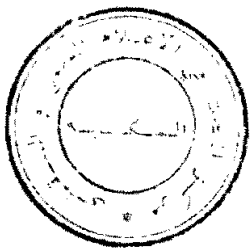
BIBLIOTHEQUE DU CERIST



PRO*C SUPPLEMENT TO THE ORACLE PRECOMPILERS GUIDE

VERSION 1.3

ORACLE®

The Relational Database Management System

Pro*C Supplement to the ORACLE Precompilers Guide
Version 1.3

Part No. 5452-V1.3 September 1989

Contributing Author: Tom Portfolio

Contributors: George Chung, Peter Clare, Matt Fadness, Ken Jacobs, Ben Linder, Jeff Muller, Donna Neville, Lee Osborne, Ken Rudin, Rakesh Shukla, Gael Turk

Copyright © Oracle Corporation 1989

All rights reserved. Printed in the U.S.A.

Restricted Rights Legend
Use, duplication, or disclosure of the Programs is subject to restrictions stated in your contract with Oracle Corporation.

Use, duplication, or disclosure of the Programs by the Government is subject to restrictions for commercial computer software and the Programs shall be deemed to be licensed with Restricted Rights under Federal Law.

This information in this document is subject to change without notice. If you find any problems in the documentation, please report them to us in writing. Oracle Corporation does not warrant that this document is error-free.

ORACLE, SQL*Net, and SQL*Plus are registered trademarks of Oracle Corporation.

PL/SQL and Pro*C are trademarks of Oracle Corporation.

VMS is a trademark of Digital Equipment Corp.
UNIX is a trademark of AT&T Bell Laboratories.

BIBLIOTHEQUE DU CERIST

BIBLIOTHEQUE DU CERIST

PREFACE

Devoted exclusively to the Pro*C Precompiler, this manual supplements the language-independent *Programmer's Guide to the ORACLE Precompilers*. This manual shows you how to write C programs that use the powerful database language SQL to access and manipulate ORACLE data. It includes several full-length program samples to better your understanding and demonstrate the usefulness of embedded SQL.

Who Should Read This Manual?

Anyone developing new C applications or converting existing C applications to run in the ORACLE environment will benefit from reading this manual. Written especially for programmers, it will also be of value to systems analysts, project managers, and others interested in embedded SQL applications.

To use this manual effectively, you need a working knowledge of the following:

- applications programming in C
- the SQL database language
- ORACLE database concepts and terminology
- the concepts, terminology, methods, requirements, and options detailed in the *Programmer's Guide to the ORACLE Precompilers*

How This Manual Is Organized

This manual contains two chapters. A brief summary of what you will find in each chapter follows:

Chapter 1: Writing a Pro*C Program
This chapter provides the basic information you need to develop a Pro*C application. You learn Pro*C programming guidelines, coding conventions, language-specific features and restrictions, how to connect to ORACLE, how to handle runtime errors, how to implement dynamic SQL Method 4, and how to run the Pro*C Precompiler.

Chapter 2: Sample Programs
This chapter provides several embedded SQL programs to guide you in writing your own. These well-commented programs illustrate the key concepts and features of Pro*C programming.

BIBLIOTHEQUE DU CERIST

BIBLIOTHEQUE DU CERIST

PREFACE

Devoted exclusively to the Pro*C Precompiler, this manual supplements the language-independent *Programmer's Guide to the ORACLE Precompilers*. This manual shows you how to write C programs that use the powerful database language SQL to access and manipulate ORACLE data. It includes several full-length program samples to better your understanding and demonstrate the usefulness of embedded SQL.

Who Should Read This Manual?

Anyone developing new C applications or converting existing C applications to run in the ORACLE environment will benefit from reading this manual. Written especially for programmers, it will also be of value to systems analysts, project managers, and others interested in embedded SQL applications.

To use this manual effectively, you need a working knowledge of the following:

- applications programming in C
- the SQL database language
- ORACLE database concepts and terminology
- the concepts, terminology, methods, requirements, and options detailed in the *Programmer's Guide to the ORACLE Precompilers*

How This Manual Is Organized

This manual contains two chapters. A brief summary of what you will find in each chapter follows:

Chapter 1: Writing a Pro*C Program
This chapter provides the basic information you need to develop a Pro*C application. You learn Pro*C programming guidelines, coding conventions, language-specific features and restrictions, how to connect to ORACLE, how to handle runtime errors, how to implement dynamic SQL Method 4, and how to run the Pro*C Precompiler.

Chapter 2: Sample Programs
This chapter provides several embedded SQL programs to guide you in writing your own. These well-commented programs illustrate the key concepts and features of Pro*C programming.

BIBLIOTHEQUE DU CERIST

Conventions Used in This Manual

Important terms being defined for the first time are italicized. In discussions, upper case is used for database objects and SQL keywords, boldface lower case is used for the names of C functions, directives, storage classes, and so on, and italicized lower case is used for the names of variables, constants, and parameters.

Notation

The following notational conventions are used in this manual:

[ ]	Brackets indicate that the enclosed items are optional.
{ }	Braces indicate that one, and only one, of the enclosed items is required.
|	A vertical bar is used to separate options within brackets or braces.
...	An ellipsis indicates that the preceding argument or parameter can be repeated, or that a statement is intentionally incomplete.

Related Publications

The following manuals are recommended for use with this manual:

- *ORACLE Error Messages and Codes Manual*, Part No. 3605
- *Programmer's Guide to the ORACLE Precompilers*, Part No. 5315
- *SQL Language Reference Manual*, Part No. 778
- *SQL*Net User's Guide*, Part No. 3604
- *SQL*Plus User's Guide*, Part No. 3201

For a complete list of the publications that support ORACLE, see the *ORACLE Technical Publications Catalog*, Part No. 3903.

BIBLIOTHEQUE DU CERIST

Your Comments Are Welcome

The Oracle Corporation technical staff values your comments. As we write and revise, your opinions are the most important feedback we receive. Please use the Reader's Comment Form at the back of this manual to tell us what you like and dislike about this Oracle publication. If you prefer, call us at (415) 598-8000 or write to us at the following address:

ORACLE Precompilers Product Manager
Oracle Corporation
20 Davis Drive
Belmont, California 94002

BIBLIOTHEQUE DU CERIST

BIBLIOTHEQUE DU CERIST

CONTENTS

Chapter 1 **Writing a Pro*C Program** 1-1
Programming Guidelines 1-2
Statement Terminator 1-2
Statement Labels 1-2
Comments 1-2
Continuation Lines 1-2
Quotation Marks 1-2
Apostrophes 1-3
Nulls 1-3
Constants 1-3
Required SQL Statements 1-4
The INCLUDE Statement 1-4
The Declare Section 1-5
Declaring and Referencing Host Variables 1-6
Declaring Host Variables 1-6
Referencing Host Variables 1-8
Declaring Indicator Variables 1-9
Referencing Indicator Variables 1-9
Declaring Host Arrays 1-9
Referencing Host Arrays 1-10
Declaring Pointers as Host Variables 1-10

Referencing Pointer Host Variables 1-10
Declaring the VARCHAR Pseudotype 1-11
Handling String Host Variables 1-12
Character Array 1-13
VARCHAR 1-14
Pointer to a Character String 1-14
Pointer to a VARCHAR 1-16
Connecting to ORACLE 1-17
Automatic Logons 1-18
Concurrent Logons 1-18
Handling Runtime Errors and Status Changes 1-19
Using the WHENEVER Statement 1-19
Using the SQLCA 1-20
Using the ORACA 1-24
Implementing Dynamic SQL Method 4 1-26
Declaring a SQLDA 1-26
The SQLDA Variables 1-27
Coercing Datatypes 1-30
Handling Nulls 1-33
The Basic Steps 1-34
A Closer Look at Each Step 1-35
Using Host Arrays 1-51
Running the Pro*C Precompiler 1-52
Required Arguments 1-52
Optional Arguments 1-52
Scope of Options 1-52
Entering Options 1-53
Doing Conditional Precompilations 1-53
Doing Separate Precompilations 1-53
Compiling and Linking 1-54

BIBLIOTHEQUE DU CERIST

Chapter 2 **Sample Programs** 2-1
Sample Program 1 2-2
Sample Program 2 2-4
Sample Program 3 2-6
Sample Program 4 2-8
Sample Program 5 2-15
Sample Program 6 2-17
Sample Program 7 2-20
Sample Program 8 2-24
Sample Program 9 2-28

Index

BIBLIOTHEQUE DU CERIST