TRESEMI
EMPOWERING TOMORROW'S LEADERS

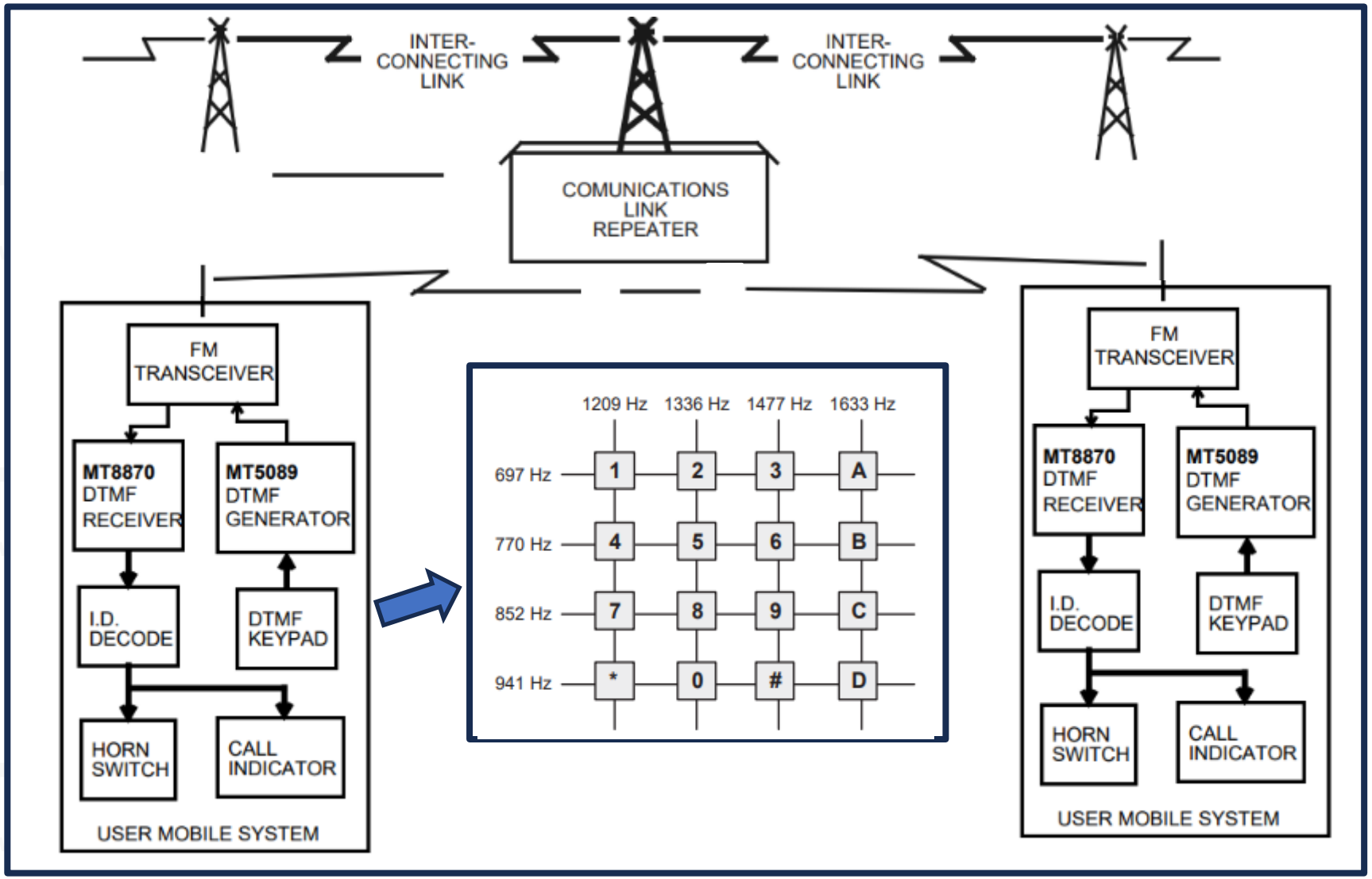
Overview of the DTFM Receiver IC

Tresemi

Example of DTMF in User Mobile System

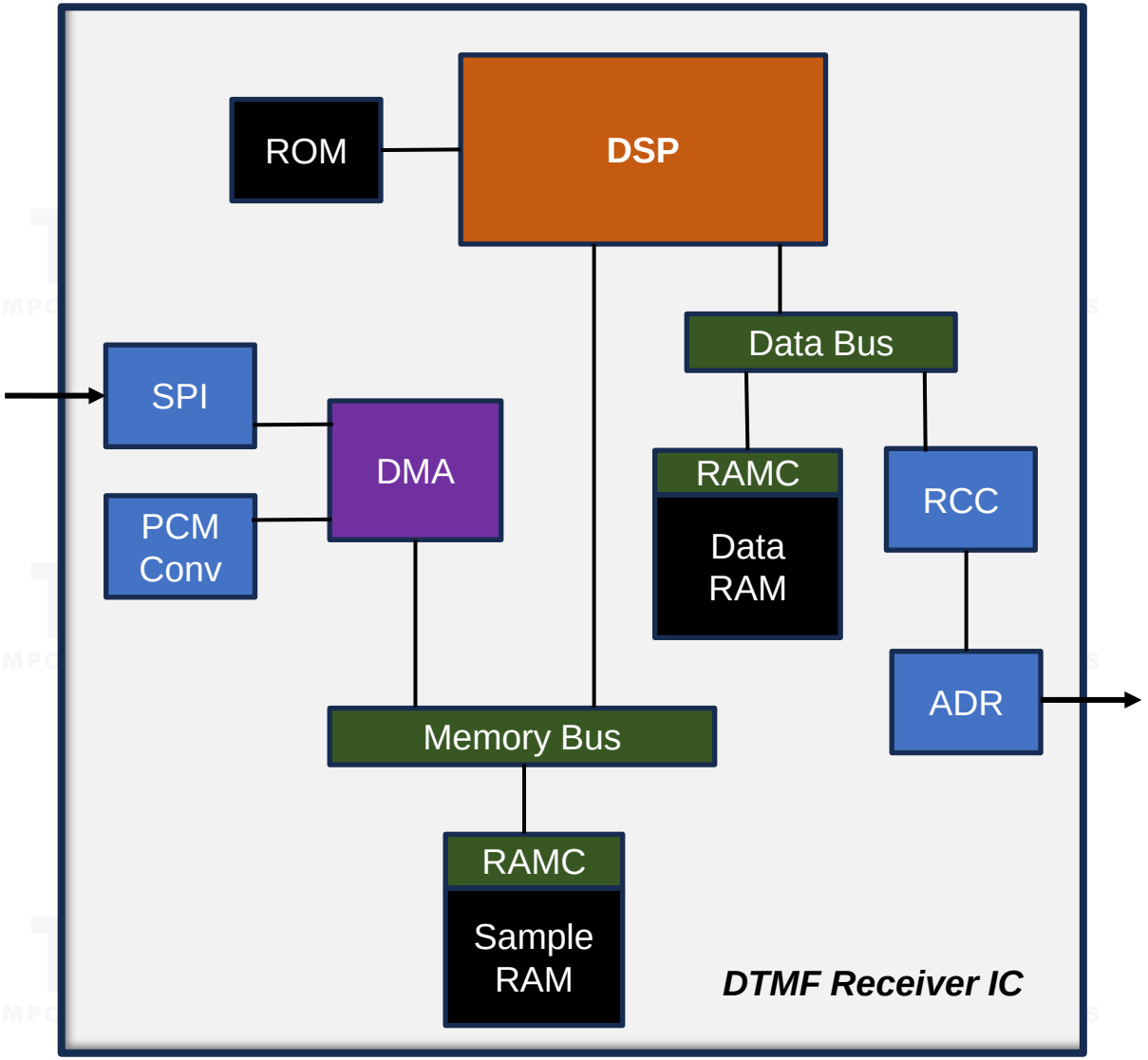
A DTMF (dual tone multiple frequency) codec incorporates:

- a generator (or encoder) that translates keystrokes or digit information into dual tone signals.
- A receiver (or decoder) detecting the presence and the information content of incoming DTMF tone signals.
- Each key on the keypad is uniquely identified by its row and its column frequency.



DTMF Receiver SoC

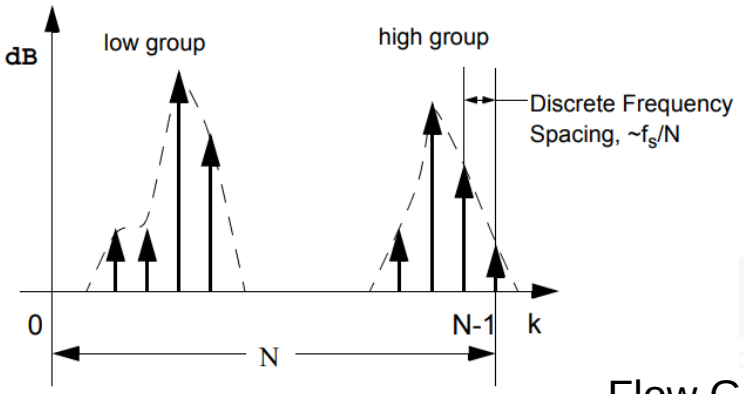
- 16-bit DSP to calculate the signal spectrum of input samples.
  - Single MAC
  - Operates up to 25MHz
  - 256 bytes ROM for DSP program
  - 384 bytes RAM for DSP scratch memory
- DMA engine for data transfer between peripherals and memory.
- 512 bytes System SRAM for holding data samples.
- Serial Peripheral Interface (SPI) to receive inputs from transceiver.
- PCM Conversion to expand u-Law compress PCM samples to linear PCM samples.
- Results Character Conversion (RCC) to analyze the DTMF digit content.
- ASCII Digit Register (ADR) receives the 8-bit result character from the RCC and sends it to the host.

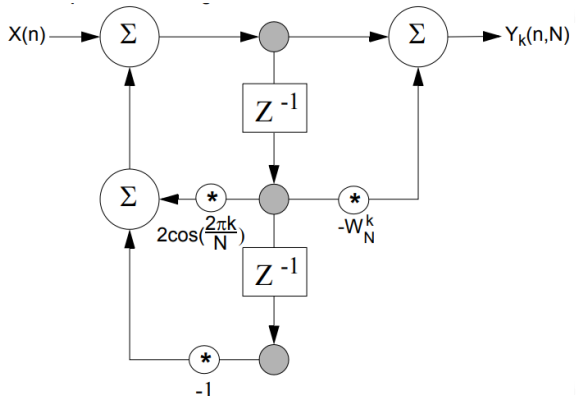


DTMF Receiver Operation

DTMF Receiver Dataflow

1. The DTMF Receiver receives input samples via the SPI port.
2. The DMA moves input samples from SPI to PCM Conv.
3. The PCM Conv expands u-Law compressed PCM samples to linear PCM samples.
4. DMA moves linear PCM samples to the Sample RAM
5. DSP loads PCM samples from the Sample RAM
6. DSP calculates the signal spectrum of PCM samples.
7. DSP writes output data to the RCC
8. RCC analyzes the digit content to identify the resultant characters.
9. The RCC sends the resultant characters to the ADR.
10. The ADR sends the resultant characters to the host processor.





Flow Graph of Goertzel Algorithm