

M25P32 PIC Audio Serial v1.0 by Norm Carlberg 1-22-07

PIC playback of wave files (voice or short music) serial downloaded from PC.
Also data for GLCD's etc.

1. RealBasic exe and source code for PC serial download of wave files or data to PIC.

REALbasic Standard Edition for Windows + documentation and CD \$139 <http://www.realbasic.com/>

2. PROTON+ BASIC code for PIC save to M25P32 flash memory chip.

http://www.picbasic.org/proton_development_suite.php

Developed on a PIC18F452 for no other reason than 16-bit architecture and speed.

Ports B and D remain unused. Frequency 40MHz.

All code is for development. Post your project.

M125P32 flash memory capacity is 4,194,304 bytes.

Code enables cascading up to 4 chips.

Each additional chip requires only 1 additional microchip pin and resistor divider.

All other M25P32 pins are in parallel.

PC program accepts data files, or wave files in stereo or mono, 16 bit or 8 bit.

Wave files must be at sample rate required (6k to 44k).

Nero or free Audacity <http://audacity.sourceforge.net/> for audio editing.

Free CDex <http://cdexos.sourceforge.net/> for CD to wave for short music.

The PC download to memory program converts all stereo to mono and offers the following options:

16 bit kept 16 bit

16 bit Ulaw compression to 8 bit
16 bit down sampled to 8 bit
8 bit kept 8 bit (All non wave files)
16 bit ADPCM compression to 4 bit

Files are recorded in consecutive order from address 0 and up. (Non FAT for speed.)

If erasing all files must be erased.

For each file there is a 23 byte fileinfo array saved at end of memory.

File one fileinfo would be the last 23 bytes in memory, file two 2ND last etc.

A 23 byte buffer of \$FF's separate data from fileinfo.

Fileinfo consists of the following 23 bytes:

First byte is config byte.

Bits 0 and 1 determine if file is 16 to 4 bit ADPCM compression, or 8 bit, or Ulaw 16 to 8 compression, or 16 bit.

Bits 2 – 7 determine sample rate. (6k to 44k)

If config byte = 0 then is data file.

Bytes 2 – 4 are file start address.

Bytes 5 – 7 are file end address.

Bytes 8 – 23 are the 16 character file name.

All files are individually played by one button menu or called in code.

Code includes 8 bit or 16 bit DA playback. Uncomment for 8bit or 16 bit DA in use.

Code is from 1 to 4 M25P32's. Uncomment for number of memory chips in use.

Code includes 40 MHz or 40.2368 MHz for 0 errors in serial timing.

Uncomment Hserial SPBRG and timer1 preload for 10 or 11.0592 baud rate crystal in use.

Speaker quality is the main remaining factor in sound quality.

A bookshelf speaker is strongly recommended for quality sound.

If application requires other speaker be certain there is separation of speaker front from speaker back.

Tested on 2" speaker to high end stereo speaker.

Also recommend upgrade of ancient 386 audio amp.

A Texas Instrument TPA701 requires no output capacitor and no hiss.

M25P32 gotcha's

1.Clock pin requires a strong voltage. Keep resistor divider values low.

2.Data sheet indicates record can start and stop at any address.

This is true if only recording a few bytes.

Record should start and end on page boundaries as is true of most memory of this type.

This would mean a 256 byte (1 page) minimum file size.

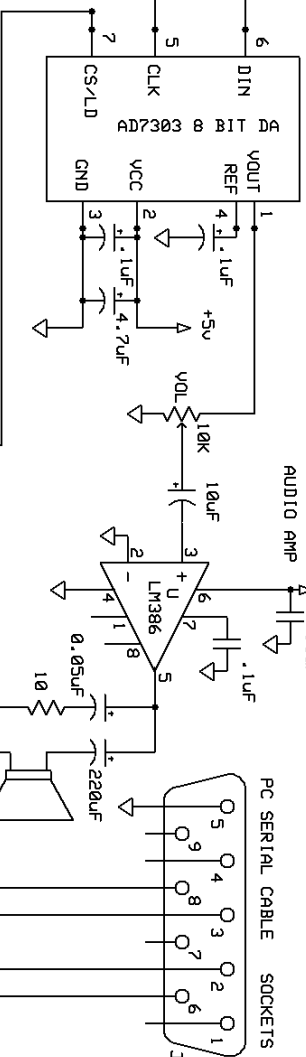
However since only erase can convert %0's to %1's, code over writes with %1's until new file address, and when record done finishes to end of page with %1's.

This coding makes possible a one byte file plus 23 byte fileinfo.

AD7303 8 BIT DA OR
LTC1655L 16 BIT DA

OLD LM386 OR TRY TPA701 (NO HISS & CAPLESS)

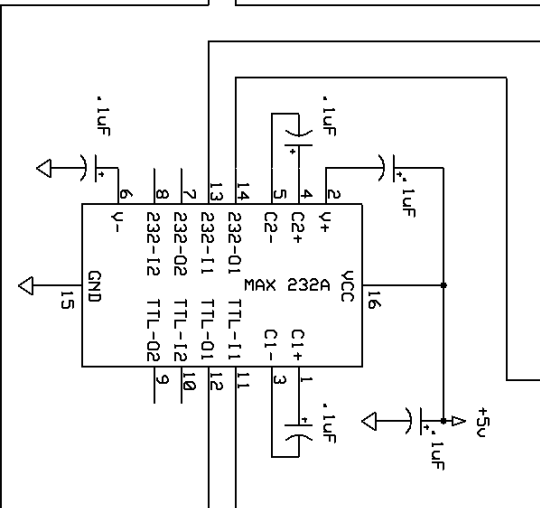
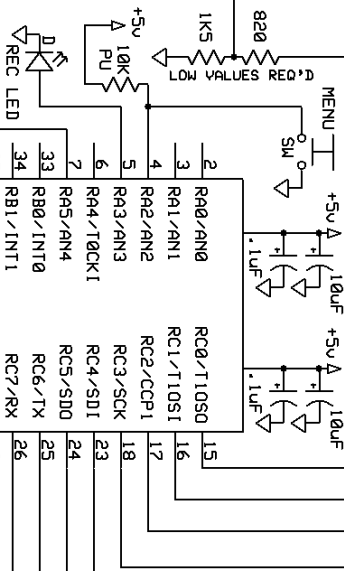
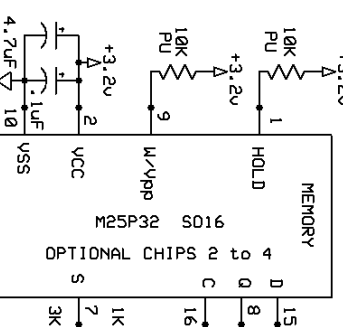
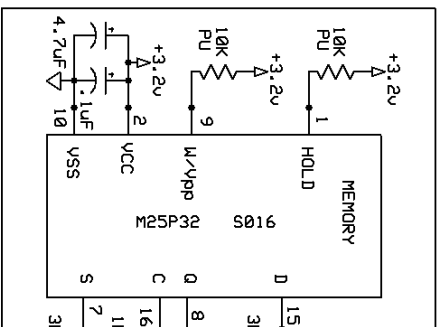
+5v



PC SERIAL CABLE SOCKETS

<<DATA>>
<<CLOCK>>

CTS 1K
DSR 1K



M25P32 PIC Audio Serial

Norm Carlberg

Rev 1.0
1/21/2007

Page 1 of 1

