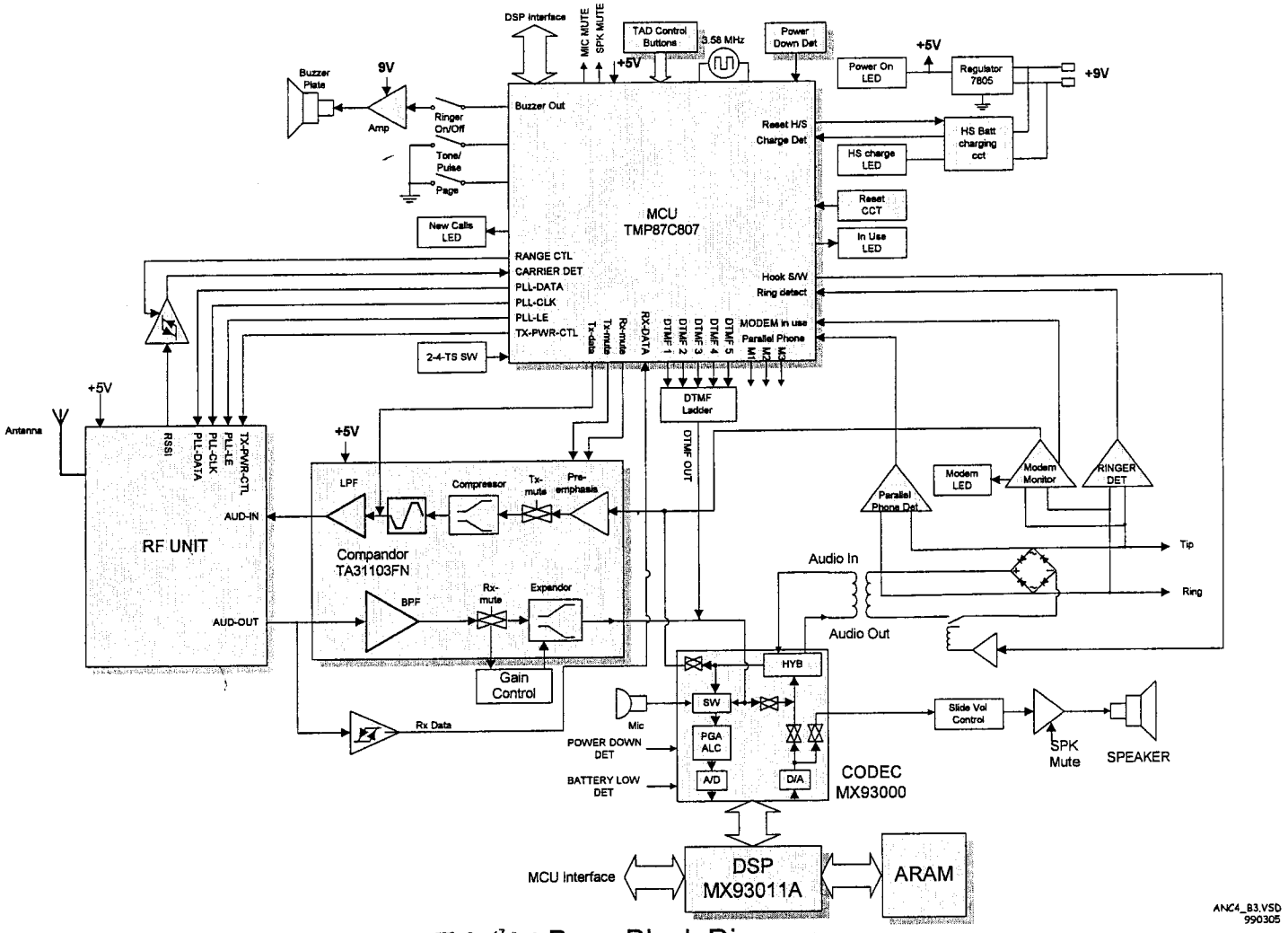
# Technical Description




TC-920 Base Block Diagram

⇒ A single 12V DC adapter is used to supply power for all components on the main board including handset battery charging.

⇒ In order to retain messages stored in ARAM, a 9V battery, no recharging, is used.

⇒ A MCU TMP87C807 running at 3.58MHz is used to centralize all controls and data handshaking with handset as well as with DAM DSP.

⇒ When the hook switch is connected, signal at tip and ring (T&R) will pass through the sidetone filter and the speech network before feeding into the compressor. The output of the LPF of the compressor will then directly modulate the main carrier which is locked by the PLL programmed by the MCU.

⇒ The tuned RF signal strength will be used as RSSI to issue an out of range alert from MCU.

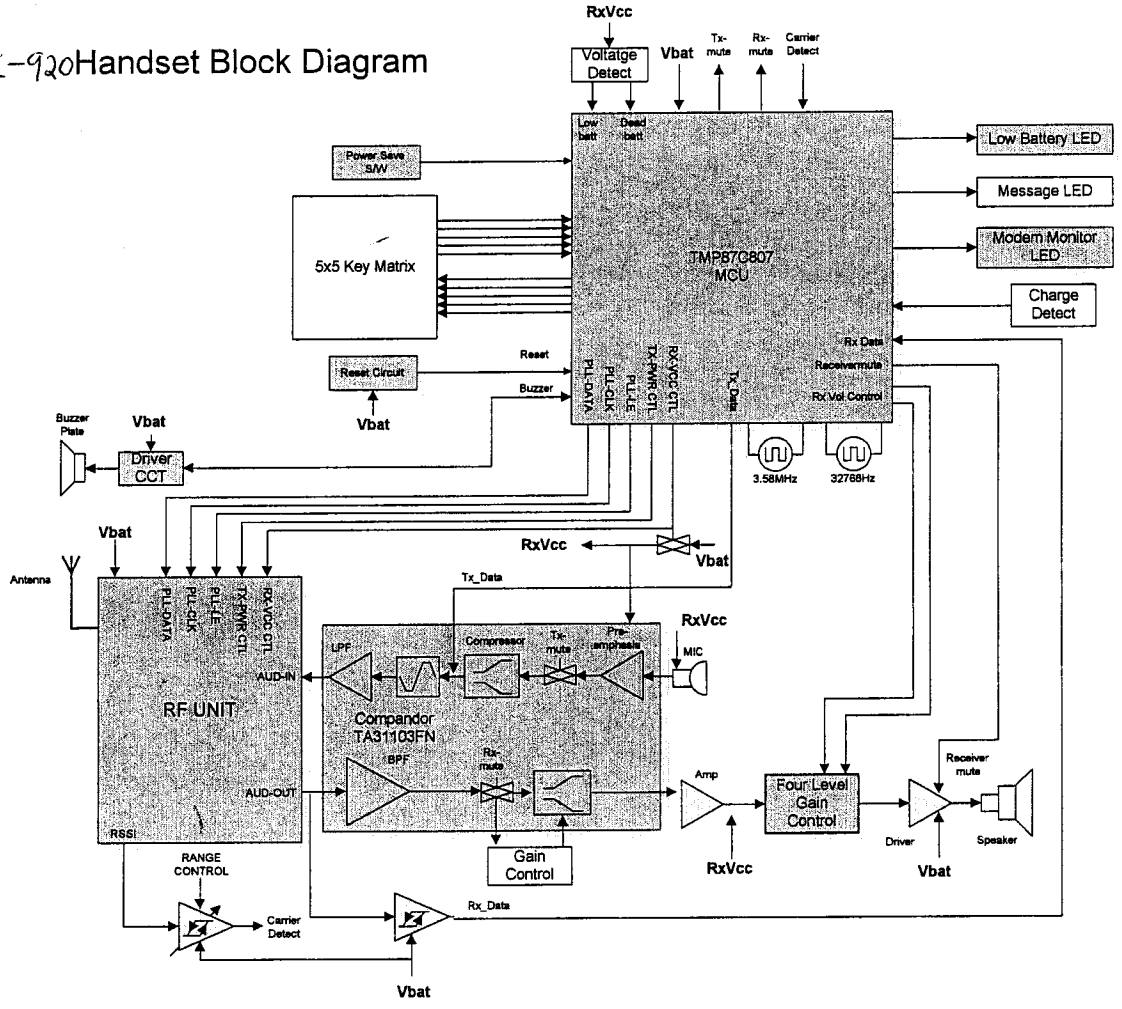
⇒ Tuned audio signal is split into 2 paths; one of them is fed to a data recovery circuit before entering the MCU while the other path goes to the expander. Unlike receiving path, the signal out of the expander will be fed into the CODEC IC of the DAM before the speech network and sidetone filter and the telephone line.

⇒ The DAM section is much like a self-contained module running at 3.58MHz with power-down capability.

⇒ Signal from line is tapped from the input path of the compressor while the signal to line signal is processed at the CODEC itself.

⇒ All LEDs, keys, and switches of the DAM are monitored and controlled by the DSP independently and only a serial bus connects with the MCU to maintain minimal handshake.

TC-920 Handset Block Diagram




ANC4_H1.VSD
980724

⇒ A MCU TMP87C807 running at 3.58MHz is used to centralize all controls and data handshaking.

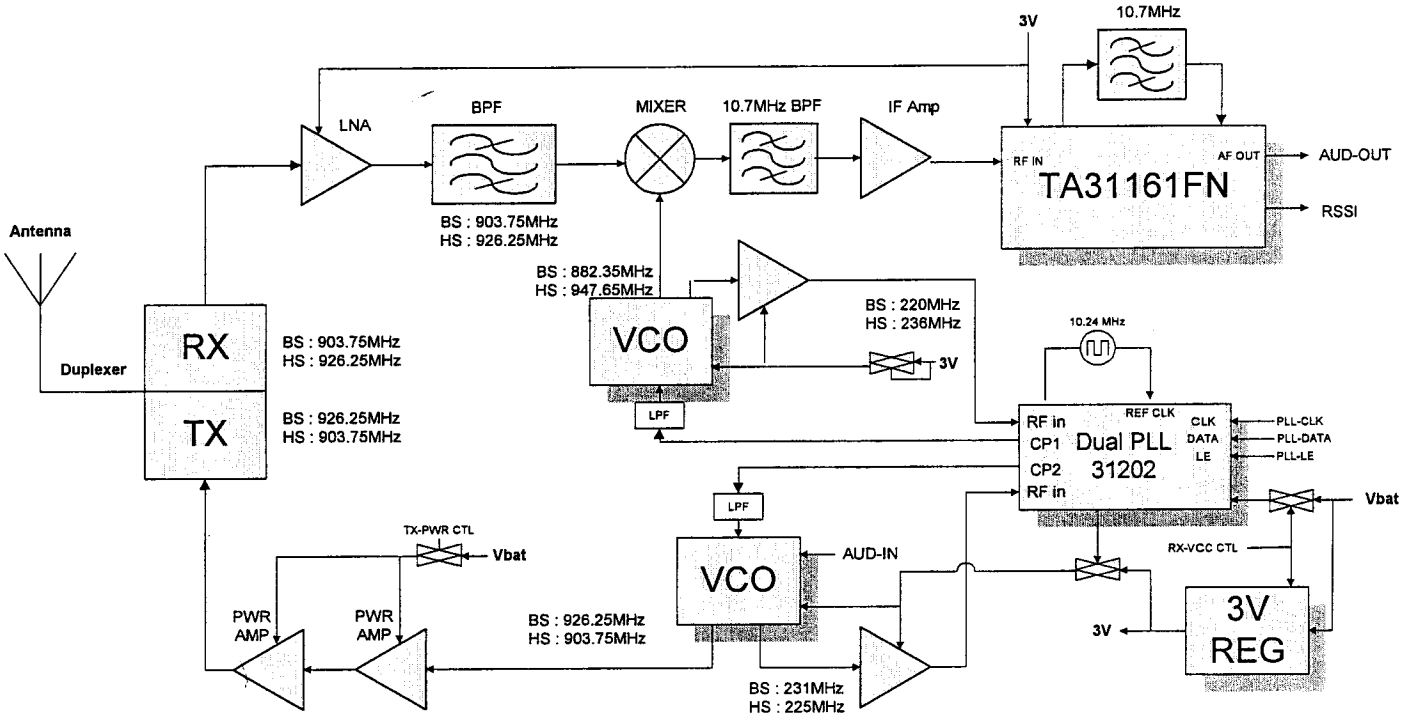
⇒ A battery detection circuit is used to determine if the battery is normal, low voltage, or unusable. If unusable, the MCU will shut down all functions and sleep to preserve memory.

⇒ The signal from mic is first amplified before feeding into the compressor. The output of the LPF of the compressor will then directly modulate the main carrier which is locked by the PLL programmed by the MCU.

⇒ The tuned RF signal strength will be used as RSSI to issue an out of range alert from MCU.

⇒ Tuned audio signal is split into 2 paths; one of them is fed to a data recovery circuit before entering the MCU while the other path goes to the expander. The output of the expander will be amplified to drive the receiver.

# RF Block




US_RF.VSD
980720

⇒ A reference clock of 10.24MHz is employed here for PLL 31202.

⇒ The 2 PLLs of 31202 are programmed through a micro-wire® bus connected directly to MCU.

⇒ The VCOs will be locked at 1/4 of the desired carrier frequencies.

⇒ In case of transmission, the audio signal will directly modulate the VCO and the transmit frequency is selected from the amplified 4th-harmonic of the VCO.

⇒ In case of receiving, the RF signal is first amplified by a low noise amplifier (LNA) before mixing with the 4th-harmonic of the local oscillator generated by the VCO. The down mixed signal then passes through a 10.7MHz ceramic filter and demodulated. The TA31161 is responsible for the signal demodulation and RSSI generation.

The Transmit frequencies for Base and Handset are as follow: -

| CH # | HS Tx freq | BS Tx freq |
|---|---|---|
| 1 | 902580000 | 925080000 |
| 2 | 902640000 | 925140000 |
| 3 | 902700000 | 925200000 |
| 4 | 902760000 | 925260000 |
| 5 | 902820000 | 925320000 |
| 6 | 902880000 | 925380000 |
| 7 | 902940000 | 925440000 |
| 8 | 903000000 | 925500000 |
| 9 | 903060000 | 925560000 |
| 10 | 903120000 | 925620000 |
| 11 | 903180000 | 925680000 |
| 12 | 903240000 | 925740000 |
| 13 | 903300000 | 925800000 |
| 14 | 903360000 | 925860000 |
| 15 | 903420000 | 925920000 |
| 16 | 903480000 | 925980000 |
| 17 | 903540000 | 926040000 |
| 18 | 903600000 | 926100000 |
| 19 | 903660000 | 926160000 |
| 20 | 903720000 | 926220000 |
| 21 | 903780000 | 926280000 |
| 22 | 903840000 | 926340000 |
| 23 | 903900000 | 926400000 |
| 24 | 903960000 | 926460000 |
| 25 | 904020000 | 926520000 |
| 26 | 904080000 | 926580000 |
| 27 | 904140000 | 926640000 |
| 28 | 904200000 | 926700000 |
| 29 | 904260000 | 926760000 |
| 30 | 904320000 | 926820000 |
| 31 | 904380000 | 926880000 |
| 32 | 904440000 | 926940000 |
| 33 | 904500000 | 927000000 |
| 34 | 904560000 | 927060000 |
| 35 | 904620000 | 927120000 |
| 36 | 904680000 | 927180000 |
| 37 | 904740000 | 927240000 |
| 38 | 904800000 | 927300000 |
| 39 | 904860000 | 927360000 |
| 40 | 904920000 | 927420000 |