

This page will contain all of the information about the Coresound synth

link to forum topic: <http://www.midibox.org/forum/index.php?topic=8150.0>

Introduction

Coresound is a digital synthesiser module based on the midibox platform.
todo: add more info

Features

- Digital synthesiser for microchip pic microcontrollers
- 24 bit phase accumulator for frequency control
- wavetable signal generation
- waveshaper with 3 modes: hardclip, softclip and foldover
- 16 bit digital filter
- uses a modified [midibox_sid](#) engine for control/modulation

Software

v0.1

This version uses a lfo, cc and env code from mb_sid v1.7
the dco is a wavetable oscillator based on the Wiard Wavecity ROM

v0.2

From v0.2 the modulation/control/cs will be separated from the actual sound generation
The data exchangement method is not decided yet, MBNET seems the best choice right now
see this forum topic for more information: <http://www.midibox.org/forum/index.php?topic=8328.0>
The sound unit registers will be refreshed each time the control routine is executed ($f = 1\text{kHz}$)

Control unit

The control unit will be based on the midibox sid engine
but will be adapted to control the sound unit parameters.

Sound unit

The first tests will be done with the wavetable dco from v0.1, after this works alternate dco implementations will be tried

Register specification:

- Satus register:
 - Status: 1 byte
- DCO registers:
 - Pitch: 3 bytes
 - Waveform: 1 byte
 - Interpolation: 1 byte
 - Phase: 1 byte
 - Free: 2nd oscillator: 6 bytes
- Waveshaper registers:
 - Mode: 1 byte
 - Type: 1 byte
- DCF registers:
 - Cutoff: 1 byte
 - Resonance: 1 byte
 - Filter type: 1 byte
- DCA registers:
 - Level: 1 byte

MBNET

My experiences with setting up a MBNET client:

- Copied MBNET.inc and SID_MBNET.inc from the sid folder to the project directory
- Renamed the SID_MBNET.inc to CRSND_MBNET.inc, changed all lables inside the file from SID_* to CRSND_*
- Changed the lables inside MBNET.inc to the new lables
- Copied the ping info from main.inc to my main .asm file, changed:

```
;; MBNET specific definitions (ping reply information - don't touch this!)
#define MBNET_CONST_PROTOCOL_V      1
#define MBNET_CONST_TYPE_C0        'S'
#define MBNET_CONST_TYPE_C1        'I'
#define MBNET_CONST_TYPE_C2        'D'
#define MBNET_CONST_TYPE_C3        ' '
#define MBNET_CONST_TYPE_VERSION    1
#define MBNET_CONST_TYPE_SUBVERSION 4685
```

into:

```
#define MBNET_CONST_PROTOCOL_V      1
#define MBNET_CONST_TYPE_C0        'C'
#define MBNET_CONST_TYPE_C1        'R'
#define MBNET_CONST_TYPE_C2        'S'
```

```
#define MBNET_CONST_TYPE_C3      'D'
#define MBNET_CONST_TYPE_VERSION 0
#define MBNET_CONST_TYPE_SUBVERSION 2
```

- Added the variables for MBNET in my app_defines.h:

```
MBNET_BASE      EQU    0x600      ; used for SET_BSR

MBNET_STATE      EQU    0x600
MBNET_RX_BUFFER_PTR_L  EQU    0x601
MBNET_RX_BUFFER_PTR_H  EQU    0x602
MBNET_MY_ID      EQU    0x603
MBNET_MASTER_ID    EQU    0x604
MBNET_SLAVE_ID    EQU    0x605
MBNET_TOS        EQU    0x606
MBNET_EID_L      EQU    0x607
MBNET_EID_H      EQU    0x608
MBNET_NODE_AVAIL  EQU    0x609
MBNET_NODE_INCOMPATIBLE EQU    0x60a
MBNET_TIMEOUT_CTR_L EQU    0x60b
MBNET_TIMEOUT_CTR_H EQU    0x60c
MBNET_LOOP_CTR    EQU    0x60d
MBNET_RETRY_WAIT_CTR EQU    0x60e
MBNET_RETRY_NODE  EQU    0x60f

MBNET_RETRY_NODE_CTR_BEGIN EQU    0x610      ; ..0x617

MBNET_NODE_INFO_BEGIN  EQU    0x620      ; ..0x65f  ; (8*8 bytes)
```

- To be continued

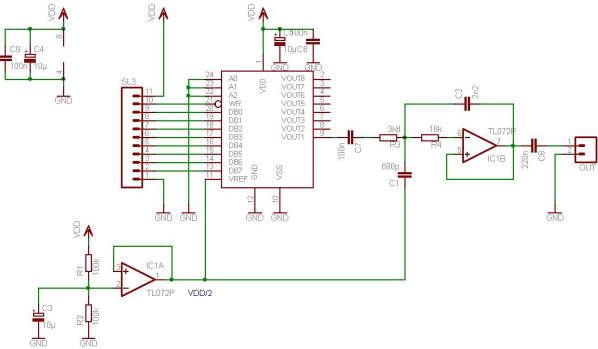


Hardware

v0.1

The hardware of the first version consists of a standard core board and a DAC module with a anti-aliasing filter

Schematic



[click to enlarge](#)

Connection diagram

connection to core:

coresound pin	core pin	pic pin nr
1	ground	-
2	J15:D7	40
3	J15:D6	39
4	J15:D5	38
5	J15:D4	37
6	J15:D3	36
7	J15:D2	35
8	J15:D1	34
9	J15:D0	33
10	J14	-
11	+5v	-

v0.x

The final version will use two pics, more info will follow

Schematic

Not available yet

Todo

Suggestions

Everybody can add suggestions here...

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