

# Back-End Program Calling

This section describes the conventions that apply to invoking a back-end program.

**Note:** This section does not apply to BS2000/OSD; refer to Calling Non-Natural Programs and Calling UTM Chained Partial Programs (described in the Natural TP Monitor Interfaces documentation; see Natural under UTM).

The following topics are covered:

- Back-End Program Calling Conventions
  - Special Considerations under CICS
  - Sample Back-End Programs
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## Back-End Program Calling Conventions

If the profile parameter PROGRAM is specified (or set dynamically during a Natural session by calling the subprogram CMPGMSET in the library SYSEXTP), a back-end program is invoked, regardless of whether the session terminated normally or abnormally.

If a back-end program is available, Natural does not issue any session termination messages. Non-zero user return codes, specified via *operand1* of the Natural TERMINATE statement, are indicated by the Natural error message NAT9987.

A parameter area containing the following information is passed to the back-end program:

- a fullword that holds the Natural system or user return code,
- a Natural termination message of 72 characters,
- a fullword that holds the length of the Natural termination data (or zero),
- the termination data passed by *operand2* of the TERMINATE statement (if any).

The back-end program parameter area is at least 80 bytes long. The macro NAMBCKP, which contains a DSECT layout of the back-end program parameter area, is supplied in the Natural source library and can be used by Assembler back-end programs.

## Special Considerations under CICS

Under CICS, the back-end program parameter data are passed in the COMMAREA and in the TWA. In the TWA, only 80 bytes are passed, containing return code and message, while the length field contains an address that points to the full back-end program parameter area. The same TWA is also provided if Natural has been invoked via EXEC CICS LINK; see also Front-End Invoked via LINK (Natural under CICS in the Natural TP Monitor Interfaces documentation).

If parameter COMAMSG=NO is set in the Natural/CICS generation macro (NCIPARM), only the termination data are passed in the COMMAREA.

## Sample Back-End Programs

The following table contains a number of sample programs:

**Sample Back-end Program for Batch and TSO Environments in COBOL:**

```

LINKAGE SECTION
  01  BACKEND-PARM-AREA .
  02  TERMINATION-RETURN-CODE          PIC S9(8) COMP .
  02  TERMINATION-MESSAGE              PIC X(72) .
  02  TERMINATION-DATA-LENGTH          PIC S9(8) COMP .
  02  TERMINATION-DATA                 PIC X(100)
...
PROCEDURE DIVISION USING BACKEND-PARM-AREA

```

**Sample Back-end Program for Batch and TSO Environments in Assembler:**

```

BACKPROG CSECT
  SAVE (14,12)
  LR 11,15
  USING BACKPROG,11
  L 2,0(1)
  USING BCKPARAM,2
...
  RETURN (14,12)
BCKPARAM NAMBCKP
  END

```

**Sample Back-end Program for CICS in Assembler:**

```

L 2,DFHEICAP
USING BCKPARAM,2
...
BCKPARAM NAMBCKP
  END

```

**Sample Back-end Program XNATBACK for Batch Mode (OS/390 and VSE/ESA):**

A sample program for batch mode is supplied as XNATBACK in the Natural source library. This program issues the Natural termination message on both SYSPRINT (OS/390) / SYSLST (VSE/ESA) and the operator console; potential termination data are printed on SYSPRINT/SYSLST in dump format.