

Memorandum

To: Cliff Brick
CC: Dan Desimone, Larry Stillings
From: Ronald Pace
Date: 05/18/01
Re: Model 49242

Circuit Description

The 900 MHz Premium Privacy Monitor model 49242 will be referred to as the equipment under test (EUT) in this report. The EUT is a nursery monitoring system designed to be a high quality, low cost audio monitor for home use. This monitor will transmit audible sounds from the Child Unit (transmitter) and receive the same sounds on the Parent Unit (receiver). The frequency band chosen for this product is the 902-928 MHz ISM band. This product is part of an ongoing family of nursery monitors provided by Safety 1st.

The transmitter and receiver operate on one of four RF channels. Channel A is set to 905.0 MHz, Channel B is set to 906.0 MHz, Channel C is set to 907.0 MHz and Channel D is set to 908.0 MHz. A switch controls the channel selection of both units.

Child Unit – Transmitter Device Operation

A microphone picks up the room sounds and amplifies the signal through an audio amplifier. This signal is controlled by an automatic gain control (AGC) circuit to limit the FM modulation. The amplified audio signal is coupled directly into a 30 kHz PLL sub-carrier FM modulator. This FM signal is then directed into a 900 MHz FM modulator. This modulator consists of a resonator-controlled oscillator tuned to the desired RF frequency by applying a DC voltage to a tuning varactor diode. The oscillator/modulator is coupled through a final gain stage and the output is matched to the external antenna. A single 9V battery or an AC/DC power adapter powers the unit.

Parent Unit – Receiver Device Operation

The receiver is a dual conversion superheterodyne. The 900 MHz RF signal is first down converted to 61 kHz through a Gilbert Cell mixer, high side injected. A resonator-controlled oscillator tuned to 61 kHz above the RF frequency (LO) generates the local oscillator. The intermediate frequency (IF) then down converted to a second IF frequency of 10.7 MHz. This second IF is then FM detected and the recovered audio signal is applied to a second sub-carrier FM detector. The detected audio signal is then amplified to a speaker for sound recovery. A three-cell rechargeable NiCad battery pack or an AC/DC power adapter powers the unit.