

# 1 INTRODUCTION

The C/C++ compiler is part of Analog Devices development software. The software aids your DSP project development efforts by:

- Processing C and C++ source files in ASCII format, producing machine level versions of the source code and object files
- Providing relocatable code and debugging information within the object files
- Providing relocatable data and program memory segments for placement by the linker in the processor's memory

Using C++, developers can significantly decrease time-to-market since it gives them the ability to efficiently work with complex signal processing data types. It also allows them to take advantage of specialized DSP operations without having to understand the underlying DSP architecture.

If you develop using the VisualDSP++<sup>™</sup> environment, you also get the following:

- An integrated development environment (IDDE) with support for editing programs, managing projects, and controlling build tools
- A source level, object-oriented debugger with support for DSP simulation and emulation
- Context-sensitive Help for the Windows<sup>®</sup> development environment
- Online access to all documentation for this product through PDF files

### Supported Processors

The name ADSP-21xxx DSP refers to the family of Analog Devices 32-bit SHARC® processors, which currently includes the following:

- ADSP-21060/L
- ADSP-21061/L
- ADSP-21062/L
- ADSP-21065L
- ADSP-21160/M/N
- ADSP-21161N

### For Additional Product Information

Analog Devices is online on the internet at [www.analog.com](http://www.analog.com). Our Web pages provide information about our broad range of products: analog integrated circuits, amplifiers, converters, and digital signal processors. For information on our digital signal processors, visit our Web site at [www.analog.com/dsp](http://www.analog.com/dsp). Our Web pages provide access to technical information and documentation, product overviews, and product announcements. You may also obtain additional information about Analog Devices and its products in any of the following ways:

- FAX questions or requests for information to 1(781) 461-3010 (North America) or 089/76 903-557 (Europe Headquarters).
- Access the DSP Division File Transfer Protocol (FTP) site at [ftp ftp.analog.com](ftp://ftp.analog.com) or [ftp 137.71.23.21](ftp://137.71.23.21) or <ftp://ftp.analog.com>.

## For Technical or Customer Support

You can reach our Customer Support group in the following ways:

- E-mail development tools questions to [dsptools.support@analog.com](mailto:dsptools.support@analog.com)
- E-mail processor questions to [dsp.support@analog.com](mailto:dsp.support@analog.com)
- Phone questions to 1800-ANALOGD
- Visit our World Wide web site at [www.analog.com/dsp](http://www.analog.com/dsp)
- Telex questions to 924491, TWX:710/394-6577
- Cable questions to ANALOG NORWOODMASS
- Contact your local ADI sales office or an authorized ADI distributor
- Send questions by mail to:

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DSP Division  
One Technology Way  
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## Purpose of This Manual

The *VisualDSP++ 2.0 C/C++ Compiler and Library Manual for ADSP-21xxx DSPs* provides information on the C/C++ compiler and run-time library software, including syntax for command lines, switches, and language extensions. This manual leads you through the process of using library routines and writing mixed C/C++/assembly code.

## Intended Audience

The primary audience for this manual are DSP programmers who are familiar with Analog Devices DSPs. This manual assumes that the audience has a working knowledge of the ADSP-21xxx family DSP architecture and instruction set and the C/C++ programming languages.

DSP programmers who are unfamiliar with ADSP-21xxx family DSPs can use this manual but should supplement it with other texts, such as the appropriate ADSP-21xxx DSP hardware reference and instruction set reference.

## Manual Contents Description

This manual contains the following chapters. Chapters may contain a guide and reference sections. Guide sections provide software usage procedures, usage examples, and error message information. Reference sections provide comprehensive information on command syntax and typical usage examples. For information on compiler and run-time library software, see the following chapters:

- [Chapter 2 — Compiler](#)

Provides information on compiler options, language extensions and C/C++/assembly interfacing

- [Chapter 3 — C/C++ Run-time Library](#)

Shows how to use library functions and provides a complete C and C++ library function reference

- Chapter 4—DSP Library for ADSP-2106x Processors

Describes the Analog Devices extensions to the C run-time library as they apply to the ADSP-2106x processors.

- Chapter 5—DSP Library for ADSP-2116x Processors

Describes the Analog Devices extensions to the C run-time library as they apply to the ADSP-2116x processors.

## What's New in This Manual

This edition of the *VisualDSP++ 2.0 C/C++ Compiler and Library Manual for ADSP-21xxx DSPs* documents support for new processors and software development environments.

In addition to documenting the new product features, this revision also provides more information geared to help you learn the product more quickly.

## Related Documents

For information on development software and Analog Devices DSPs, see the following documents:

- *Product Bulletin for VisualDSP++ & ADSP-21xxx Family DSPs*
- *VisualDSP++ 2.0 User's Guide for ADSP-21xxx DSPs*
- *VisualDSP++ 2.0 Assembler Manual for ADSP-21xxx Family DSPs*
- *VisualDSP++ 2.0 Linker and Utilities Manual for ADSP-21xxx DSPs*
- The *ADSP-21060/60L, ADSP-21061/61L, ADSP-21062/62L, ADSP-21065L, ADSP-21160M, and ADSP-21161N (preliminary) data sheets*

## Related Documents

All of the manuals are included on the software distribution CD-ROM. To access these documents within VisualDSP++:

1. Choose `Help Topics` from the VisualDSP++ `Help` menu.
2. Select the `Reference book` icon.
3. Select the `Online Manuals` topic.
4. Click the `Click here to view online manuals` button. A list of documents displays.
5. Select the document you want to view.

If you are not using VisualDSP++, you can manually access these PDF files from the CD-ROM using Adobe® Acrobat®.

Other related DSP publications, such as hardware and instruction set reference manuals, are available for download from [http://www.analog.com/industry/dsp/tech\\_doc/gen\\_purpose.html](http://www.analog.com/industry/dsp/tech_doc/gen_purpose.html)

## Conventions

[Table 1-1](#) identifies and describes text conventions used in this manual. These conventions apply to all chapters in the manual.



Additional conventions, which apply only to specific chapters, appear throughout this document.

Table 1-1. Notation Conventions

Example	Description
Close Command (File Menu)	Titles in reference sections indicate the location of an item within the VisualDSP++ environment's menu system (for example the <code>Close</code> command appears on the <code>File</code> menu)
{this   that}	Alternative items in syntax descriptions appear within curly brackets and are separated by vertical bars; read the example as <code>this</code> or <code>that</code> . One or the other is required.
[this   that]	Optional items in syntax descriptions appear within brackets and are separated by vertical bars; read the example as an optional <code>this</code> or <code>that</code> .
[this,...]	Optional item lists in syntax descriptions appear within brackets delimited by commas and terminated with an ellipse; read the example as an optional comma-separated list of <code>this</code> .
.SECTION	Commands, directives, keywords, and feature names are shown in text with <code>letter gothic</code> font.
filename	Non-keyword placeholders appear in text with <i>italic</i> style format.

## Conventions