

# How to compile Frame Library ver.8 with Borland C++ compiler?

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## **Purpose**

I aim to make a data acquisition system for noise monitoring related to cryogenic system. Because I choose Windows OS and Borland C++ compiler, some modifications to Frame Library are needed. In this document, these modifications are explained.

## **Environments**

### ***Machine Spec.***

Intel Core2 Quad CPU  
Q6600 @ 2.4GHz  
2.4 GHz, 2.00 GB RAM

### ***Operation system:***

Windows XP  
Professional  
Version 2002  
Service Pack 3

### ***Compiler***

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

### ***Frame Library***

<http://lappweb.in2p3.fr/virgo/FrameL/>

Version: v8r19p2 (June 05, 2013)

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### 1. MakeBcc.bat

Makefile (batch file) for bcc32

### 2. Memo.txt

It shows compile errors and its solutions.

### 3. Modified (diff) Files

FrameL.h

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FrIO.c

### 4. Additional C program for windows

gettimeofday.c

## MakeBcc.bat

```
::@echo off

SET MYUNAME="bcc_win"
SET MYCC=bcc32
::SET FLAGS="-I. %src% -I. %src%zlib -lm FrameL.lib"
SET FLAGS="FrameL.lib"

echo "-----> This is %MYUNAME% <--- We compile with %MYCC%"
mkdir ..%MYUNAME%
cd ..%MYUNAME%

echo "-----Delete existing *.o files"
del *.obj

echo "-----Compile the library"
%MYCC% -c -w- ..%src%FrameL.c ..%src%FrIO.c ..%src%FrFilter.c
..%src%gettimeofday.c ..%src%zlib%*.c -I. %src%zlib -I.%

echo "-----Build the regular library"
del FrameL.lib
tlib /C FrameL +FrameL +FrIO +FrFilter +Fradler32 +Frcompress +Frcrc32
+Frdeflate +Frinfblock +Frinfcodes +Frinffast +Frinflate +Frinftrees +Frinfutil
+Frtrees +Fruncompr +Frzutil +gettimeofday

::echo "-----Compile shared the library"
::%MYCC% -tWD ..%src%FrameL.c ..%src%FrIO.c ..%src%FrFilter.c ..%src%zlib%*.c
-I. %src%zlib

::echo "-----Build the shared Library"
::%MYCC% -shared -g -fPIC -o libFrame.so *.o

echo "-----Compile the utilities"

%MYCC% -w- ..%src%FrDump.c %FLAGS%
%MYCC% -w- ..%src%FrCopy.c %FLAGS%
%MYCC% -w- ..%src%FrCheck.c %FLAGS%
::ln -s FrDump FrDump.exe
::ln -s FrCopy FrCopy.exe
::ln -s FrCheck FrCheck.exe

::echo "-----Compile and Build the debug library"
::%MYCC% -g -c ..%src%FrameL.c ..%src%FrIO.c ..%src%FrFilter.c ..%src%zlib%*.c
-I. %src%zlib
::rm -f libFrameDebug.a
::ar r libFrameDebug.a *.o
::ranlib libFrameDebug.a

echo "-----Delete *.o files"
del *.obj
del *.tds
dir
echo "-----All done"

cd ..%mgr%
```

"-----Compile the library"

```
C:\Documents and Settings\tama300\My Documents\libframe-8.19.2\bcc_win>bcc32 -c -w- ..\src\FrameL.c  
..\src\FrIO.c ..\src\FrFilter.c ..\src\gettimeofday.c ..\src\zlib\*.c -I..\src\zlib -I\
```

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

..\src\FrameL.c:

\*\*\* 21 errors in Compile \*\*\*

%%%%%%%% 1

```
Error E2176 ..\src\FrameL.h 1309: Too many types in declaration  
Error E2176 ..\src\FrameL.h 1309: Too many types in declaration  
Error E2176 ..\src\FrameL.c 132: Too many types in declaration in function FrLibShortIni  
Error E2176 ..\src\FrameL.c 17454: Too many types in declaration in function FrVectExpand  
Error E2176 ..\src\FrameL.c 17454: Too many types in declaration in function FrVectExpand  
Error E2176 ..\src\FrameL.c 18028: Too many types in declaration in function FrVectInt  
Error E2176 ..\src\FrameL.c 18045: Too many types in declaration in function FrVectInt  
Error E2176 ..\src\FrameL.c 20181: Too many types in declaration  
Error E2176 ..\src\FrameL.c 20182: Too many types in declaration  
Error E2176 ..\src\FrameL.c 20186: Too many types in declaration in function FrVectZExpandL  
Error E2176 ..\src\FrameL.c 20187: Too many types in declaration in function FrVectZExpandL  
Error E2176 ..\src\FrameL.c 20206: Too many types in declaration in function FrVectZExpandL
```

..\src\FrFilter.c:

```
Error E2176 ..\src\FrameL.h 1309: Too many types in declaration  
Error E2176 ..\src\FrameL.h 1309: Too many types in declaration
```

\*\*\* 2 errors in Compile \*\*\*

--> These errors are due to lack of "long long" type definition in Borland C++ Compiler 5.5.

--> I tried to define "long long" type in a header file of FrameL.h.

--> But a type which consists of two words cannot be recognised by the compiler.

```
: typedef signed __int64 long long;
```

```
: Error E2176 ..\src\FrameL.h 19: Too many types in declaration
```

```
: Error E2146 ..\src\FrameL.h 19: Need an identifier to declare
```

--> Therefore I define both of "Llong" and "Ulong" in "FrameL.h".

--> And then, I replace all of "long long" and "unsigned long long"

--> to "Llong" and "Ulong", respectively.

```
: typedef signed __int64 Llong;
```

```
: typedef unsigned __int64 Ulong;
```

%%%%%%%% 2

```
Error E2209 ..\src\FrameL.c 18: Unable to open include file 'sys/time.h'
```

```
Error E2450 ..\src\FrameL.c 8164: Undefined structure 'timeval' in function FrGetCurrentGPS
```

```
Error E2449 ..\src\FrameL.c 8164: Size of 'tv' is unknown or zero in function FrGetCurrentGPS
```

```
Error E2450 ..\src\FrameL.c 8164: Undefined structure 'timeval' in function FrGetCurrentGPS
```

```
Error E2450 ..\src\FrameL.c 8164: Undefined structure 'timeval' in function FrGetCurrentGPS
```

```
Error E2449 ..\src\FrameL.c 8164: Size of 'tv' is unknown or zero in function FrGetCurrentGPS
```

```
Error E2451 ..\src\FrameL.c 8168: Undefined symbol 'tv_sec' in function FrGetCurrentGPS
```

```
Error E2451 ..\src\FrameL.c 8168: Undefined symbol 'tv_usec' in function FrGetCurrentGPS
```

--> The above errors are due to lack of timeval function in Borland C++ Compiler 5.5.

```
: #ifdef BCC32
```

```
: struct timeval {
```

```
:     long tv_sec;
```

```
:     long tv_usec;
```

```
: };
```

```
: #else
```

```
: #include <sys/time.h>
```

```
: #endif

%%%%% 3
Error E2453 ..\src\FrFrameL.c 3884: Size of the type 'void' is unknown or zero in function FrCListFindDuplicate
: name = list->table + i*list->rowSize;
--> It seems to be a problem of typecast. So I change as follows.
: name = (char *)list->table + i*list->rowSize;
```

```
%%%%% 4
..\src\FrIO.c:
Error E2209 ..\src\FrIO.c 14: Unable to open include file 'unistd.h'
Error E2451 ..\src\FrIO.c 37: Undefined symbol 'S_IRWXG' in function FrIOmkdir
Error E2451 ..\src\FrIO.c 37: Undefined symbol 'S_IROTH' in function FrIOmkdir
Error E2451 ..\src\FrIO.c 37: Undefined symbol 'S_IXOTH' in function FrIOmkdir
*** 4 errors in Compile ***
```

--> The above is due to lack of "file permission bit" definition in unistd.h.

```
#define BCC32
#ifdef BCC32
#define S_IRWXG 00070
#define S_IROTH 00004
#define S_IXOTH 00001
#else
#include <unistd.h>
#endif
```

"-----Compile the utilities"

```
C:\Documents and Settings\tama300\My Documents\libframe-8.19.2\bcc_win>bcc32 -w- ..\src\FrDump.c
"FrameL.lib"
Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland
..\src\FrDump.c:
Turbo Incremental Link 5.00 Copyright (c) 1997, 2000 Borland
Error: Unresolved external '_gettimeofday' referenced from C:\DOCUMENTS AND SETTINGS\TAMA300\MY
DOCUMENTS\LIBFRAME-8.19.
2\BCC_WIN\FRAMEL.LIB|FrameL
--> The above is due to lack of "gettimeofday" function in Borland C++ Compiler 5.5
--> Therefore, I write a file of "gettimeofday.c". And add the function to "FrameL.lib".
```

-----  
That's all.

16a17,21

> #define BCC32

> #ifdef BCC32

> typedef signed \_\_int64 Llong;

> typedef unsigned \_\_int64 Ulong;

> #endif

1309c1314

< void FrVectZExpandL(long long \*out, unsigned long long \*data, FRULONG nData);

---

> void FrVectZExpandL(Llong \*out, Ulong \*data, FRULONG nData);

```

17a18,24
>
> #ifdef BCC32
> struct timeval {
>     long tv_sec;
>     long tv_usec;
> };
> #else
18a26
> #endif
132,133c140,141
< if(sizeof(long long) != 8)
<     {FrError(3,"FrLibShortIni","Warning: sizeof(long long) != 8 !!!!!");}
---
> if(sizeof(Llong) != 8)
>     {FrError(3,"FrLibShortIni","Warning: sizeof(Llong) != 8 !!!!!");}
3884c3892
<     name = list->table + i*list->rowSize;
---
>     name = (char *) list->table + i*list->rowSize;
17454c17462
<     FrVectZExpandL((long long *)uncompr,(unsigned long long *)vect->data,vect->nData);}
---
>     FrVectZExpandL((Llong *)uncompr,(ULlong *)vect->data,vect->nData);}
18028c18036
< long long* dataL;
---
> Llong* dataL;
18045c18053
< {dataL = (long long*) vect->data;
---
> {dataL = (Llong*) vect->data;
20181,20182c20189,20190
< void FrVectZExpandL(long long *out,
<     unsigned long long *data,
---
> void FrVectZExpandL(Llong *out,
>     ULlong *data,
20186,20187c20194,20195
< unsigned long long nBits, pIn, uData, *buf, iBuf, i, iIn, iOut, bSize;
< static unsigned long long wMax[65], mask[65], iFirst = 0;
---
> ULlong nBits, pIn, uData, *buf, iBuf, i, iIn, iOut, bSize;
> static ULlong wMax[65], mask[65], iFirst = 0;
20206c20214
< buf = (unsigned long long *) &iBuf;
---
> buf = (ULlong *) &iBuf;

```

```
14d13
< #include <unistd.h>
18a18,26
>
> #define BCC32
> #ifdef BCC32
> #define S_IRWXG 00070
> #define S_IROTH 00004
> #define S_IXOTH 00001
> #else
> #include <unistd.h>
> #endif
```



## gettimeofday.c

```
#include <time.h>
#include <windows.h>

#if defined(_MSC_VER) || defined(_MSC_EXTENSIONS)
    #define DELTA_EPOCH_IN_MICROSECS  1164447360000000000Ui64
#else
    #define DELTA_EPOCH_IN_MICROSECS  116444736000000000
#endif

struct timezone
{
    int  tz_minuteswest; /* minutes W of Greenwich */
    int  tz_dsttime;     /* type of dst correction */
};

int gettimeofday(struct timeval *tv, struct timezone *tz)
{
    FILETIME ft;
    unsigned __int64 tmpres = 0;
    static int tzflag = 0;

    if (NULL != tv)
    {
        GetSystemTimeAsFileTime(&ft);

        tmpres |= ft.dwHighDateTime;
        tmpres <<= 32;
        tmpres |= ft.dwLowDateTime;

        tmpres /= 10;
        /*convert into microseconds*/
        /*converting file time to unix epoch*/
        tmpres -= DELTA_EPOCH_IN_MICROSECS;
        tv->tv_sec = (long)(tmpres / 1000000UL);
        tv->tv_usec = (long)(tmpres % 1000000UL);
    }

    if (NULL != tz)
    {
        if (!tzflag)
        {
            _tzset();
            tzflag++;
        }
        tz->tz_minuteswest = _timezone / 60;
        tz->tz_dsttime = _daylight;
    }

    return 0;
}
```