

**SHARP**

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**THE IDEAS COMPANY**

# SHARP



# Sharp

Since 1912, our company has stood for technological innovation. Even its name comes from an innovation, the “Ever Sharp” automatic pencil. An these innovations are turned into products to meet their users’s need.

**1915**



*Ever Sharp Pencil*

**1960**



*Colour TVs  
mass production*

**1962**



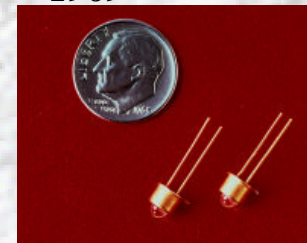
*Microwave ovens  
mass production*

**1964**



*Electr. calculator,  
fully transistorized*

**1969**



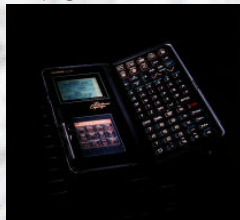
*Gallium-arsenid-  
diode (LED)*

**1973**



*Pocket calculator  
with LCD-display*

**1987**



*Electronic Organizer*

**1989**



*Big-sreen LCD  
Projektor*

**1991**



*8,6" colour  
LCD TV*

**1992**



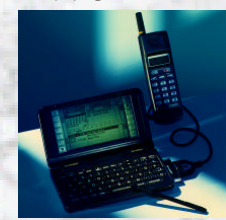
*16,5" colour TFT-LC-  
diplay*

**1993**



*ViewCam, Camcorder  
with LC-display*

**1995**



*ZR-5000G, mobile  
communication*

# SHARP



## Sharp Profile

⇒ Founded in 1912  
- Tokyo, Japan

⇒ Business Creed  
“Sincerity and Creativity”

⇒ Employees Worldwide  
as of April 1, '96  
**65,100 employees**

⇒ No. of Manufacturing Sites  
**29 in 17 countries**

⇒ No. of Sales Subsidiaries  
**21 in 19 countries**

⇒ Net Sales in FY'95  
**¥ 1,281,752 million**

⇒ Capital Stock as of Mar.31, '96  
**¥ 198,325 million**

⇒ Capital Investment in FY '95  
**¥ 138,358 million**

⇒ R & D Investment in FY '95  
**¥ 115,330 million**

Non-consolidated base  
FY '95: Apr. '95 to Mar. '96



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## '96 Forecast

Consolidated ( ¥ M, %)

vs. '95

⇒ Net Sales	:	1,770,000	107.0
⇒ Income before Special Items	:	96,000 (5.4)	108.0
⇒ Net Income	:	51,000 (2.9)	110.0

( ): Proportion to net sales

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## '95 Financial Results

Consolidated ( ¥ M, %)

	'95	vs.'94	'94
<b>Net Sales</b>	<b>1,650,708</b>	<b>102.0</b>	<b>1,617,620</b>
<b>Operating Income</b>	<b>89,381</b> <b>(5.4)</b>	<b>111.3</b>	<b>80,311</b> <b>(5.0)</b>
<b>Income before Special Items</b>	<b>88,499</b> <b>(5.4)</b>	<b>114.6</b>	<b>77,223</b> <b>(4.8)</b>
<b>Net Income</b>	<b>46,319</b> <b>(2.8)</b>	<b>104.1</b>	<b>44,508</b> <b>(2.8)</b>

( ): Proportion to net sales

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## '95 Financial Results

Non-consolidated ( ¥ M, % )

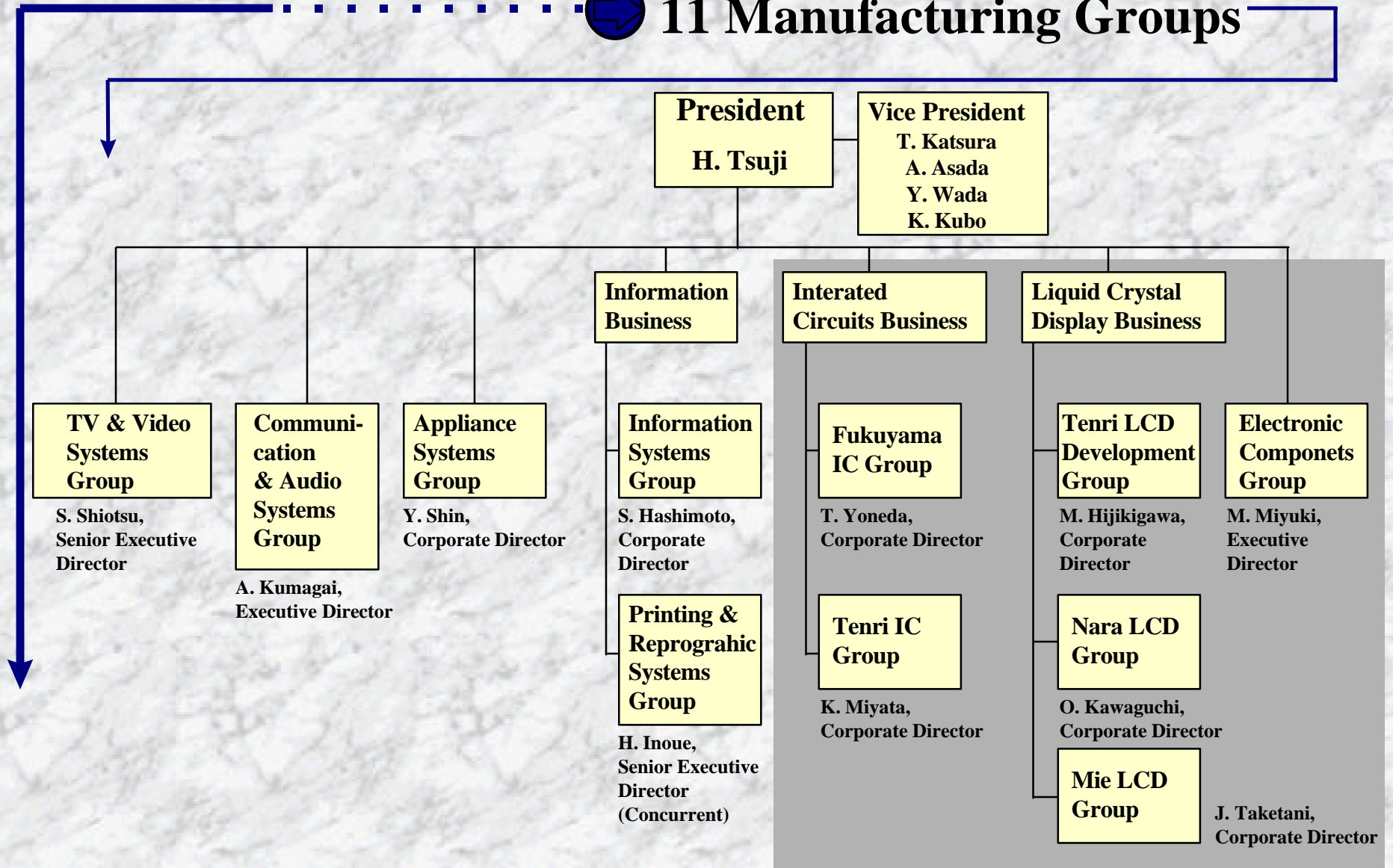
	'95	vs.'94	'94
<b>Net Sales</b>	<b>1,281,752</b>	<b>101.6</b>	<b>1,261,562</b>
<b>Operating Income</b>	<b>57,919</b> <b>(4.5)</b>	<b>103.3</b>	<b>56,062</b> <b>(4.4)</b>
<b>Income before Special Items</b>	<b>70,530</b> <b>(5.5)</b>	<b>105.2</b>	<b>67,073</b> <b>(5.3)</b>
<b>Net Income</b>	<b>39,372</b> <b>(3.1)</b>	<b>113.7</b>	<b>34,631</b> <b>(2.7)</b>

( ): Proportion to net sales

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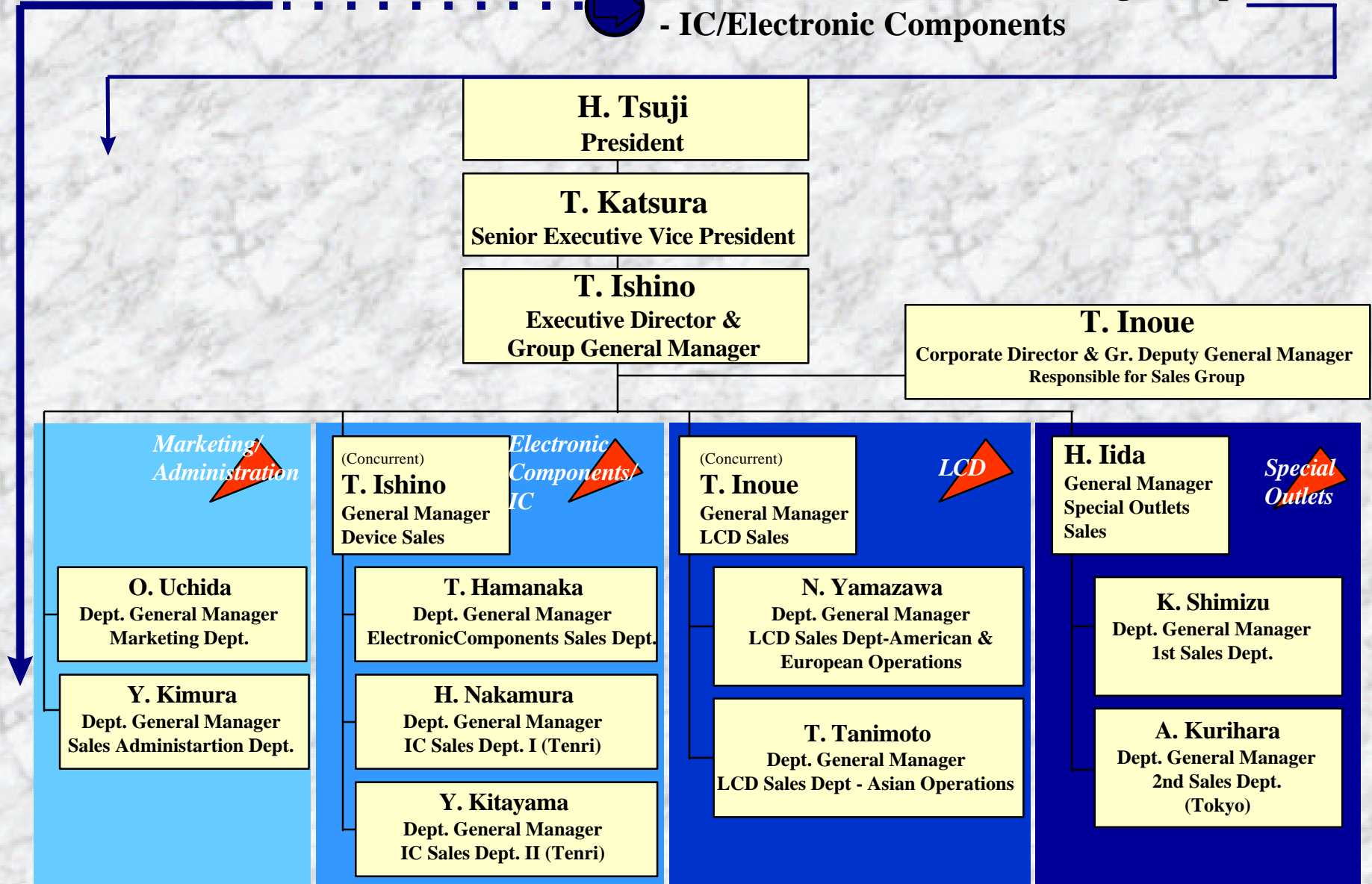
## 11 Manufacturing Groups



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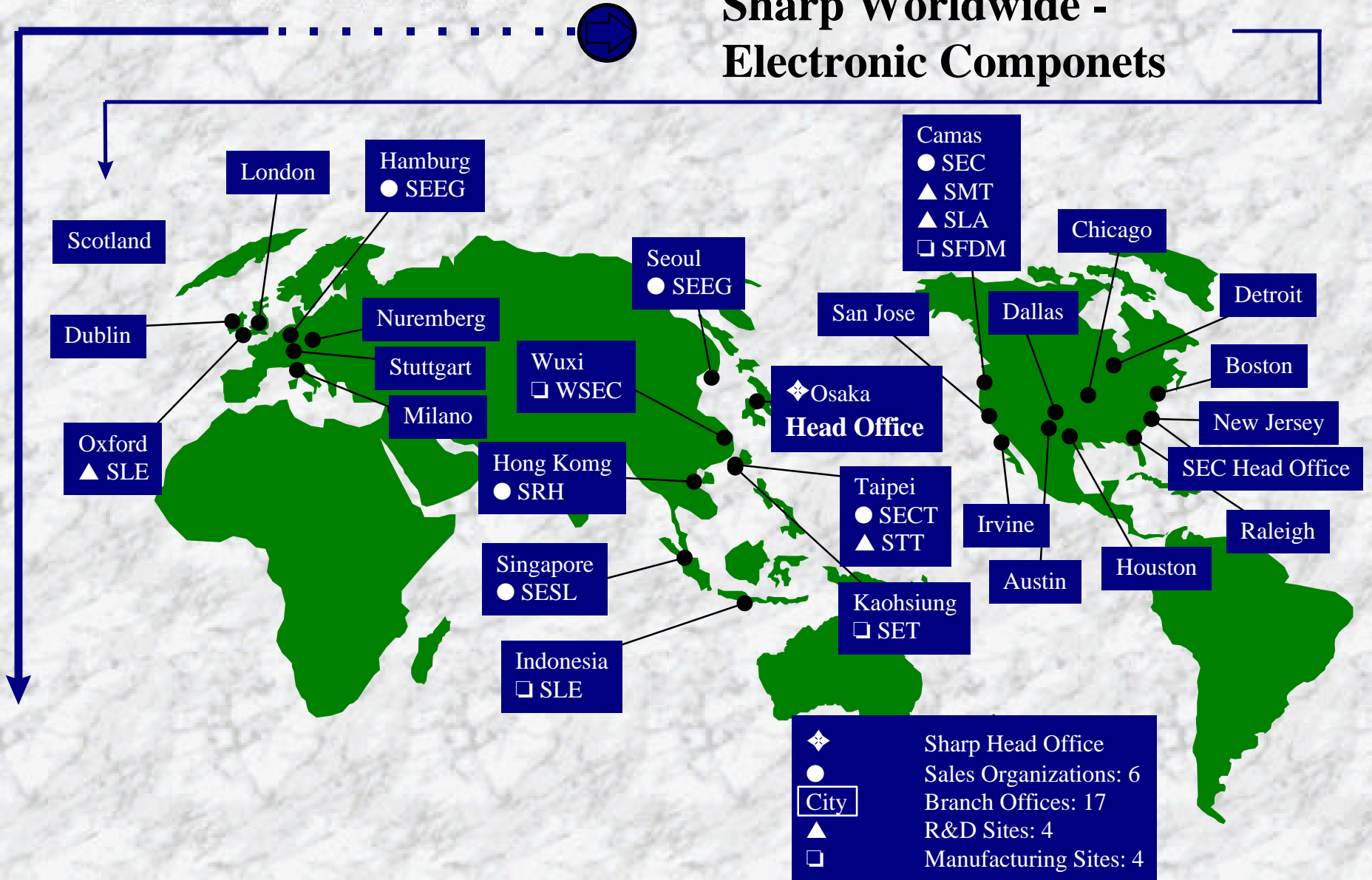
## International Sales & Marketing Group - IC/Electronic Components





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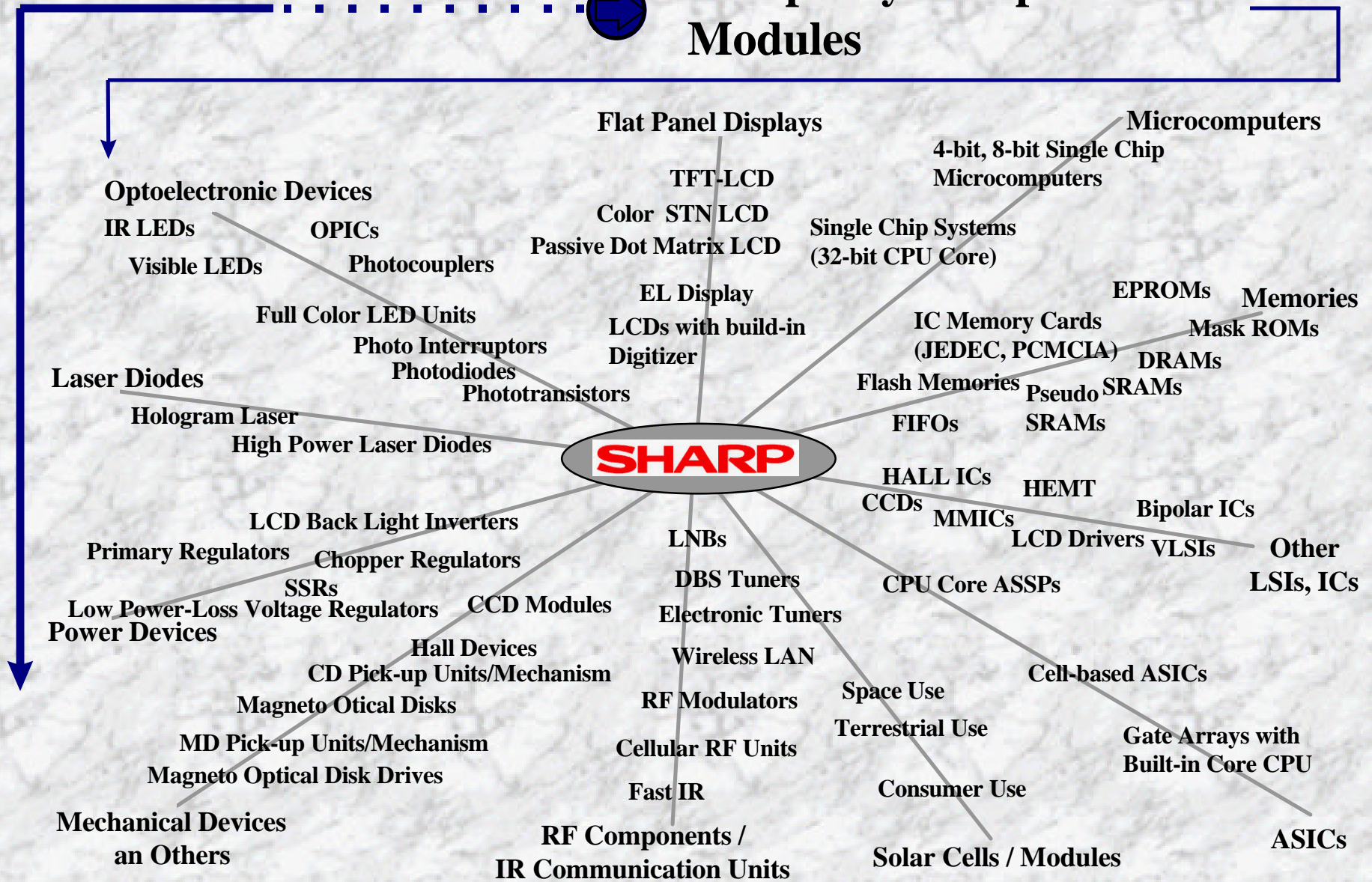
## Sharp Worldwide - Electronic Components



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## Sharp Key Components & Modules



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## Sharp Europe

### ⇒ Subsidiaries in

- ⇒ Germany
- ⇒ Sweden
- ⇒ United Kingdom
- ⇒ Belgium
- ⇒ Austria
- ⇒ Switzerland
- ⇒ France
- ⇒ Italy
- ⇒ Spain
- ⇒ Netherlands
- ⇒ Denmark

### ⇒ Distributors in Greece

- Portugal, Finland, Norway,
- Iceland, Russia, Bulgaria,
- Romania, Ukraine, Slovenia,
- Belarus, Estonia, Lithuania,
- Rep. of Kazakhstan, Rep. of
- Georgia, Czech Republic,
- Slovak Republic, Hungary,
- Latvia, Poland, Israel,
- Turkey, Malta

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Manufacturing in Europe

⇒ UK: Copier systems, electronic typewriters, video recorders, microwave ovens.

⇒ France: Telefax systems and copier systems

⇒ Spain: Colour TVs and telefax systems



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## Development in Europe Sharp Laboratories of Europe Ltd.



- ⇒ Optoelectronic
- ⇒ Imaging technology
- ⇒ Information technology
- ⇒ Liquid crystal
- ⇒ Strategy & planning
- ⇒ Administration

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**SEEG**

**⇒ Sharp Electronic (Europe) GmbH  
Sales in Europe**

# SHARP



## CED

Consumer Electronics Division

- ⇒ ViewCam
- ⇒ video printers
- ⇒ colour TVs
- ⇒ video recorders
- ⇒ LCD-projectors
- ⇒ cordless telephones
- ⇒ microwave ovens

- ⇒ air conditioners
- ⇒ audio systems
- ⇒ stereo radio-recorders
- ⇒ MiniDisc recorders
- ⇒ cassette-players

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## ISD

### Information Systems Division

➤ copier systems

➤ scanners

➤ laser printers

➤ telefax systems

➤ notebooks

➤ electronic organizers

➤ calculators

➤ electronic typewriters

➤ cash registers



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## VPE



**Visual Presentation Equipment**

- ⇒ LCD projectors for professional usage with data displays, video displays and multimedia applications
- ⇒ LCD-monitors
- ⇒ computer projection panels

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## GSM

⇒ GSM TQ-G400

Handy Telephone

⇒ GSM accessories

⇒ complete “Mobil Office”

incl. Handy, ZR-5000 G

and PCMCIA GSM Fax/Datacard

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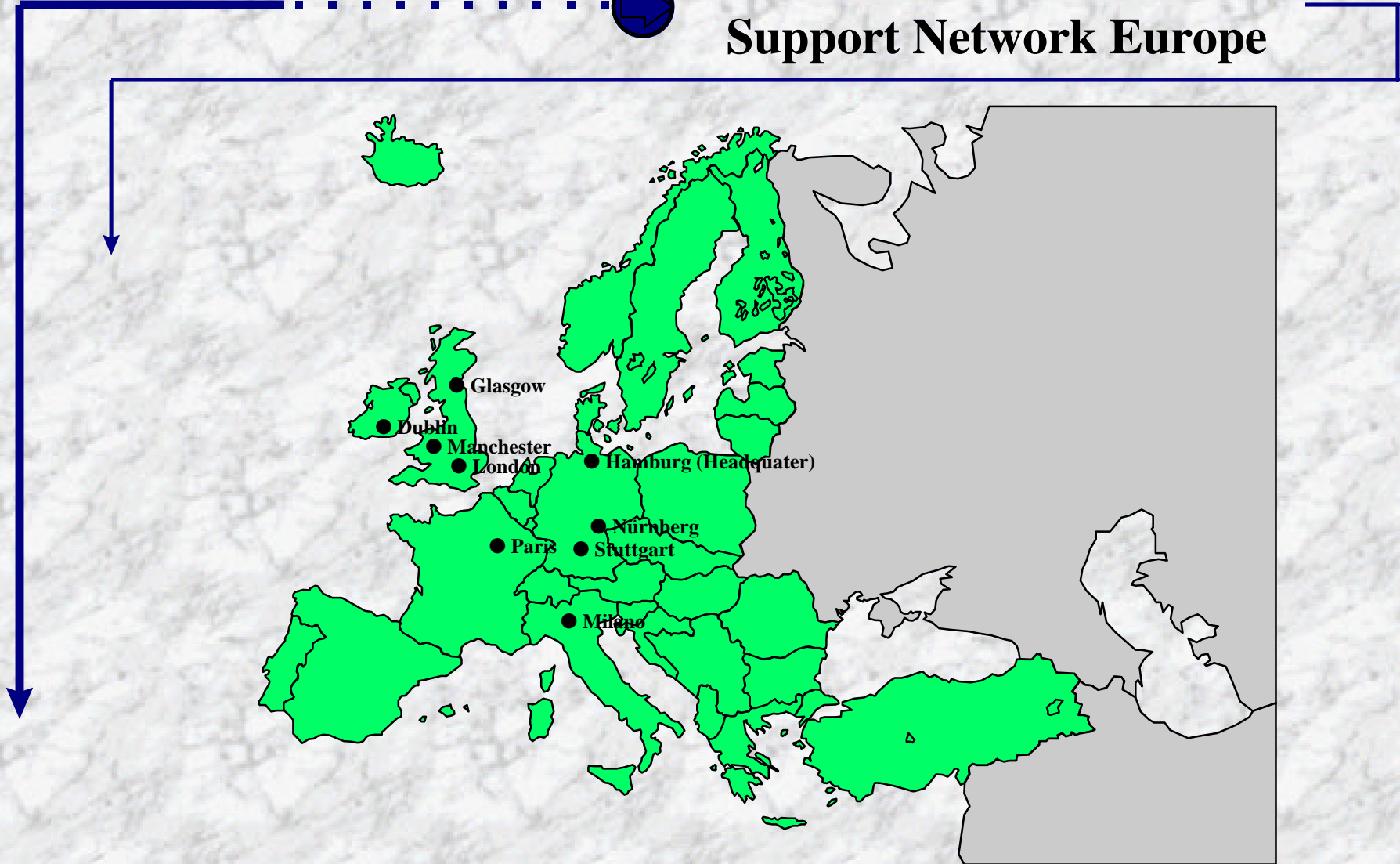
## MED

### Microelectronics Division

- ⇒ LC-Displays
- ⇒ opto-electronic device
- ⇒ integrated circuits
- ⇒ RF components
- ⇒ Solar cells
- ⇒ CCD`s

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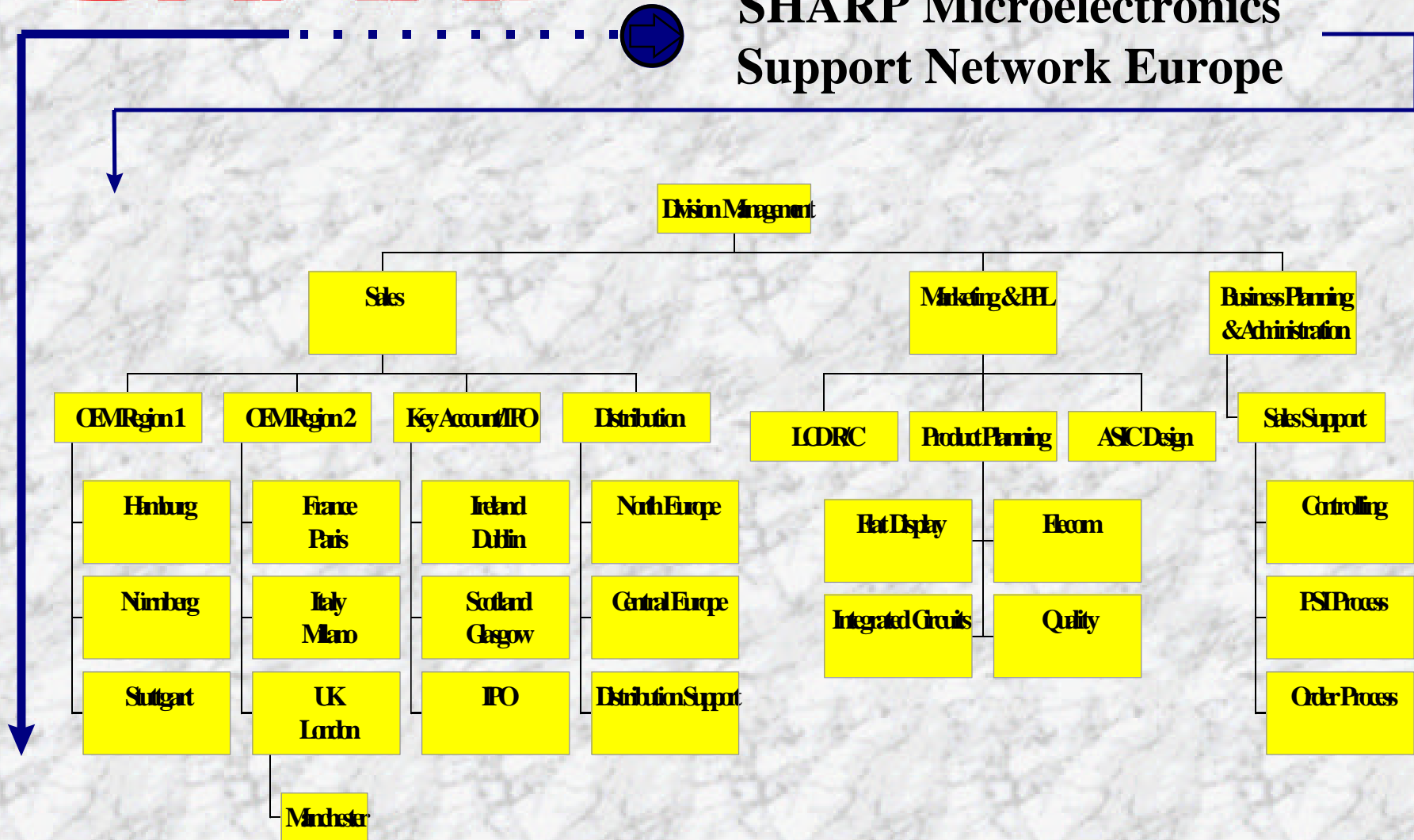
## SHARP Microelectronics Support Network Europe





# SHARP

## SHARP Microelectronics Support Network Europe



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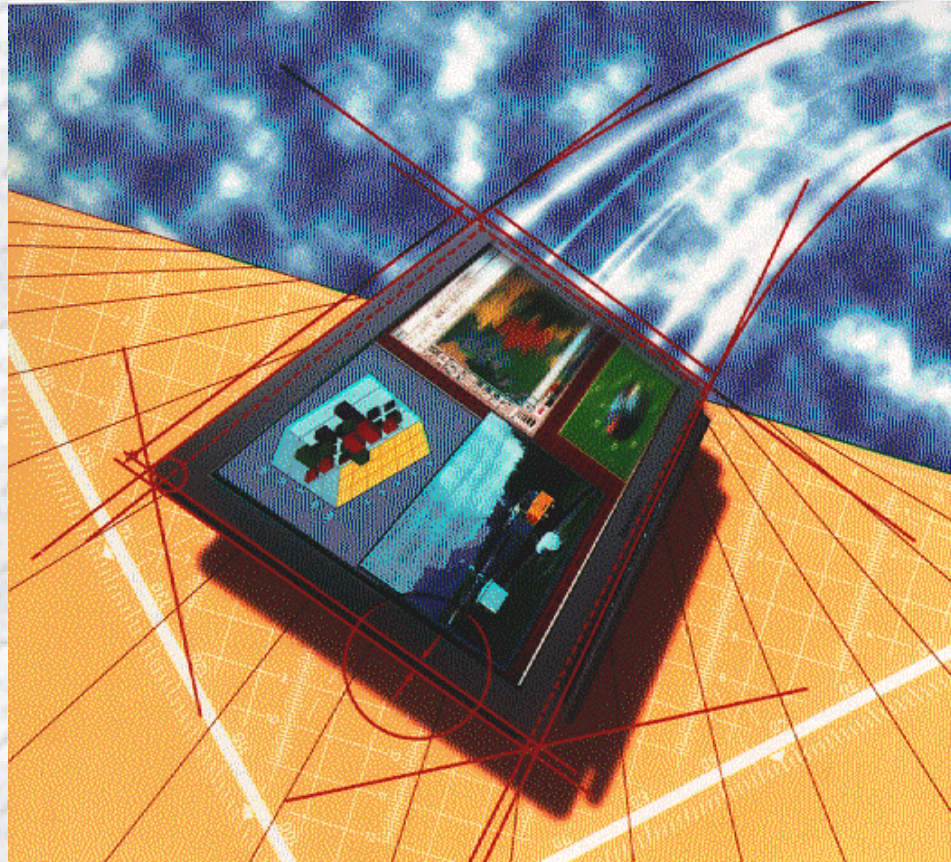
## Key Components for Powerful Systems

- ⇒ Flat Panel Displays
- ⇒ Optoelectronic Devices
- ⇒ Power Devices
- ⇒ LED/Laser Components
- ⇒ RF Components
- ⇒ Integrated Circuits
- ⇒ Mechanical Devices and others
- ⇒ Solar Cells/Modules

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## Flat Panel Displays



### Accelerating a Multimedia Future



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## Flat Panel Displays

- ⇒ Colour TFT-LCD Modules
- ⇒ Colour STN-LCD Modules
- ⇒ Passive Dot Matrix LCD Modules
- ⇒ Electroluminescent Display Modules



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## Colour TFT-LCD Modules

### ⇒ TFT for Monitor/FA/OA

- size: 6.4", 8.4", 10.4", 11.3", 12.1", 13.8", 15", 17.x"
- Resolution: VGA, SVGA, XGA, SXGA
- S2-technology for high aperture ratio
- Wide viewing Angle
- High brightness, high transmissivity
- Long life CCFT 25Khrs (typ.)
- CPP types available
- High light and het durability

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## Colour TFT-LCD Modules

### ⇒ TFT for Automotive / AV

- Size: 3", 4", 5", 5.5", 5.7", 6.4", 7.2", 8.6"
- Interface: RGB-analog, PAL-composite, NTSC-composite
- Extended Temp. range (-30°C to + 85°C) with integrated backlight
- Wide Viewing angle (  $\sim 120^\circ$  )
- Display rotation function
- 16:9 Aspect ratio

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## Colour STN-LCD Modules

- Size: 5.5", 8.0", 8.4", 9.4", 10.4", 11.3", 12.1", 13.8", 15", 17.7"
- Resolution: QVGA, VGA, SVGA, XGA
- High brightness types > 150 cd/m<sup>2</sup>
- Long life CCFT 25 Khrs (typ.)
- Mech. compatible to TFT
- Sharp Addressing for improved picture quality

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## Passive Dot Matrix LCD Modules

- Resolution: 16x1, 16x2, 20x2, 40x2, QVGA
- TN, STN with LED backlight
- Standard Interface



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## Electroluminescent Display Modules

- ⇒ 320x240 to 1024x768
- ⇒ high brightness (200cd/m<sup>2</sup>)
- ⇒ upto 16 greyscale
- ⇒ LCD interface
- ⇒ high contrast moduls (require to circular polarizer)

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## Optoelectronic Components



**Advanced Optoelectronics Technology to  
Meet Tomorrow's Needs Today**

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## Optoelectronic Components

⇒ OPIC\*

\*OPIC (Optical IC) is trademark of the SHARP Corporation

⇒ Infrared Emitting Diodes and Photodiodes

⇒ Photocouplers

⇒ Photointerrupters

⇒ IR detecting units for remote control

⇒ Fiber Optics

⇒ Optical System Device



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## Main Features of Optoelectronic Components

### ⇒ Infrared Emitting Diodes and Photodiodes

- Models with beam angle for combination with various Photodetectors
- Double-end models for surface mounting
- Can-packaged models that provide high-reliability
- Models with SHARP's OPIC technology to improve function of Photodetector
- Blue Sensitive Photodiodes
- Position Sensitive Detectors



# SHARP

## Main Features of Optoelectronic Components

### ⇒ Photocouplers

- High isolation models made using double transfer mold technology <Viso-5.000V>
- Compact SMD type for automatic molding
- Half pitch type
- Wide product line-up approved safety standard UL,TÜV,VDE etc
- Models with variety of outputs which meet the needs of various applications
  - >> OPIC output for high speed/high functional equipment
  - >> Phototriac/thyristor output for triggering of triac/thyristor for power supplies

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## Main Features of Optoelectronic Components

### ➤ Photointerrupters

- Reflective and transmissive types
- Models with a variety of shapes and outputs
- Ultra-compact models made using a two-layer resin
- High functional models which use our OPIC technology
- Ultra-compact models with leadless chips for high-density mounting by using MID technology
- High-resolution models for high-precision detection
- Suitable for detecting high-speed rotation

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## Main Features of Optoelectronic Components

### ⇒ IR Detecting Units for Remote Control

- Compact, thin and ultra compact SMD models with our OPIC technology
- IR Units with mesh for improved EMI resistance
- Compatible with various “BPF frequencies”

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## Main Features of Optoelectronic Components

### ⇒ Fiber Optic

- High-speed signal transmission  
(25MB/s for OA equipment, 8MB/s for AV equipment)
- Models with optical mini-jack (for AV equipment) to accommodate optical/analogue/digital signals

### ⇒ Optical Systems Devices

- High performance due to Position Sensitive Device
- Distance Measuring Sensors
- Optical Pointing Device



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## Power Devices

- ⇒ LCD Backlight Inverters
- ⇒ Low-Power-Loss Voltage Regulators
- ⇒ Chopper Regulators
- ⇒ Primary Regulators
- ⇒ Solid State Relais
- ⇒ Phototriac/Photothyristor

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## Main Features of Power Devices

### ⇒ Low-Power-Loss Voltage Regulator

- Low power loss that makes it easier to design smaller, lighter, energy-saving equipment. Voltage difference between input and output: 0.5 V MAX
- Multi functional models. (ON/OFF control function, minute adjustable output, variable output, low dissipation current at OFF-state, reset signal generation function etc.)
- Various build-in protection circuits (Overcurrent, overheat, reverse voltage etc.)
- 4-pin compact, full mold package models (TO-220)  
Surface mount package models (SC-63)

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## Main Features of Power Devices

### ⇒ Chopper Regulators

- Only a few externally attached components required.
- Various build-in functions (ON/OFF control; overheat; overcurrent protection)
- Compact surface-mount package

### ⇒ Primary Regulator

- Build-in power MOS-FET control IC
- Low-Power-loss due to build in overcurrent protection circuit

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## Main Features of Power Devices



### ⇒ Solid State Relais

- Models with a zero-cross circuit to minimize the generation of noise
- Models with snubber circuit to control surge current
- A variety of package styles (SIP,DIP)

### ⇒ Phototriac/Photothyristor

- Various Packages available
- Output Voltages up to 800 V

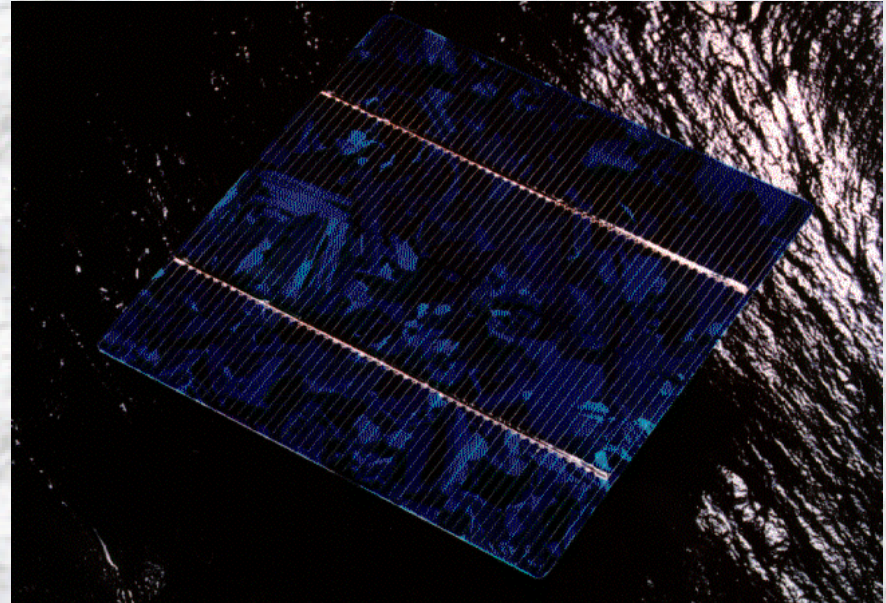


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## Solar Cell/Modules

- ⇒ Space Use
- ⇒ Terrestrial Use
- ⇒ Consumer Use



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## LED/Laser Components

- ⇒ Through hole LEDs
- ⇒ SMD LEDs
- ⇒ LED for Bar Graphic Displays
- ⇒ LED Units
- ⇒ Laser Diodes

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## Main Features of Optoelectronic Components

### ⇒ Through hole LEDs

- Wide variety of packages
- High brightness materials (AlGaInp, TS AlGaAS)
- Dichromatic LEDs

### ⇒ SMD LEDs

- Chiplid types
- MID types (molded interconnected device)
- Dichromatic and RGB SMD LEDs

### LED for bar graph displays

- seven segment displays
- Backlighting modules
- LED arrays for scanners



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## Main Features of Optoelectronic Components

### ⇒ LED Units

- Outdoor Dot Matrix LED units
- Indoor Dot Matrix LED units
- Monochrome and Dichromatic and RGB
- varies sizes and dot pitches
- Clusters

### ⇒ Laserdiodes

- Hologram Lasers
- Laserdiodes
- visible and infrared



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## RF units

- LNB-specified for digital broadcasting
- Front End units for digital DBS broadcasting
- Front End units for digital CATV broadcasting
- Tuner for analog DBS reception
- RF modulator
- RF transend units for cordless phones,  
DECT, CT1, CT1+

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## Integrated Circuits

- ⇒ Micro Processors
- ⇒ Memories
- ⇒ ASICs
- ⇒ Other ICs

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## Microcomputers

- ⇒ 4-bit, 8-bit Single Chip Microcomputers
- ⇒ Single Chip Systems (32-bit CPU CORE)

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## Memories

➤ DRAM's

➤ SRAM's

➤ Pseudo SRAM's

➤ Mask ROM's

➤ Flash Memories

➤ EPROM

➤ FIFO's

➤ IC Memory Cards

JEDEC

PCMCIA



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## ASIC's

- CPU Core ASSP's
- Cell-based ASIC's
- Gate Arrays with  
Built-in Core CPU
- ARM based ASSP's

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## Other LSI's, IC's

⇒ CCD Sensor Chips

⇒ Hall IC's

⇒ HEMT

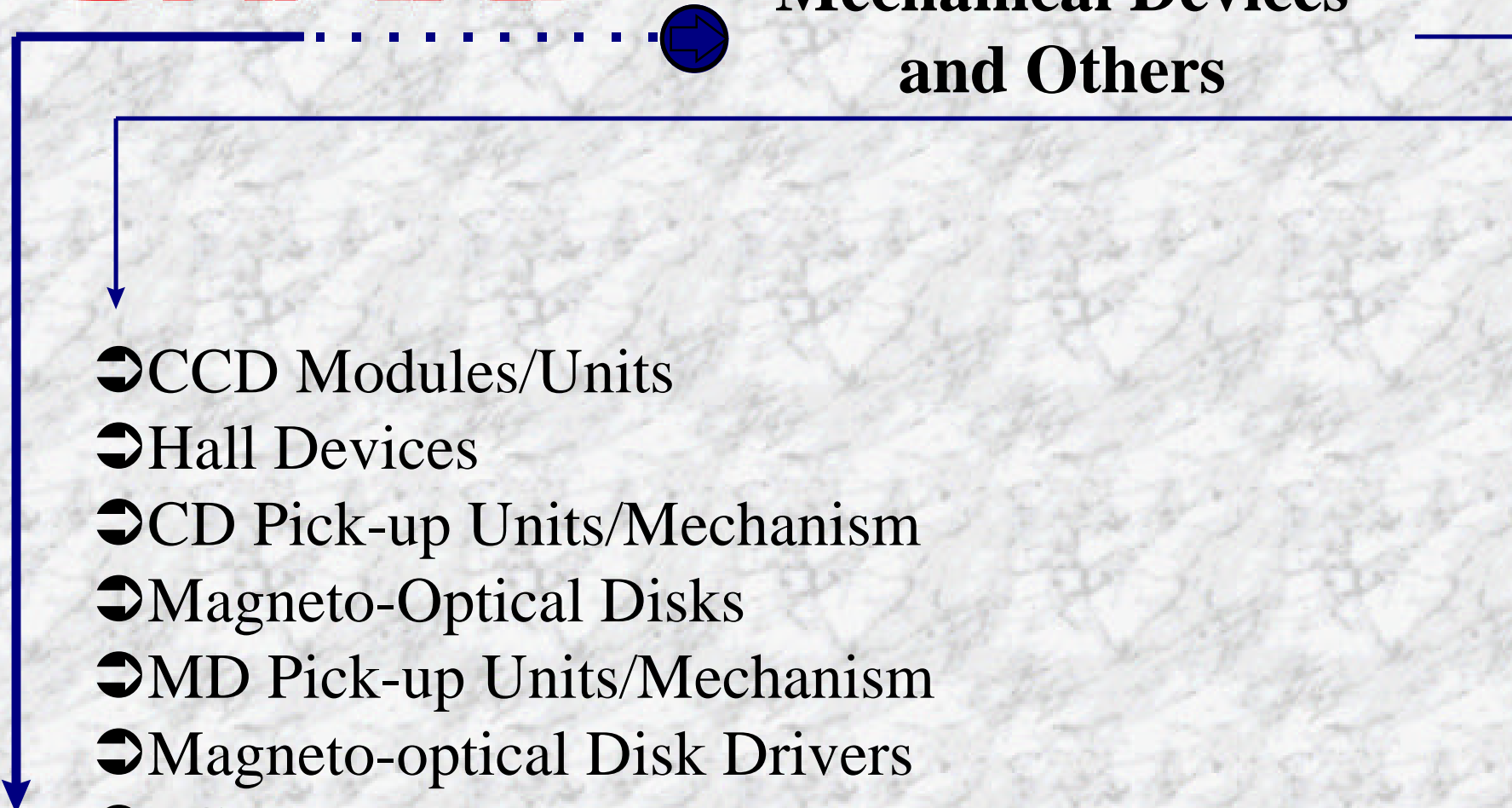
⇒ MMIC's

⇒ LCD Drivers

⇒ Bipolar IC's

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## Mechanical Devices and Others

- 
- ⇒ CCD Modules/Units
  - ⇒ Hall Devices
  - ⇒ CD Pick-up Units/Mechanism
  - ⇒ Magneto-Optical Disks
  - ⇒ MD Pick-up Units/Mechanism
  - ⇒ Magneto-optical Disk Drivers
  - ⇒ PCBs