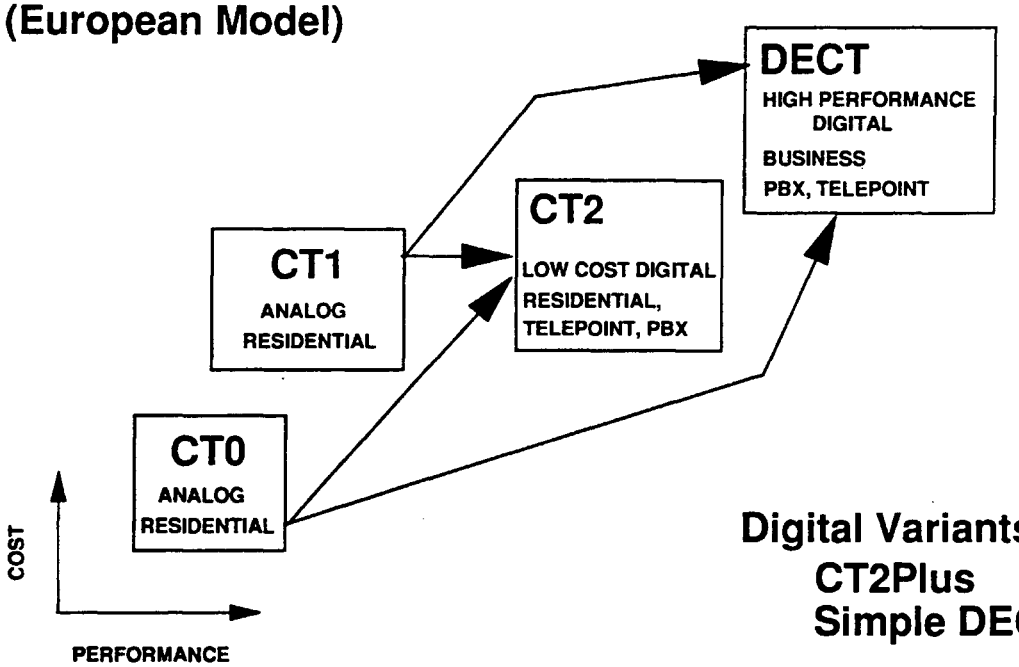
ADVANCED MICRO DEVICES

AN INTEGRATED SOLUTION FOR CT2 DIGITAL CORDLESS TELEPHONES

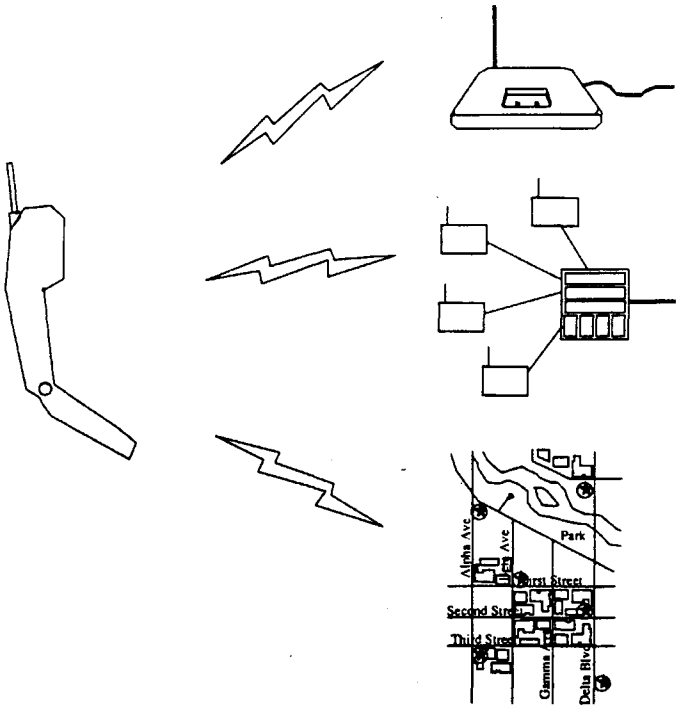
The Am79C410 PhoX™ Chip

PROGRESSION of CORDLESS TELEPHONY
(European Model)



Digital Variants:
CT2Plus
Simple DECT

CT2 APPLICATIONS

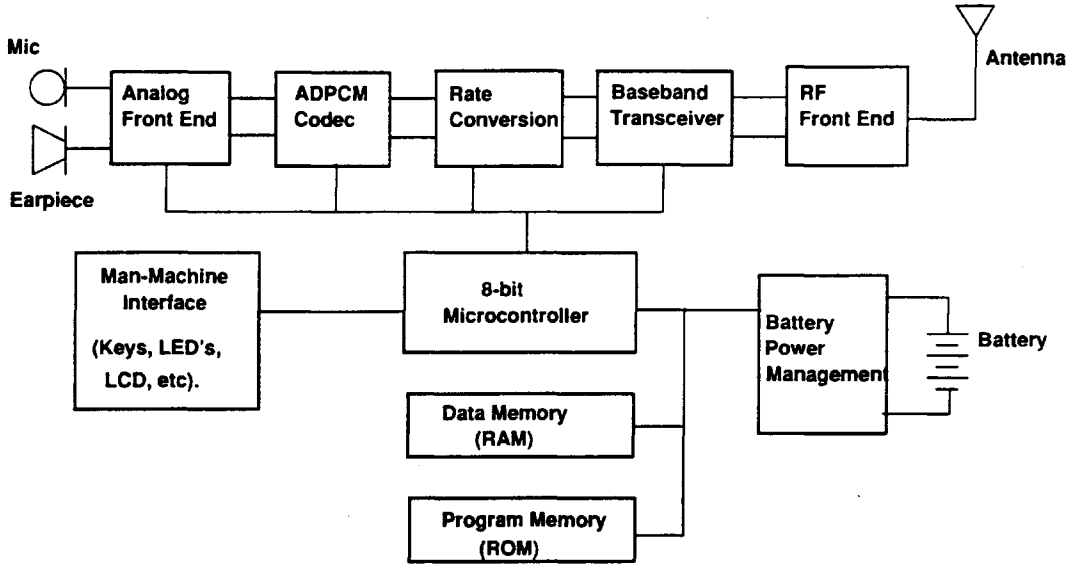


RESIDENTIAL TELEPHONES

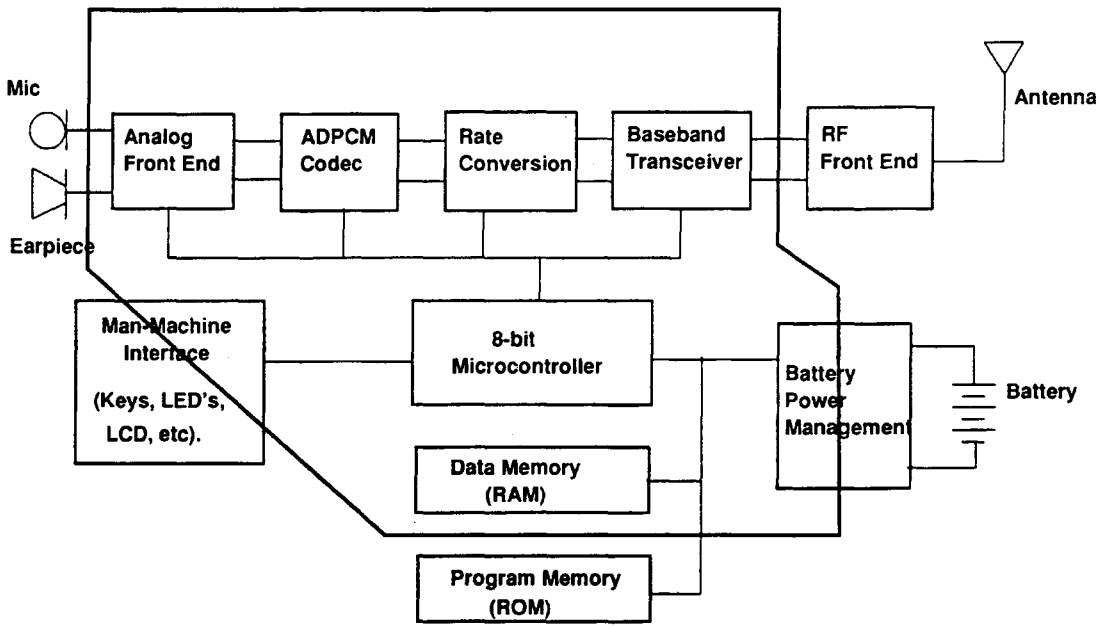
OFFICE PBX SYSTEMS

PUBLIC TELEPOINT NETWORKS

BASIC CT2 HANDSET FUNCTIONS



PhoX CHIP FUNCTIONS



Am79C410 CT2 PhoX

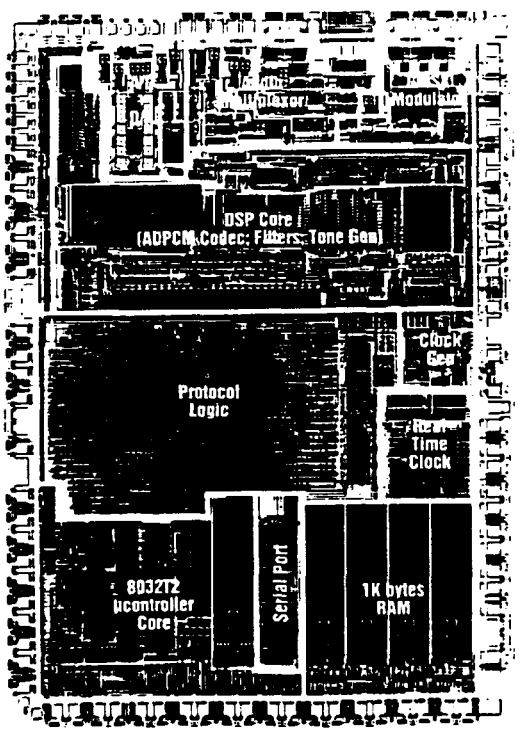
INTEGRATED TECHNOLOGIES

- 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

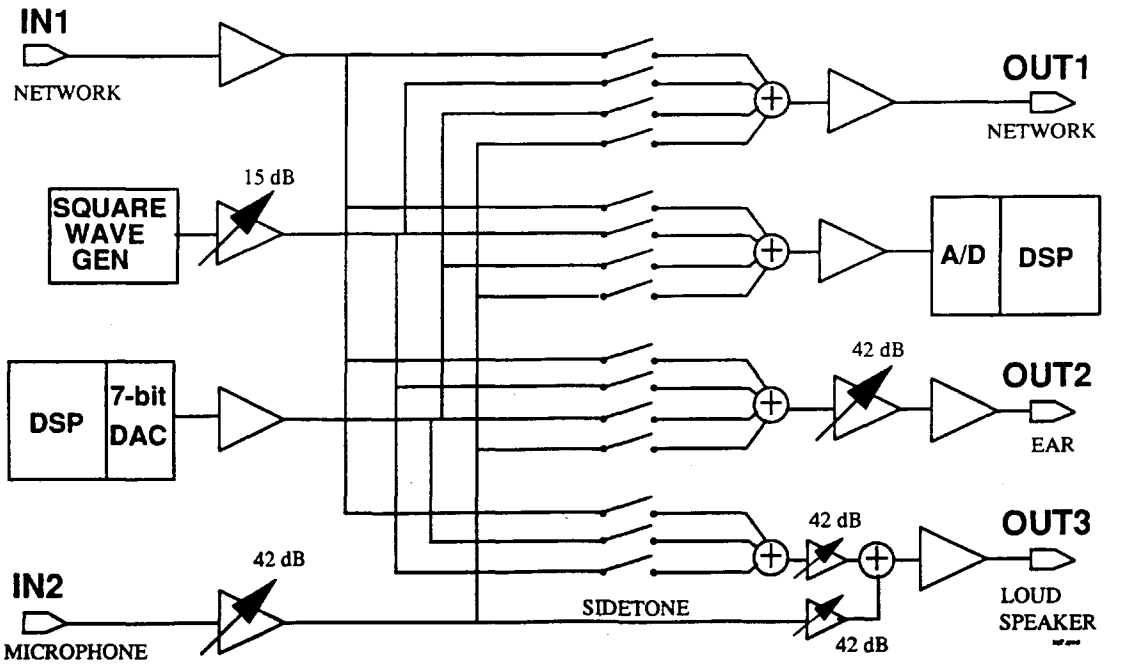
THE PhoX CHIP DIE



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

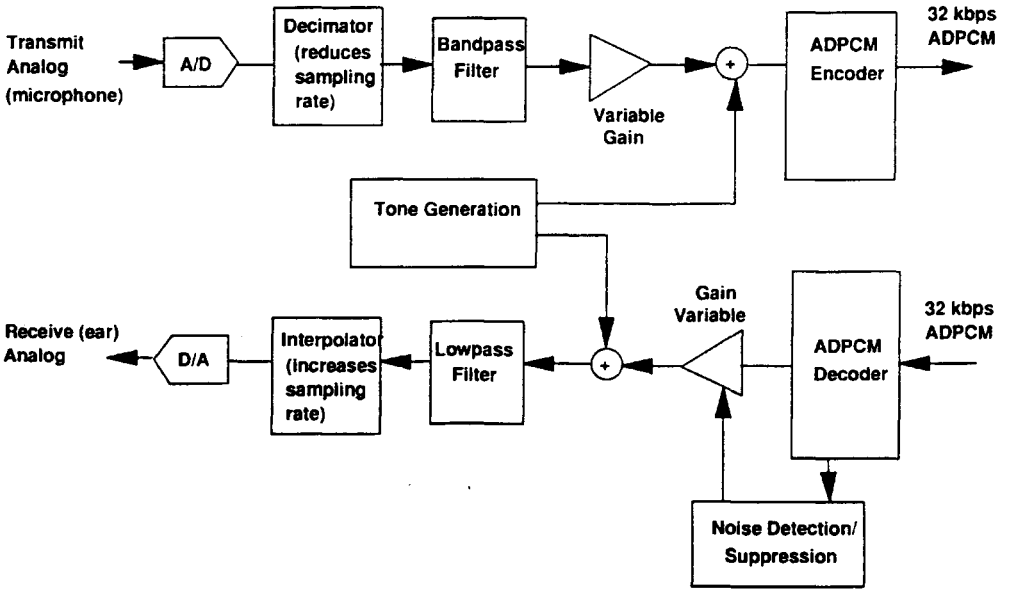
A-D Converter:

- Delta-Sigma Modulator Architecture
- 2 MHz Sampling Rate
- 1-bit Output
  - * High sampling rate makes anti-aliasing filters easy.

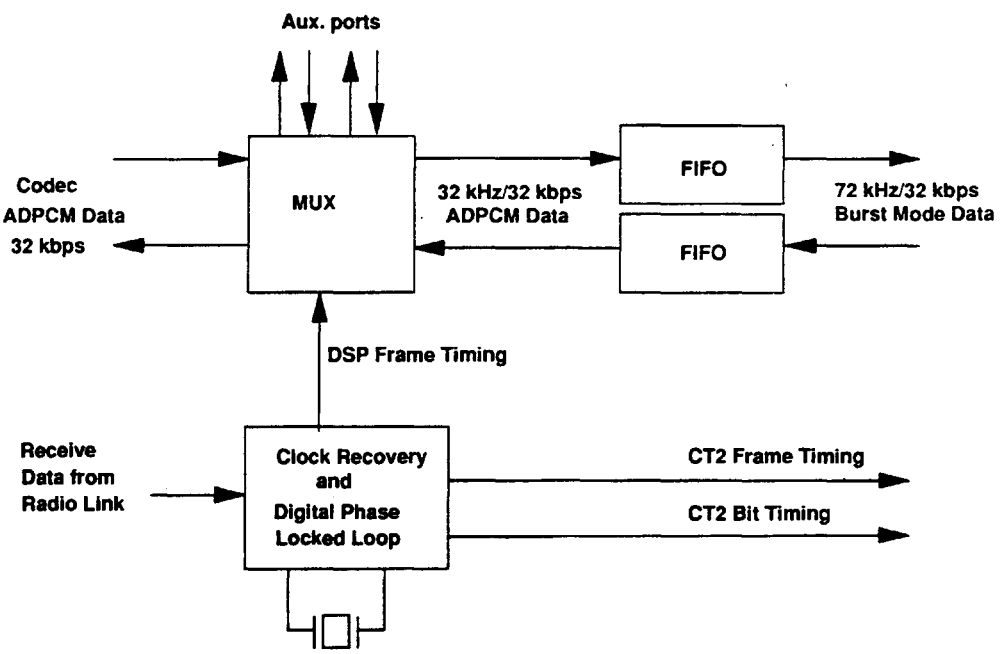
D-A Converter:

- 8-bit Resolution
- 128 kHz Sampling Rate
- * High sampling rate makes output images easy to filter.

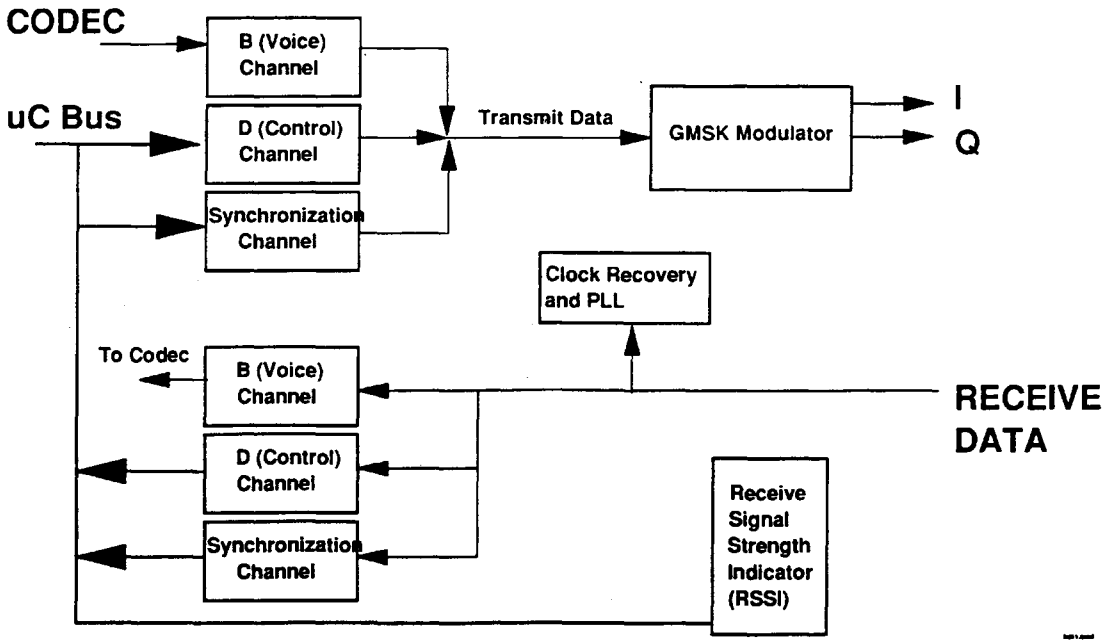
DSP and VOICE COMPRESSION



DATA RATE CONVERSION



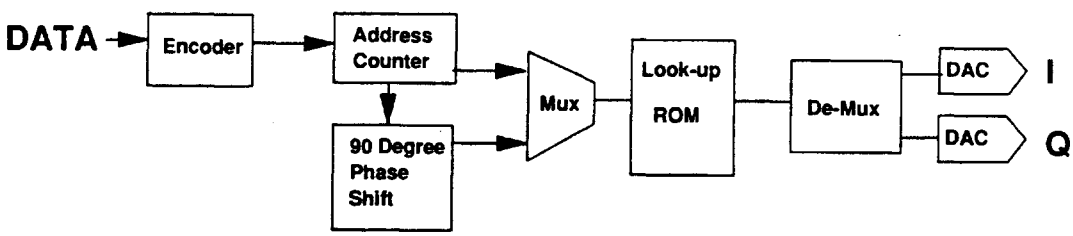
CT2 BASEBAND TRANSCEIVER



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



ADVANCED MICRO DEVICES

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

ADVANCED MICRO DEVICES

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**

ADVANCED
MICRO
DEVICES

PhoX CHIP CHALLENGES

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