# ARM Holdings plc
# 2001 Investor Update

Sir Robin Saxby - Executive Chairman

Warren East - CEO

Jonathan Brooks - CFO

**ARM**

# Vision: ARM Technology for Everyone

# Semiconductor Trends



16/32 bit MCU Forecast November 2000

16/32 bit MCU Forecast November 2001

Billions $

2001  2002  2003

Global Monthly Semiconductor Sales

Billions $

20
18
16
14
12
10
8
6
4
2
0

Jan'00  Apr'00  July'00  Oct'00  Jan'01  Apr'01  Jul'01  Oct'01  Nov'01
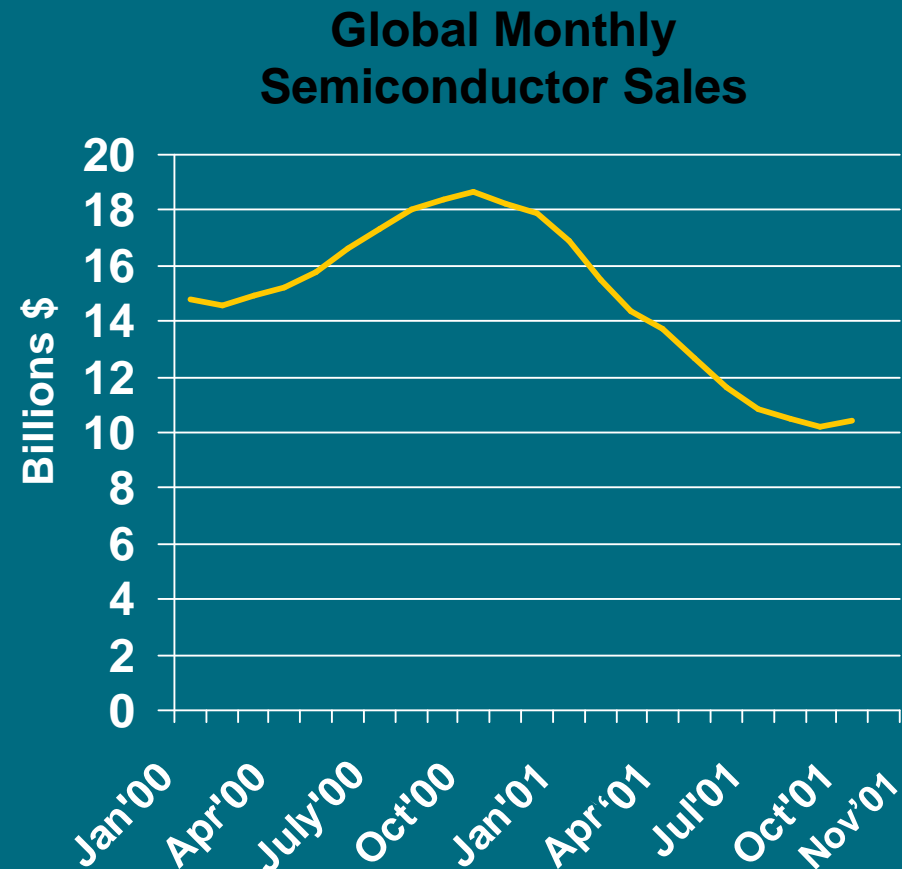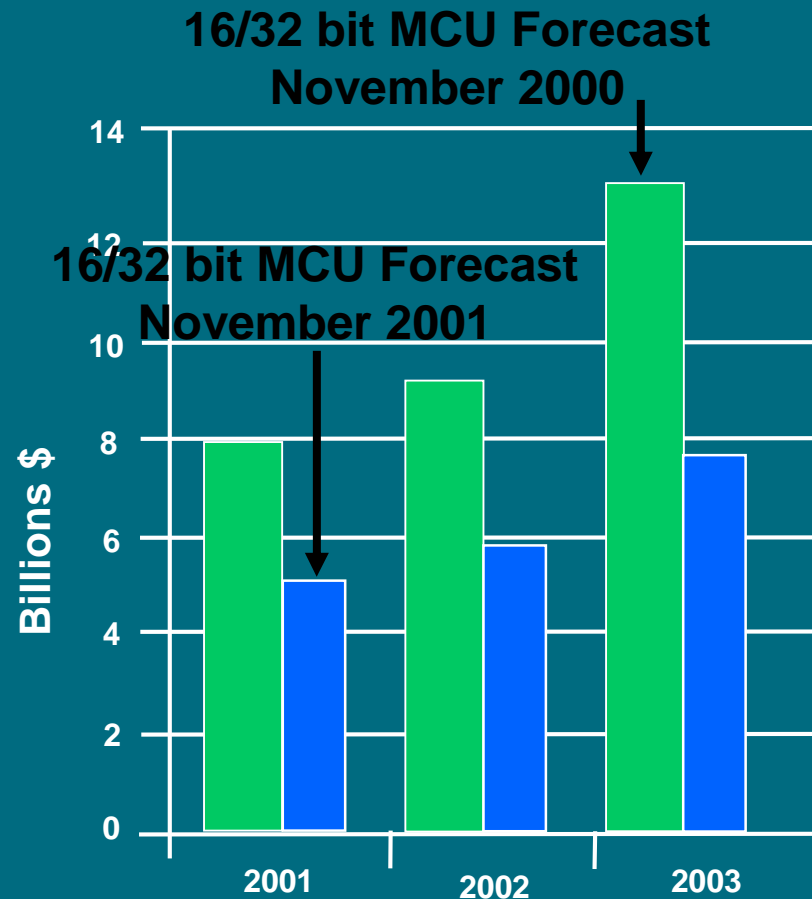
Source: Semiconductor Industry Association (SIA) November 2000, 2001

# The ARM Economy

## ARM Performance

£M

| | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|

(y-axis: 0, 40, 80, 120, 160)
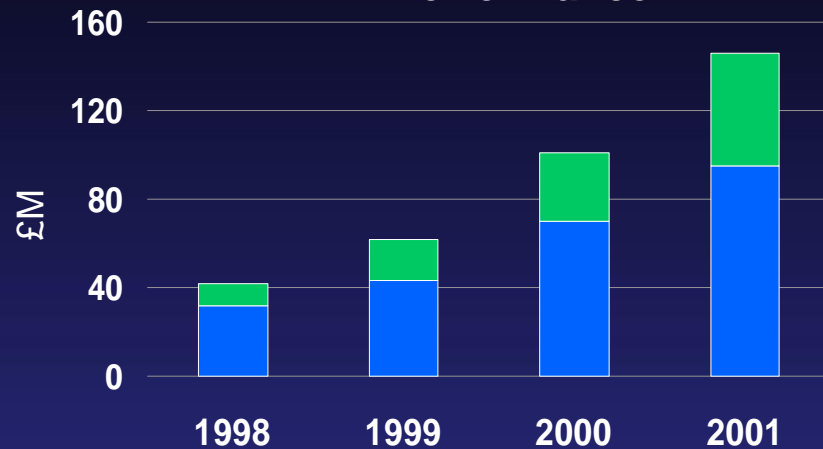
## Cumulative ARM Powered ® Shipments

Units (millions)

(y-axis: 0, 200, 400, 600, 800, 1000)

| 1998 | 1999 | 2000 | 2001 |

## ARM ATAP Partners

Number

(y-axis: 0, 5, 10, 15, 20, 25, 30)

| 1998 | 1999 | 2000 | 2001 |
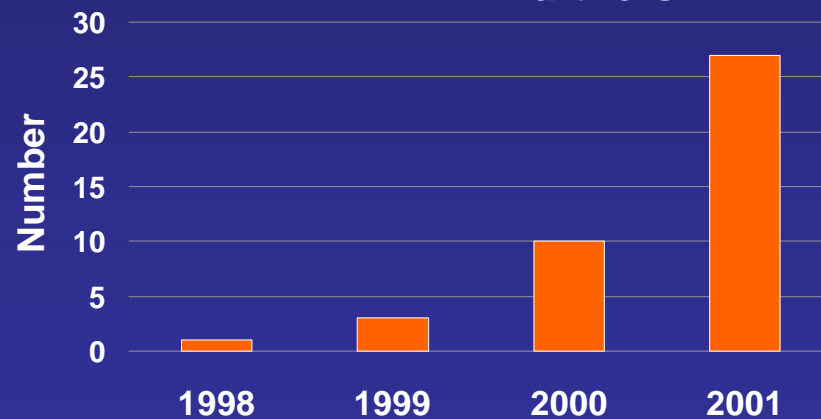
## Development Systems Revenue

Revenue £m

(y-axis: 0, 5, 10, 15, 20, 25)

| 1998 | 1999 | 2000 | 2001 |
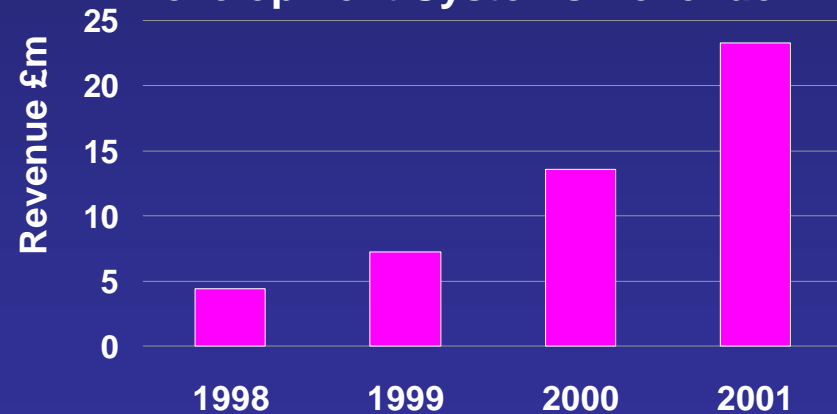
# Royalty Revenue by Segment
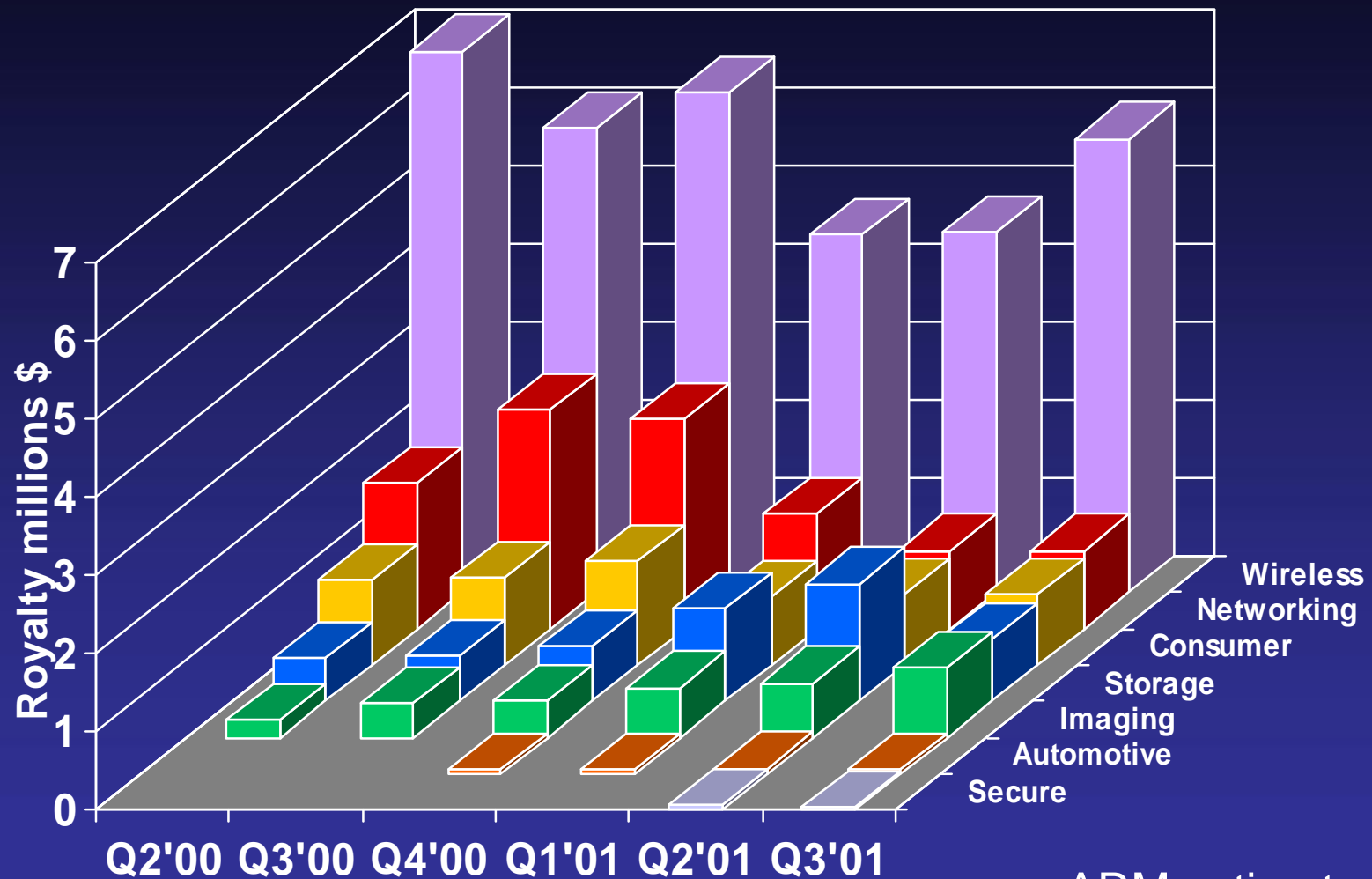


ARM estimates

# Wireless

- Nokia 7650
  - Symbian OS, colour display, camera, Bluetooth™

- New PDA's from Samsung, Compaq and Danger Inc

- Connected Pocket PC PDA from mmo2



Nokia 7650



Danger Inc Hiptop



Samsung Nexio PDA





New Compaq iPAQ



POGO wireless internet browser

# Imaging

**HP® Photosmart™ 1315 -**
**Intelligent high res printing**

**Kodak® MC3 Portable Multimedia Device -**
**Combine MP3 & Video for under $200**

**HP Photosmart 100**

**Kodak Easyshare Share System -**
**One touch download of images**

**HP Laserjet 1000 -**
**<  $250 LP market**

**FujiFilm® 2600Z Digital Camera**

# Consumer – More Bytes - Video

- ARM9 based solutions:-

- Pace OpenTV Di4000 home gateway using Conexant

- Amstrad new BskyB STB using Conexant

- Nokia launch new range of STB products supplied by TI

- Technotrend USB PC STB using TI



**Pace Di4000 home gateway ports**

**"Pace's advanced Di4000 cable home gateway is fast becoming the de facto digital cable platform in Western Europe" - Pace Press Release Nov 01**



**Amstrad BskyB STB**

Mediamaster 9902 S

Nokia Mediamaster 9650 S

Nokia Mediamaster 9470 S

**Nokia STB range**



**Technotrend STB**

# Consumer – More Bits - Audio

- New products at CES
  - SonicBlue digital audio
  - Fullplay jukebox
  - Motorola SimpleFI

- Apple iPOD HDD based digital audio player

- New players from Sanyo

SonicBlue Rio Audio Center and Riot

**New Digital Audio Players from Apple and Sanyo**

**FullPlay Digital Audio JukeBox**

**Motorola Digital Audio Receiver**

# Security

- ARM Powered SIM in volume
  - World's fastest JavaCard™

- High performance AT91SC321RC security chip announced by Atmel
  - 2-Mbytes Per Second Streaming Encryption

- SecurCore™ is the most widely licensed CPU for smart cards
  - 6 licensees: Atmel, Samsung, ST, Philips public

- ARM in "Smart Objects"

- ARM e-Commerce design center has grown by 50%
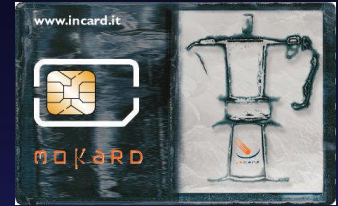
# Warren East CEO

# First 3G ARM Powered Phones

- NTT DoCoMo 3G service - 1 Oct ARM Powered handsets

- First 3G roaming call from Spain to Japan on ARM UMTS phone



**P2101V 3G Videophone**

'An ARM-based processor core can now be found in the baseband design of about 90% of all cellular handsets shipped' - Will Straus, Forward Concepts, Dec 2001
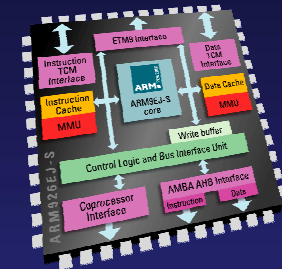
# ARM Hardware + Software

- Offer binary hardware + software solution
- Software enables use of hardware
- Extension of existing revenue model
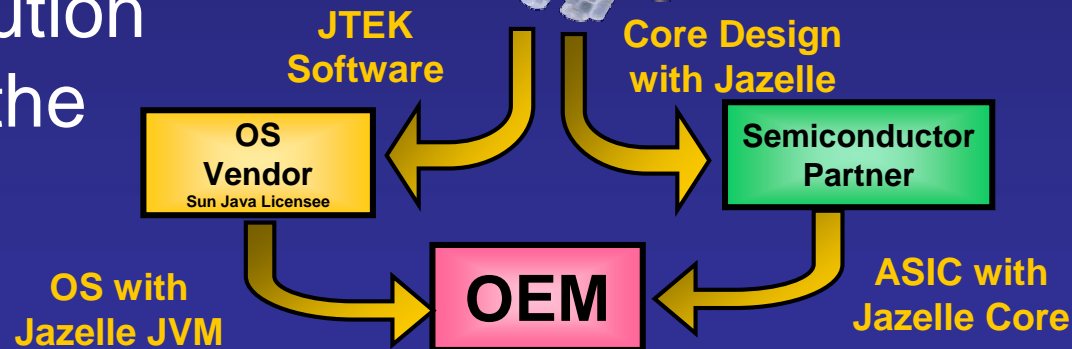- Jazelle™ solution has proven the concept

Jazelle
Software

Jazelle
Enabled
CPU Core

jazelle™
ARM Java™ Technology

JTEK
Software

Core Design
with Jazelle

OS
Vendor
Sun Java Licensee

Semiconductor
Partner

OS with
Jazelle JVM

OEM

ASIC with
Jazelle Core

# ARM Platform Strategy

- First licensee: STMicroelectronics
    - More in pipeline

- Integrated platform solution

    - SoC Kernel, OS Ports, Device drivers, Integrated development environments, System model tools, Multimedia extensions

- A framework for partners to create differentiated platform solutions
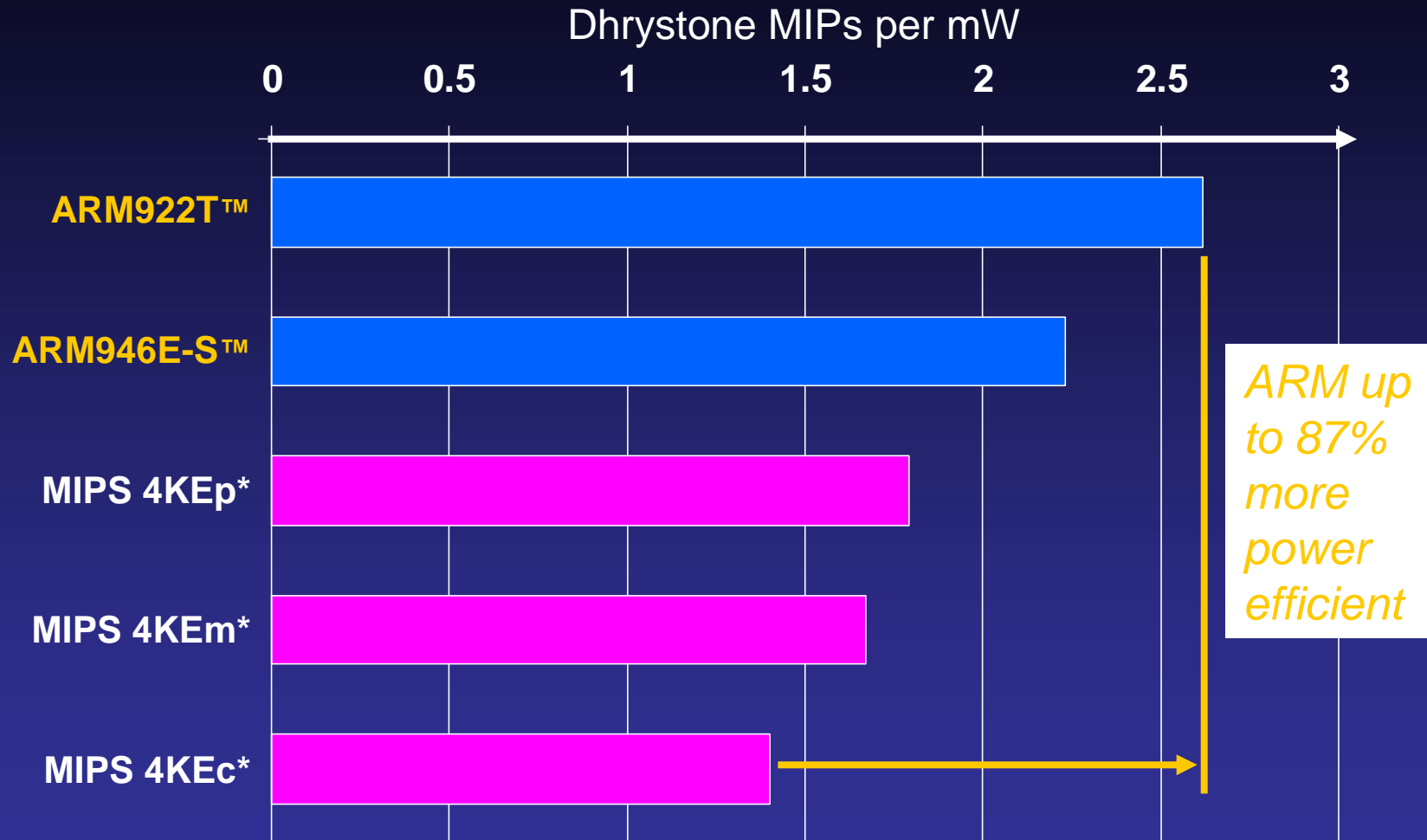
    - Support of multiple OS

**Innovative Technology**

**ARM Architecture**

**Partnership**  **Total Solution**
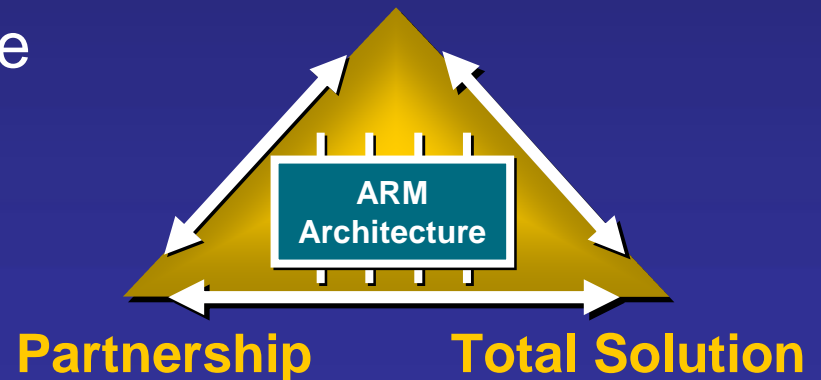
# V6 - On Track

- **Backwards Compatibility**
  - ARMv5 compliant OS or application runs on ARMv6
- **Fast context switching**
  - Memory management (VMSAv6)
  - New CPS, SRS and RFE instructions
- **Data handling & Multiprocessing**
  - New instructions for Synchronisation
  - Mixed Endian Systems to save memory
- **Multimedia support**
  - >50 SIMD instructions added
  - Up to 4x performance

# Class Leading Power *Efficiency*

Dhrystone MIPs per mW



*Source: MIPS Pipeline Newsletter Oct 2001
Scaled by ARM to 1.8V

ARM up to 87% more power efficient

**ARM**

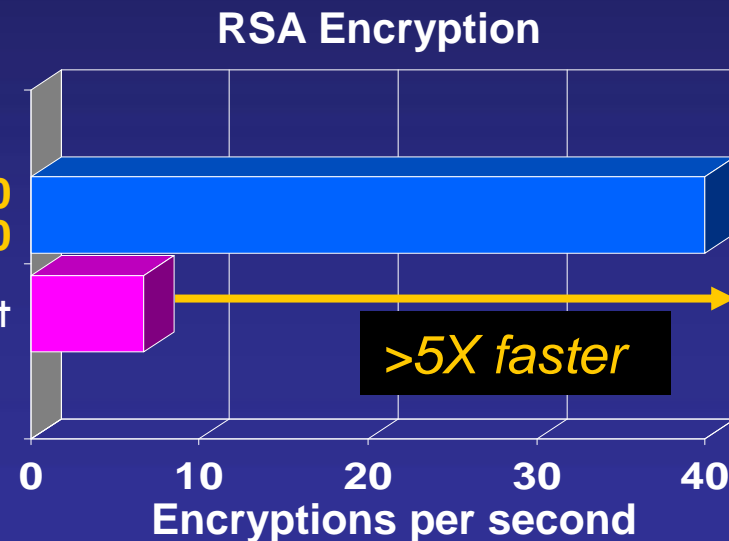THE ARCHITECTURE FOR THE DIGITAL WORLD™    CONFIDENTIAL    16

# Industry Leading Secure Processors

- SC110™ & SC210™ cores
  Jazelle acceleration for 8X Java Card performance
- 6 licensees for SC100 smart card core
  - Atmel, Philips, Samsung, ST, plus 2 undisclosed
- Will offer secure features in wider range of products

**RSA Encryption**
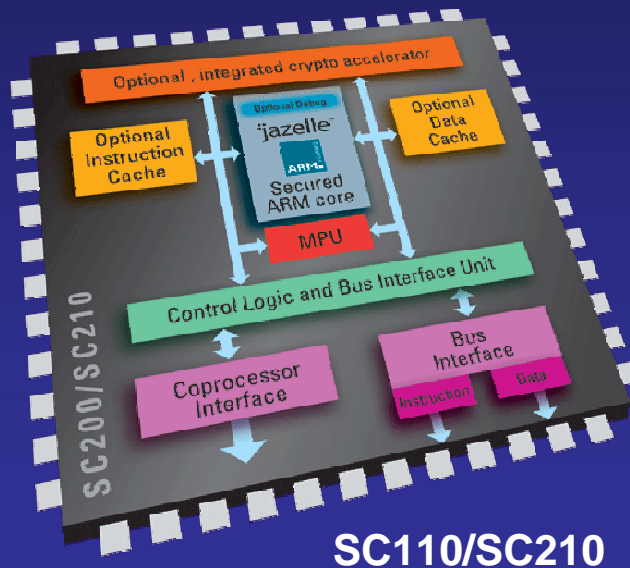
ARM SC100
ARM SC200

MIPS 4KSc[†]

>5X faster

0    10    20    30    40
**Encryptions per second**

**SC110/SC210**

[†]Source: MIPS Pipeline Newsletter Oct 2001
Scaled by ARM to 20MHz

# ARM Foundry Program

- Foundries:
  - UMC, TSMC, & AMI
  - ARM cores in program: AR7TDMI, ARM922T™, ARM946E-S, ARM1022E™
- Fabless vendors:
  - 25 licensees
    - 1st Chinese: ZTEIC
- Designs driven by growth in new comms markets:
  - Bluetooth
  - Wi-Fi (802.11 LAN)
  - VoIP

**Fabless Vendors by Application**



| | |
|---|---|
| ■ | **Networking** |
| ■ | **Wireless** |
| ■ | **Consumer** |
| ■ | **Computing** |
| ■ | **Industrial** |
| ■ | **Automotive** |
| ■ | **Other** |

8%  8%  20%  13%  20%  13%  18%
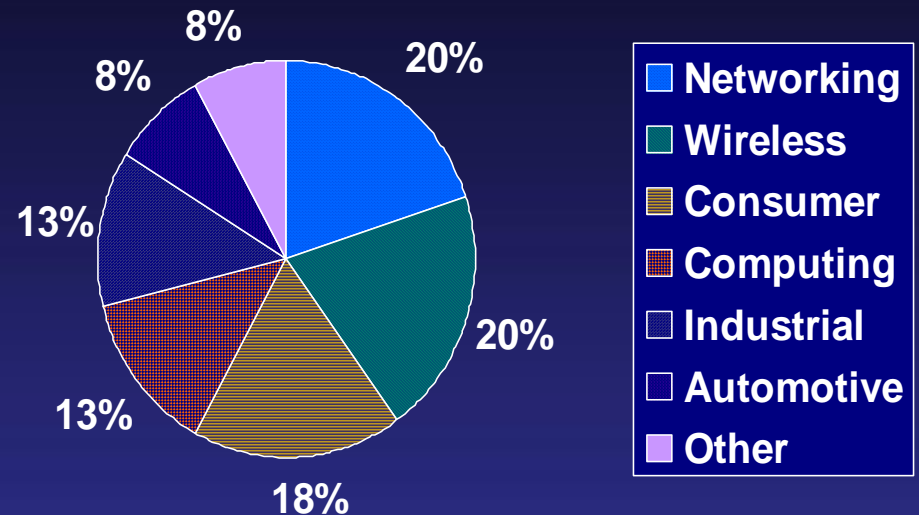
**~450 Fabless Vendors Worldwide**

Source: Gartner Group, December 2000

# Growth in East Asia

- Chinese Activity
  - 1st Licensee: ZTEIC
  - Impact are first tools distributor
  - Dr Jun Tan President of ARM China - Shanghai Office
- Samsung licenses ARM9, ARM10™, and SC100™, many end products

**Asia-Pac Fabless Si Vendors**

6%

16%

21%

57%

- Taiwan
- Korea
- China
- Singapore

Source: Gartner Group, October 2001
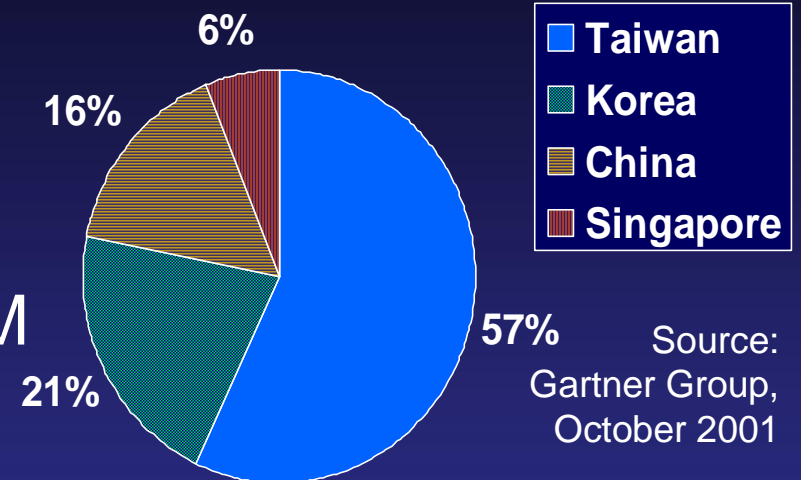
**~125 Fabless Vendors in Asia-Pac**



**ARM Korea seminar - Nov 2001**

# Networking Growth

- **High speed**
  - 1.4 GHz Network Processor - IXP1200 based Xscale Product
  - Conexant Cable Modem - Dual ARM9™ core processor engine
- **VOIP**
  - Virata Azurite Chipset targeting
- **Powerline**
  - Cogency launches Piranha, HomePlug-compliant powerline home networking chipset

**HP's
Jetdirect 610n
Internal Print Server**

**Linksys EtherFast® Cable Model**

**D-Link's
DWL-110AP
Wireless LAN**

# New Storage Applications

- Toshiba - Music Storage for leading portable Digital Audio Player (ARM7TDMI®)

- M-Systems Disk-on-Key - high capacity file transfer via USB

- Increasing presence in CD-RW drives

- More focus on non-disk drive storage – e.g. Storage Networks, Flash devices

DISK on KEY

# Automotive - Momentum Growing

- ABS designs shipping in volume

- Design wins achieved in 1st tier dashboard

- Partners targeting body electronics with ARM

- Road tolling designs starting to ship

- ARM Automotive conferences in Detroit, Germany and Paris



Airbag

Auto Infotainment

Dashboard

Door, Seat Body, Misc

Engine Control    Antilock Braking
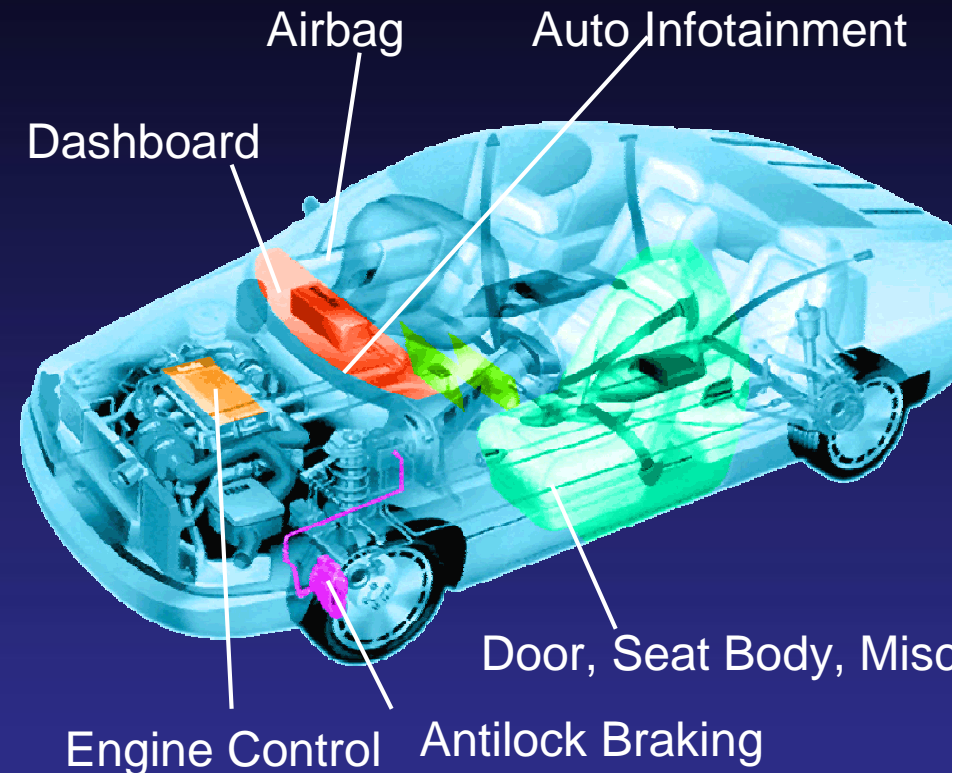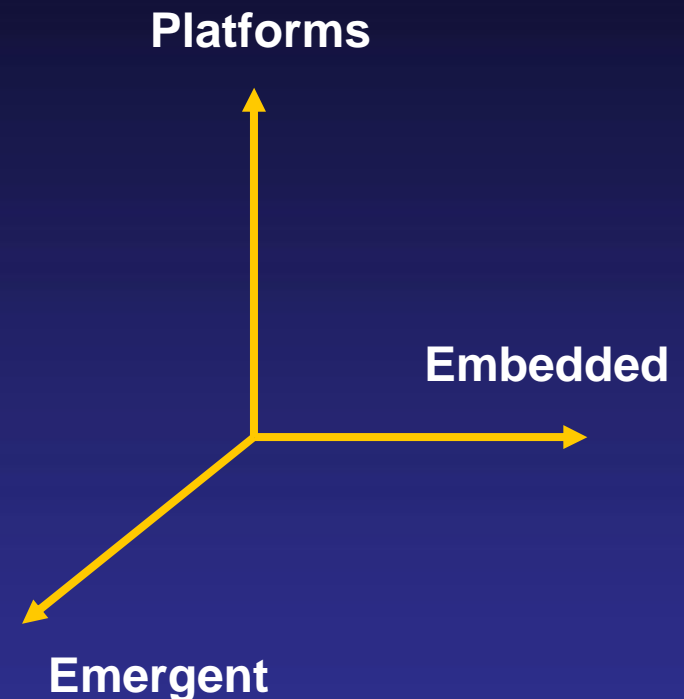
# Segment Themes

- **Media**
  - Advanced graphics for consumer products,
  - SW/Hardware

- **Enhanced Security**
  - Trusted Embedded Processing
  - New architectural features

- **Emergent markets**
  - 8-bit migration such as toys, white goods

**Platforms**

**Embedded**

**Emergent**

# Jonathan Brooks CFO

# Results Q4 and full year, 2001

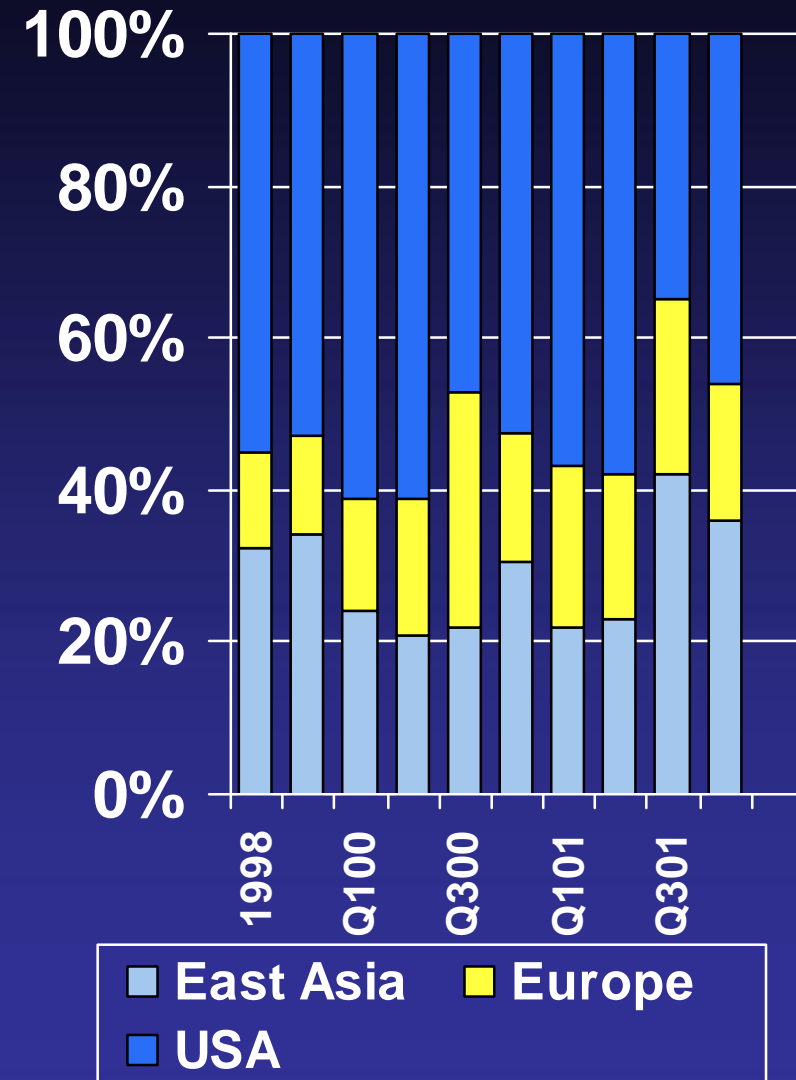| | Q401 | Q301 | | 2001 | 2000 | Yr/Yr |
|---|---|---|---|---|---|---|
| | £'000 | £'000 | | £'000 | £'000 | % |
| Total Revenues | 40.2 | 37.6 | | 146.3 | 100.7 | 45% |
| | | | | | | |
| Operating Profit | 12.8 | 11.7 | | 46.1 | 31.2 | 48% |
| M gn | *31.7%* | *31.2%* | | *31.5%* | *31.0%* | |
| | | | | | | |
| PBT-US GAAP | 13.8 | 12.9 | | 50.3 | 35.4 | 42% |
| | | | | | | |
| Net -US GAAP | 9.2 | 8.8 | | 34.0 | 29.4 | 16% |
| | | | | | | |
| EPS - US GAAP | 0.9 | 0.9 | | 3.3 | 2.9 | 14% |
| EPS excluding QUEST | | | | 3.3 | 2.4 | 38% |

Exchange rate $1.455

# Geographical Analysis

- Revenues Q4 01
  - 49% USA ( 53% Q4 00)
  - 38% East Asia ( 30% Q4 00)
  - 13% Europe ( 17% Q4 00)

- Bookings Q4 01
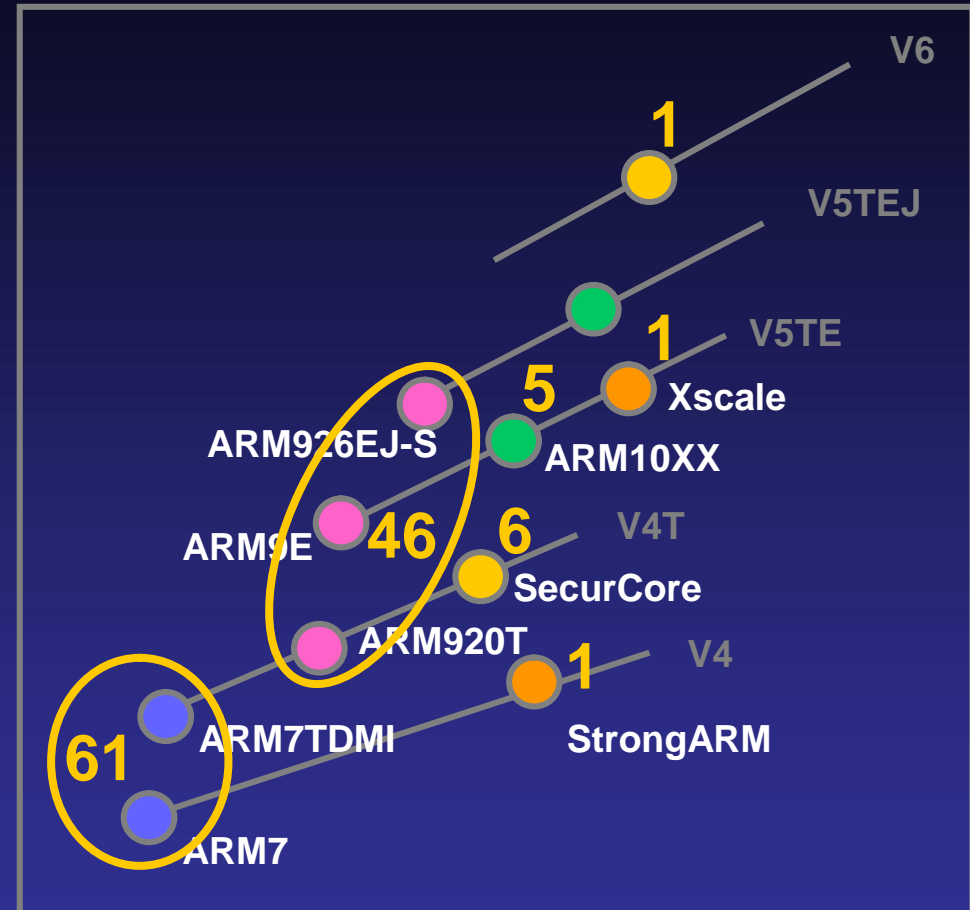  - 41% USA
  - 42% East Asia
  - 17% Europe



Chart legend: East Asia, Europe, USA. X-axis: 1998, Q100, Q300, Q101, Q301. Y-axis: 0% to 100%.

# Royalties

| | Q2 01 | Q3 01 | Q4 01 |
|---|---|---|---|
| | | | |
| Roy.Revs | £6.4M | £6.4M | £6.8M |
| % of Revs | 18% | 17% | 17% |
| Units | 98.0 | 103M | 96M |
| No.shipping | 26 | 31 | 33 |

Units

**ARM**

**THE ARCHITECTURE FOR THE DIGITAL WORLD™**  **CONFIDENTIAL**
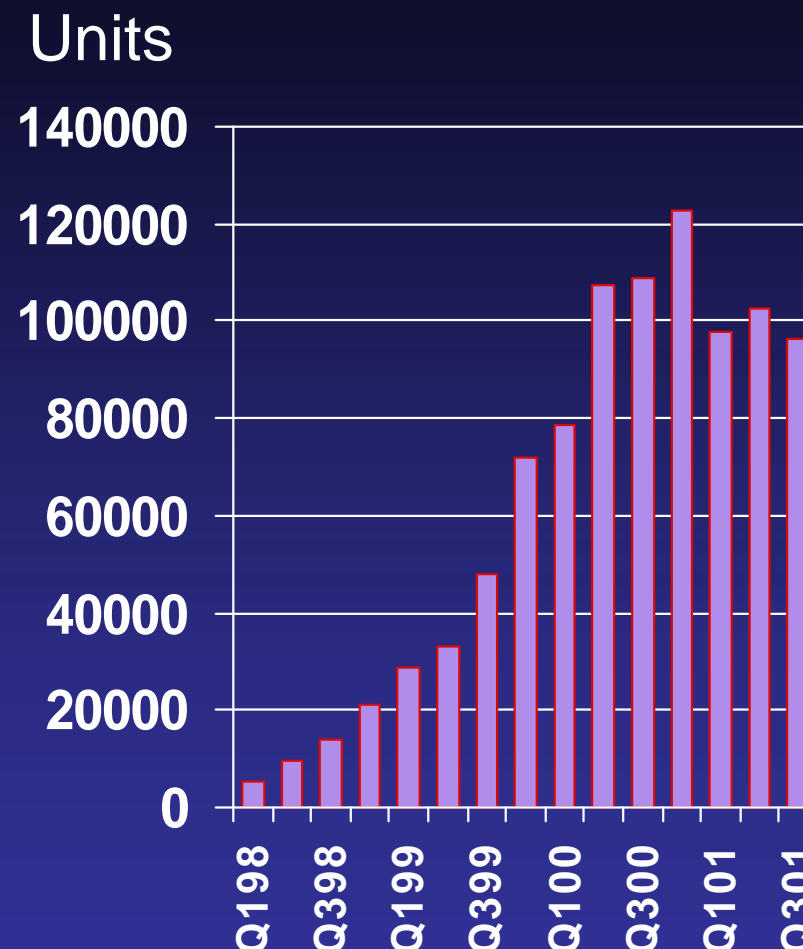
# Core Licensing

- **Q4 01: 15 licenses**

- **6 new partners in Q4 2001**
  - **4 SUDL's**
  - **SecurCore**
  - **7TDMI**

- **4 upgrades**
  - **2 x 1022E**

- **5 "derivatives"**

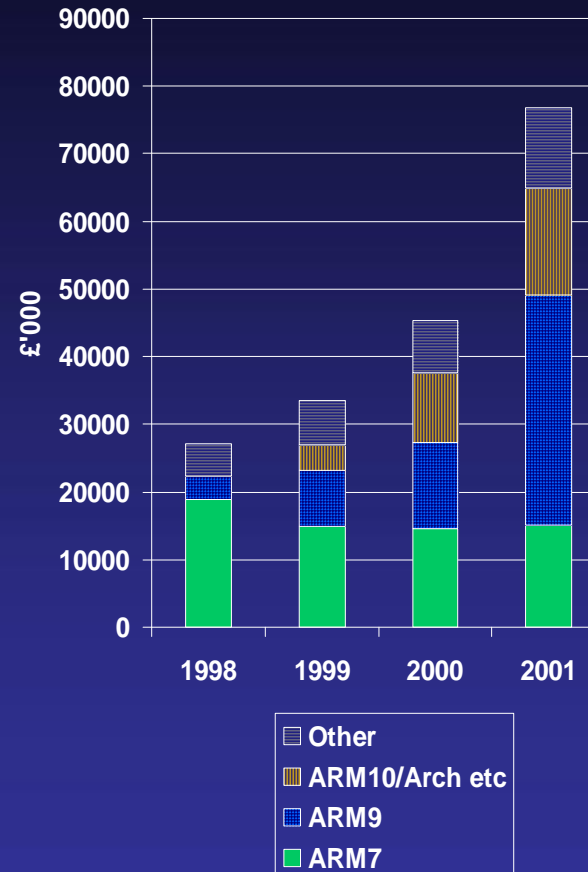- **77 Partners in total at end Q4 of which 25 are SUDL's and 3 are foundries**

V6

**1**

V5TEJ

**1** V5TE

**5**

Xscale

ARM926EJ-S ARM10XX

**46** **6** V4T

ARM9E SecurCore

ARM920T **1** V4

**61** ARM7TDMI StrongARM

ARM7

Excludes recent ST/Philips "broad" agreements

# Licensing activity



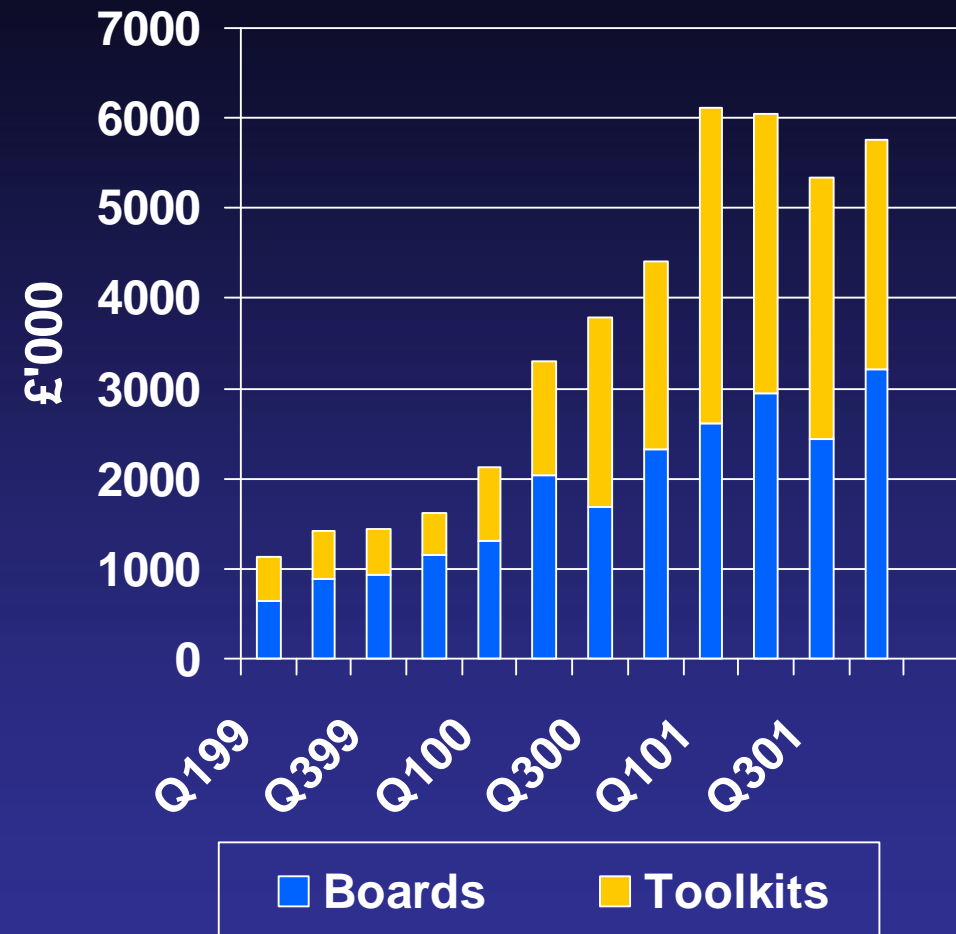**New vs Existing Licensees**
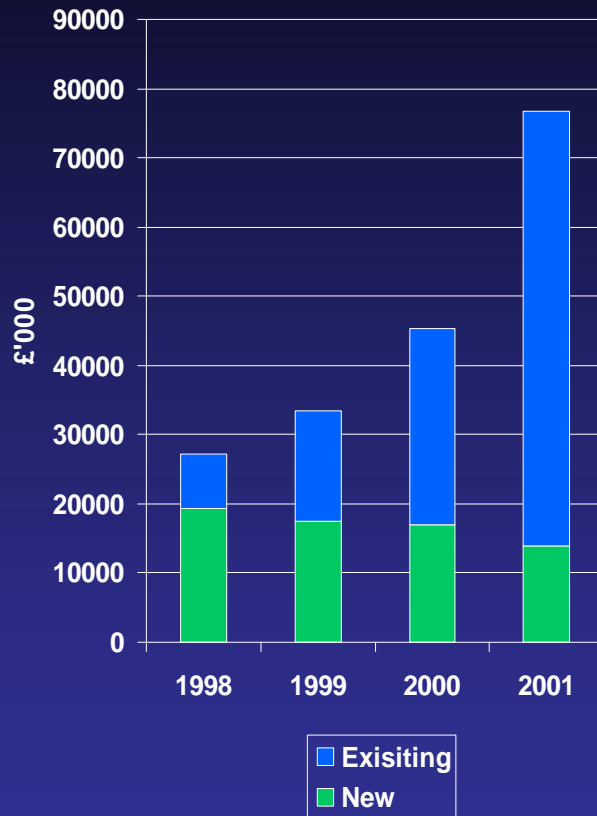
**Core and non Core Licenses**

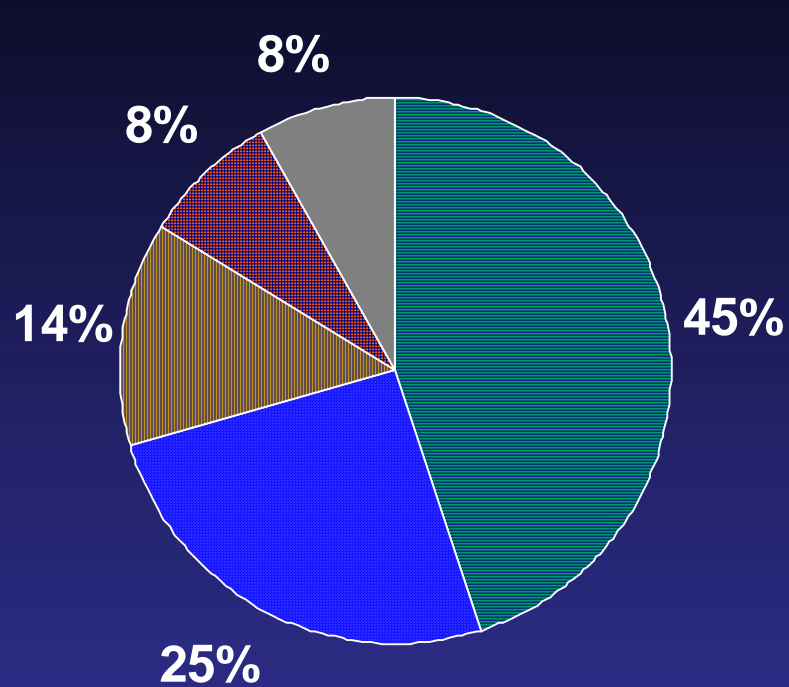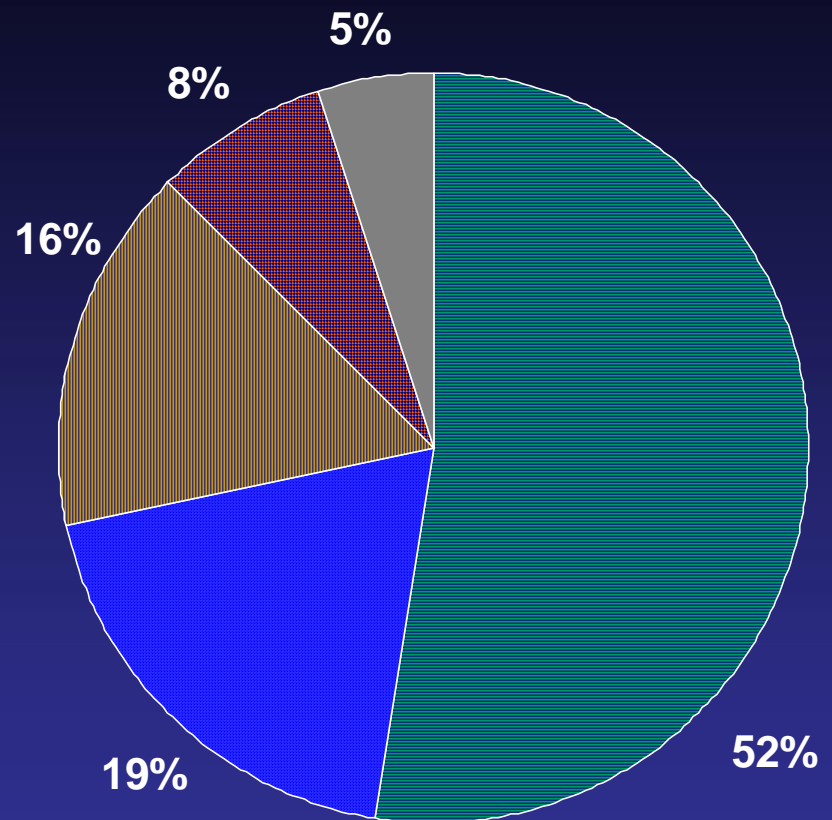Customer Concentration : Largest customer 8%, Top Ten customers 33%

# Development Systems

- **Dev't systems sales Q4 01**
  - **28 % (34%) USA**
  - **44% (47%) East Asia**
  - **28% (19%) Europe**

- **14% of revenues in Q4 01 and 14% in Q3 01**

- **21% revenues through distribution**

- **3 new distributors Q4 01- Europe, China, Japan**
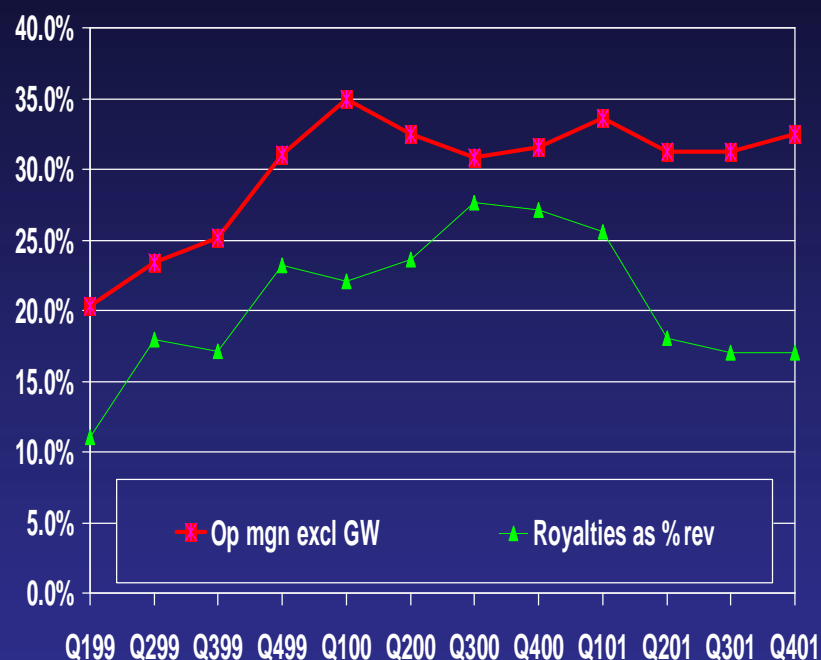
# Revenue Breakdown

**2000**

- 45%
- 25%
- 14%
- 8%
- 8%

**2001**

- 52%
- 19%
- 16%
- 8%
- 5%

**Legend:**
- ■ Licensing
- ■ Royalties
- ■ Dev Sys
- ■ Support
- ■ Consulting

# Operating Margin Trend



|  | Q3 01 | Q4 01 |
|---|---|---|
| G.Mgn | 88.9% | 87.7% |
|  |  |  |
| R+D | 25.1% | 23.7% |
| SG+A | 31.2% | 31.2% |
| Goodwill | 1.4% | 1.1% |
| Op Mgn | 31.2% | 31.7% |

# Strong Cash Generation Q4
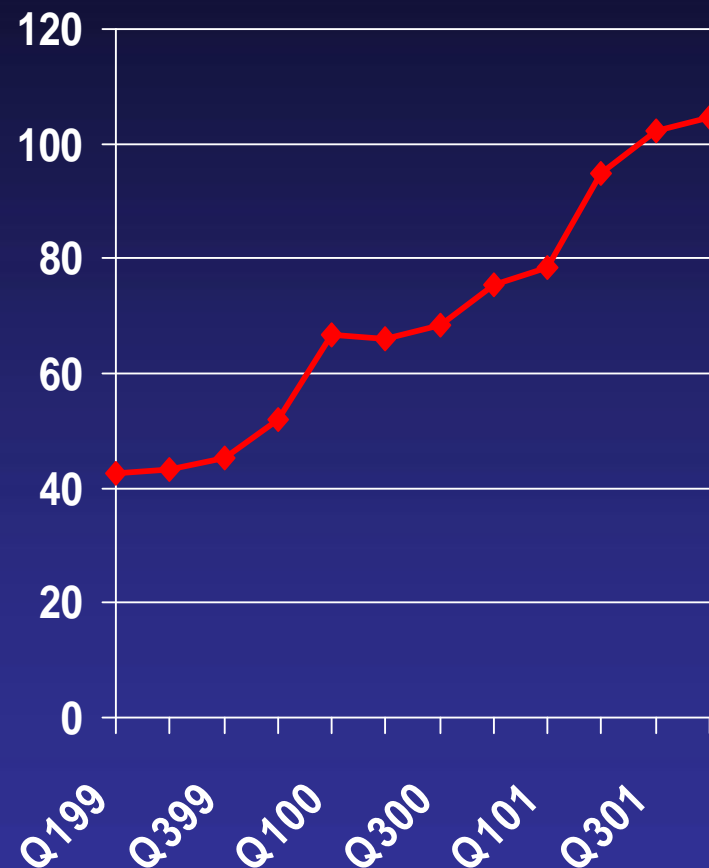


|  | Q3 01 | Q4 01 |
|---|---|---|
|  | £MM | £MM |
|  |  |  |
| Cash Gen. | 16.0 | 20.8 |
| Capex/Invest | -5.4 | -12.8 |
| Tax | -3.2 | -5.7 |
| Cash 31/12/2001 |  | **104.5** |
|  |  |  |
| Accruals | 7 | 9 |

**ARM**

# ARM Success

- All eight end markets shipping product

- 1 Billionth ARM chip shipped in Nov

- ARM Community
  27 ATAPS, 3 pure foundry, 77 Semi Partners,
  Leading apps specific OS > 50

- PrimeXsys™ – Extending the Standard

- Trends
  - Software standards become more important
  - Security is new growth driver

- New products to be announced this year

**Partner and no. of shippers**



| | 1997 | 1998 | 1999 | 2000 | 2001 |

Legend: Partners, Shippers