



Apple® IIgs

Link Layer Reference Manual



Caen Hill locks at Devizes on the Kennet & Avon Canal - links Bristol to London
Photo: © 2009 Ewen Wannop

**Dedicated to the memories of Joe Kohn 1947-2010
and Ryan Suenega 1967-2011**

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spectrumdaddy@speccie.co.uk

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Credits

My thanks go to Glenn Jones for creating the Uthernet card in the first place,
Richard Bennet for writing the Marinetti TCP/IP stack, and to Eric Shepherd
for the amazing Sweet16 emulator.



Preface



Welcome to the Link Layers

Background

Back at my first KFest in 1996, a germ of an idea was born late at night in one of the dorm rooms. Geoff Weiss had been demonstrating to us how simple the Internet actually was, and how easily it could be controlled. A light bulb was turned on for both myself, and Richard Bennet, who both had been watching what Geoff was doing. As a result, Richard wrote the Marinetti TCP/IP stack for us to use, I wrote the graphics engine that powered the first version of SIS, and Geoff himself, with a little help from me, wrote the scripts that made Spectrum Internet Suite work...

SIS still actually works for many web sites, even though you may find that some are now too complex for it to handle. The Internet was simpler back then!

One of the main features of Marinetti is the ability to drop in multiple Link Layers (LL), so it can talk to the many different communication systems. When Glenn Jones first designed the Uthernet card, he asked me to write an LL for the card. That LL has been available for many years, and now with the release of the Uthernet II, I have updated it to a new LL specifically to drive the new card. I also adapted the LL code a few years back for a Sweet16 emulator LL, allowing any Marinetti aware program to be run from within Sweet16.

All three LLs are available from my web site:

<http://www.speccie.co.uk>

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Reference

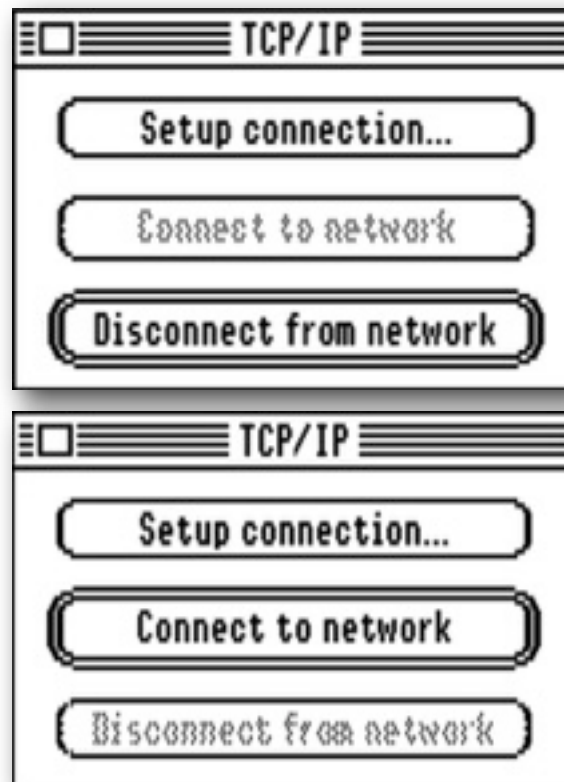
Setting up the Link Layer

Requirements

To use the Link layers, you need to have Marinetti 3.0 or later installed and operational.

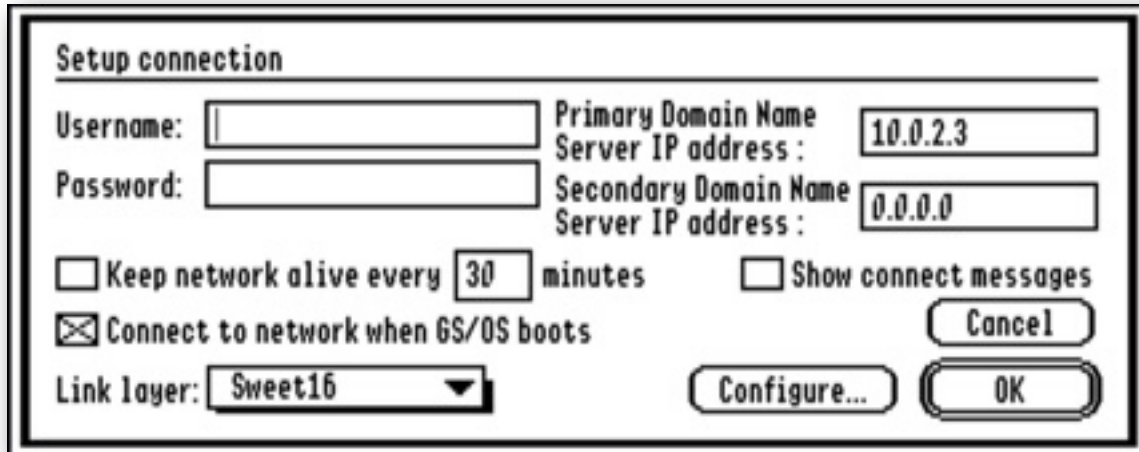
Getting to the Control Dialogs

Open the TCP/IP Control Panel, and if you are currently connected and online, click 'Disconnect from network' to go offline:



Click 'Setup connection' to get to the Marinetti Setup dialog, where you can choose the required Link Layer from the 'Link Layer' Popup menu.

Configuring the Sweet16 Link Layer



Setup connection

Username: Primary Domain Name:

Password: Server IP address:

☐ Keep network alive every minutes ☐ Show connect messages

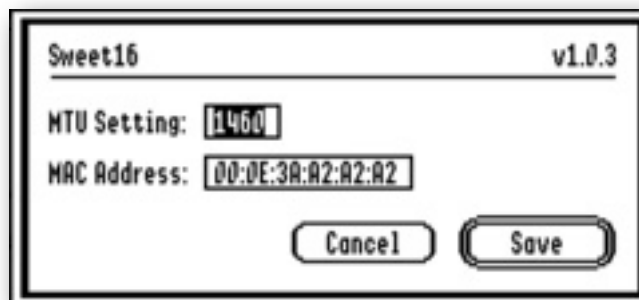
☒ Connect to network when GS/OS boots

Link layer:

Buttons: Cancel, Configure..., OK

Note: The Primary and Secondary DNS settings will be set automatically by Sweet16, and should not need to be changed.

Having selected 'Sweet16' from the 'Link Layer' menu, click the 'Configure' button:



Sweet16 v1.0.3

MTU Setting:

MAC Address:

Buttons: Cancel, Save

There are only two settings that can be changed for this Link Layer, the MTU setting, and the unique MAC address of the emulated IIGs.

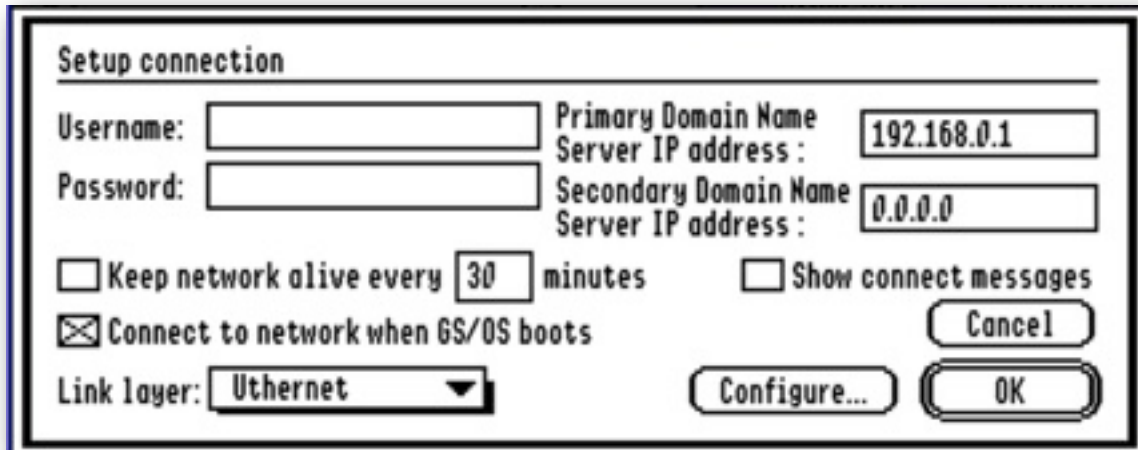
MTU

Unless you have reason to change it, I suggest that you leave it at the default of 1460 packet size. If you wish to try and fine tune your transfers, then you can try adjusting this value within the range 1000-1600.

MAC Address

Every device on your LAN, must have a unique MAC address to identify it to your router. If you are running more than one version of Marinetti, on multiple computers, you may want to adjust the MAC address here so it is unique for each computer. The number must be a valid six part Hexadecimal number, separated by colons.

Configuring the original Uthernet Link Layer



Setup connection

Username: Primary Domain Name Server IP address:

Password: Secondary Domain Name Server IP address:

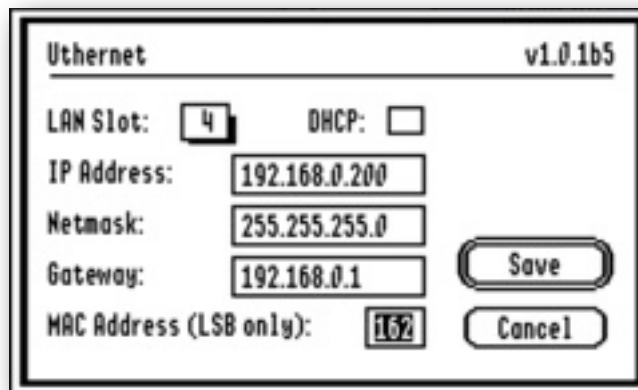
☐ Keep network alive every minutes ☐ Show connect messages

☒ Connect to network when GS/OS boots

Link layer:

Note: The Primary and Secondary DNS settings should either point to your router, or to a DNS server of your choice.

Having selected 'Uthernet' from the 'Link Layer' menu, click the 'Configure' button:



Uthernet v1.0.1b5

LAN Slot: DHCP: ☐

IP Address:

Netmask:

Gateway:

MAC Address (LSB only):

There are a number of settings here that you can change, and some that must be set correctly for the Link Layer to work.

LAN Slot

This must be set to the IIgs Slot you have the Uthernet card installed.

Note: It has been found that there can be conflicts with some software, such as the ANSI display in Spectrum™, if you place the card in Slot 3. If possible, place it in another slot, such as Slot 4.

Gateway

This should point at your router. For most routers, it will probably be either 192.168.0.1, 192.168.1.1, or 10.0.0.1.

DHCP

The easiest way to set up the card is to check the DHCP box, and then let your router set the IP Address, and Netmask automatically through its NAT DHCP service. Leave the IP Address and Netmask boxes as they are, as they will automatically get set by the DHCP process.

IP Address

If you are not using DHCP, then you must manually enter the static IP Address for the card to use. This must be within the range that your router expects, and the IP Address must be unique on your LAN.

Netmask

If you are not using DHCP, then you must manually enter the Netmask. This should match the IP Subnet Mask of your router, and the default is usually set to 255.255.255.0.

MAC Address

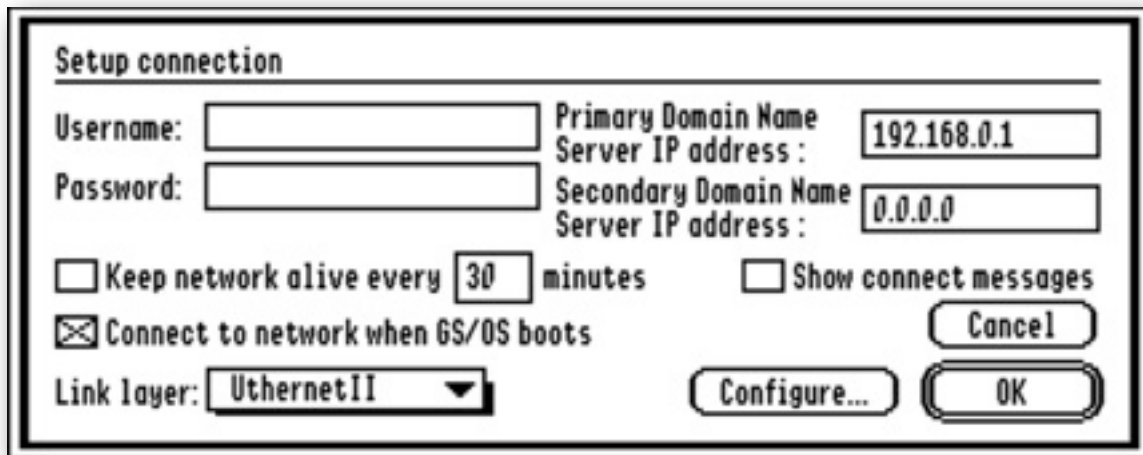
Every device on your LAN, must have a unique MAC address to identify it to your router. If you are running more than one version of Marinetti on multiple computers, you may want to adjust the MAC address so it is unique for each computer. Only the least significant byte can be set, but that still allows for up to 255 IIGS computers on your LAN, more than enough for most people I would think.

The default MAC code for the original Uthernet Link Layer is: 00:0e:3a:a2:a2:a2

Slot Selection

It has been noted that there can be conflicts with some software, such as the ANSI display in Spectrum™, if you place the card in Slot 3. If possible, place it in another slot, such as Slot 4.

Configuring the Uthernet II Link Layer



Setup connection

Username: Primary Domain Name Server IP address:

Password: Secondary Domain Name Server IP address:

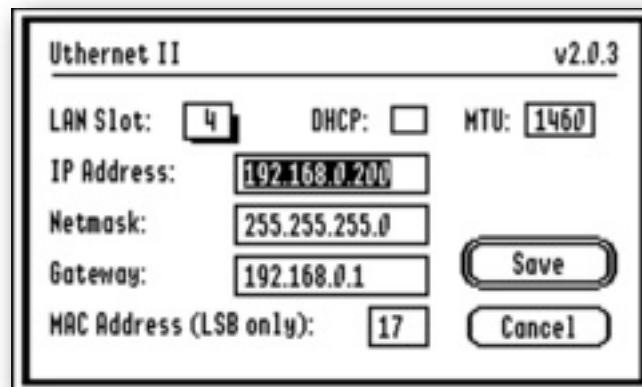
☐ Keep network alive every minutes ☐ Show connect messages

☒ Connect to network when GS/OS boots

Link layer:

Note: The Primary and Secondary DNS settings should either point to your router, or to a DNS server of your choice.

Having selected 'UthernetII' from the 'Link Layer' menu, click the 'Configure' button:



Uthernet II v2.0.3

LAN Slot: DHCP: ☐ MTU:

IP Address:

Netmask:

Gateway:

MAC Address (LSB only):

There are a number of settings here that you can change, and some that must be set correctly for the Link Layer to work.

LAN Slot

This must be set to the IIGS Slot you have the Uthernet card installed.

Note: It has been found that there can be conflicts with some software, such as the ANSI display in Spectrum™, if you place the card in Slot 3. If possible, place it in another slot, such as Slot 4.

Gateway

This should point at your router. For most routers, it will probably be either 192.168.0.1, 192.168.1.1, or 10.0.0.1.

MTU

Unless you have reason to change it, I suggest that you leave at it the default of 1460 packet size. If you wish to try and fine tune your transfers, then you can try adjusting this value within the range 576-1600.

DHCP

The easiest way to set up the card is to check the DHCP box, and then let your router set the IP Address, and Netmask automatically through its NAT DHCP service. Leave the IP Address and Netmask boxes as they are, as they will automatically get set by the DHCP process.

IP Address

If you are not using DHCP, then you must manually enter the static IP Address for the card to use. This must be within the range that your router expects, and the IP Address must be unique on your LAN.

Netmask

If you are not using DHCP, then you must manually enter the Netmask. This should match the IP Subnet Mask of your router, and the default is usually set to 255.255.255.0.

MAC Address

Every device on your LAN, must have a unique MAC address to identify it to your router. If you are running more than one version of Marinetti on multiple computers, you may want to adjust the MAC address so it is unique for each computer. Only the least significant byte can be set, but that still allows for up to 255 IIGs computers on your LAN, more than enough for most people I would think.

The default MAC code for the UthernetII Link Layer is: 00:08:DC:11:11:11



Extras



Problems

Hopefully you will have none, but if you do, and they cannot be answered by reading these notes, please contact me on:

spectrumdaddy@speccie.uk

Other information

If you don't yet have an Uthernet card, go to Glenn's web site to order one:

<http://a2retrosystems.com>

To get the most recent copy of Marinetti, go to:

<http://www.apple2.org/marinetti/>

To get the most recent version of Sweet16, go to:

<http://www.sheppyware.net/software-mac/sweet16/>

If you do not already know about Spectrum™, please drop by my home pages and read more. Apart from all the other wonderful things it does, Spectrum™ offers many useful tools for processing files, such as post processing text files that you have received that may have obstinate formatting.

Spectrum™ is now Freeware, and amongst my other applications, is available from my web site:

<http://speccie.uk>

Someone once said to me, 'Spectrum™ does everything!'