6710 Bertram Place
Victoria, BC
CANADA V8M 1Z6
ph: (250) 544-4091
fax: (250) 544-4100

VIDEOMAKER BELTPACK HARWARE FUNCTIONAL DESCRIPTION

VERSION 1.001

24 AUGUST 2004

Change Control

Version	**Date**	**Author**	**Hardware Version Referenced**	**Description**
0.001	19August 2004	D. Anderson	PDC0272-F02	created
1.000	20August 2004	D. Anderson	PDC0272-F02	Updated Rev for official release
1.001	24August 2004	D. Anderson	PDC0272-F02	Added oscillators to block diagram

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1 OVERVIEW

1.1 Functions

The Videomaker Beltpack performs the following functions:

- Scans the user interface keypad, encodes the result and sums it with the audio signal to be transmitted to the base unit
- Preamplifies, compresses, and pre-emphasizes the microphone signal, then feeds to the FM transmitter
- Transmits the microphone audio and keypad data via a PLL-synthesized 915MHz FM radio transmitter

1.2 Analog Circuitry

1.2.1 Microphone Audio Path

The microphone path consists of the following stages, listed in order of signal flow

- microphone input jack
- mic preamp/compressor, implemented with two opamp gates and a JFET
- 9.5kHz, 2-pole low pass filter, implemented with an opamp gate
- pre-emphasis/summing stage implemented with an opamp gate
- 15kHz 2-pole low-pass filter on mixed audio/data signal before going into transmitter modulation input. This filter is also implemented with an opamp gate.

1.2.2 AM Data Path

The amplitude-modulated data path starts at the microcontroller. The microcontroller outputs a 20.5kHz square wave modulated with status and key data. This then goes through a level-shifting transistor (Q3), and then through a 4-pole high pass filter implemented with two opamp gates, then finally to the summing stage where it is summed with the audio from the microphone path.

1.3 Power Control

The 68HC908 micro has a sleep mode – when this is enabled, the micro shuts down the 3.3V regulator which supplies power to all the audio and RF circuitry and to the digital buffer.

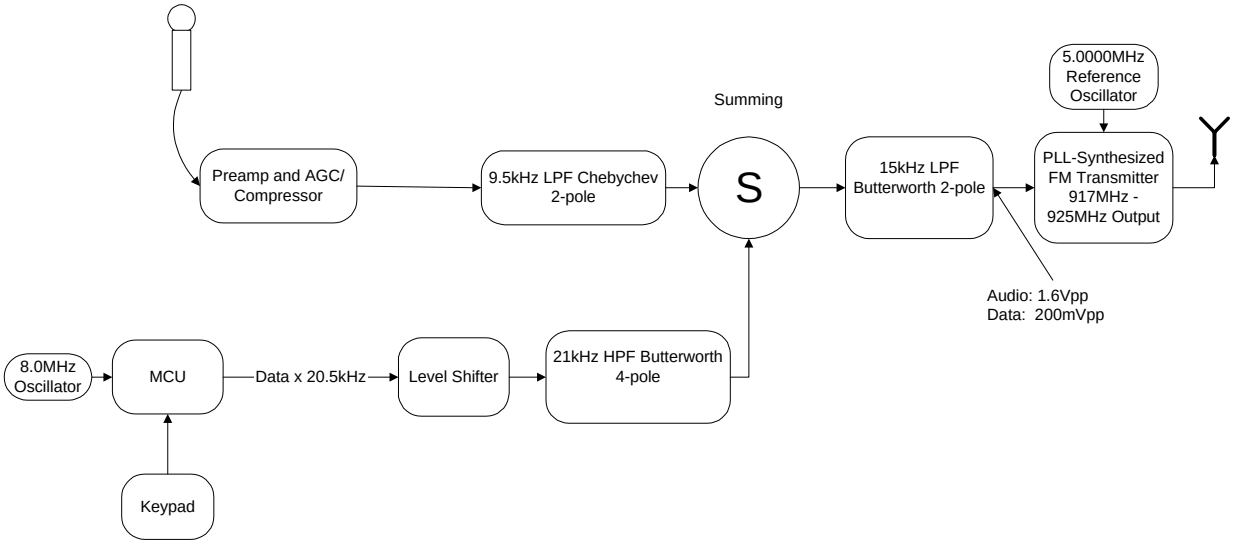
1.4 Digital Circuitry

The digital circuitry consists of a the 68HC908 microcontroller, with a 4x4 keypad matrix as input and the quad tri-state latch.

1.5 FM Transmitter

The FM transmitter is based on a programmable PLL, which is driven by a 5.00MHz xtal and programmed by the microcontroller. The circuitry consists of the PLL IC (U6), the voltage controlled oscillator, and an output low noise amplifier.

2 SYSTEM BLOCK DIAGRAM



3 RADIO FREQUENCY SPECIFICATIONS

3.1 Frequency Range

This device uses 5 carrier frequencies which are selectable by pressing the front panel "CH SEL" key. The carrier frequencies are:

CH1	917.000MHz
CH2	919.000MHz
CH3	921.000MHz
CH4	923.000MHz
CH5	925.000MHz

3.2 Output Power

This device has a maximum RF output power of 1.0mW (0dBm)

3.3 Antenna

This device uses the Lynx LP series 915MHz reduced-height ¼ wave whip antenna counterpoised to the ground plane on the printed circuit board.