

XPEDITER/TSO — Altering Program Flow

General Questions

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NOTE: The following examples apply to COBOL, PL/I and Assembler unless otherwise indicated.

Will inserted XPEDITER commands change the actual load module?

An inserted command is used to temporarily insert an XPEDITER/TSO command into the program. XPEDITER/TSO interprets the inserted command and executes it as if it were part of your source code. The inserted command does not update the actual source code or load module and is deleted when a DELETE command is issued or the test session ends.

Why does the GOTO command not work when reviewing program execution using the REVERSE and MONITOR commands?

Review mode enables you to record and then review the execution path by reversing the direction of program execution. The MONITOR command must first be issued to record execution. Then the REVERSE command is used to review the execution history by tracing through the recorded history in the reverse direction. You can see the execution path and the changing data values as you review program execution, however, you cannot alter the path of previously executed code. Therefore, the GOTO command is not valid during review mode.

Will it generate any problems if we use the GOTO command?

There are some usage risks associated with the GOTO command because the logical flow of the program is changed. Program abends (S0C4 or S0C7) could occur, or you could run off the end of your program, yielding unpredictable results.

Will optimized code affect the program flow?

XPEDITER/TSO displays the source for optimized code as it was originally written, but it executes the code generated by the optimizer. As a result, depending on the optimizing algorithm applied to the code, execution trace and stepping through code in XPEDITER/TSO can appear to be incorrect because the source does not match the load module. The logic optimization can also impact data flow in the program.

What are the dangers of using optimized code, GOTO and SKIP?

Because optimized code is displaying the original source but executing the code generated by the optimizer, the following can occur:

- Highlighting during execution of the trace of the optimized code can be misleading.
- Data values displayed by the KEEP and PEEK commands cannot be updated according to the program logic.
- Abends can occur when you use XPEDITER/TSO commands such as GOTO and SKIP that alter the program execution paths. These abends occur when the altered execution paths are in conflict with path dependencies generated by the optimizer.
- If you use the Copy Suppress in the Procedure Division, you might not be able to set a breakpoint on the first statement following the copied code.

How do I use the SKIP command?

The following example illustrates using the SKIP command when you want to skip a call to a subroutine.

1. Find all call statements.

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ==> f call x nol                                SCROLL ==> CSR
                BEFORE BREAKPOINT ENCOUNTERED
                -----
000347  01 PARMINFO                                     > ..00003
                ** END **

----- Before CWXTCOB <>
===== B  PROCEDURE DIVISION USING PARMINFO.
000351      0000-MAINLINE.
000352      PERFORM 9000-OPEN.
000353      PERFORM 9100-CHECK-PARM.
000354      IF GOOD-PARM
000355          PERFORM 9200-INIT
000356          PERFORM 8000-READ-INPUT
000357              UNTIL RECORDS-READ = START-NUMBER
000358              OR END-OF-FILE
000359          PERFORM 1000-PROCESS-DATA
000360              UNTIL END-OF-FILE
000361          PERFORM 6000-PRINT-EMPLOYEE-REPORT
000362          MOVE 1 TO REGION-SUB
000363          IF END-OF-MONTH
000364          PERFORM 7000-PRINT-REGION-REPORT

```

Figure 1: FIND Command

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ==>>                                           SCROLL ==> CSR
                5 CALLS FOUND
                -----
000347  01 PARMINFO                                     > ..00003
                ** END **

----- Before CWXTCOB <>
***** TOP OF MODULE *****
000405      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000406          YRS-OF-SERVICE
000407          TODAYS-DATE
000408          WA-EMP-HIRE-DATE.
000425      CALL 'CWXTSUBC' USING EMP-TYPE,
000426          CALC-SALES,
000427          CALC-COMMISSION
000433      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000434          YRS-OF-SERVICE
000435          TODAYS-DATE
000436          WA-EMP-HIRE-DATE.
000583      CALL 'CWXTSUBC' USING EMP-TYPE,
000584          CALC-SALES,
000585          CALC-COMMISSION.
000656      CALL 'CWXTDATE' USING END-OF-MONTH-SW

```

Figure 2: Results of FIND Command

2. Bypass calls to program CWXTDATE.

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ===> [ENTER]                                SCROLL ===> CSR
PROGRAM: CWXTCOB   MODULE: CWXTCOB   COMP DATE: 02/25/99   COMP TIME: 09:47:36
-----+-----
000347   01 PARMINFO                                > ..00003
          ** END **

----- Before CWXTCOB <>
***** TOP OF MODULE *****
s  405      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000406                                YRS-OF-SERVICE
000407                                TODAYS-DATE
000408                                WA-EMP-HIRE-DATE.
000425      CALL 'CWXTSUBC' USING EMP-TYPE,
000426                                CALC-SALES,
000427                                CALC-COMMISSION
s  433      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000434                                YRS-OF-SERVICE
000435                                TODAYS-DATE
000436                                WA-EMP-HIRE-DATE.
000583      CALL 'CWXTSUBC' USING EMP-TYPE,
000584                                CALC-SALES,
000585                                CALC-COMMISSION.
s  656      CALL 'CWXTDATE' USING END-OF-MONTH-SW

```

Figure 3: SKIP Command

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ===>                                SCROLL ===> CSR
                                     3 COMMAND(S) COMPLETED
-----+-----
000347   01 PARMINFO                                > ..00003
          ** END **

----- Before CWXTCOB <>
***** TOP OF MODULE *****
000405 s      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000406                                YRS-OF-SERVICE
000407                                TODAYS-DATE
000408                                WA-EMP-HIRE-DATE.
000425      CALL 'CWXTSUBC' USING EMP-TYPE,
000426                                CALC-SALES,
000427                                CALC-COMMISSION
000433 s      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000434                                YRS-OF-SERVICE
000435                                TODAYS-DATE
000436                                WA-EMP-HIRE-DATE.
000583      CALL 'CWXTSUBC' USING EMP-TYPE,
000584                                CALC-SALES,
000585                                CALC-COMMISSION.
000656 s      CALL 'CWXTDATE' USING END-OF-MONTH-SW

```

Figure 4: Results of SKIP Command

3. Reset excluded lines.

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ===> [PF3]                                SCROLL ===> CSR
                3 COMMAND(S) COMPLETED
                -----
000347  01 PARMINFO                                > ..00003
        ** END **

----- Before CWXTCOB <>
***** TOP OF MODULE *****
000405 S      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000406                                YRS-OF-SERVICE
000407                                TODAYS-DATE
000408                                WA-EMP-HIRE-DATE.
000425      CALL 'CWXTSUBC' USING EMP-TYPE,
000426                                CALC-SALES,
000427                                CALC-COMMISSION
000433 S      CALL 'CWXTDATE' USING END-OF-MONTH-SW
000434                                YRS-OF-SERVICE
000435                                TODAYS-DATE
000436                                WA-EMP-HIRE-DATE.
000583      CALL 'CWXTSUBC' USING EMP-TYPE,
000584                                CALC-SALES,
000585                                CALC-COMMISSION.
000656 S      CALL 'CWXTDATE' USING END-OF-MONTH-SW
    
```

Figure 5: Reset Excluded Lines

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ===>                                SCROLL ===> CSR
PROGRAM: CWXTCOB  MODULE: CWXTCOB  COMP DATE: 02/25/99  COMP TIME: 09:47:36
                -----
000347  01 PARMINFO                                > ..00003
        ** END **

----- Before CWXTCOB <>
=====> B  PROCEDURE DIVISION USING PARMINFO.
000351      0000-MAINLINE.
000352      PERFORM 9000-OPEN.
000353      PERFORM 9100-CHECK-PARM.
000354      IF GOOD-PARM
000355          PERFORM 9200-INIT
000356          PERFORM 8000-READ-INPUT
000357              UNTIL RECORDS-READ = START-NUMBER
000358              OR END-OF-FILE
000359          PERFORM 1000-PROCESS-DATA
000360              UNTIL END-OF-FILE
000361          PERFORM 6000-PRINT-EMPLOYEE-REPORT
000362          MOVE 1 TO REGION-SUB
000363          IF END-OF-MONTH
000364          PERFORM 7000-PRINT-REGION-REPORT
    
```

Figure 6: Results of Resetting Excluded Lines

4. Begin program execution.

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ==> go                                SCROLL ==> CSR
PROGRAM: CWXTCOB    MODULE: CWXTCOB    COMP DATE: 02/25/99    COMP TIME: 09:47:36
                                -----+-----
000347    01 PARMINFO                                > .00003
          ** END **

----- Before CWXTCOB <>
====> B  PROCEDURE DIVISION USING PARMINFO.
000351    0000-MAINLINE.
000352          PERFORM 9000-OPEN.
000353          PERFORM 9100-CHECK-PARM.
000354          IF GOOD-PARM
000355              PERFORM 9200-INIT
000356              PERFORM 8000-READ-INPUT
000357                  UNTIL RECORDS-READ = START-NUMBER
000358                  OR END-OF-FILE
000359              PERFORM 1000-PROCESS-DATA
000360                  UNTIL END-OF-FILE
000361              PERFORM 6000-PRINT-EMPLOYEE-REPORT
000362              MOVE 1 TO REGION-SUB
000363              IF END-OF-MONTH
000364              PERFORM 7000-PRINT-REGION-REPORT

```

Figure 7: GO Command

```

----- XPEDITER/TSO - SOURCE -----
COMMAND ==>                                SCROLL ==> CSR
                                TEST COMPLETED
          ** END **

----- After CWXTCOB <>
000366          PERFORM 9900-CLOSE.
====> A  GOBACK.
000368    ***
000369    *** DIFFERENT PROCESSING OCCURS BASED ON EMPLOYEE TYPE.  THERE
000370    *** ARE 3 VALID EMPLOYEE TYPES.  IF A RECORD IS READ CONTAINING
000371    *** A RECORD TYPE OTHER THAN H, S OR M, AN ERROR MESSAGE IS
000372    *** WRITTEN AND PROCESSING CONTINUES.
000373    ***
000374          1000-PROCESS-DATA.
000375          IF HOURLY
000376              PERFORM 2000-PROCESS-HOURLY
000377          ELSE
000378              IF SALES
000379                  PERFORM 3000-PROCESS-SALES
000380          ELSE

```

Figure 8: Results of GO Command