# Bricking It!

## From back of an envelope to backbone of the Internet

The development of the FireBrick

Rev. Adrian Kennard – Firebrick Ltd – a@k.gg

# Early days

- Bracknell, 1997
- Most people still using dial-up modems
- Some ISDN – very expensive
- uk.telecom newsgroup
- Spice Girls in the charts

# Early days

- BT price lists issued on paper in binders
- Kevin Hones, Adrian Kennard
- Couriers have **not** improved in 15 years

  ... http://tinyurl.com/revk-couriers
- Instant reply to an email – unusual in 1997
- New Nokia phone on Orange

# The Manor, Bracknell

- Still one of the better Wetherspoon's
- Group of technical people
- Mix of ISDN and modem users, and Tele2
- ADSL very distant on the horizon
- Regular meetings

# Andrews & Arnold Ltd

- Orange mobile phones, PBX, telephones
- Domains, dialup (AAISP)
- ISDN hardware/services


A&A website circa 1998

# WatchFront Ltd

- Contract electronic engineering and design
- Power, Data logging & control, automation
- Electronic engineering in telecom sector
- Embedded control systems

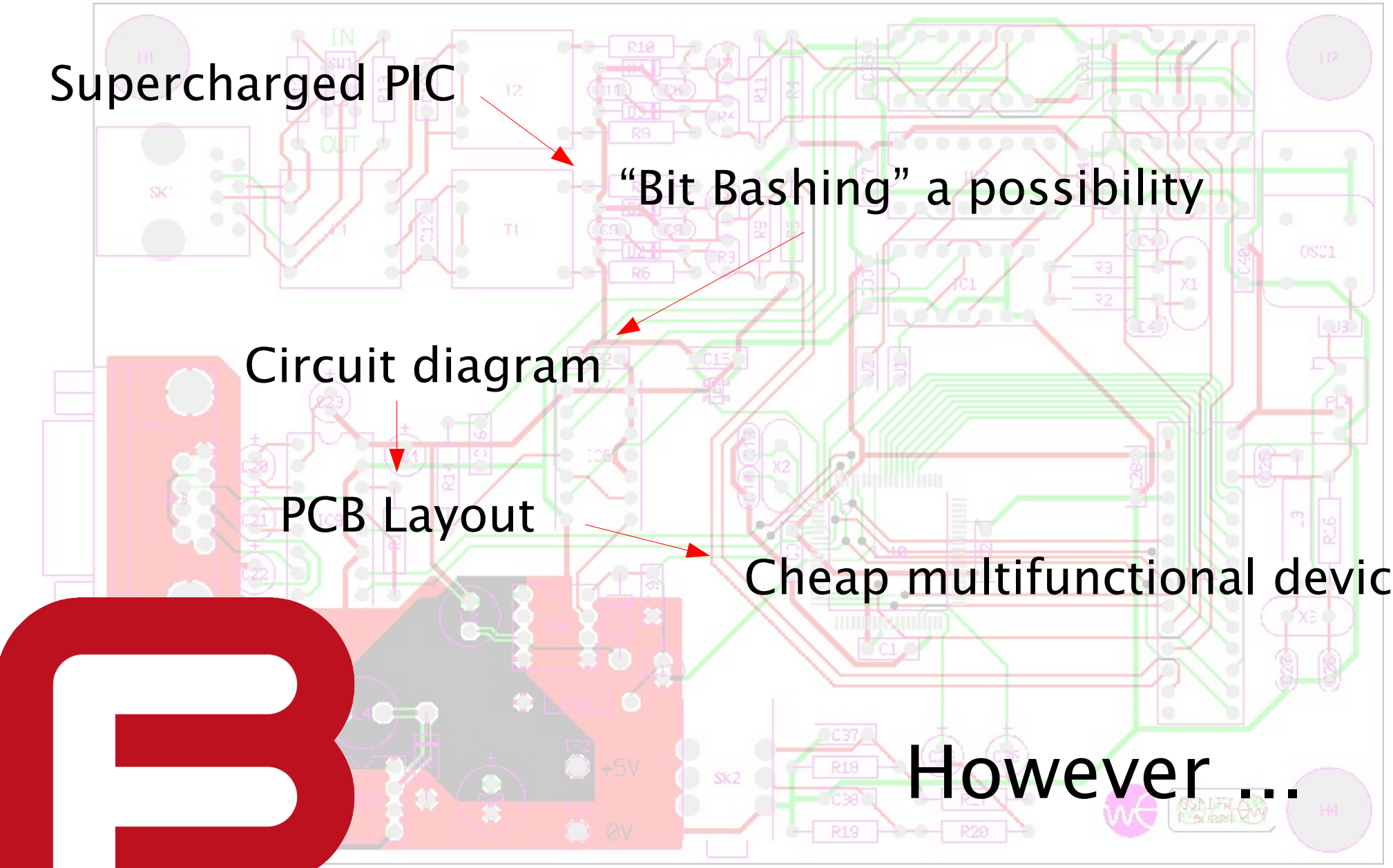
# The ISDN Widget

Existing ISDN kit :

- Mediocre quality
- No support for extended functionality
- Very expensive

So ...

# The ISDN Widget



Supercharged PIC

"Bit Bashing" a possibility

Circuit diagram

PCB Layout

Cheap multifunctional device

However ...

# The ISDN Widget

Never actually manufactured because :

- ISDN being phased out
- Real costs to be incurred

But still …

# The ISDN Widget

Silver lining :

- Both parties then knew what could be achieved

# AAISP Developing

- Aug 2000, ADSL from office in Reading
  (BT 2Mbits/sec Central + UUNET 2Mbits/sec leased line)
- BT supplied “black box” routers
- Only 1 routed block of IP addresses

Example pricing

| | |
|---|---|
| ADSL 500K internet service, monthly fee | £125.00 |
| ADSL 500K internet service, connection charge | £350.00 |
| ADSL 500K internet service 3 year contract, monthly fee | £135.00 |
| ADSL 1000K internet service, monthly fee | £190.00 |
| ADSL 1000K internet service, connection charge | £425.00 |

# FireBrick Plus/Soho

Design requirements :

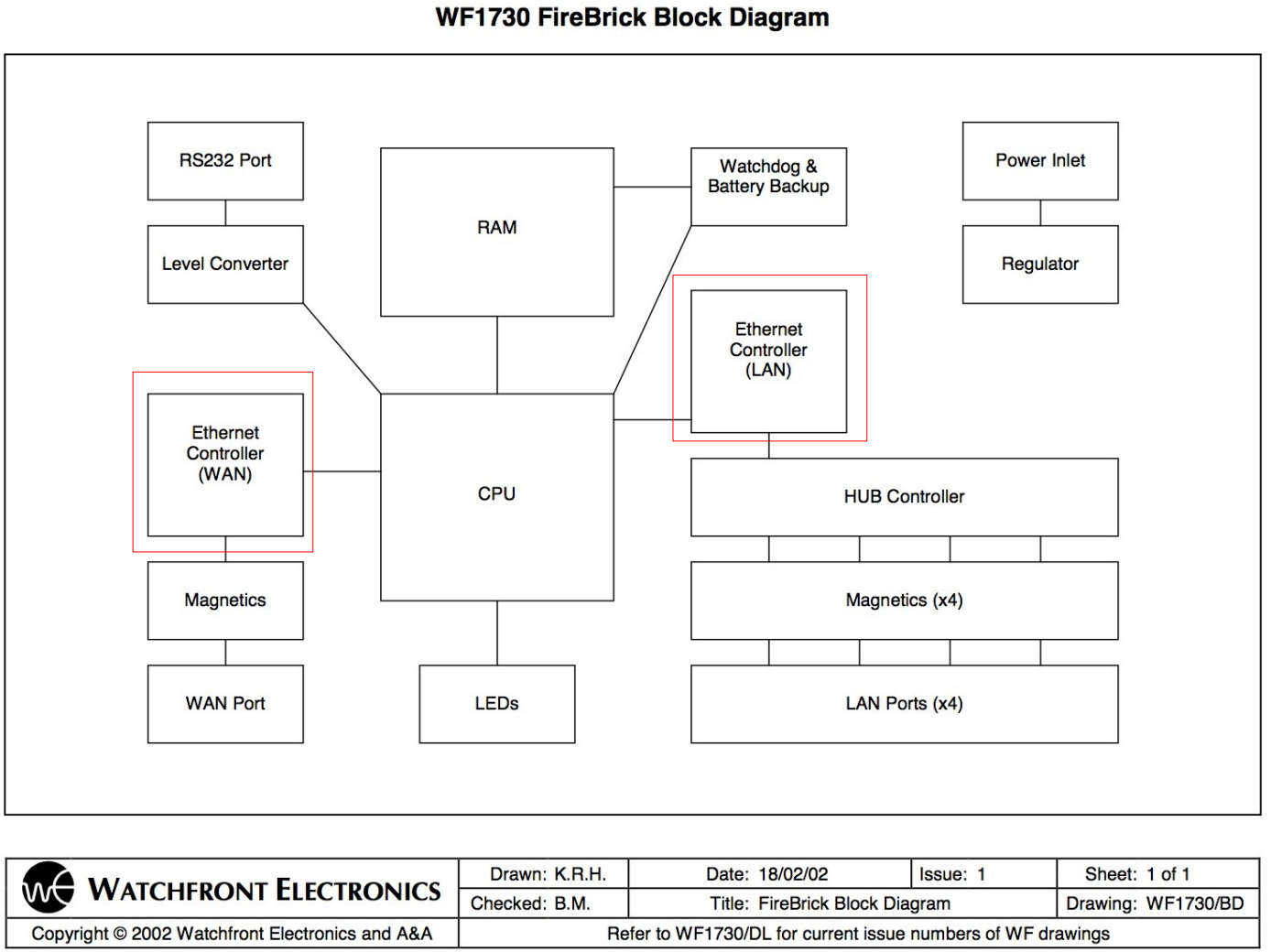
- Stealth mode (because of BT supplied routers/1 block of IPs)
- Traffic shaping (because 2Mbit central + 2Mbit leased line)
- Profiles (peak and offpeak times etc)
- Four port 10mbit hub + 1 port
- A small box for an office/home

And work began …

# FireBrick Plus/Soho

- Hardware design – electronics

- An unusual idea - ethernet controller attached to a microcontroller



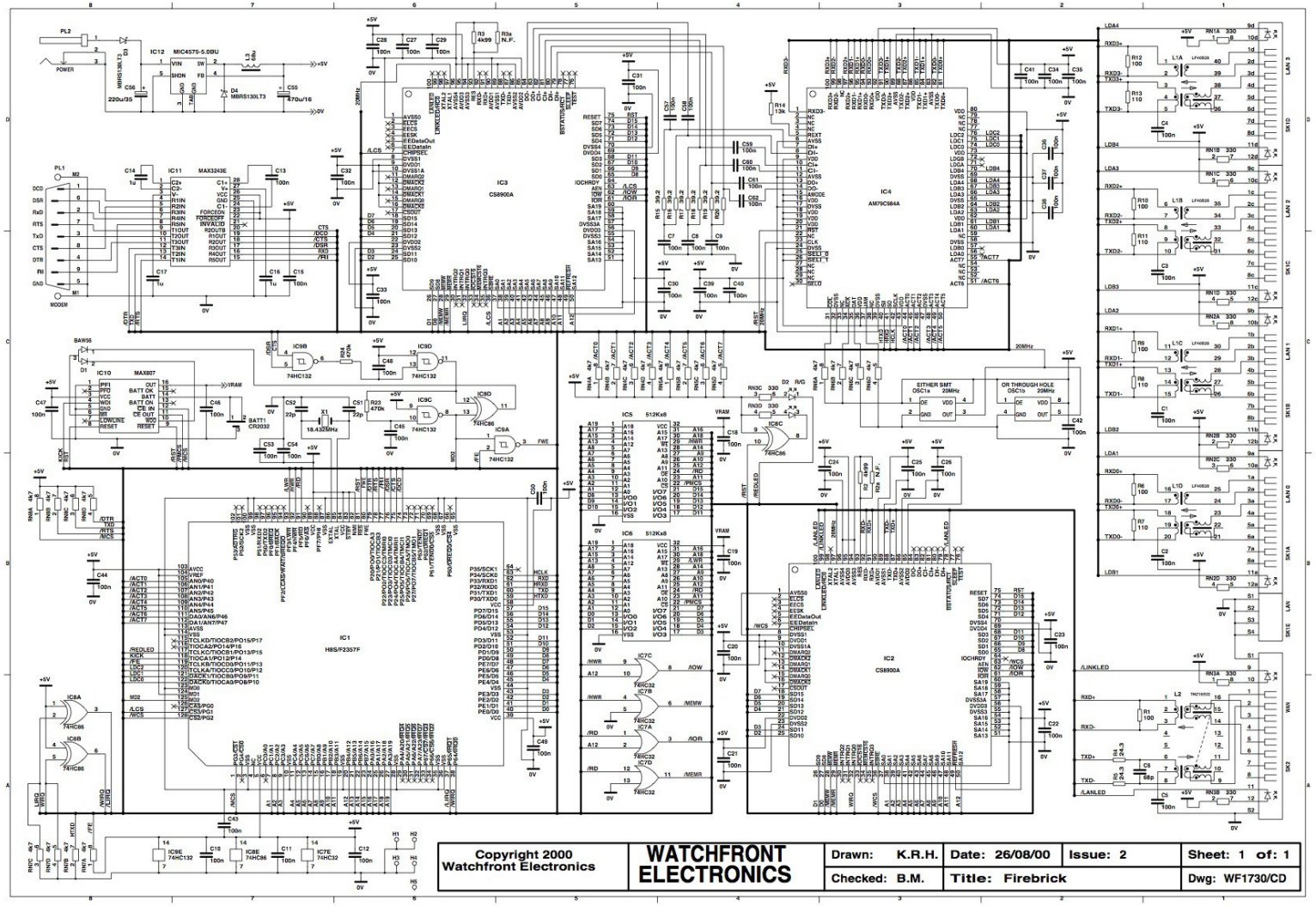
# FireBrick Plus/Soho

- Possibility of an immediate demand
- Meeting with Tele2
- Agreement to order 250 units, once built

- Gave confidence to go to manufacture

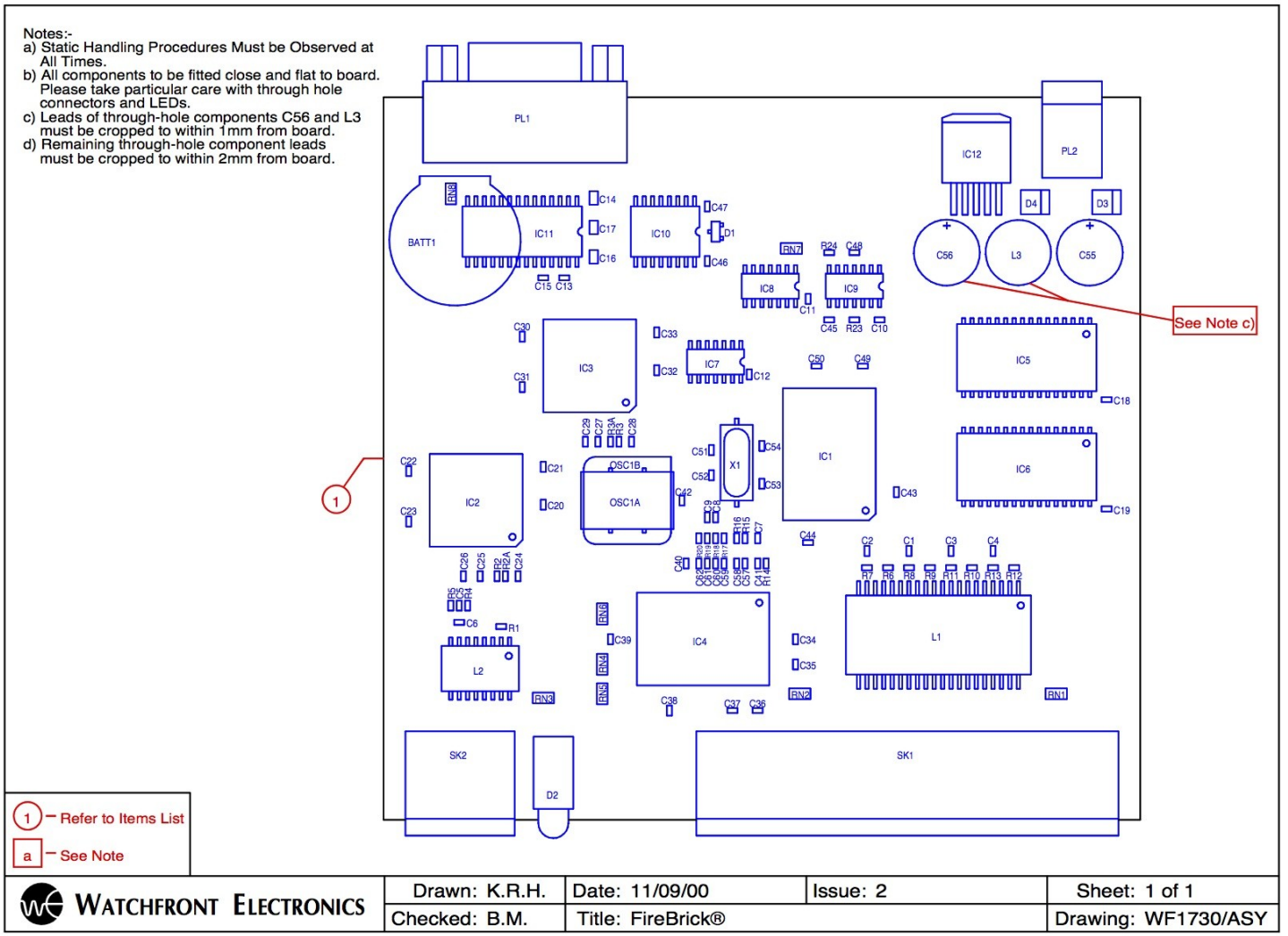
# FireBrick Plus/Soho

- Hardware design – circuit diagram



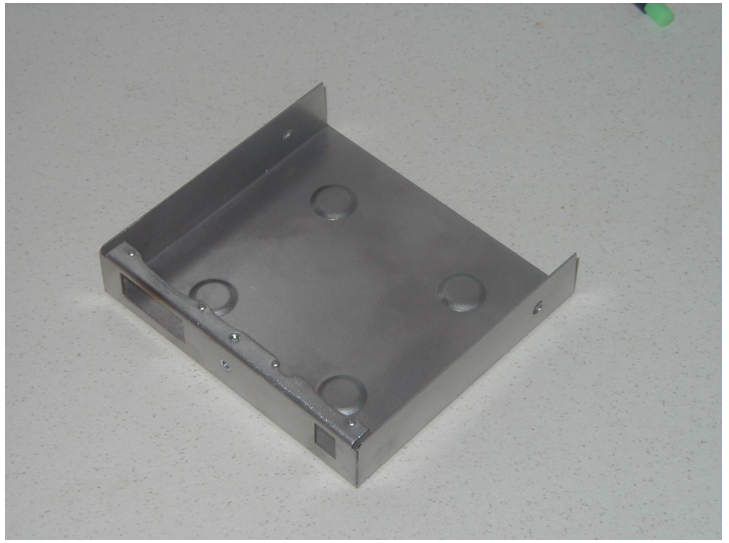
# FireBrick Plus/Soho

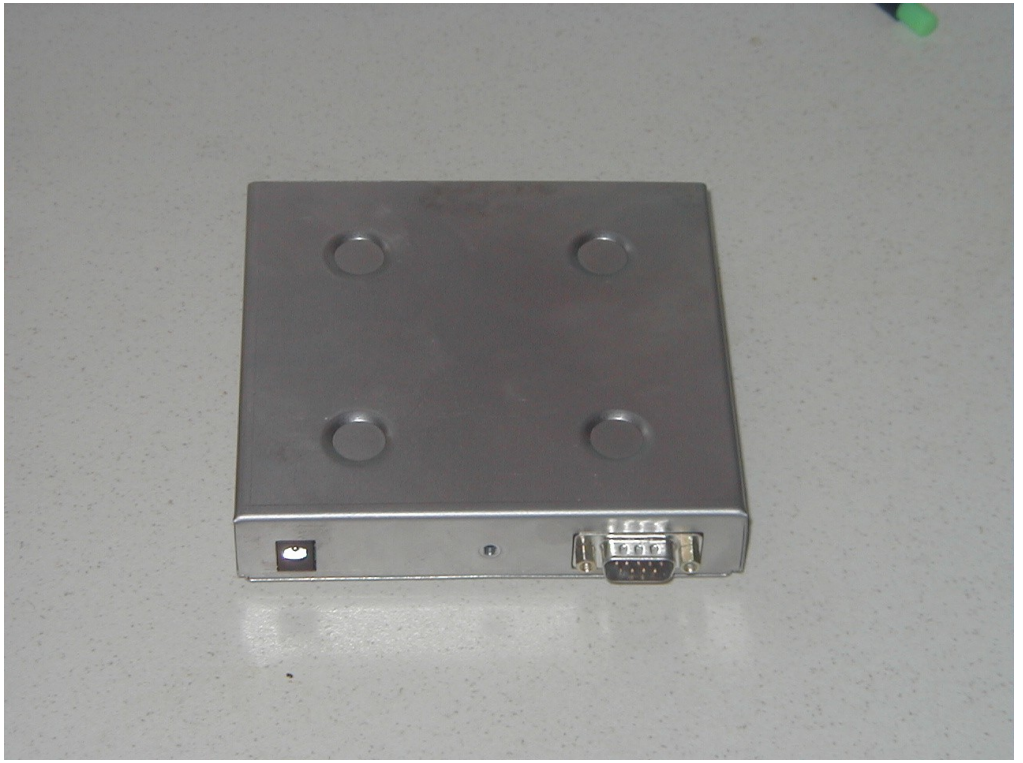
- Hardware design – assembly layout



# FireBrick Plus/Soho

- Hardware design – “metal bashing”





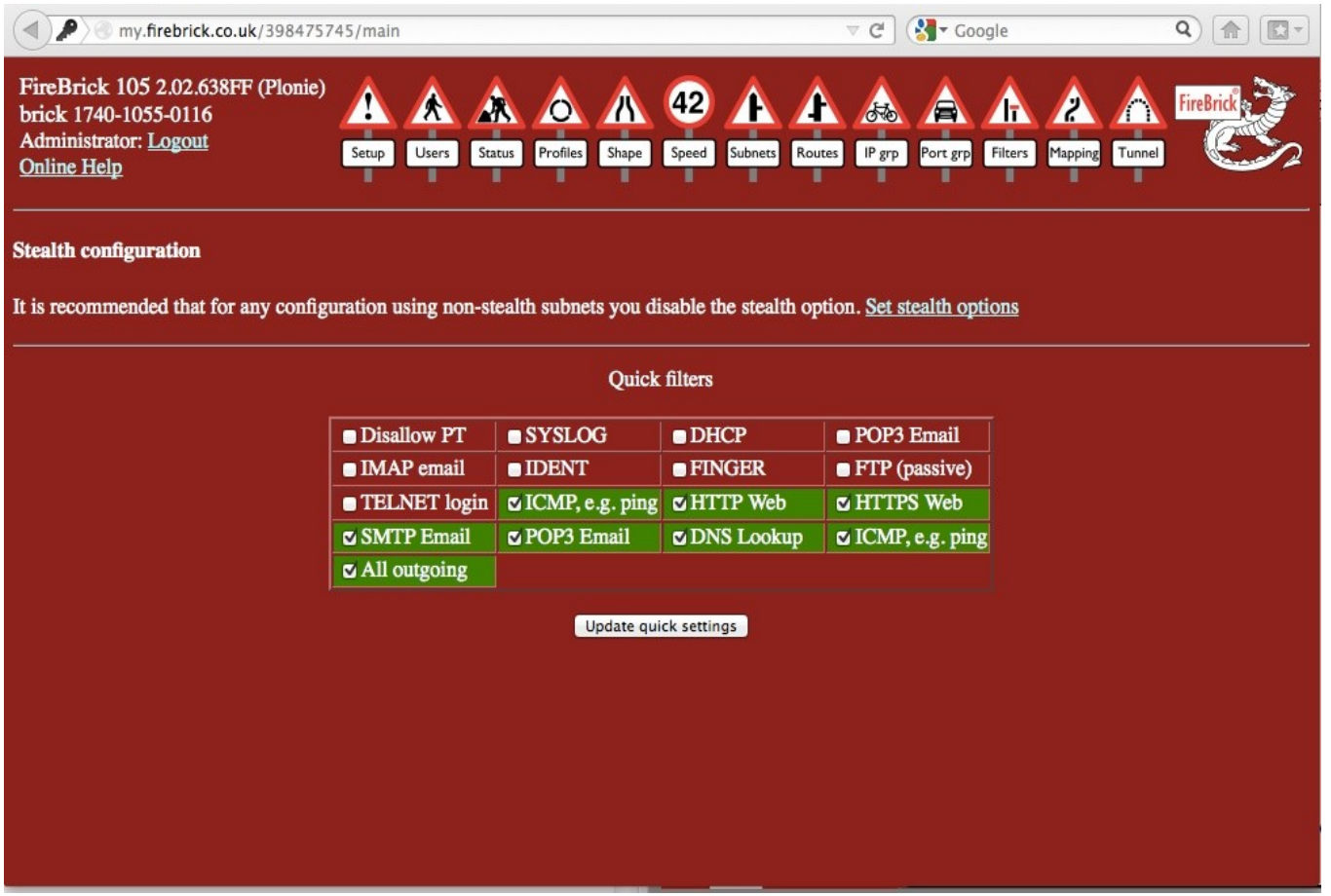
# FireBrick Plus/Soho

- Software development
    - Operating system
    - Ethernet chipset drivers
    - Firewalling/routing/network code

And ...

# FireBrick Plus/Soho

- Software development – web interface




- Almost unique at the time

# FireBrick Plus/Soho

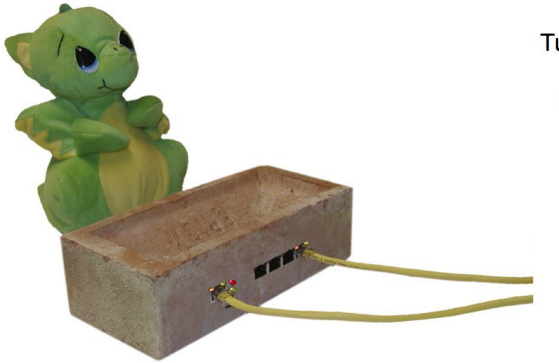
The end result

# FireBrick Plus/Soho

Early Marketing and Advertising

Tele2 deal never happened, but still, hundreds of units were sold and commercially it was a success.

## Permanent internet connection ?
## Immediate network protection



Firewall
Tunnelling
Stealth
Shaping
NAT
DHCP

You may have already protected your equipment from email virus attack, but moving to a permanent internet connection such as ADSL, cable modem, radio link or leased line, greatly increases the risk of others gaining access to your hard disk.

The FireBrick® will protect you as soon as it's connected to your network. It's ready to use without configuration settings, although built in web pages will let you make changes if needed.

The FireBrick® is supplied with a built–in 4 port hub, network patch lead and plug top power supply for truly plug and play installation.

www.FireBrick.co.uk


# FireBrick 105

- Development up from the Plus/Soho
- Similar physical form factor
- 100base network switch
- Internet connections getting faster, so routing up to 10-12 megabits

# Architecture Change

- Orders of magnitude change in throughput
- 105 = 16 bit CPU = incapable
- Decision to move to ARM
- Strategy to move to bigger scale products
- Allowing IPv6 from the ground up

# FireBrick 2500/2700

- Replacement for the 105
- Larger case, capable of 100/350Mbits/sec
- Gigabit switch
- Office target, but also used in datacentre
- 3G dongle on 2700

# FireBrick 6000 range

- LNS, BGP, OSPF + more
- ISP/carrier grade
- Dual power supplies
- Incredibly low power
- Gigabit throughput


- SIP / VoIP

# Full Circle

- 1997 – A&A sell ISDN phone systems
  (which can also do data)
- 2012 – FireBrick network appliance
  (which can also do voice)
- Complete office comms solution

# Thanks for listening

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With :
Rev. Adrian Kennard – Firebrick Ltd – a@k.gg

# Talk to us!

- In person at IPEXPO 2012, Stand C9

  17–18 October 2012, Earls Court 2

- Visit www.firebrick.co.uk