

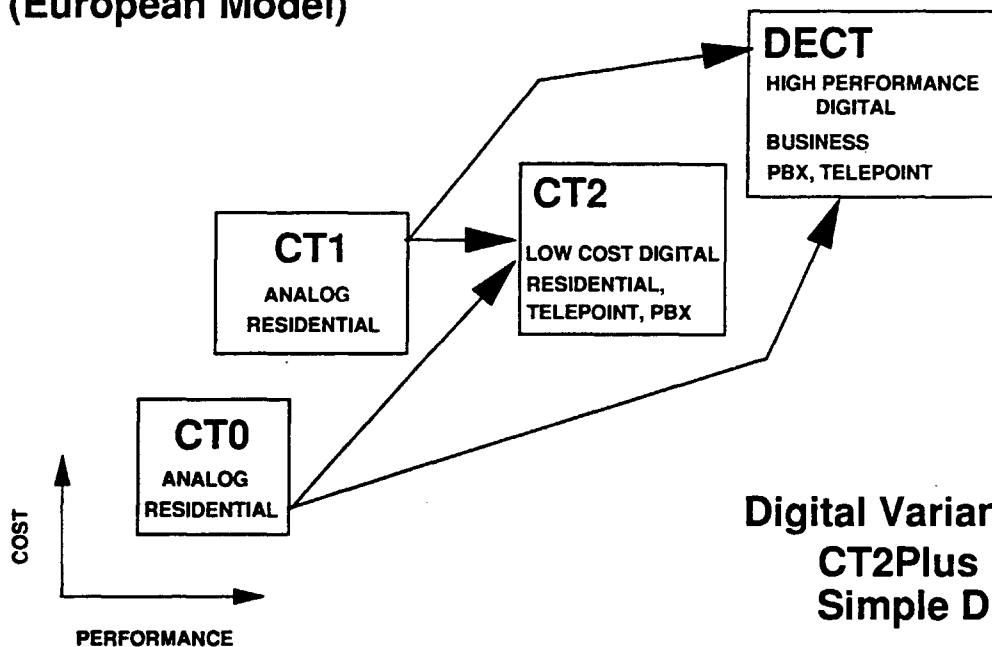


# AN INTEGRATED SOLUTION FOR CT2 DIGITAL CORDLESS TELEPHONES

## The Am79C410 PhoX™ Chip

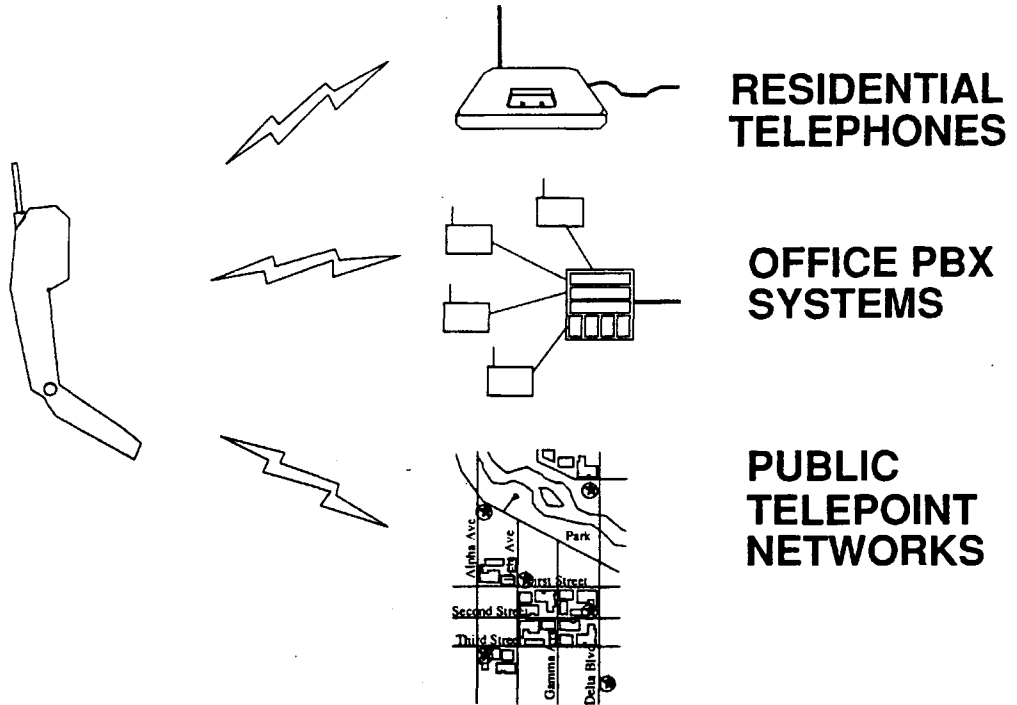


### PROGRESSION of CORDLESS TELEPHONY (European Model)

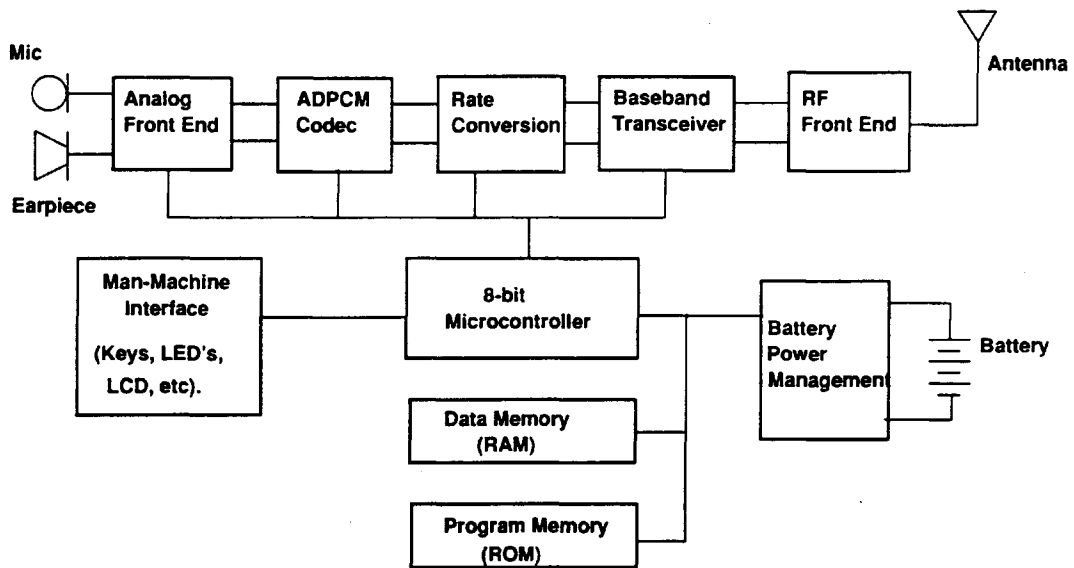




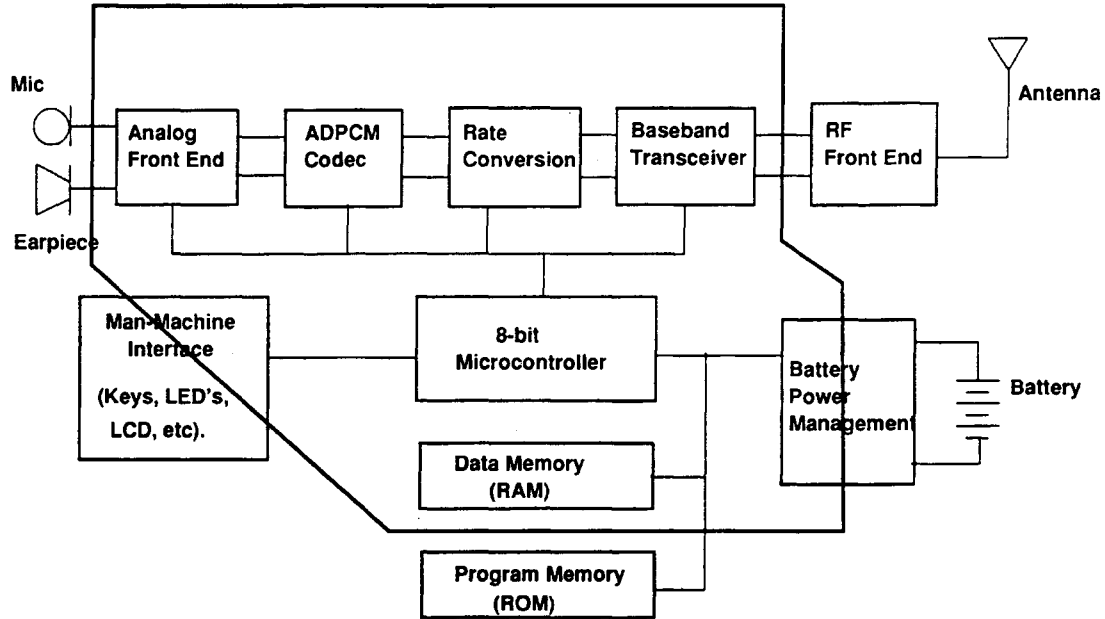
# CT2 APPLICATIONS



# BASIC CT2 HANDSET FUNCTIONS



## PhoX CHIP FUNCTIONS



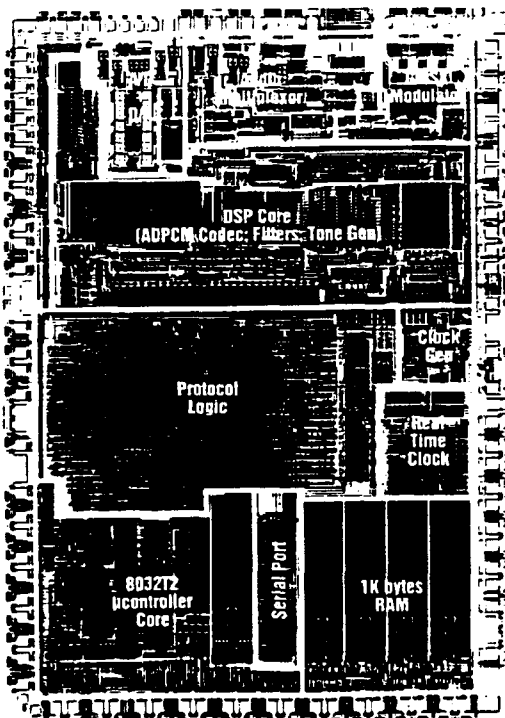
## INTEGRATED TECHNOLOGIES

- Analog (audio) Signal Processing
- Analog <-> Digital Conversion
- Digital Signal Processing (DSP)
- Voice Data Compression (ADPCM)
- Direct Digital Waveform Synthesis

## INTEGRATED TECHNOLOGIES

- Digital CMOS "ASIC" Design
- 8-bit CMOS Microcontroller
- Memories: Static RAM and FIFO
- 3-5 V Power Supply
- Battery Back-up
- Integrated Power Management

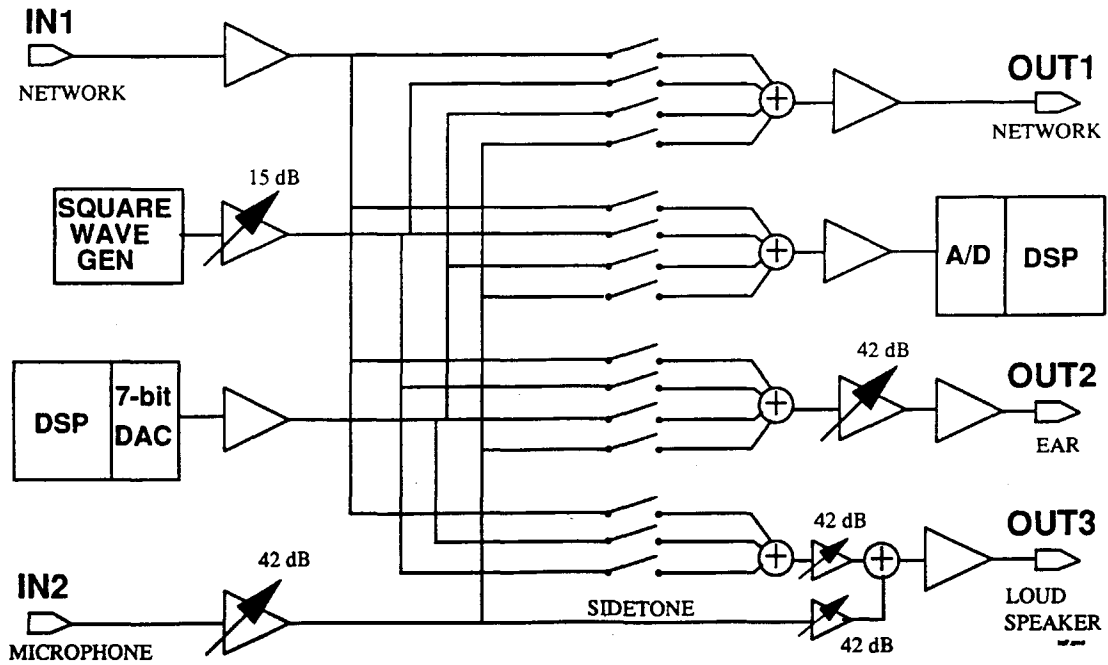
## THE PhoX CHIP DIE



### Vital Statistics:

**Process: 0.8 um CMOS**  
**Die Area: 80k sq mils**  
**#Transistors: 200k**  
**Power Supply: 2.7 - 5.5 V**  
**Active Power @3V: 38 mW**  
**Standby @3V: 100 uW**

## ANALOG FRONT END



## DATA CONVERSION

### A-D Converter:

**Delta-Sigma Modulator Architecture**

**2 MHz Sampling Rate**

**1-bit Output**

\* High sampling rate makes  
anti-aliasing filters easy.

### D-A Converter:

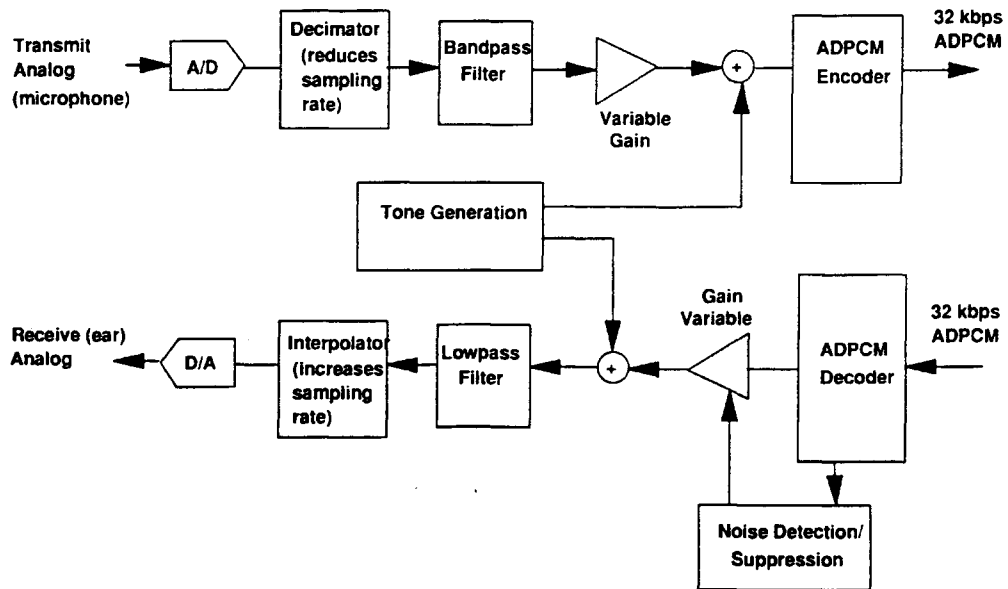
**8-bit Resolution**

**128 kHz Sampling Rate**

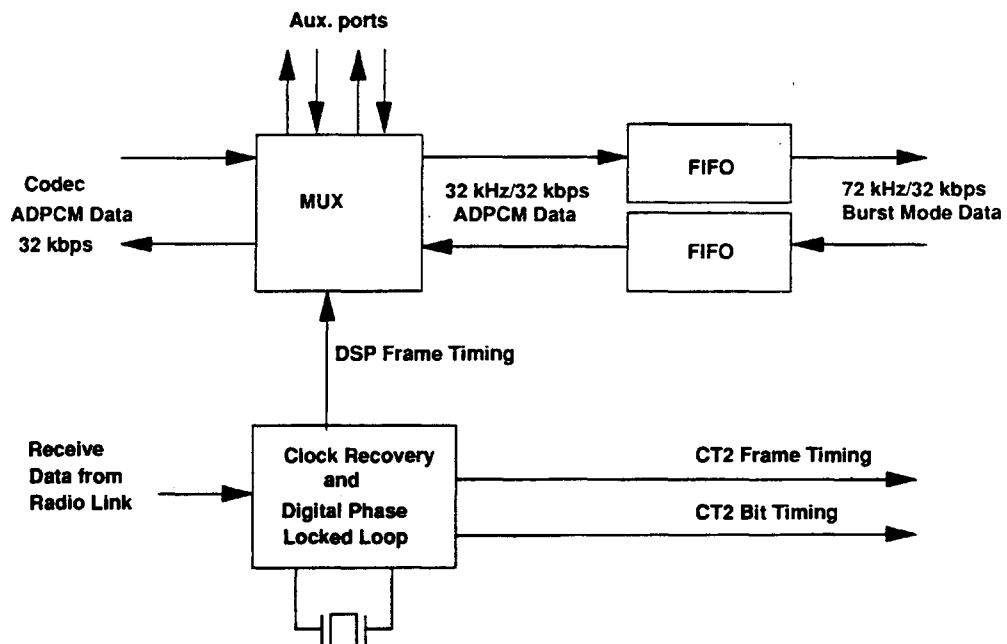
\* High sampling rate makes  
output images easy to filter.



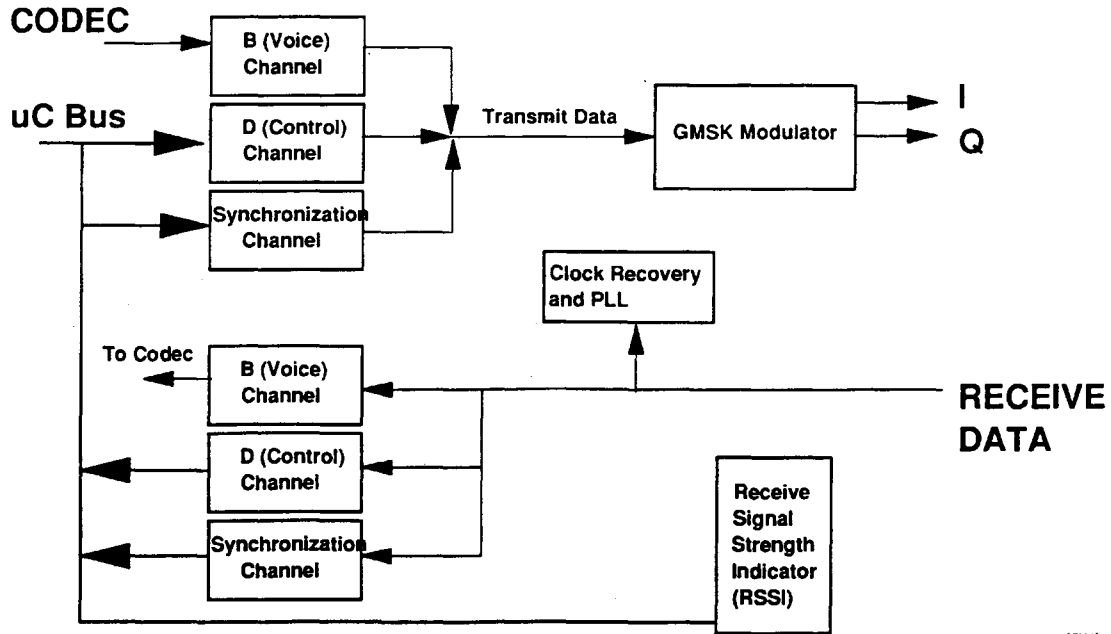
## DSP and VOICE COMPRESSION



## DATA RATE CONVERSION



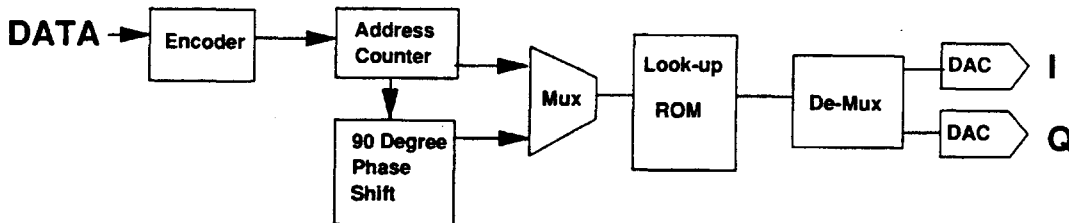
## CT2 BASEBAND TRANSCEIVER



## GMSK MODULATOR

**GMSK - Gaussian-filtered Minimum Shift Key,**  
a Frequency Shift Keying Technique for  
minimum spectral spread.

**DDS - Direct Digital Synthesis:**  
Reduces part-to-part variation  
Mask-programmed frequency response,  
in this case a 6th-order Bessel filter





## LOW POWER DESIGN

Low power is **IMPERATIVE** in a hand-held design

- 3 V Capability
- Full CMOS Design
- Special Low Power and "Zero Power" Modes
- Optimized DSP Engine
- Variable Processor Clock Rates
- Battery back-up input for static RAM
- Separate Enable Controls for Various Internal Peripheral Blocks



## RAPID TIME TO MARKET

Rapid time to market is **KEY** to customer success in consumer industries.

- Parallel Development Paths
  - Software
  - Baseband Hardware
  - RF Hardware
- In-Circuit Emulation Capability for Software Design
- Test Injection/Detection Ports for Software Error Testing
- Audio Test Loopback Paths for Analog and Bit Error Rate Testing
- Direct Transmit Modulator Drive for RF Transmission Testing





## **PhoX CHIP CHALLENGES**

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- **High Integration**
- **Diverse Silicon Requirements**
- **Low Power**
- **Variable Supply Voltage**
- **Built-in Development Support**
- **LOW COST**