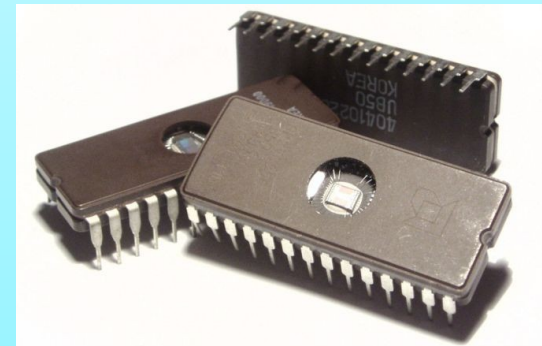# 25 Microchips That Shoot The World

- 報告人： 電機二Ｂ葉姿妤　電機二Ａ趙得宇
　　　　　電機二Ａ廖禹喬　電機二Ａ陳宛楨

- 指導老師：劉建男老師

簡介

- Focus on chips that proved unique, intriguing, awe-inspiring
- How it came about? Why it was innovative?
- Now: enduring objects, textbook design examples, commercial success, geeky reference, …

# Motorola MC68000 Microprocessor(1979)

- Internal 32-bit registers

- Designed by using pencil and paper

- Applications: laser printers, arcade games, industrial controllers...

Reference: http://en.wikipedia.org/wiki/Motorola_68000

Computer Cowboys Sh-Boom Processor (1988)

- Designed by Russell H. Fish & Chuck H. Moore

- Run its own superfast internal clock

- Not a commercial success

- Patriot & Moore have reaped over $125 million in licensing fees since 2006.
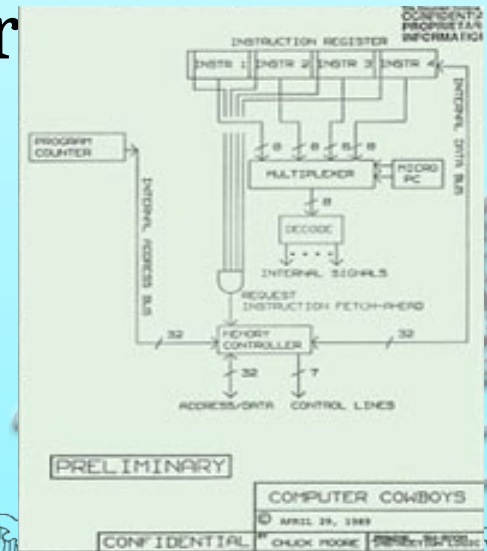
Chips & Technologies AT Chip Set(1985)

- IBM: 80286 AT line of PCs

  (100 chips on the motherboard)

- C&T: need only 5 chips to duplicate the functionality

- PC become cheaper

- 台灣 Chip set 廠 :
  威盛 , 矽統
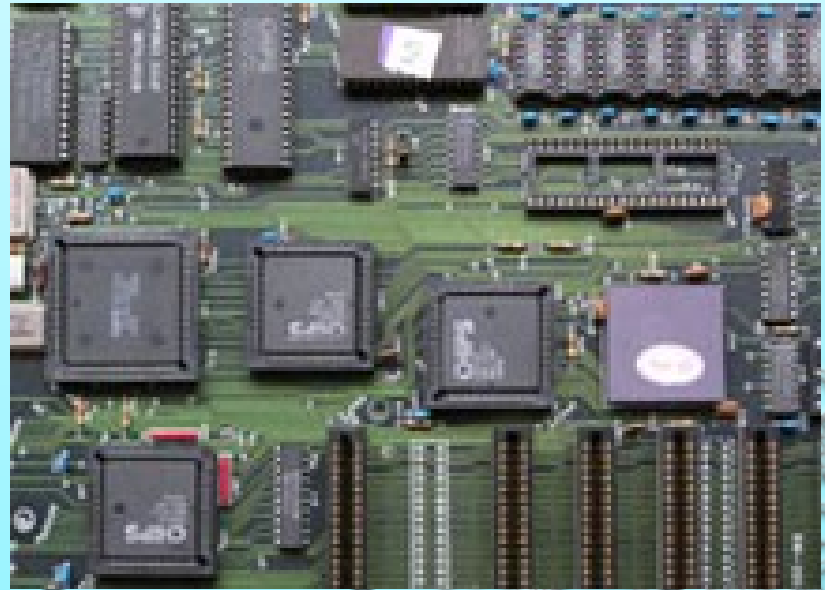
Amati Communications Overture ADSL Chip Set(1994)

- Use DMT(Discrete Multitone) modulation.

- In the mid-1990's, Amati's chip set sold in modest quantities, but by 2000, volume had increased to millions.

- In the early 2000s, sales exceeded 100 million chips per year.

Toshiba NAND Flash Memory(1989)

- Before: floppy disks, hard disks, EPROM… (2 transistors per memory cell)

- *Masuoka* : a transistor per memory .cell

- Intel: 256 kb chip in 1988.

- Toshiba became one of the biggest players in a multibillion-dollar markets due to digital photography in the late 1990s.

Tripath Technology TA2020 Audio Amplifier(1998)

- Performed better and cost less than vacuum tube-based amp.

- Low-end: 15W version sold for $3 and used in boom boxes and ministereos.

- Other version(max. 1000W output) used in home theaters.
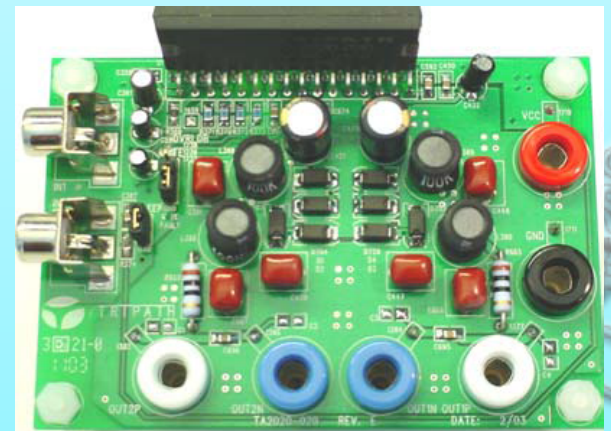
Signetics NE555 Timer(1971)

- As a timer or an oscillator

- Wtith fewer transistors, resistors, and diodes

- Versatility, stability and low cost

- Produce long time delays in a variety of applications

- Application: kichen appliance ,toy , spacecraft…

8-DIP封装   8-SOP封装
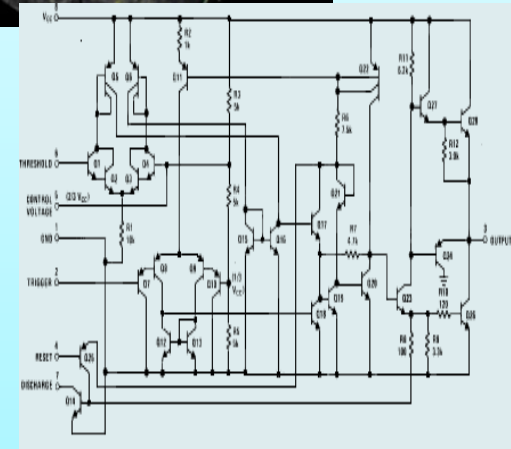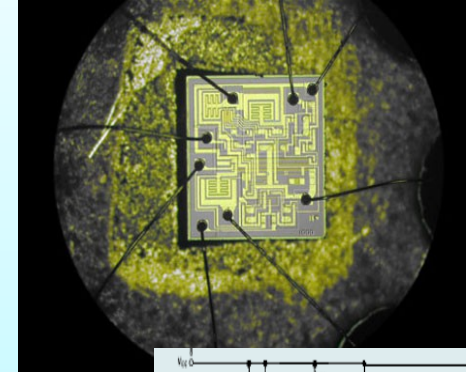
Texas Instruments TMC0281(1978)

- The first single-chip speech synthesizer

- Speak & Spell learning toy

- Conveyed voice by linear predictive coding

- Buzzing, hissing, & popping
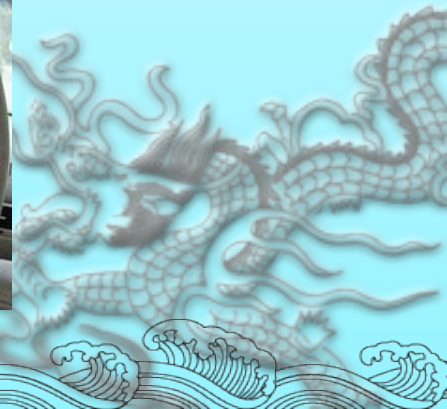
Deep Blue 2 Chess Chip(1997)

- On May 11, 1997, defeat world champion Garry Kasparov

- Written in C

- With 480 special purpose VLSI chess chips

- By Taiwanese Feng-hsiung Hsu

- The 259th most powerful supercomputer

Texas Instruments
Digital Micromirror Device (DMD)
(1987)

- An array of microscopically small, square mirrors

- A mirror, a single pixel

- Controlled by electrostatic forces

- An be turned on and off thousands of times per second

- Make images brighter, sharper and more realistic

- Application: projector
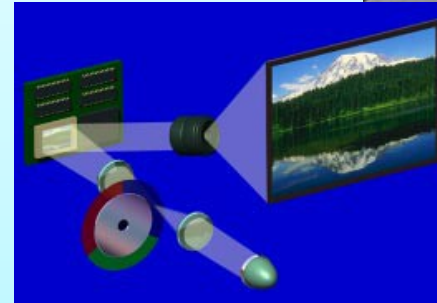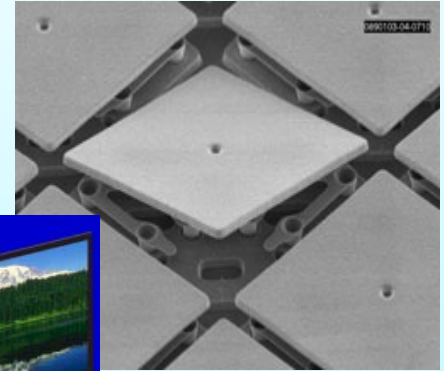
Transmeta Crusoe(1978)

- Low power consumption

- High efficiency

- Special method of achieving x86 compatibility

- Proved that dynamic binary translation was commercially viable
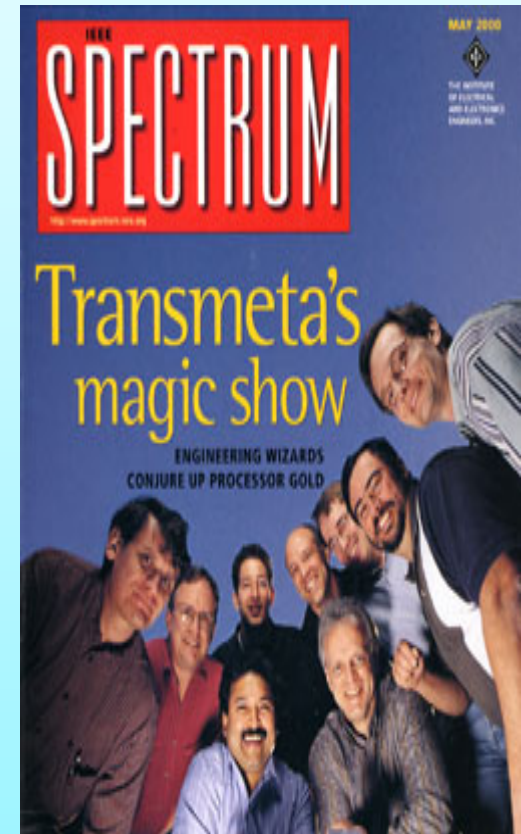
MOS Technology 6502(1975)

- an 8-bit microprocessor with a 16-bit address bus

- High efficiency but cheap

- the first "public" uses : Apple I Apple II

- Another uses: video games
- It is still made for embedded systems.

- result in the home computer revolution of the 1980s
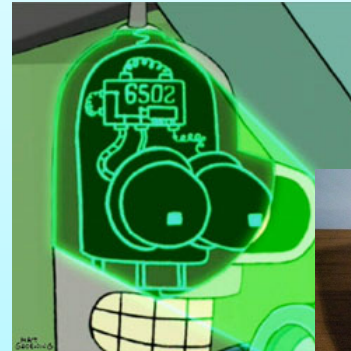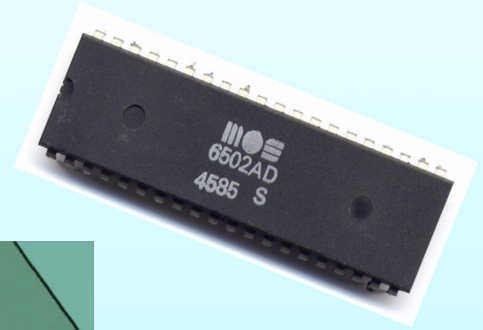
Intel 8088 Microprocessor(1979)

- First 16-bit CPU that IBM chose for its original PC line

- "A castrated version of 8086" one of Intel's best decisions

- The first PC to use the 8088 was IBM's Model 5150, a monochrome machine that cost US$3000

- Not bad for a castrated chip.
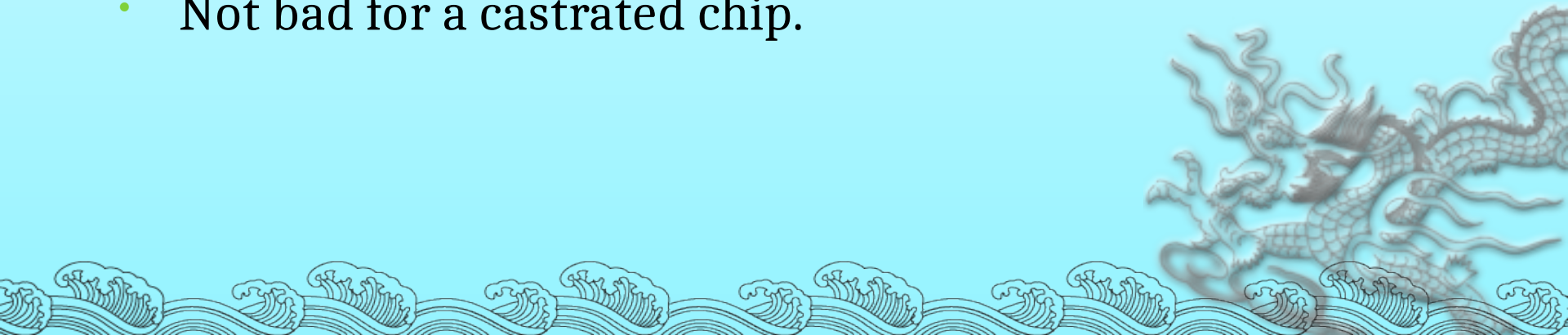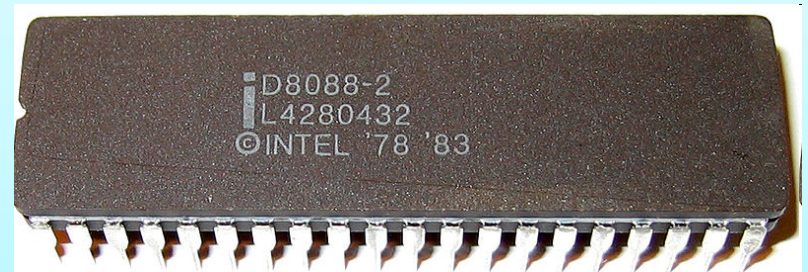
Micronas Semiconductor MAS3507 MP3 Decoder(1997)

- The player(Diamond Rio PMP300) carried the MAS3507 MP3 decoder chip--a RISC-based digital signal processor

- The Rio and its successors paved the way for the iPod, and you can carry thousands of songs.
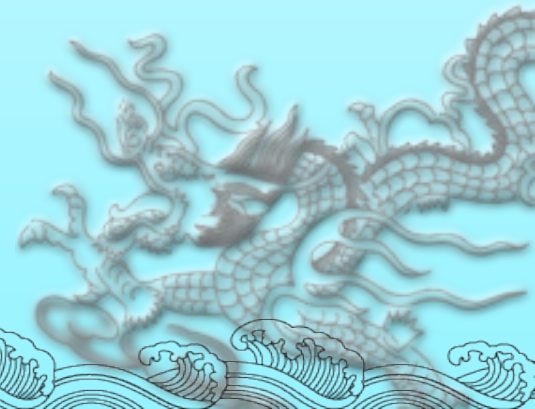
Mostek MK4096 4-Kilobit DRAM(1973)

- More pins memories as memory density increased

- A circuitry trick called address multiplexing(Bob Proebsting)

- Problem:4096 used 16 pins, whereas Texas Instruments,Intel,and Motorola used 22 pins.
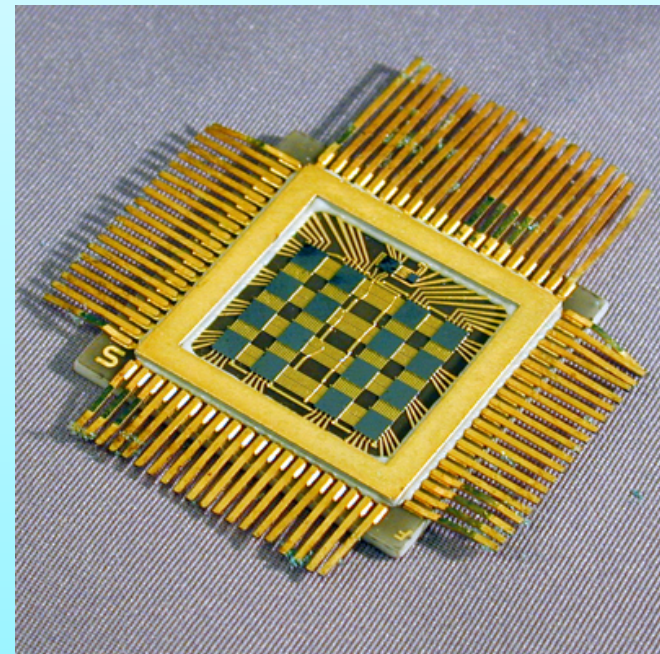
Xilinx XC2064 FPGA(1985)

- Ross Freeman came up with a chip packed with transistors that formed loosely organized logic blocks that in turn could be configured and reconfigured with software.

ZilogZ80 MIcroprocessor

- Federico Faggin want to design a single-chip microcontroller.

- They worked 80-hour weeks hunched over tables, drawing the Z80.(small is beautiful)

- The goal was to outperform the 8080 and also offer full compatibility with 8080 software

- Applications: Osborne I, Radio Shack TRS-80,MSX home computers, printers, fax machines, photocopiers, modems, and satellites.

Sun Microsystems SPARC Processor

- a 32-bit RISC processor called SPARC

- Power profitable work satations
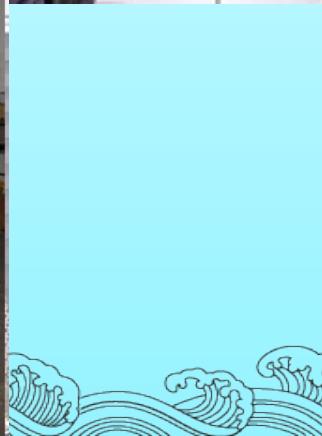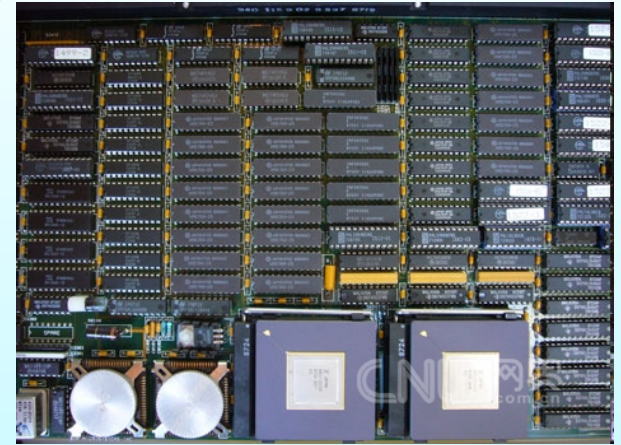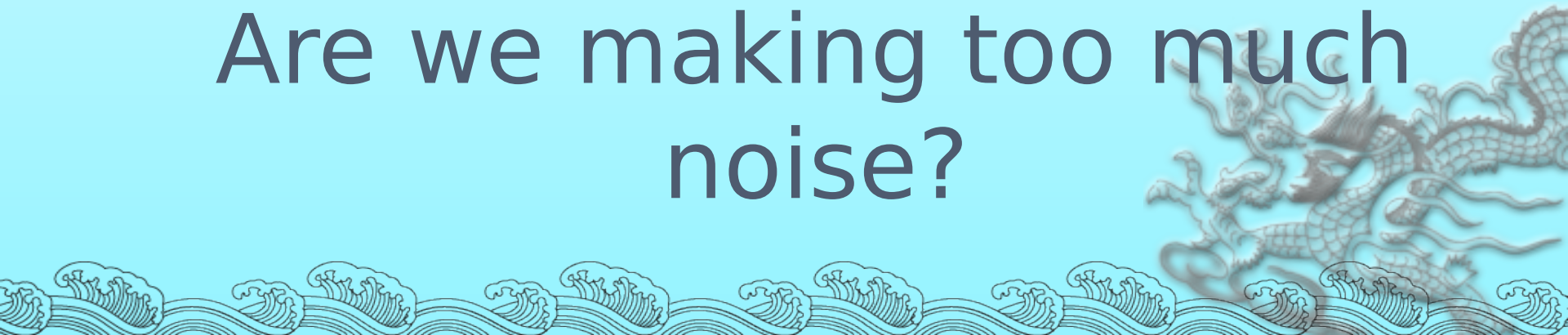
TMS32010 Digital Signal Processor

- Created by Texas Instrument, and made TI's big fortune.

- The fastest DSP. It can compute a multiply operation in 200 nanoseconds.

- Application : modems, medical devices, military systems, and Julie doll.

- Julie doll, that could sing and talk

Are we making too much noise?

PIC 16C84 Microcontroller

- Incorporated a type of memory called EEPROM, it didn't need UV light to be erased.

- Now users could change their code on the fly.

- The beginning of a line of microcontrollers that became electronics superstars.

- Application : smart cards, remote controls, wireless car keys, chip-controlled fireworks, and unmanned aerial vehicles.

Operational amplifiers µA741

- Make audio and video preamplifiers, voltage comparators, precision rectifiers

- Improve from LM101, which has frequency distortions and sensitive to noise.

- Become the standard for op-amps
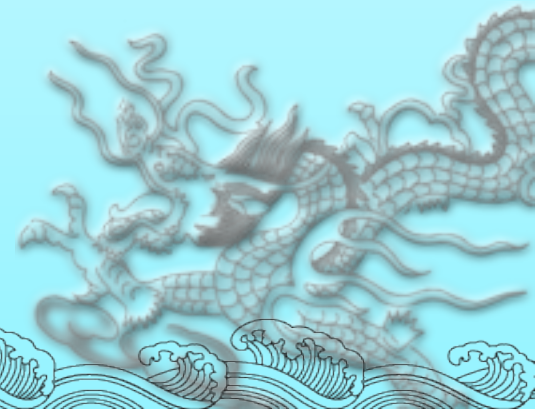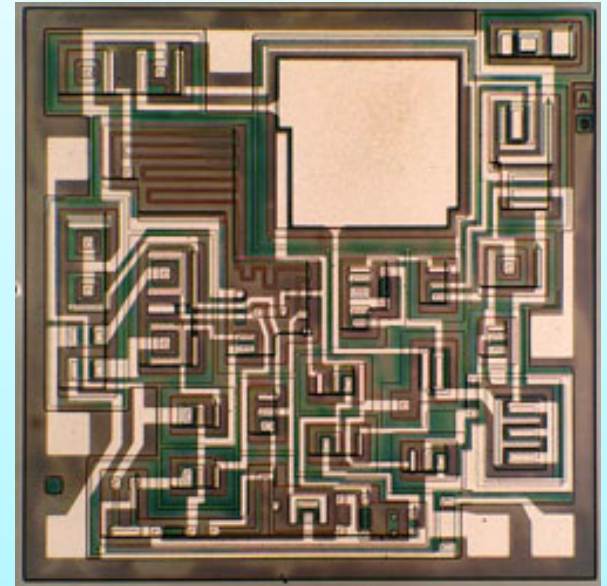
ICL8038 Waveform Generator

- A generator of sine, square, triangular, sawtooth, and pulse waveforms.

- But it has limited performance and propensity for behaving erratically.

- Use in Moog music synthesizers, homemade function generators and theremins and the "blue boxes" that "phreakers" used to beat the phone companies in the 1980s
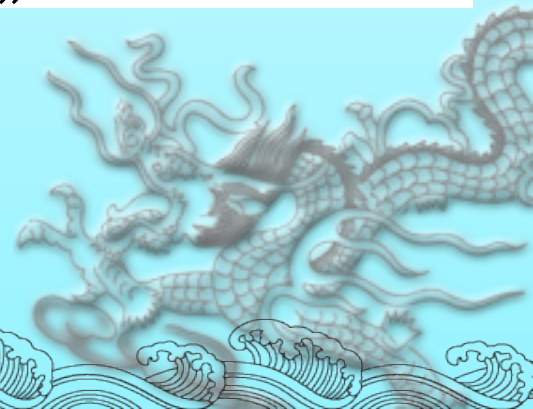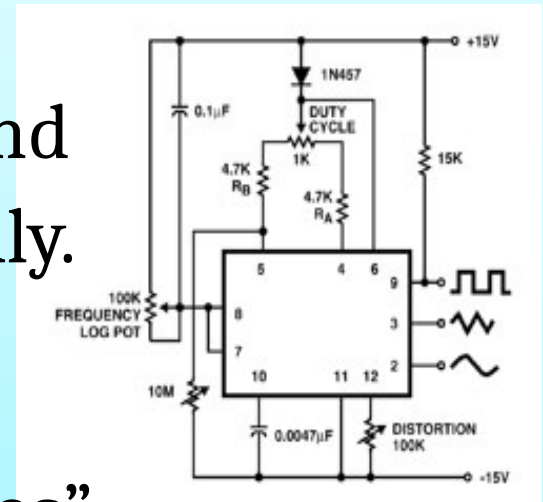
WD1402A UART

- Universal Asynchronous Receiver/Transmitter
- Translates data between parallel and serial forms
- Used in modems, PC peripherals

ARM1 Processor

- Advanced RISC Machine

- 32-bit reduced instruction set computer

- ARM was small, low power, and easy to program.

- Dominant in the mobile and embedded electronics market as relatively low cost.

- More than 10 billion ARM cores have been used.
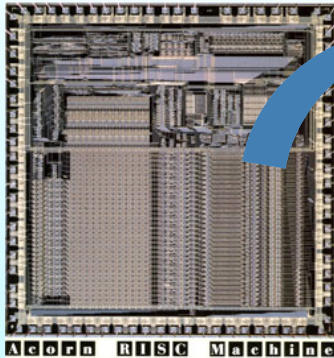
Used in iPhone

KAF-1300 Image Sensor

- The chip became the basis for future CCD sensors.

- CCD sensors is the application of the Photoelectric effect.

- Nobel Goes to Boyle and Smith for CCD Camera Chip.

What was the very first photo made with the KAF-1300?

The wall of the laboratory......