines relating to the card and note:

The version of EtherH on the card; four point something is DCI-4; one point something is DCI-2.

All the modules on the card (except any AppFS ones), noting their status (Active/Dormant/Unplugged) and their version. Note that dormant (and, in some versions of RISC OS, unplugged) modules may be in that state because either the operating system or an application has replaced them by another module - or another version of the same module.

If you find you have a DCI-2 version of EtherH: we suggest you replace it with a DCI-4 version before carrying out any further tests; see Notes below.

If the card does not appear in the Podules list: Remove the card; check the connectors are clean (on the card and on the computer mother board), and that no pins are bent or sockets out of alignment. Replace the card, making sure it aligns correctly into its sockets. Points to watch:

- On A3020/A4000 computers the sockets on the motherboard may be twisted out of line so the card does not mate with them; also it is quite easy to install the card too far to the left or to the right - possibly causing damage to the card.
- On the A3000: In the internal podule slot it is possible to install the card too far to the left or to the right. The external connector is prone to problems with dirt, and some casings for an E500-series card mounted in this slot may prevent the card from fitting into its socket correctly.
- With the E500-series cards (A300/A400/A5000/Risc PC computers) manufacturing tolerances may sometimes make it advisable to loosen the screws securing the metalwork to the card and adjusting the metalwork to allow the card to push fully into its socket.

3. Do a *EHTest command. *This command is only supported by the DCI-4 versions of EtherH.* This gives a number of checks:

- a. At the start of the output: It should indicate `Diagnostic Tests Star ted/Complete`
- b. Look at the Card Info section: At the end of this section it tells you whether the card is using its 10BaseT or its 10Base2 interface. Does this match the interface you believe it should be using? If not, and the card is a combo card other than the E602 then it is probable that the interface select link is forcing the card to use the wrong interface. *There is no interface select link on the E602 card.*
- c. Look at the very end of the output: There will be a controller mode message; it should be `multicast Ornormal`. If it reports `CD/Heartbeat failure` then this could indicate a network fault (including no connection or a faulty drop lead), or a faulty card. If it indicates `Transmit blocked` or similar there might be a software fault in the computer (see d below) or a card fault.
- d. Look at the Frame info section: There should be type 8035, 806 and 800 frame filters set up (there may also be type 0 or type IEEE). Provided these three types are set up the rest of the information provided is not of any real interest. If these frame types are not listed then there is probably something wrong with the computer's configuration. If the card has passed all earlier tests then it cannot be responsible for

the lack of filters - but without them the computer will not communicate across the network. Possible causes for the filters not being set up are BootNet being configured off, or the networking modules being unplugged, missing or inconsistent with each other (e.g. a mixture of DCI-2 and DCI-4 modules). You may wish to soft-load a self-consistent set of networking modules at this point - see *Notes* below.

- e. **Look at the i/o stats:** In particular, look at the *Rx frames* and *Tx frames* figures. These are the counts of the number of frames received and transmitted by the card. If all checks up to this point are correct then the *Tx frames* figure should be non-zero. If the card is connected to a network and there are any other active stations on the network then the *Rx frames* figure should also be non-zero. If this is the case then the card is successfully transmitting and receiving data (and the odds are that it is not faulty). (This test can also point to network problems; see *Notes* below.) If the Net (AUN/Level 4) stack is active then two further tests may be useful. Firstly, `*Netprobe` another station (if you are only connected to a dummy network you can still netprobe a non-existent station). This should cause the *Tx frames* figure to increase. If the other station is present you will receive a *Station present* message and there should also be an increase in the *Rx frames* value. Second, try a `*Netstat -a` command; this will give you details on the network set-up of the local computer, including its station number. If you have two Acorn computers with Net software on the network you can test them by netprobing each from the other. (Note that a station can also netprobe itself but this does not test the network at all!)

4. Final test.

The tests described so far prove most aspects of a card's functionality.

Exceptionally, a card will transmit and receive small blocks of data but will fail on large data transfers. It is worth trying to load/save a large file from the computer. While this is simply done between two computers with Access+ software, without Access+ it can only be done conveniently if there is a file server on the network which you can transfer data to/from.

Notes:

1. Provided the computer under test is fitted with RISC OS 3.10 or later it is possible to 'soft load' the DCI-4 networking modules, and EtherH driver. A utility to do this will be provided on the support disc referred to on the order form. These soft-loadable [modules only provide 'Net (AUN/Level 4)' operations; to use these between two computers each will need to be given a unique station number. Subject to approval from Acorn Computers Limited the utility for setting station numbers will be included on the disc.
2. For networking to function a full set of the appropriate networking modules (see lists on page 2) must be active in the computer; without this being the case the EtherLan interface card will appear not to function. You can check for the presence of a module by entering `*Help <module name>` - if the module is present the returned information will start `Module is: ...` with name and version number. Remember that if Net is not present it may have been replaced by Neil.
3. In the i/o stats section of the output from an EHtest command (Test 3, **part e** above) if there are any RXerrs or TXerrs then the error types will also be given. A significant number of CRC or FAE errors suggests a faulty network, while a high Collisions value should only occur on a busy network.
4. Older (A300/A400 series) computers must have the MemC to upgrade for the network card to work. A utility to check for MemC1a will be provided on the support disc.

i3 limited, Rustat House, 62 Clifton Road, Cambridge, United Kingdom, C131 4GY

Technical Support: 01223 566119 Fax: 01223 566313 Switchboard 01223 566113

email: support@i-cubed.co.uk

web: <http://www.i-cubed.co.uk>