

CIRCUIT DESCRIPTION

Model: 33012 Combo (BellSouth)

1 Base

a. RF Transmitter Section

The AF signal from other part is passed through telephone line to base line interface. The signal is again sent to combo IC's compressor circuit to reduce the noise level after modulation. The modulated signal is passed through TX buffer amplifier, TX power amplifier, Bandpass filter and Duplexer for spurious reduction. The transmitter RF signal is then propagated through the antenna. The pure fundamental carrier frequency can be sent out from antenna with field strength less than 80dBuV/3M.

b. RF Receiver Section

The Base Unit antenna receives RF signal. The receiver is using double conversion method with 1st IF 10.695MHz and 2nd 455KHz respectively. The carrier frequency is received through FL3 duplexer, from amplifier band-pass filter, and then feed to combo IC to down convert to 1st IF 10.695MHz and 2nd IF 455KHz. The IF signal is sent to IF amplifier and demodulate by quad detector. Since the carrier, frequency is with compressed modulation signal. So the AF signal is fed to expander for returning to normal characteristics and then sends out through the telephone interface to telephone line.

c. Transmitter Audio Section – Main Board

Audio Frequency signal from the telephone line is compressed through the compressor part of IC Combo to minimize the transmission noise. The degree of compression depends on the external RC combinations. AGC is also utilized by

IC Combo to avoid shock noise caused by abrupt change of audio levels. The compressed audio is filtered and amplified for better acoustical performance.

d. Receiver Audio Section – Main Board

The compressed Audio Frequency signal is passed through passive RC filters for acoustic compliance. The filtered audio is then fed to the IC Combo for expansion thus retrieving the original Audio signal with noise filtered out. Q9 & Q20 are used as buffer circuit. Matching transformer HYB1 isolates the high-voltage telephone line to the rest of the circuit. HYB1 is also used as a hybrid transformer to create a two-way path for audio transmission to and reception from the telephone line.

2

Handset

a. RF Transmitter Section – RF Board

Refer to portion 1.a for this section. All circuit performance is the same except that Band Pass Filter FL4 is changed to FL5 for the handset transmission.

b. RF Receiver Section – RF Board

Refer to portion 1.b for this section. All circuit performance is the same except that Band Pass Filter FL3 duplexer is changed to FL4 duplexer for the handset reception.

c. Transmitter Audio Section – Main Board

Audio Frequency signal from the handset or from the headset microphone is compressed through the compressor part of IC Combo to minimize the transmission noise. The degree of compression depends on the external RC

combinations. AGC is also utilized by IC Combo to avoid shock noise caused by abrupt change of audio levels. The compressed audio is filtered and amplified for better acoustical performance. Q7 is a switching transistor that controls the power supply for the TX RF part.

d. Receiver Audio Section – Main Board

The compressed Audio Frequency signal is passed through passive RC filters for acoustic compliance. The filtered audio is then fed to the Compander IC Combo for expansion thus retrieving the original Audio signal with noise filtered out. Q5 act as audio amplifier to sufficiently drive the handset speaker.

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3 OTHERS (Handset):

a. Charging and Reset Controls

Recharging the handset battery is accomplished by putting the handset on the cradle. Q200 detects this action and sends a command to the CPU for proper exchange of security code. Switching SW4 to the RING OFF mode can extend Battery life.

b. Ring Detection

When the handset receives the ring command from the base unit, the CPU will send buzzer signal to the ringer amplifier Q3 that drives the Buzzer.

a. Hook Switching and Dialing

Hook switching and pulse dialing is accomplished by the reed relay RL1 which is controlled by the CPU through switching transistor Q10. DTMF signal from the ladder circuit internal to the CPU is filtered and amplified by buffer amplifier.

b. Over-voltage Protection

Fuse F1 and varistor Z1 act as high current and high voltage protectors for the telephone line interface. In case of presence of voltage surge across the telephone line, Z1 decreases its resistance and dumps the line voltage to a safe level. Fuse F1 opens when excessive current is present on the line thus protecting both the user and the line interface.

c. Battery Charging & Code Setting

Battery charging commences when transistor Q5 detects the presence of the handset on cradle. Q4, & C63 form the reset circuit in conjunction with the charge detect circuit to command the CPU to change the security code. When the reset circuit is activated, the CPU will send a new security code to the handset selecting among 65536 combinations.



d. Ring Detection

Incoming ring signal is detected by the photo-coupler IC7. Diode D6, D4 and R45 set the level of signal detection. The CPU checks the frequency of the ring signal, and when valid, sends the ringing command to the speaker or to the Handset.

e. Power Supplies

Diode D11 ensures uniform polarity for the entire circuit. IC2 regulates the voltage to +5Vdc for the rest of the circuit. Transistor Q3 controls the power supplied to the TX part of the RF circuits.

f. Squelch Detection

In conjunction with the IC detector Combo, sets the level of signal detection and IC4B acts as the comparator circuit whose composite output is the RSSI signal for the CPU.

g. RX Data

Commands from the Handset is filtered and re-constructed by the internal Schmitt trigger circuit on the IC Combo. The composite output is the RX Data that is input to the CPU for validation and processing.