

# Remote CW paddle operation

**Remote Control**



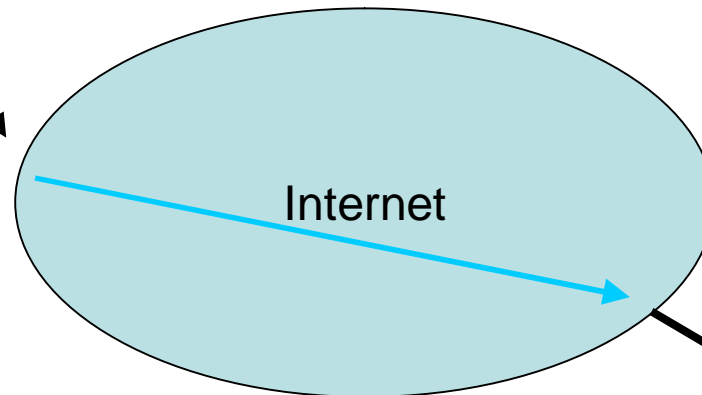
**SM7LCB**



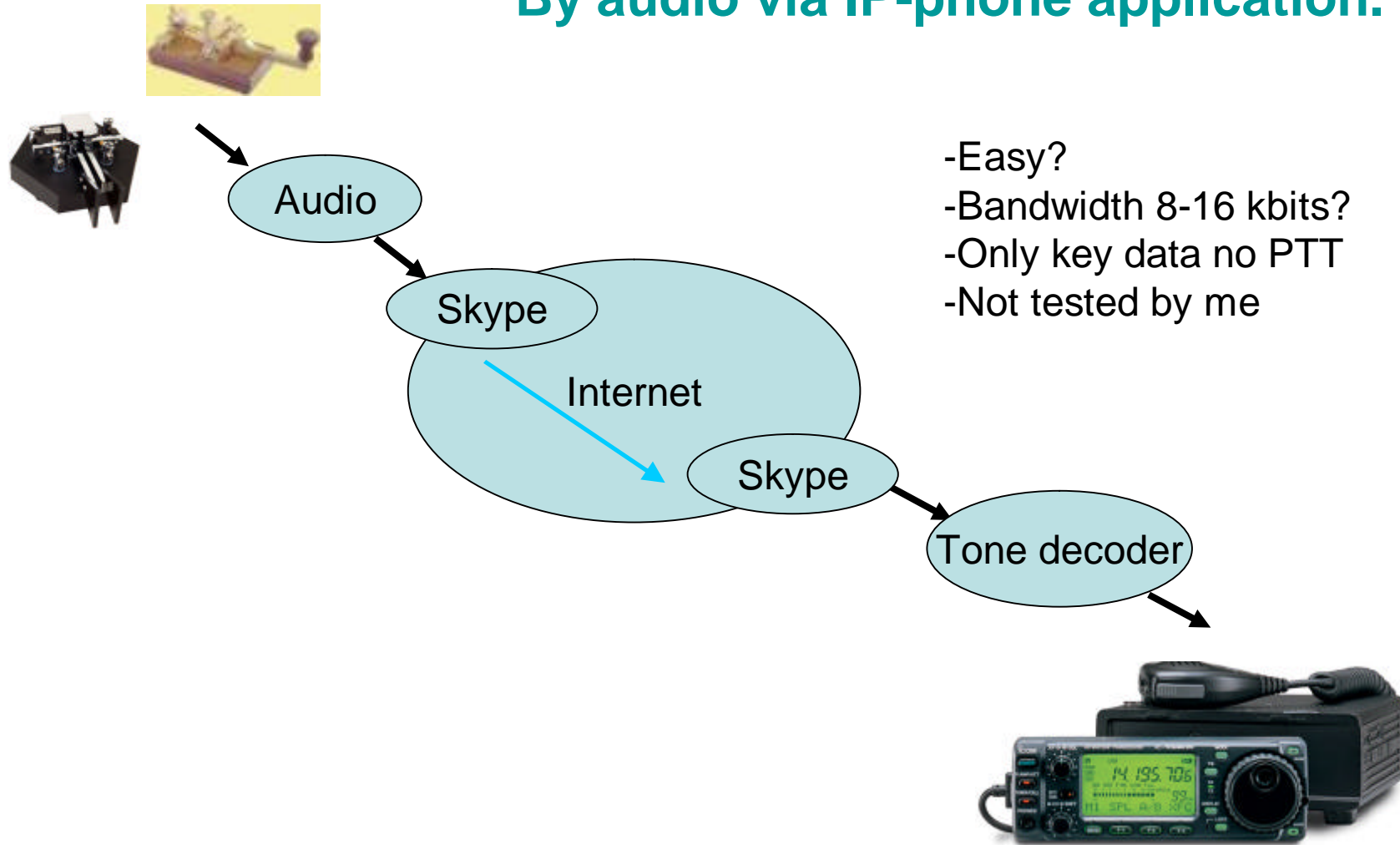
# Remote CW paddle operation



How to transfer local generated CW  
to a remote station?

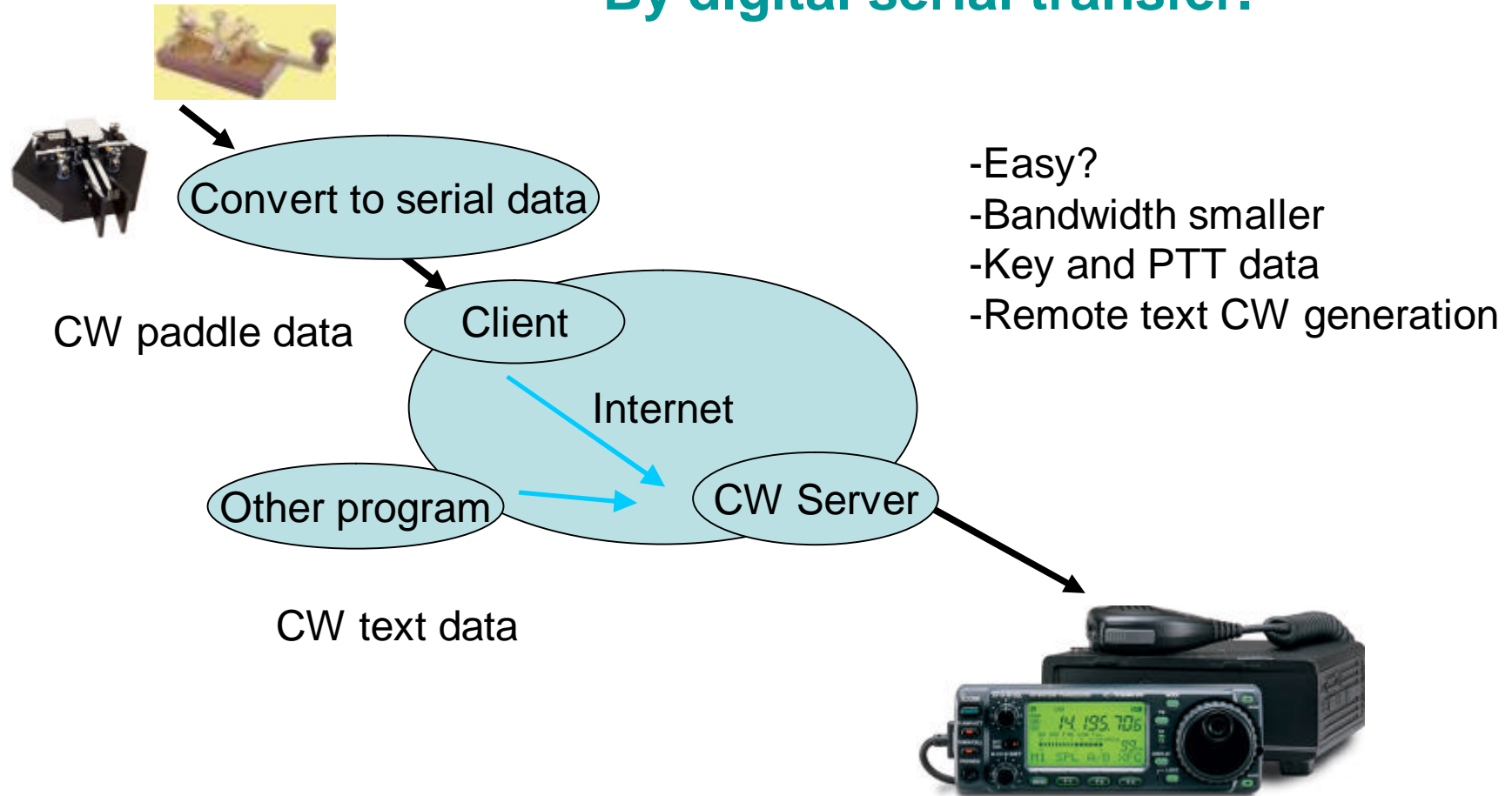


## By audio via IP-phone application.



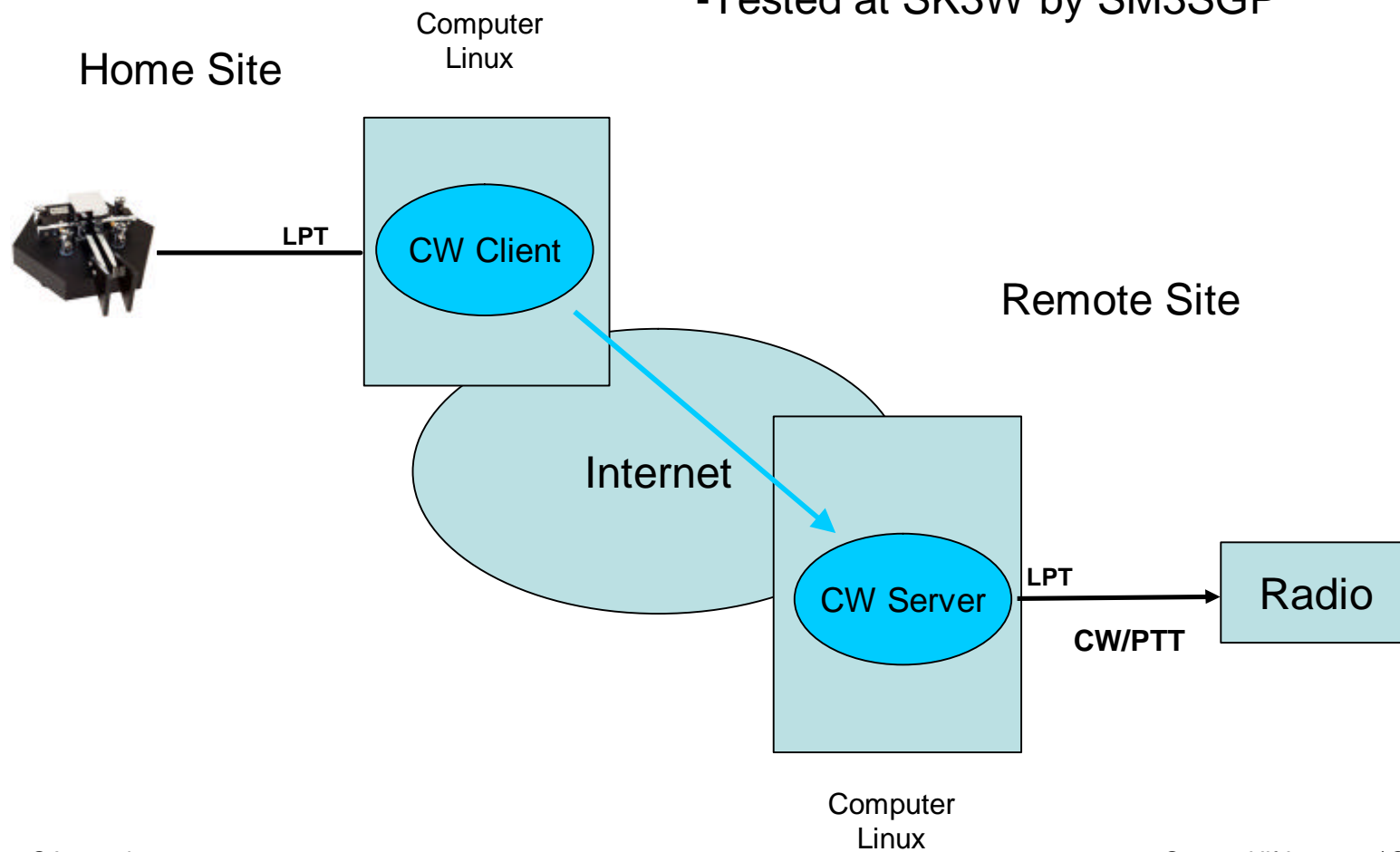
- Easy?
- Bandwidth 8-16 kbits?
- Only key data no PTT
- Not tested by me

## By digital serial transfer.



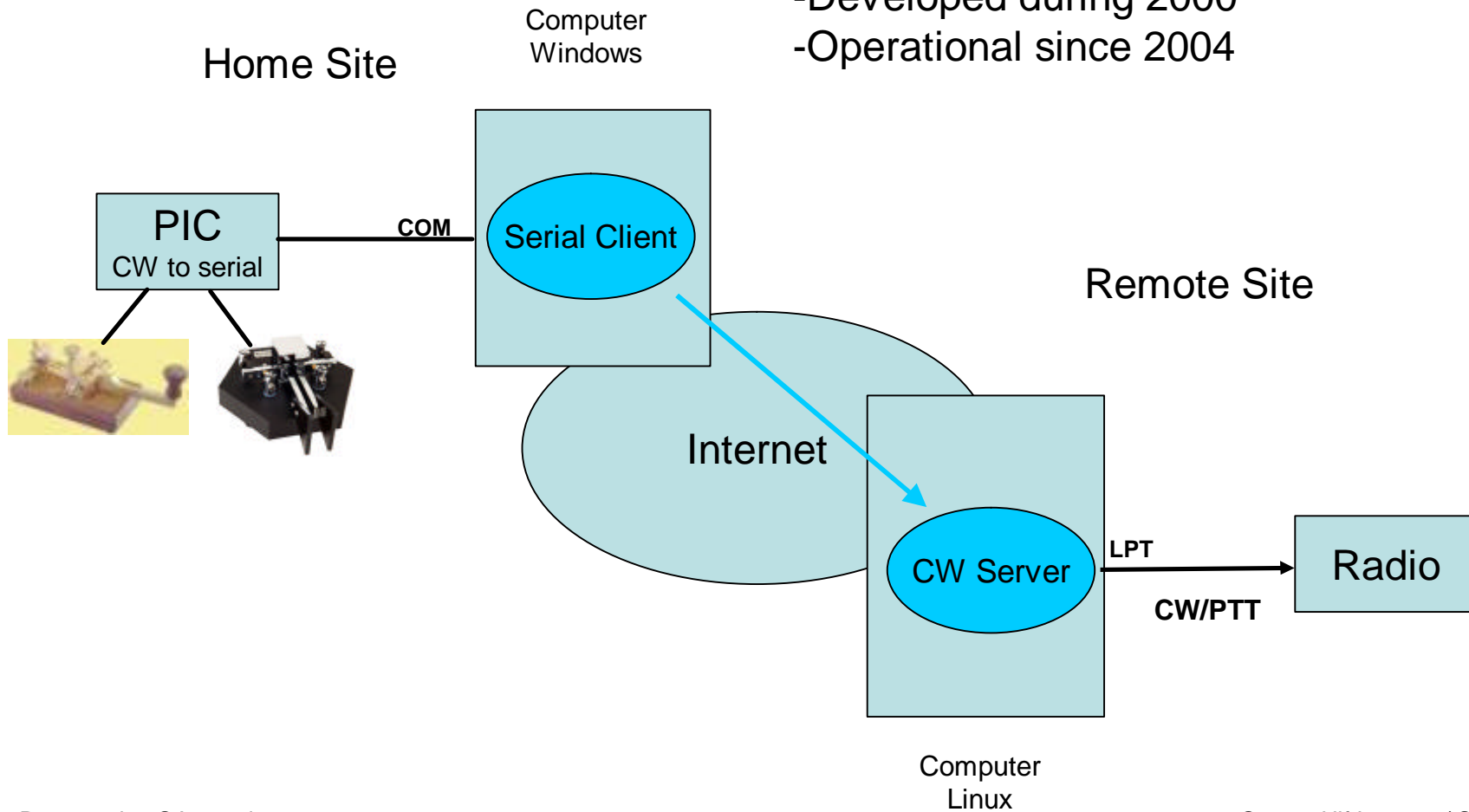
# Remote CW version 1

- Linux running a CW client
- Linux running a CW server
- Developed during 2000
- Tested at SK3W by SM3SGP



## Remote CW version 2

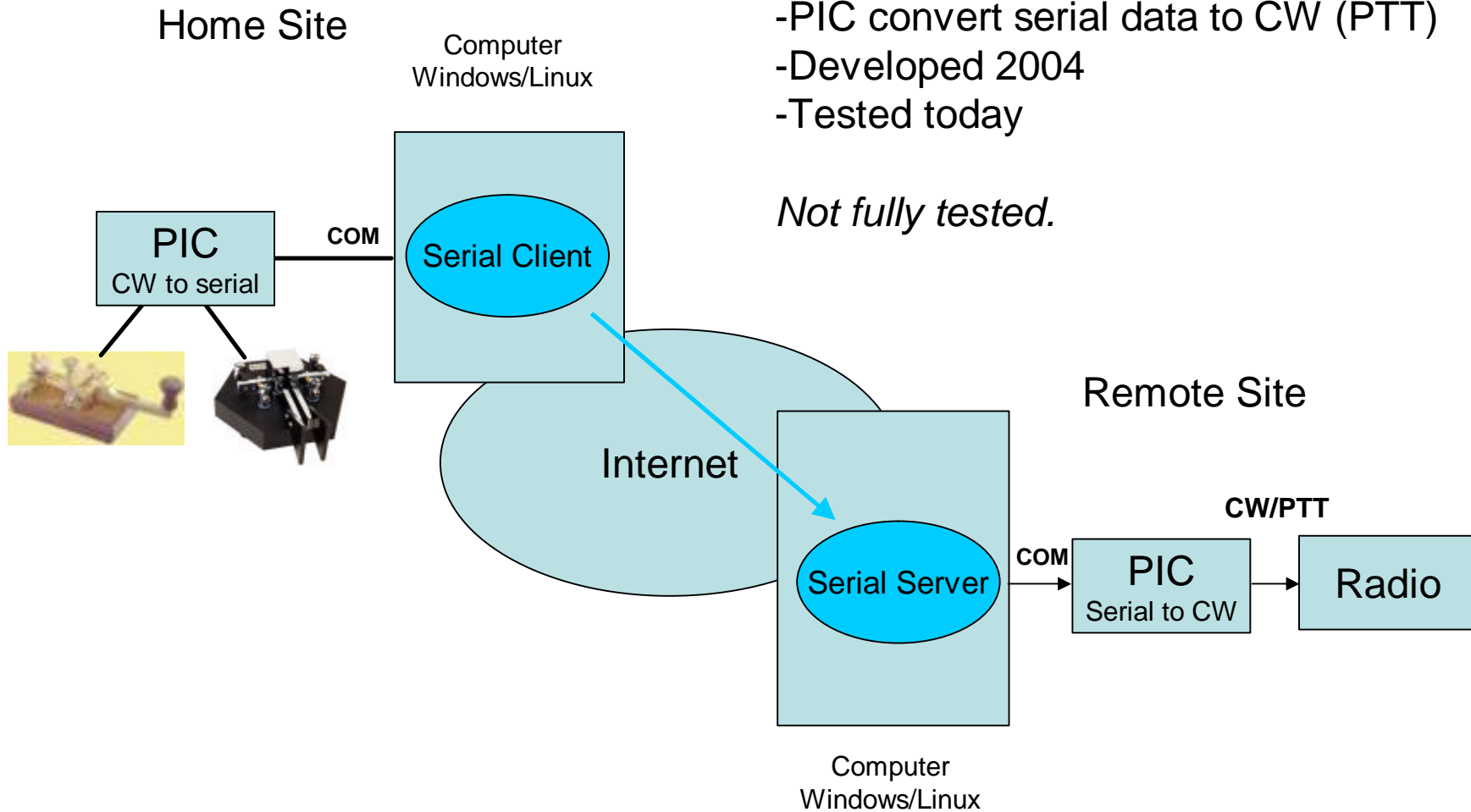
- PIC convert CW to serial data
- Windows serial client program
- Linux running a CW server
- Developed during 2000
- Operational since 2004



## Remote CW version 3

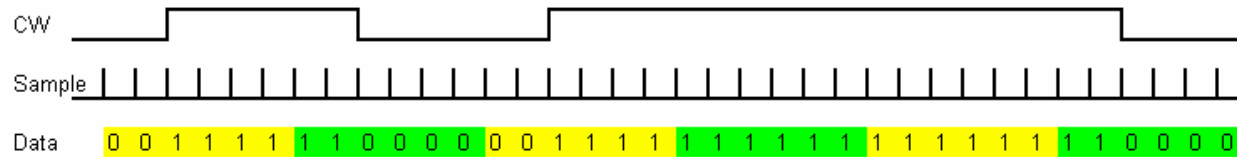
- PIC convert CW to serial data
- Windows/Linux serial client program
- Windows/Linux serial server program
- PIC convert serial data to CW (PTT)
- Developed 2004
- Tested today

*Not fully tested.*



# PIC CW to serial conversion.

- PIC sample the CW key signal (~ 2ms)
- 6 samples added into one byte
- One bit in the byte hold PTT status
- Bytes are sent in 9600 bits



Byte information

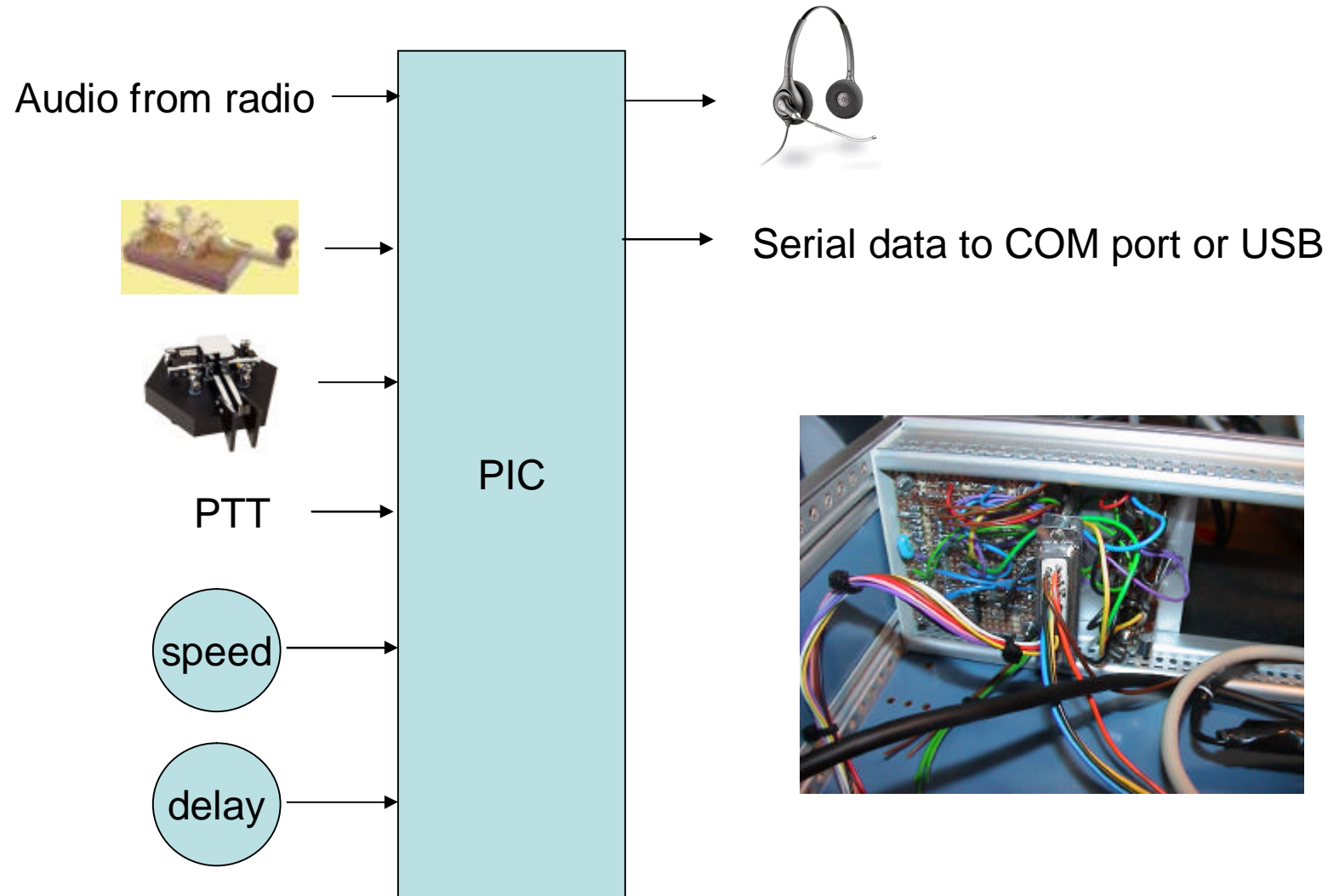
7	6	5	4	3	2	1	0
PTT	0		CW data				

- One sample every 2ms
- 6 samples in each byte
- One byte every 12 ms
- 83.3 bytes per second
- Equal to 833 bits!

RS-232 transfer of data  
Alternative USB interface

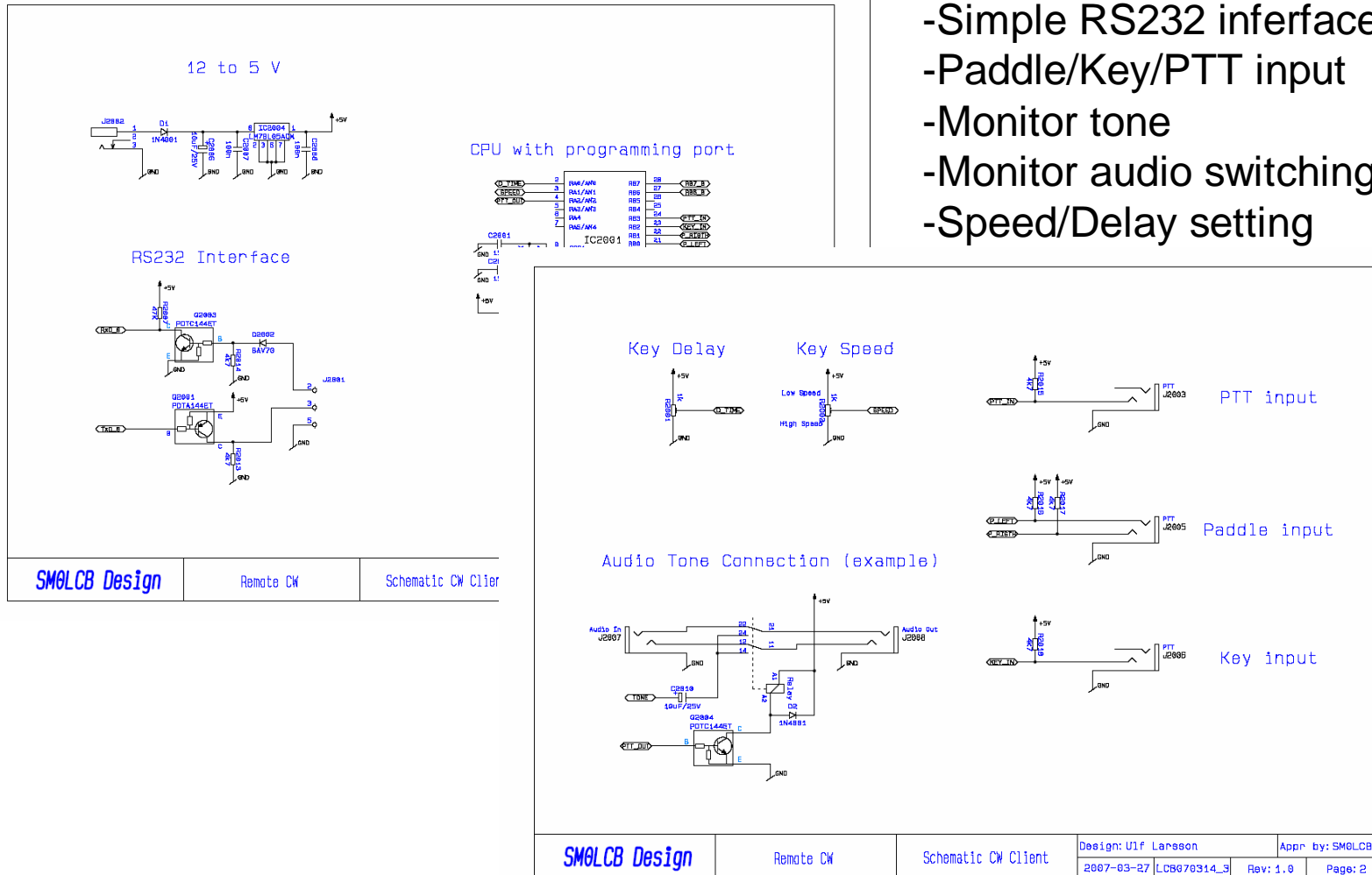


# PIC, CW to serial.

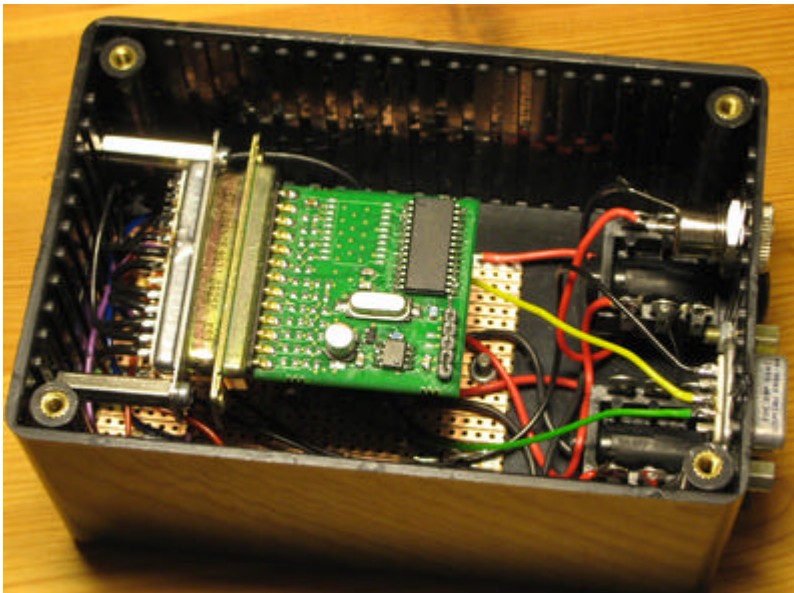
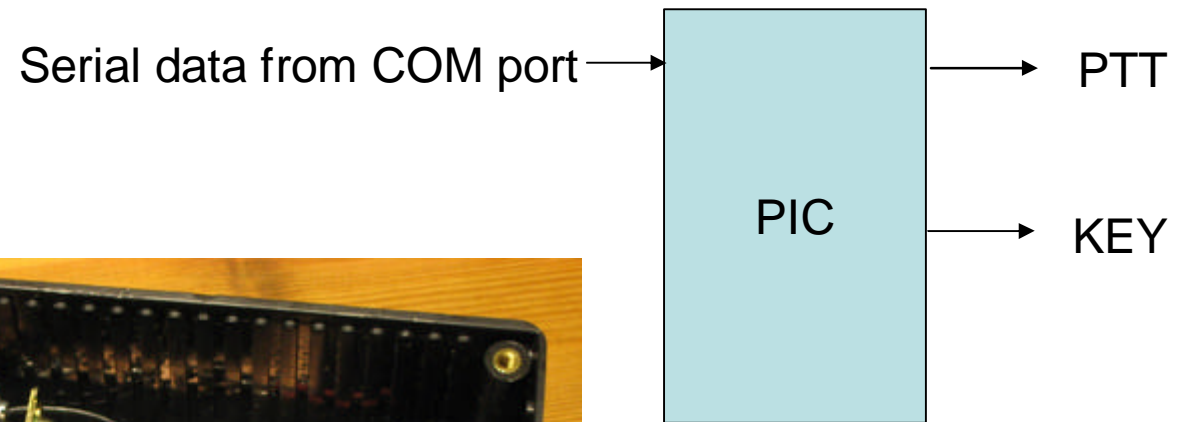


# PIC, CW to serial.

- CPU PIC16F876A
- Simple RS232 interface
- Paddle/Key/PTT input
- Monitor tone
- Monitor audio switching
- Speed/Delay setting

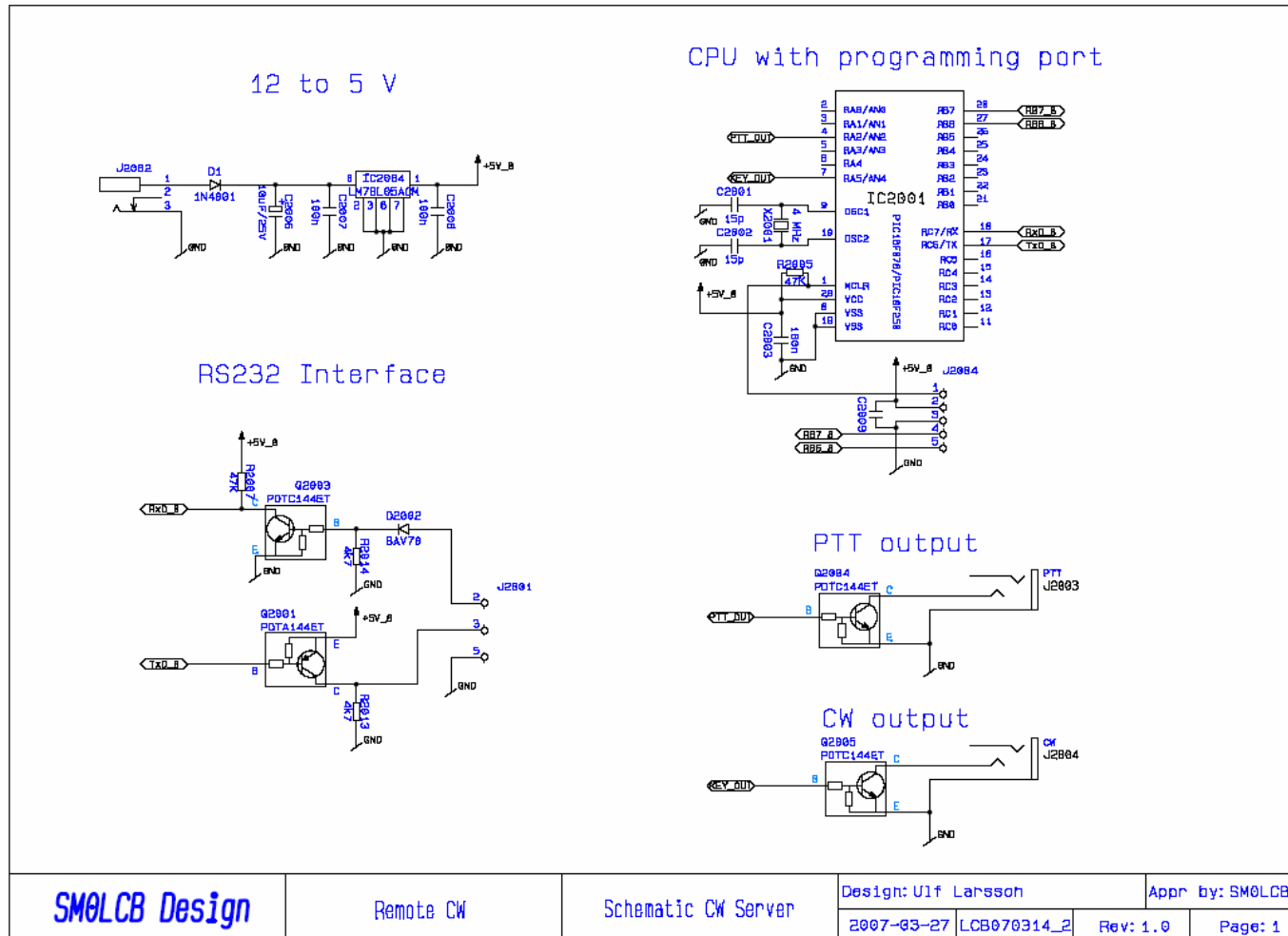


## PIC, Serial to CW.



# PIC, Serial to CW.

# Schematics

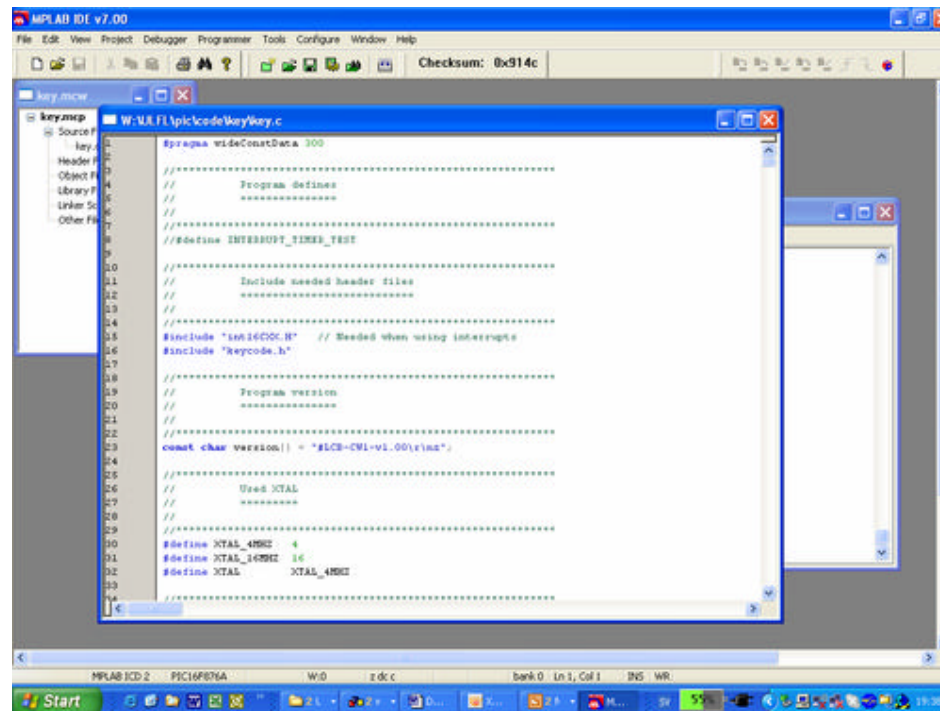


## PIC, CW serial software.

- CPU Microchip PIC16F876A
- Development (free) IDE MPLAB from Microchip
- Coder written in C
- C compiler CC5X

- Same program for both  
“CW to serial” and  
“Serial to CW”.
- Not fully tested  
(2007-03-28)
- Hopefully hex file  
will be possible  
to download from  
my homepage soon...

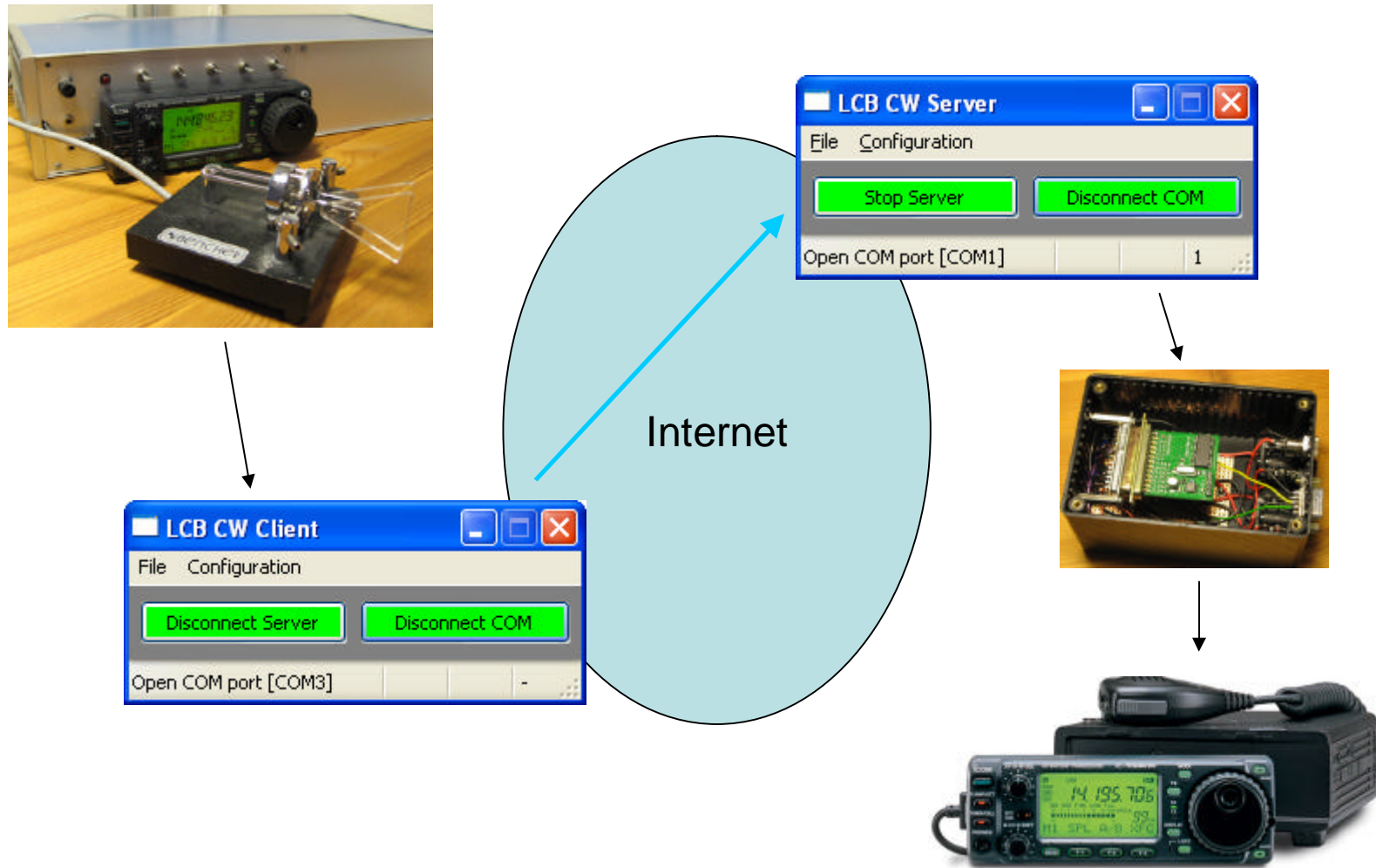
<http://sm7lcb.shacknet.nu>



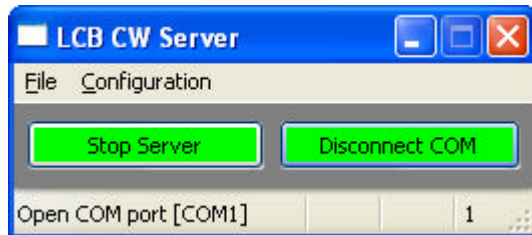
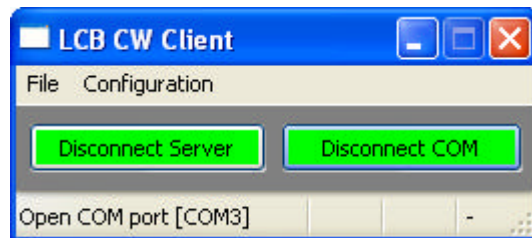
The screenshot shows the MPLAB IDE v7.00 interface. The main window displays the source code for 'key.c'. The code includes preprocessor directives for wide character data, program defines, and include files. It also shows a version string and XTAL frequency definitions.

```
1 #pragma wideCharData 300
2
3 .....
4 // Program defines
5 // .....
6 //
7 // #define INTERRUPT_TIMER_TEST
8 // .....
9 //
10 //
11 // Include needed header files
12 // .....
13 //
14 //
15 #include "int16CCLK.H" // Needed when using interrupts
16 #include "keycode.h"
17 // .....
18 //
19 // Program version
20 // .....
21 //
22 //
23 const char version[] = "SLCB-CW1-v1.00r1ms";
24 // .....
25 //
26 // Used XTAL
27 // .....
28 //
29 //
30 #define XTAL_4MHz 4
31 #define XTAL_16MHz 16
32 #define XTAL XTAL_4MHz
33 // .....
34
```

# Serial Client/Server Software.



# Serial Client/Server Software “wxLcbSerialNetwork”.



- Same program for client/server
- Configuration file \*.lcbc
- Open source GUI (wxWidget).
- C++
- Support Windows/Linux(/Mac)
- Windows free IDE Dev-CPP

Information about wxWidget  
see <http://www.wxwidget.org>

Program “wxLcbSerialNetwork”  
see <http://sm7lcb.shacknet.nu>

# SM7LCB remote control desktop layout.

The screenshot shows a Windows XP desktop environment used for remote control. The main window is a chat application titled "The QRL chat (by QRA3ST) embedded version - Microsoft Internet Explorer". The chat interface includes a menu, a list of users, and a message log. The message log contains the following entries:

UTC	CALLNAME	GHz	ENGLISH MESSAGE
17:02:37	LX2LA Andre	GE	all, 731- k2la qrv 23cm from JN99CP, anyone ?
16:53:59	GM4CKM Ray	GB3CLE	1296.911 weak trace IO75<1062 normally zlich
16:02:16	DK1KR Walter		bing into YOUR direction. ... 200
14:57:04	DK1KR Walter		ALL ready 4 test 1296.220
14:56:28	G4DDK Sam		1
13:35:06	GM4LBV John	1FF	gd kjeld ,sendig cq's in your direction 1296.200 SLOW cw
09:08:31	GM3SBC Ed	GM	All. Anyone hearing / working anyone today.
08:30:40	DK1KR Walter	GM	ALL sunny, no wind temp 11°C
08:29:21	DL7YC Manfred	BNCI	Alles weitere dann kurzfristig davor
08:25:20	DL6NCI Lorenz	7YC	rgt Manfred
08:23:43	DL7YC Manfred	BNCI	Der Tiergarten ist ca. eine halbe Autostunde von uns nördlich
08:22:42	DL7YC Manfred	BNCI	Vielleicht können wir bei schönem Weiter mal im Garten einen "Kaffeeklatsch" veranstalten ?
08:19:34	DL6NCI Lorenz	7YC	sind in einem Hotel am Tiergarten
08:19:18	DL6NCI Lorenz		ja klar, DL6NCI, DL6NCI und DL6NCI
08:17:54	DL7YC Manfred		Hallo Lorenz, ich habe in den Terminkalender eingetragen, kommt die Familie mit ?
07:54:14	DJ6JJ Hans D	GM	all 10°C sunshine, no wind
07:50:42	GB6WN Gordon	GM	All Wx 1093 Misty, no wind, 8c, forecast to clear to fine day. UK beacons on 23cms very strong
07:42:04	G8VR Ken	H	Bryn. B'ggersd up my 1271E. Hoping to get to ICOM in day or so. New 36 el working fine 73 Ken
07:36:03	G4DEZ Bryn		Calling QZ on 1296.2 beaming DL
07:26:51	DL6NCI Lorenz	gm	Manfred, ich bin vom 12:15:04. in Berlin
06:44:46	DL6NCI Lorenz	gm	all, sunny morning in jst50x, +2deg 1023m asl
06:28:13	DK1ZD Timm	QRT	due to QRL
06:15:44	OZ1FF Kjeld		Und auch SW
06:15:07	OZ1FF Kjeld		Her de O/SO
06:13:32	DK3WG Jurg		gm.....
06:12:56	DK1ZD Timm	GM	Kjeld cond's nur in de nord
06:11:45	OZ1FF Kjeld	GM	Timm OZ5SHF war 699 auf 246GHz wotrin
06:08:03	DK1ZD Timm	GM	Tolle! we have good cond's on 10GHz
06:07:42	F1PYR Andre		Gm...!
06:07:13	DK1ZD Timm	OZ5SHF/B	59+30
06:06:54	SK7MW Moggjarp	GM	Timm - nice 2 here U yesterday, hope U come for a new visit. 2 Mogg
06:06:39	DK1ZD Timm	OZ1UHF	59+30
06:05:46	SK7MW Moggjarp	GM	- tnx for all NICE QSOs yesterday, cond's were above normal DB5M
05:27:30	OZ8AF C Palle	GM	

Other windows include a "LOG121.EXI" window showing a log of QSOs with columns for Time, Call, Freq, and other details. A "Spectrum Analyzer" window is also visible, showing a frequency plot with a vertical line indicating a signal at approximately 1296 MHz.



For more information see

<http://sm7lcb.shacknet.nu>

**END**

**DEMO....**