



IBM IT Education Services

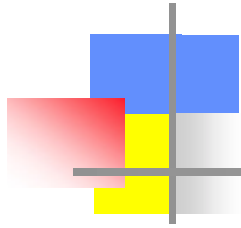
Session ID: E55

**Speaker : Janice Winchell
MICOM Inc**

Debug Tool - Totally *COOL*

November 10 - 12, 2003 | Hilton, Las Vegas, NV

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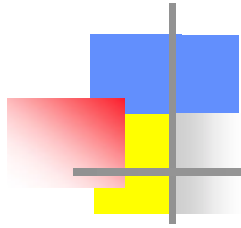
IBM DEBUG TOOL

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COBOL for VSE/ESA
COBOL for MVS & VM
COBOL OS/390
LANGUAGE ENVIRONMENT/370
LANGUAGE ENVIRONMENT for MVS & VM
LANGUAGE ENVIRONMENT OS/390
LANGUAGE ENVIRONMENT for VSE/ESA
MVS
MVS/ESA
OS/390
VSE/ESA
IBM
CICS CICS/ESA
SYSTEM/390

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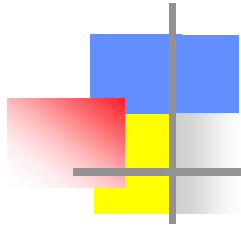
- **RULE 1**

- IF PROGRAM IS WORKING CORRECTLY AND THERE IS NO PERFORMANCE ISSUE - *MOVE ON*

- ***HOWEVER***

- IF PROGRAM RUNS INCORRECTLY
- IF PROGRAM ABENDS
- IF PROGRAM PERFORMS POORLY

WHAT THEN?

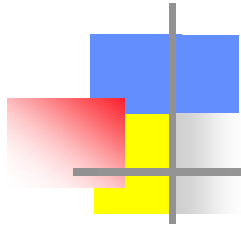


- **DEBUGGING TOOLS AVAILABLE**

- **DEBUG TOOL**

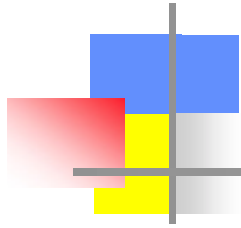
and don't forget

- **COBOL Compiler options**
- **Language Environment (LE) run-time options**
- **LE callable routines**
- **COBOL debugging module**
- **Dump information**
- **Compiler listing**

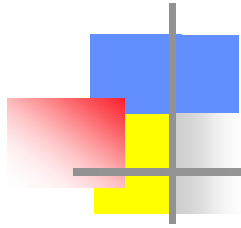


- **DEBUG TOOL**

- **Interactive source level tool**
 - **Step through execution**
 - 1 instruction at a time
 - “Animate”
 - **Set dynamic breakpoints**
 - May be simple “stop”
 - May be conditional based upon derived values during execution
 - **Monitor working-storage fields**
 - **Modify program**
 - **Modify variables**
- **Same interface (same product) for batch and on-line**



- **Debug Tool debugs programming languages supported by Language Environment**
 - **COBOL**
 - **C/VSE**
 - **PL/I**
 - **Same interface for batch/online**
 - **Difference is how to “start” DT/VSE**
 - **JCL for “interactive/batch”**
 - **DTCN to set up for CICS debugging**



- **FULL SCREEN** (referred to as “interactive or interactive/batch” debugging)
 - 3270 interface to host
 - 3 “logical” screens
 - Monitor “window”
 - Source “window”
 - Log “window”
- **Batch mode** (often called “batch/batch” debugging)
 - Use pre-determined commands (file)
 - No terminal interaction

IBM DEBUG TOOL

```
Quick3270 - Session A - A - .No Title
File Edit View Session Transfer Macro Settings Help
[Icons]

COBOL LOCATION: LAB1DB initialization
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5---+ LINE: 1 OF 123
1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. LAB1DB.
3 ENVIRONMENT DIVISION.
4 CONFIGURATION SECTION.
5 INPUT-OUTPUT SECTION.
6 FILE-CONTROL.
7 SELECT PRINTOUT ASSIGN SYSPRINT.

LOG 0---+---1---+---2---+---3---+---4---+---5---+---6- LINE: 4 OF 8
0004 SET FREQUENCY ON ;
0005 AT 101
0006 LIST FREQUENCY * ;
0007 SET PF16 'Monitor List' = Monitor List ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4Bì 19/15
```




IBM DEBUG TOOL

- **Preparing Your Program for DEBUG TOOL**

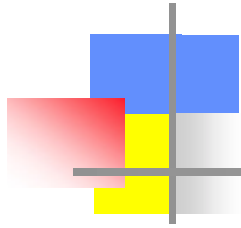
- **COMPILE** with appropriate compiler option
 - Suboptions influence what/how you will debug
- **NOTEST** is default
- **SYM** builds symbol table information
- Listing of compile to permanent dataset (or source listing for C/VSE)
 - This is accomplished by using the supplied EQALIST exit when you compile

TEST compiler option has different “sub-options” available

- **ALL** – generates hooks for everything you can do
- **BLOCK** – hooks are inserted at block entry/exit points
- **PATH** – hooks inserted at “path” points
- **STMNT** – hooks at every statement, label, entry, exit
- **SYM** – access to working-storage fields in COBOL

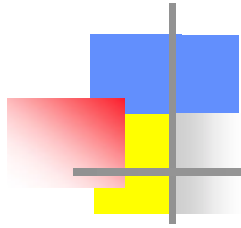
TEST(ALL,SYM) – creates **SYMBOL** tables and is the recommended **COMPILE OPTION** but only when you want to use Debug TOOL

Note that at this time the SEPARATE suboption of the TEST compiler option is not supported (yet) by DT/VSE

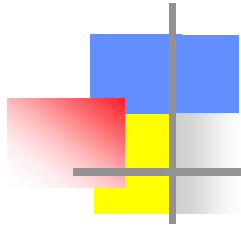


- **Preparing to EXECUTE your Program**
 - *Execute* with appropriate **TEST RUN-TIME OPTION**
 - **TEST**
 - **Test_level**
 - **Commands_file**
 - **Prompt_level**
 - **VTAM terminal for debug sessions commands**
 - **This identifies the terminal to use for your debug session**
 - **Preferences_file**

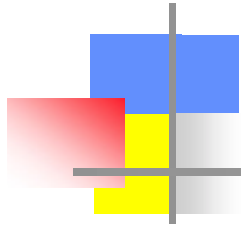
TEST(ALL,*,PROMPT,MFI%LU00001:*)



- **More about the datasets DT/VSE “can” use**
 - **PRIMARY COMMANDS FILE** contains regular Debug Tool “commands”
 - Can be simply “coded” using an editor
 - Can be a saved log file from an interactive DT/VSE session
 - **Format matters (commands must have ; terminator)**
 - When entering commands from terminal, correct formatting is set up
 - Using an * or simply leaving blank (two adjacent commas) indicates **NO COMMANDS FILE**
 - Can indicate presence/absence on JCL for this file – or you can issue the **USE** command to “use” the commands file in DT/VSE interactive session



- **More about the datasets DT/VSE “can” use**
 - **SYSLST for log or dump output (Call %DUMP)**
 - **Can be set to disk output or “normal” SYSLST in JCL**
 - **Preferences File**
 - **Input to set preferences (userid.DTSAFE)**
 - **Commands File**
 - **Input of DT commands to execute**
 - **Profile Settings File**
 - **Color customization, profile changes in PANEL PROFILE**
 - **Log File**
 - **Record of commands issued and output results**



- **Files specifically for DEBUG TOOL**

- **Preferences File**

- **Sets up Debug Tool session with user preferences (layout of windows, screen colors, cursor scroll amount, etc)**

- **Commands File**

- **Pass commands to Debug Tool in “batch” mode**

- **Could be “regression” test**
 - **Save LOG from interactive session and “re-use” as COMMANDS FILE input**

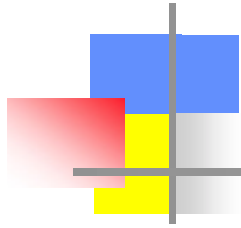
- **Profile Settings File**

- **User customized profile specifications**

- **Log File**

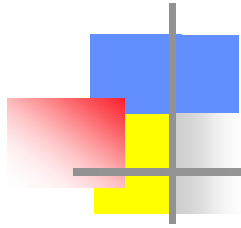
- **Record of commands executed and responses to commands**

Not required to set up any of these files - may choose to use defaults initially



- **Sample JCL for COMPILE**
 - The COBOL compiler is now IGYCRCTL
 - The PARM identifies the IBM supplied exit EQALIST
 - Compiler listing goes to POWER list queue as normal
 - Also written to DISK FILE for DEBUG TOOL

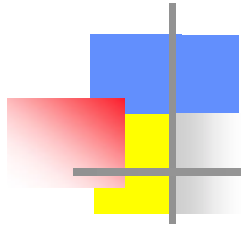
```
/* VSE JCL for COMPILING for DEBUG TOOL *****/
* $$ JOB JNM=COMPILE,CLASS=A,DISP=D
* $$ LST DISP=H,CLASS=A
// JOB COMPILE DEBUG PROGRAM
.....
// EXEC IGYCRCTL,SIZE=IGYCRCTL,PARM='EXIT(PRTEXT("DTVSE.LIST",EQALIST))'
   CBL TEST(ALL,SYM)
.....
/&
* $$ EOJ
```



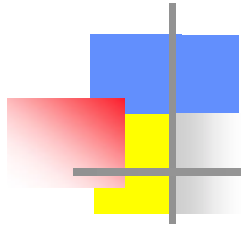
- **More about where your compiler listing might go!**

```
// EXEC IGYCRCTL,SIZE=500K,PARM='EXIT(PRTEXT(' 'PARAMETER' ',EQALIST))'
```

- **parameters that might be passed**
 - **NONE**
 - **member_name**
 - **lib.sublib**
 - **member_name as part of prt exit**
 - **VSAM**

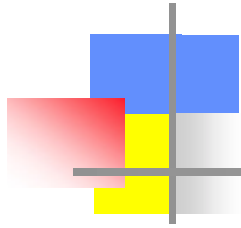


- **Compiler Listing(COBOL) or source (C/VSE, PL/I) should be available to Debug Tool**
 - **Dataset name stored in object module**
 - **No need to specify LIST compiler option (generates Assembler statements)**
 - **Performance improves with NOLIST (smaller listing to read in)**
 - **If you MOVE the information you may need to TELL DEBUG TOOL where to find your listing and symbol table information!**
 - **SET SOURCE**
 - **If the LIBDEF search chain has a different search order than when you compiled**



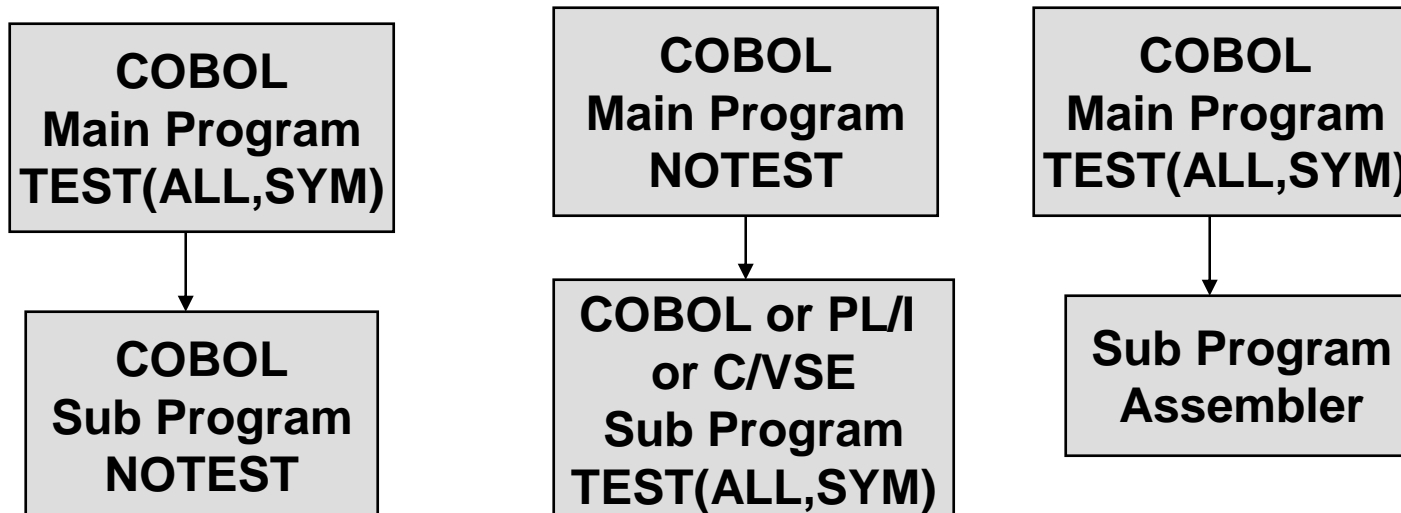
- **Debug Tool terminology**
 - Intent is to be “language neutral” in reference
 - These terms are used in the Debug Tool manuals

| Term used | COBOL equivalent | PL/I equivalent | C/VSE equivalent |
|--------------|---------------------------|------------------------|--------------------------------|
| Compile Unit | Program | Program or PL/I source | C source file |
| Block | Program or Nested program | Block | Function or compound statement |
| Label | Paragraph or Section name | Label | Label |



- **Multiple Program Compile Unit**

- Can “MIX & MATCH” what is to be “DEBUG TOOL” ready
 - Languages
 - Debug Tool
 - Static or Dynamic Call

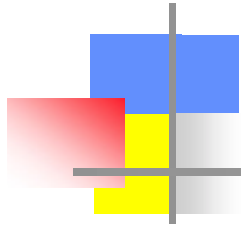


IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 77.1
Command ==> Scroll ==> CSR
MONITOR ---1---+---2---+---3---+---4---+---5---+---6 LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 71 OF 123
71 PROCEDURE DIVISION.
72 100-INITIAL-PROGAM.
73 OPEN INPUT HOUSEINV
74 OUTPUT PRINTOUT
75 EVALUATE HOUSEINV-STATUS
76 WHEN '00'
77 MOVE SPACES TO PRINT-RECORD
78 WRITE PRINT-RECORD FROM PRINT-RECORD-HEADINGS
79 CONTINUE
80 WHEN OTHER
LOG 0---1---+---2---+---3---+---4---+---5---+---6 LINE: 7 OF 10
0007 QUALIFY RESET ;
0008 SET FREQUENCY ON ;
0009 STEP ;
0010 STEP ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A080+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
MONITOR ---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 9
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
0005 02 LAB1DB:>PURCH-LOC 'DALLAS, TEXAS'
0006 02 LAB1DB:>PURCH-DATE 10111996
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 88 OF 123
88 SET HOUSEINV-EOF-ON TO TRUE
89 NOT AT END
90 EVALUATE HOUSEINV-STATUS
91 WHEN '00'
92 PERFORM 300-DETAIL THROUGH 300-DETAIL-EXIT
93 WHEN OTHER
LOG 0 ---1---+---2---+---3---+---4---+---5--- LINE: 15 OF 19
0015 STEP ;
0016 AT 101 ;
0017 AT 101
0018 LIST FREQUENCY * ;
0019 The STATEMENT LAB1DB ::> LAB1DB :> 101.1 breakpoint is replaced.
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A153+
```



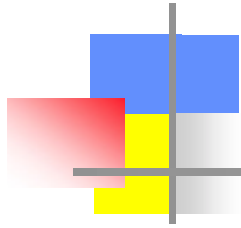
- **Starting a Debugging Session**

- **Batch**

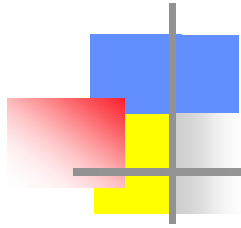
- **Execute with TEST run-time option or CALL 'CEETEST' from application**
 - **Log file can be “captured” IF YOU ASK FOR IT by specifying dataset**

- **CICS**

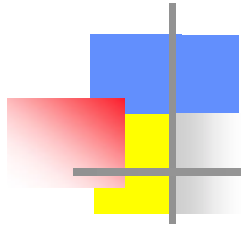
- **Complete DT install for CICS (EQACSD - which gets you DTCN)**
 - **Assemble CEEUOPT and link with application or INSTALL DTCN**



- **Using DT/VSE in different environments**
 - **DL/I can use Debug Tool interactively, or batch**
 - **Special LINKEDT required**
 - **CEEUOPT – special user run-time option**
 - **Must be able to set up PARM='/TEST(ALL,,,MFI%luname)'** and VTAM LU identified for execution
 - **Use your normal JCL for job execution**
 - **DB2 can use “batch/batch” or “interactive/batch” debugging**
 - **No “special” requirements other than the TEST PARM for execution identifying the VTAM LU for Debug Tool for interactive/batch**
 - **Save the pre-compiler listing as well for C/VSE**
 - **Can break before/after each SQL call**



- **For CICS**
 - **DTCN (supplied with Debug Tool) sets up information for debugging a CICS transaction**
 - **Terminal ID**
 - **Transaction ID**
 - **Test run-time options**
 - **use PF4 to ADD your “profile” which remains active until CICS is re-cycled**
 - **Use PF5 to REPLACE a profile**
 - **Use PF6 to DELETE an existing profile**
 - **Scope of “profile”**
 - **Specific TERMINAL running Specific TRANSACTION**
 - **ANY “enabled” transactions FROM THIS TERMINAL**
 - **Specific TRANSACTION running on ANY TERMINAL**
 - **PF3 Exits DTCN, now you start your TRANSACTION**
 - **PF10 deletes the profile repository for all stored profiles (clears all your work)**



IBM DEBUG TOOL

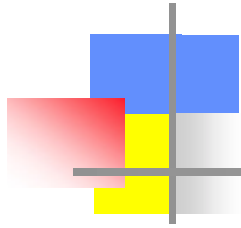
- **DEBUG TOOL basics**
 - **Command line**
 - One of the places where you can enter commands
 - **Three windows**
 - **MONITOR WINDOW**
 - Display/change values of monitored variables, etc
 - **SOURCE WINDOW**
 - Displays “source” listing (from compiler listing dataset file)
 - **LOG WINDOW**
 - Records what you enter, what DEBUG TOOL “answers”
 - **ON-LINE HELP**
 - Enter ? On command line
 - PF1 KEY is set to ‘?’

IBM DEBUG TOOL

```
Quick3270 - Session A - A - .No Title
File Edit View Session Transfer Macro Settings Help
[Icons]
COBOL LOCATION: LAB1DB initialization
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5---+ LINE: 1 OF 123
1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. LAB1DB.
3 ENVIRONMENT DIVISION.
4 CONFIGURATION SECTION.
5 INPUT-OUTPUT SECTION.
6 FILE-CONTROL.
7 SELECT PRINTOUT ASSIGN SYSPRINT.

LOG 0---+---1---+---2---+---3---+---4---+---5---+---6- LINE: 4 OF 8
0004 SET FREQUENCY ON ;
0005 AT 101
0006 LIST FREQUENCY * ;
0007 SET PF16 'Monitor List' = Monitor List ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4Bì 19/15
```



- **PANEL LAYOUT** command
 - Change relative layout of the 3 windows

- **WINDOW SIZE**

- Command to change size of windows
- May want more source, less log
- Can always

ZOOM to get “FULL SCREEN” (PF10 set to ZOOM)

- **PF keys to manipulate paging within windows**
- **PFKEYS** to zoom, set breakpoints, step through program, etc
- **Can customize your PF settings with SET PFn command**

IBM DEBUG TOOL

Passport - A

Terminal Edit Windows Functions Setup Help

Window Layout Selection Panel

Command ==> _

1

| |
|---|
| M |
| S |
| L |

2

| | | |
|---|--|---|
| - | | - |
| - | | - |

3

| | | |
|---|--|---|
| - | | - |
| - | | - |

Legend:

L - Log
M - Monitor
S - Source

To reassign the Source, Monitor, and Log windows, type over the current settings or underscores with L, M, or S.

4

| | | | | |
|---|--|---|--|---|
| - | | - | | - |
| - | | - | | - |

5

| | | |
|---|--|---|
| - | | - |
| - | | - |

6

| | | |
|---|--|---|
| - | | - |
| - | | - |

Enter END/QUIT to return with current settings saved.
CANCEL to return without current settings saved.

PF 1: ? 2: STEP 3: QUIT 4: LIST 5: FIND 6: AT/CLEAR
PF 7: UP 8: DOWN 9: GO 10: ZOOM 11: ZOOM LOG 12: RETRIEVE
4B a: Connected Port A110+

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB initialization
Command ==> size Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5---+ LINE: 1 OF 123
1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. LAB1DB.
3 ENVIRONMENT DIVISION.
4 CONFIGURATION SECTION.
5 INPUT-OUTPUT SECTION.
6 FILE-CONTROL.

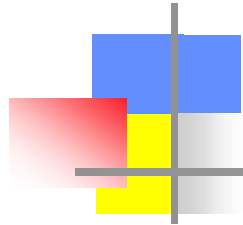
LOG 0---+---1---+---2---+---3---+---4---+---5---+---6- LINE: 1 OF 3
***** TOP OF LOG *****
0001 IBM Debug Tool Version 1 Release 2 Mod 0
0002 06/03/2002 12:29:25 PM
0003 5688-194 (C) Copyright IBM Corp. 1992, 1995
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB initialization
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5---+ LINE: 1 OF 123
1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. LAB1DB.
3 ENVIRONMENT DIVISION.
4 CONFIGURATION SECTION.
5 INPUT-OUTPUT SECTION.
6 FILE-CONTROL.
7 SELECT PRINTOUT ASSIGN SYSPRINT.
8 SELECT HOUSEINV ASSIGN HOUSEINV
9 FILE STATUS IS HOUSEINV-STATUS.

LOG 0---+---1---+---2---+---3---+---4---+---5---+---6- LINE: 1 OF 3
***** TOP OF LOG *****
0001 IBM Debug Tool Version 1 Release 2 Mod 0
0002 06/03/2002 12:29:25 PM
0003 5688-194 (C) Copyright IBM Corp. 1992, 1995
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```



- **COMMANDS for DEBUG TOOL**

- **SEVERAL WAYS TO “ENTER” COMMAND**

- **ENTER ON COMMAND LINE**
- **“RETRIEVE” from LOG or SOURCE window BY changing anything in line, then hit enter to “move” it to command area, press enter to issue command**
- **PF12 is set to “RETRIEVE”**
- **“PREFIX” commands may be entered in SOURCE LISTING LINES in PREFIX AREA**
 - **AT** **Set breakpoint**
 - **CLEAR** **Remove breakpoint**
 - **DISABLE** **Temporarily turn off break**
 - **ENABLE** **Restore disabled breakpoint**
 - **QUERY** **Find out current breaks**
 - **SHOW** **What statement or verb you want frequency count for (shown in the suffix window, temporary counter!)**

IBM DEBUG TOOL

```

Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> 10 PRT-PURCH-DATE PIC XX/XX/XXXX. Scroll ==> CSR
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 17 OF 123
17 10 PRT-ITEMNO PIC X(5).
18 10 PIC X(2).
19 10 PRT-DESCR PIC X(20).
20 10 PIC X(2).
21 10 PRT-PURCH-LOC PIC X(20).
22 10 PIC X(2).
23 10 PRT-PURCH-DATE PIC XX/XX/XXXX.
24 10 PIC X(2).
25 10 PRT-ORIG-AMT PIC ZZ,ZZZ.ZZ.
26 10 PIC X(2).
27 10 PRT-REPL-AMT PIC ZZ,ZZZ.ZZ.
28 10 PIC X(48).
29 01 TOTAL-RECORD.
30 10 PIC X(50).
31 10 PRT-NEW-HEAD PIC X(12).
32 10 PIC X(1).
33 10 PRT-TOT-ORIG-AMT PIC $$$,$$$.$99.
34 10 PIC X(1).
35 10 PRT-TOT-REPL-AMT PIC $$$,$$$.$99.
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B* ↑↑ a:Connected Port A110+
  
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> MONITOR LIST PRT-PURCH-DATE_ Scroll ==> CSR
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 17 OF 123
17      10  PRT-ITEMNO      PIC X(5).
18      10                PIC X(2).
19      10  PRT-DESCR      PIC X(20).
20      10                PIC X(2).
21      10  PRT-PURCH-LOC  PIC X(20).
22      10                PIC X(2).
23      10  PRT-PURCH-DATE PIC XX/XX/XXXX.
24      10                PIC X(2).
25      10  PRT-ORIG-AMT   PIC ZZ,ZZZ.ZZ.
26      10                PIC X(2).
27      10  PRT-REPL-AMT   PIC ZZ,ZZZ.ZZ.
28      10                PIC X(48).
29      01  TOTAL-RECORD.
30      10                PIC X(50).
31      10  PRT-NEW-HEAD   PIC X(12).
32      10                PIC X(1).
33      10  PRT-TOT-ORIG-AMT PIC $$$,$$$ .99.
34      10                PIC X(1).
35      10  PRT-TOT-REPL-AMT PIC $$$,$$$ .99.
PF  1:?      2:STEP      3:QUIT      4:LIST      5:FIND      6:AT/CLEAR
PF  7:UP      8:DOWN      9:GO       10:ZOOM     11:ZOOM LOG 12:RETRIEVE
4B*          ↑↑                a:Connected Port A110+
```


IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 1 OF 10
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER ' '
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
SOURCE: LAB1DB ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 82 OF 123
82 SET HOUSEINV-ERR-ON TO TRUE
83 END-EVALUATE
84 PERFORM UNTIL HOUSEINV-EOF-ON OR HOUSEINV-ERR-ON
85 READ HOUSEINV
86 AT END
87 PERFORM 500-TOTALS THROUGH 500-TOTALS-EXIT
88 SET HOUSEINV-EOF-ON TO TRUE
89 NOT AT END
90 EVALUATE HOUSEINV-STATUS
LOG 0 ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 19 OF 22
0019 ZOOM
0020 The command element 10 is invalid.
0021 MONITOR
0022 LIST PRT-PURCH-DATE ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```




IBM DEBUG TOOL

- **USING DEBUG TOOL WITH your PROGRAMS**
 - **DEBUG TOOL specific commands (The 20% you need to know to start)**
 - **AT|CLEAR**
 - **LIST|MONITOR LIST**
 - **SIZE**
 - **CURSOR**
 - **STEP**
 - **SCROLL**
 - **SET**
 - **ZOOM**
 - **GO**
 - **GOTO**
 - **SUBSET of COBOL language statements for “DYNAMIC PATCHING”**
 - **COMPUTE**
 - **MOVE**
 - **IF EVALUATE**
 - **PERFORM**
 - **SET**
 - **CALL**

AT command

- **Defines breakpoint or set of breakpoints**
- **Breakpoint remains until you CLEAR or ENABLE/DISABLE (temporary suspend)**

AT statement

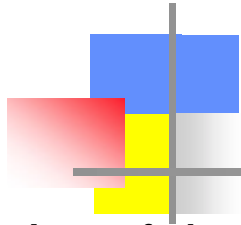
- **Break at THIS statement - give me control**

AT CHANGE

- **Break when VALUE of this storage location CHANGES**
- **May set for %STORAGE or WORKING-STORAGE DATA NAME**

AT typed in PREFIX area sets breakpoint at this statement

If you are “replacing” an existing breakpoint this will show in LOG window



IBM DEBUG TOOL

Lots of places to set breakpoints/stop

- **AT ALLOCATE** – at PL/I dynamic allocation
- **AT APPEARANCE** – when compile unit is either entered or “found”
- **AT CALL** – when program attempts CALL
- **AT CHANGE** – when a value changes
- **AT CURSOR** – set breakpoint where cursor positioned
- **AT DELETE** – when named program is deleted (LE service does delete)
- **AT ENTRY/EXIT** – set break at this entry/exit
- **AT GLOBAL** – make the break “GLOBAL”
- **AT LABEL** - required to set breakpoint on COBOL PARAGRAPH NAME!
- **AT LOAD** – break at load of a module
- **AT OCCURRENCE** - GIVE DT CONTROL ON THIS CONDITION OR EXCEPTION (so you can take action)
- **AT PATH** - GET CONTROL AT PATH POINT
- **AT TERMINATION** - GET CONTROL AT TERMINATION

Key Point: Break occurs PRIOR TO EXECUTION OF STATEMENT when set on statement/label

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> f 'goback'_ Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

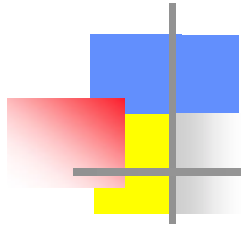
SOURCE: LAB1DB ---+---1---+---2---+---3---+---4---+---5--- LINE: 73 OF 123
73 OPEN INPUT HOUSEINV
74 OUTPUT PRINTOUT
75 EVALUATE HOUSEINV-STATUS
76 WHEN '00'
77 MOVE SPACES TO PRINT-RECORD
78 WRITE PRINT-RECORD FROM PRINT-RECORD-HEADINGS

LOG 0---+---1---+---2---+---3---+---4---+---5---+---6- LINE: 1 OF 5
***** TOP OF LOG *****
0001 IBM Debug Tool Version 1 Release 2 Mod 0
0002 04/18/2002 09:54:11 AM
0003 5688-194 (C) Copyright IBM Corp. 1992, 1995
0004 STEP ;
0005 STEP ;

PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A047+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 77.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5-----6 LINE: 1 OF 16
***** TOP OF LOG *****
0001 IBM Debug Tool Version 1 Release 2 Mod 0
0002 04/02/2002 12:18:18 PM
0003 5688-194 (C) Copyright IBM Corp. 1992, 1995
0004 STEP ;
0005 STEP ;
0006 AT 101 ;
0007 QUALIFY RESET ;
0008 SET FREQUENCY ON ;
0009 STEP ;
0010 STEP ;
0011 The partially parsed command is:
0012 AT TOGGLE
0013 The command element AT is invalid.
0014 AT 101
0015 LIST FREQUENCY * ;
0016 The STATEMENT LAB1DB ::> LAB1DB :> 101.1 breakpoint is replaced.
***** BOTTOM OF LOG *****
PF 1:?          2:STEP      3:QUIT      4:LIST      5:FIND      6:AT/CLEAR
PF 7:UP         8:DOWN      9:GO       10:ZOOM     11:ZOOM LOG 12:RETRIEVE
4B▪ a:Connected Port A080+
```



LIST command puts information in LOG window

- **Display contents of SINGLE data variable in LOG window 1 TIME, right now**
- **LIST AT - display currently defined breakpoints**
- **LIST FREQUENCY - statement execution counts**
- **LIST STORAGE - hex display, default 16 bytes**
- **LIST %HEX - hex display exact size of field**
- **LIST data-field - show contents RIGHT NOW for this field - displays value in LOG window**

MONITOR command puts information in MONITOR window

- **MONITOR LIST**
- **MONITOR DESCRIBE**
- **MONITOR QUERY**

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 1 OF 10
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
SOURCE: LAB1DB ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 88 OF 123
88 SET HOUSEINV-EOF-ON TO TRUE
89 NOT AT END
90 EVALUATE HOUSEINV-STATUS
91 WHEN '00'
92 PERFORM 300-DETAIL THROUGH 300-DETAIL-EXIT
93 WHEN OTHER
94 DISPLAY 'FILE-STAT ERROR ON READ = '
LOG 0 ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 24 OF 28
0024 LIST AT ;
0025 The STATEMENT LAB1DB :> LAB1DB :> 101.1 breakpoint action is:
0026 LIST FREQUENCY * ;
0027 The TERMINATION breakpoint action is:
0028 ;
***** BOTTOM OF LOG *****
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 1 OF 10
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
SOURCE: LAB1DB ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 88 OF 123
88 SET HOUSEINV-EOF-ON TO TRUE
89 NOT AT END
90 EVALUATE HOUSEINV-STATUS
91 WHEN '00'
92 PERFORM 300-DETAIL THROUGH 300-DETAIL-EXIT
93 WHEN OTHER
94 DISPLAY 'FILE-STAT ERROR ON READ = '
LOG 0 ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 27 OF 32
0027 The TERMINATION breakpoint action is:
0028 ;
0029 CLEAR AT TERMINATION ;
0030 LIST AT ;
0031 The STATEMENT LAB1DB ::> LAB1DB :> 101.1 breakpoint action is:
0032 LIST FREQUENCY * ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```

IBM DEBUG TOOL

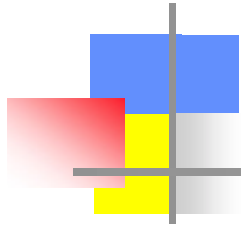
```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 1
***** TOP OF MONITOR *****
0001 1 The address of 01 LAB1DB:>HOUSE-RECORD has been determined to be inval
***** BOTTOM OF MONITOR *****

SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 71 OF 123
71 PROCEDURE DIVISION.
72 100-INITIAL-PROGAM.
73 OPEN INPUT HOUSEINV
74 OUTPUT PRINTOUT
75 EVALUATE HOUSEINV-STATUS
76 WHEN '00'

LOG 0 ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 6 OF 9
0006 AT 101 ;
0007 QUALIFY RESET ;
0008 MONITOR
0009 LIST HOUSE-RECORD ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A118+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 75.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 9
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO
0004 02 LAB1DB:>DESCR
0005 02 LAB1DB:>PURCH-LOC
0006 Invalid data for 02 LAB1DB:>PURCH-DATE is found.
0007 Invalid data for 02 LAB1DB:>ORIG-AMT is found.
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 73 OF 123
73 OPEN INPUT HOUSEINV
74 OUTPUT PRINTOUT
75 EVALUATE HOUSEINV-STATUS
76 WHEN '00'
77 MOVE SPACES TO PRINT-RECORD
78 WRITE PRINT-RECORD FROM PRINT-RECORD-HEADINGS
LOG 0 ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 5 OF 8
0005 STEP ;
0006 MONITOR
0007 LIST HOUSE-RECORD ;
0008 STEP ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A080+
```



CURSOR

- **Some commands are sensitive to CURSOR LOCATION**
- **Must TYPE IN COMMAND and THEN position cursor....**
 - **AT [CURSOR]**
 - **DESCRIBE [CURSOR]**
 - **LIST [CURSOR]**
 - **SCROLL....[CURSOR]**
 - **WINDOW....[CURSOR]**
- **BUT...**
 - **SAME COMMANDS MAY BE “ASSIGNED” TO PFKEYS using SET PFn**

IBM DEBUG TOOL

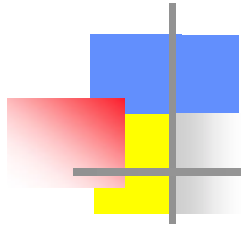
```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 1 OF 10
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
SOURCE: LAB1DB ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 88 OF 123
88 - SET HOUSEINV-EOF-ON TO TRUE
89 NOT AT END
90 EVALUATE HOUSEINV-STATUS
91 WHEN '00'
92 PERFORM 300-DETAIL THROUGH 300-DETAIL-EXIT
93 WHEN OTHER
94 DISPLAY 'FILE-STAT ERROR ON READ = '
LOG 0 ---+---1---+---2---+---3---+---4---+---5---+--- LINE: 32 OF 37
0032 LIST FREQUENCY * ;
0033 DESCRIBE ATTRIBUTES ( TOT-ORIG-AMT ) ;
0034 ATTRIBUTES for TOT-ORIG-AMT
0035 Its length is 4
0036 Its address is 0E5C4088
0037 01 LAB1DB:>TOT-ORIG-AMT 9(5)V99 CMP3
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
MONITOR ---1---2---3---4---5--- LINE: 1 OF 10
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER ' '
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
SOURCE: LAB1DB ---1---2---3---4---5--- LINE: 111 OF 123
111 ADD REPL-AMT TO TOT-REPL-AMT 0
112 WRITE PRINT-RECORD. 0
113 300-DETAIL-EXIT. .
114 EXIT. .
115 500-TOTALS. .
116 MOVE SPACES TO PRINT-RECORD 0
117 MOVE 'TOTAL AMT = ' TO PRT-NEW-HEAD 0
LOG 0 ---1---2---3---4---5--- LINE: 51 OF 56
0051 found.
0052 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = '..'
0053 Invalid data for 02 LAB1DB:>PRT-REPL-AMT of 01 LAB1DB:>PRINT-RECORD is
0054 found.
0055 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD =
0056 '.....'
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 111.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 64 OF 82
0064 STEP ;
0065 STEP ;
0066 STEP ;
0067 LIST ( PRINT-RECORD ) ;
0068 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = ' '
0069 02 LAB1DB:>PRT-ITEMNO of 01 LAB1DB:>PRINT-RECORD = '00001'
0070 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = ' '
0071 02 LAB1DB:>PRT-DESCR of 01 LAB1DB:>PRINT-RECORD = 'CORBY WARDROBE PRESS'
0072 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = ' '
0073 02 LAB1DB:>PRT-PURCH-LOC of 01 LAB1DB:>PRINT-RECORD =
0074 'DALLAS, TEXAS'
0075 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = ' '
0076 02 LAB1DB:>PRT-PURCH-DATE of 01 LAB1DB:>PRINT-RECORD = '10/11/1996'
0077 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = ' '
0078 02 LAB1DB:>PRT-ORIG-AMT of 01 LAB1DB:>PRINT-RECORD = ' 275.00'
0079 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = ' '
0080 02 LAB1DB:>PRT-REPL-AMT of 01 LAB1DB:>PRINT-RECORD = ' 275.00'
0081 02 LAB1DB:>FILLER of 01 LAB1DB:>PRINT-RECORD = ' '
0082 ' '
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A110+
```

IBM DEBUG TOOL

DEBUG TOOL DEFAULT PFKEYS

- **PF1** **?**
- **PF2** **STEP**
- **PF3** **QUIT**
- **PF4** **LIST**
- **PF5** **FIND (and repeat FIND)**
- **PF6** **AT/CLEAR (acts as toggle)**
- **PF7** **UP**
- **PF8** **DOWN**
- **PF9** **GO**
- **PF10** **ZOOM**
- **PF11** **ZOOM LOG**
- **PF12** **RETRIEVE**

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5-----6 LINE: 2 OF 20
0002 06/03/2002 4:57:23 PM
0003 5688-194 (C) Copyright IBM Corp. 1992, 1995
0004 STEP ;
0005 STEP ;
0006 SET FREQUENCY ON ;
0007 AT 101
0008 LIST FREQUENCY * ;
0009 CLEAR AT TERMINATION ;
0010 The next word may be one of:
0011 ; ENABLE MONITOR SCROLL
0012 declaration END MOVE SET
0013 AT EVALUATE PANEL STEP
0014 CALL FIND PERFORM SYSTEM
0015 CLEAR GO PROCEDURE name TRIGGER
0016 COMMENT GO TO QUALIFY TSO
0017 COMPUTE GOTO QUERY USE
0018 CURSOR IF QUIT WINDOW
0019 DESCRIBE INPUT RETRIEVE
0020 DISABLE LIST RUN
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A022+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> Scroll ==> CSR
MONITOR ---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 5
0001 1 The address of 01 LAB1DB:>HOUSE-RECORD has been determined to be inval
0002 2 The address of 01 LAB1DB:>PRINT-RECORD has been determined to be inval
0003 3 ORIB-AMT
0004 The variable ORIB-AMT is undefined or is incorrectly qualified.
0005 4 The address of 02 LAB1DB:>REPL-AMT has been determined to be invalid.
***** BOTTOM OF MONITOR *****
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 73 OF 123
73 OPEN INPUT HOUSEINV 0
74 OUTPUT PRINTOUT .
75 EVALUATE HOUSEINV-STATUS 0
76 WHEN '00' .
77 MOVE SPACES TO PRINT-RECORD 0
78 WRITE PRINT-RECORD FROM PRINT-RECORD-HEADINGS 0
LOG 0---+---1---+---2---+---3---+---4---+---5--- LINE: 23 OF 28
0023 MONITOR
0024 LIST PRINT-RECORD ;
0025 MONITOR
0026 LIST ORIB-AMT ;
0027 MONITOR
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A022+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 5
0001 1 The address of 01 LAB1DB:>HOUSE-RECORD has been determined to be inval
0002 2 The address of 01 LAB1DB:>PRINT-RECORD has been determined to be inval
0003 3 ORIB-AMT
0004 The variable ORIB-AMT is undefined or is incorrectly qualified.
0005 4 The address of 02 LAB1DB:>REPL-AMT has been determined to be invalid.
***** BOTTOM OF MONITOR *****
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 73 OF 123
73 OPEN INPUT HOUSEINV 0
74 OUTPUT PRINTOUT .
75 EVALUATE HOUSEINV-STATUS 0
76 WHEN '00' .
77 MOVE SPACES TO PRINT-RECORD 0
78 WRITE PRINT-RECORD FROM PRINT-RECORD-HEADINGS 0
LOG 0---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 65 OF 69
0065 CLEAR MONITOR
0066 The next word may be one of:
0067 (
0068 :
0069 integer <= 99
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A022+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 71 OF 89
0071 MONITOR
0072 LIST
0073 The next word may be one of:
0074 ( FLOATING NAMES
0075 constant FREQUENCY PATHS
0076 prefix operator GROUP PROCEDURES
0077 reference HISTORY REGISTERS
0078 register LAST SHORT FLOATING
0079 AT LINE NUMBERS STATEMENT NUMBERS
0080 CALLS LINES STATEMENTS
0081 CURSOR LONG FLOATING STORAGE
0082 Debug Tool variable MONITOR
0083 The partially parsed command is:
0084 MONITOR
0085 The next word may be one of:
0086 : LIST
0087 integer <= 99 LOCAL
0088 DESCRIBE QUERY
0089 GLOBAL
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A022+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 78 OF 96
0078 register LAST SHORT FLOATING
0079 AT LINE NUMBERS STATEMENT NUMBERS
0080 CALLS LINES STATEMENTS
0081 CURSOR LONG FLOATING STORAGE
0082 Debug Tool variable MONITOR
0083 The partially parsed command is:
0084 MONITOR
0085 The next word may be one of:
0086 ; LIST
0087 integer <= 99 LOCAL
0088 DESCRIBE QUERY
0089 GLOBAL
0090 The partially parsed command is:
0091 MONITOR 3
0092 The next word may be one of:
0093 ;
0094 DESCRIBE
0095 LIST
0096 QUERY
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A022+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 73.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 4
0001 1 The address of 01 LAB1DB:>HOUSE-RECORD has been determined to be inval
0002 2 The address of 01 LAB1DB:>PRINT-RECORD has been determined to be inval
0003 3 The address of 02 LAB1DB:>ORIG-AMT has been determined to be invalid.
0004 4 The address of 02 LAB1DB:>REPL-AMT has been determined to be invalid.
***** BOTTOM OF MONITOR *****
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 73 OF 123
73 OPEN INPUT HOUSEINV 0
74 OUTPUT PRINTOUT .
75 EVALUATE HOUSEINV-STATUS 0
76 WHEN '00' .
77 MOVE SPACES TO PRINT-RECORD 0
78 WRITE PRINT-RECORD FROM PRINT-RECORD-HEADINGS 0
LOG 0---+---1---+---2---+---3---+---4---+---5--- LINE: 95 OF 99
0095 LIST
0096 QUERY
0097 MONITOR 3
0098 LIST ORIG-AMT ;
0099 The MONITOR 3 command is replaced.
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A022+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 110.1
Command ==> Scroll ==> CSR
MONITOR ---1---2---3---4---5---6 LINE: 1 OF 9
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO '00010'
0004 02 LAB1DB:>DESCR 'ESPRESSO COFFEE MKR'
0005 02 LAB1DB:>PURCH-LOC 'DALLAS, TEXAS'
0006 02 LAB1DB:>PURCH-DATE '05301995'
0007 Invalid data for 02 LAB1DB:>ORIG-AMT is found.
SOURCE: LAB1DB ---1---2---3---4---5--- LINE: 109 OF 123
109 MOVE REPL-AMT TO PRT-REPL-AMT 10
110 ADD ORIG-AMT TO TOT-ORIG-AMT 10
111 ADD REPL-AMT TO TOT-REPL-AMT 09
112 WRITE PRINT-RECORD. 09
113 300-DETAIL-EXIT.
114 EXIT. 09
LOG 0 ---1---2---3---4---5--- LINE: 114 OF 120
0114 LIST STORAGE ( ORIG-AMT ) ;
0115 0E90A2C6 40404040 404040F0 F0F2F4F5 F0F04040 * 0024500 *
0116 LIST %HEX ( ORIG-AMT ) ;
0117 %HEX ( ORIG-AMT ) = X'40404040404040'
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A015+
```


IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 110.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 97 OF 115
0097 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'MANHATTAN, KANSAS'
0098 02 LAB1DB:>PURCH-DATE of 01 LAB1DB:>HOUSE-RECORD = 11041964
0099 02 LAB1DB:>ORIG-AMT of 01 LAB1DB:>HOUSE-RECORD = 00030.00
0100 02 LAB1DB:>REPL-AMT of 01 LAB1DB:>HOUSE-RECORD = 00070.00
0101 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0102 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0103 02 LAB1DB:>ITEMNO of 01 LAB1DB:>HOUSE-RECORD = '00010'
0104 02 LAB1DB:>DESCR of 01 LAB1DB:>HOUSE-RECORD = 'ESPRESSO COFFEE MKR '
0105 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'DALLAS, TEXAS'
0106 02 LAB1DB:>PURCH-DATE of 01 LAB1DB:>HOUSE-RECORD = 05301995
0107 Invalid data for 02 LAB1DB:>ORIG-AMT of 01 LAB1DB:>HOUSE-RECORD is
0108 found.
0109 02 LAB1DB:>REPL-AMT of 01 LAB1DB:>HOUSE-RECORD = 00245.00
0110 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0111 You were prompted because the CEE347 condition was raised in your program
0112 CEE347 is a severity or class 3 condition.
0113 The current location is LAB1DB :> LAB1DB :> 110.1.
0114 LIST STORAGE ( ORIG-AMT ) ;
0115 0E90A2C6 40404040 404040F0 F0F2F4F5 F0F04040 * 0024500 *
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A015+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 108.1
Command ==> Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 9
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
0005 02 LAB1DB:>PURCH-LOC 'DALLAS, TEXAS'
0006 02 LAB1DB:>PURCH-DATE 10111996
0007 02 LAB1DB:>ORIG-AMT 00275.00
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 105 OF 123
105 MOVE DESCR TO PRT-DESCR 1
106 MOVE PURCH-LOC TO PRT-PURCH-LOC 1
107 MOVE PURCH-DATE TO PRT-PURCH-DATE 1
108 MOVE ORIG-AMT TO PRT-ORIG-AMT 0
109 MOVE REPL-AMT TO PRT-REPL-AMT 0
110 ADD ORIG-AMT TO TOT-ORIG-AMT 0
LOG 0---+---1---+---2---+---3---+---4---+---5--- LINE: 28 OF 31
0028 LIST ( ORIG-AMT ) ;
0029 ORIG-AMT = 00275.00
0030 AT CHANGE ITEMNO
0031 LIST ( HOUSE-RECORD ) ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A118+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 108.1
Command ==> step 50 Scroll ==> CSR
MONITOR ---+---1---+---2---+---3---+---4---+---5---+---6 LINE: 1 OF 9
0001 1 01 LAB1DB:>HOUSE-RECORD
0002 02 LAB1DB:>FILLER
0003 02 LAB1DB:>ITEMNO '00001'
0004 02 LAB1DB:>DESCR 'CORBY WARDROBE PRESS'
0005 02 LAB1DB:>PURCH-LOC 'DALLAS, TEXAS'
0006 02 LAB1DB:>PURCH-DATE 10111996
0007 02 LAB1DB:>ORIG-AMT 00275.00
SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5--- LINE: 105 OF 123
105 MOVE DESCR TO PRT-DESCR 1
106 MOVE PURCH-LOC TO PRT-PURCH-LOC 1
107 MOVE PURCH-DATE TO PRT-PURCH-DATE 1
108 MOVE ORIG-AMT TO PRT-ORIG-AMT 0
109 MOVE REPL-AMT TO PRT-REPL-AMT 0
110 ADD ORIG-AMT TO TOT-ORIG-AMT 0
LOG 0 ---+---1---+---2---+---3---+---4---+---5--- LINE: 23 OF 26
0023 LIST ( ORIG-AMT ) ;
0024 ORIG-AMT = 00275.00
0025 AT CHANGE ITEMNO
0026 LIST HOUSE-RECORD ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A019+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 17 OF 35
0017 STEP ;
0018 STEP ;
0019 STEP ;
0020 STEP ;
0021 STEP ;
0022 STEP ;
0023 LIST ( ORIG-AMT ) ;
0024 ORIG-AMT = 00275.00
0025 AT CHANGE ITEMNO
0026 LIST HOUSE-RECORD ;
0027 STEP 50 ;
0028 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0029 02 LAB1DB:>ITEMNO of 01 LAB1DB:>HOUSE-RECORD = '00002'
0030 02 LAB1DB:>DESCR of 01 LAB1DB:>HOUSE-RECORD = 'STEIFF HEDGEHOG TOY '
0031 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'FRANKFURT, GERMANY '
0032 02 LAB1DB:>PURCH-DATE of 01 LAB1DB:>HOUSE-RECORD = 08101988
0033 02 LAB1DB:>ORIG-AMT of 01 LAB1DB:>HOUSE-RECORD = 00085.00
0034 02 LAB1DB:>REPL-AMT of 01 LAB1DB:>HOUSE-RECORD = 00170.00
0035 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A019+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==>
LOG 0-----1-----2-----3-----4-----5----- LINE: 29 OF 47
0029 The partially parsed command is:
0030 ZOOM LOG
0031 The command element STEP is invalid.
0032 STEP 50 ;
0033 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0034 02 LAB1DB:>ITEMNO of 01 LAB1DB:>HOUSE-RECORD = '00002'
0035 02 LAB1DB:>DESCR of 01 LAB1DB:>HOUSE-RECORD = 'STIEFF HEDGEHOG TOY '
0036 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'FRANKFURT, GERMANY '
0037 02 LAB1DB:>PURCH-DATE of 01 LAB1DB:>HOUSE-RECORD = 08101988
0038 02 LAB1DB:>ORIG-AMT of 01 LAB1DB:>HOUSE-RECORD = 00085.00
0039 02 LAB1DB:>REPL-AMT of 01 LAB1DB:>HOUSE-RECORD = 00170.00
0040 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0041 LIST AT ;
0042 The CHANGE ITEMNO (%STORAGE(H'0E846011',5)) breakpoint action is:
0043 LIST HOUSE-RECORD ;
0044 The STATEMENT LAB1DB :> LAB1DB :> 101.1 breakpoint action is:
0045 LIST FREQUENCY * ;
0046 The TERMINATION breakpoint action is:
0047 ;
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A019+
```

IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 90.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 25 OF 43
0025 LIST ( ORIG-AMT ) ;
0026 ORIG-AMT = 00275.00
0027 AT CHANGE ITEMNO
0028 LIST HOUSE-RECORD ;
0029 STEP 50 ;
0030 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0031 02 LAB1DB:>ITEMNO of 01 LAB1DB:>HOUSE-RECORD = '00002'
0032 02 LAB1DB:>DESCR of 01 LAB1DB:>HOUSE-RECORD = 'STEIFF HEDGEHOG TOY '
0033 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'FRANKFURT, GERMANY '
0034 02 LAB1DB:>PURCH-DATE of 01 LAB1DB:>HOUSE-RECORD = 08101988
0035 02 LAB1DB:>ORIG-AMT of 01 LAB1DB:>HOUSE-RECORD = 00085.00
0036 02 LAB1DB:>REPL-AMT of 01 LAB1DB:>HOUSE-RECORD = 00170.00
0037 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0038 AT CHANGE ITEMNO
0039 PERFORM
0040 LIST HOUSE-RECORD ;
0041 GO ;
0042 END-PERFORM ;
0043 The CHANGE ITEMNO (%STORAGE(H'0E846011',5)) breakpoint is replaced.
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A019+
```

IBM DEBUG TOOL

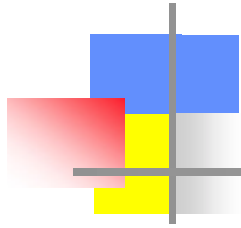
```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 101.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 97 OF 171
0097 02 LAB1DB:>ITEMNO of 01 LAB1DB:>HOUSE-RECORD = '00011'
0098 02 LAB1DB:>DESCR of 01 LAB1DB:>HOUSE-RECORD = 'BERLIN WALL MEMENTO '
0099 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'BERLIN, GERMANY '
0100 02 LAB1DB:>PURCH-DATE of 01 LAB1DB:>HOUSE-RECORD = 12251987
0101 02 LAB1DB:>ORIG-AMT of 01 LAB1DB:>HOUSE-RECORD = 00040.00
0102 02 LAB1DB:>REPL-AMT of 01 LAB1DB:>HOUSE-RECORD = 00250.00
0103 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0104 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0105 02 LAB1DB:>ITEMNO of 01 LAB1DB:>HOUSE-RECORD = '00012'
0106 02 LAB1DB:>DESCR of 01 LAB1DB:>HOUSE-RECORD = 'POTTERY PLATES '
0107 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'ROTA, SPAIN '
0108 02 LAB1DB:>PURCH-DATE of 01 LAB1DB:>HOUSE-RECORD = 07311988
0109 02 LAB1DB:>ORIG-AMT of 01 LAB1DB:>HOUSE-RECORD = 00002.50
0110 02 LAB1DB:>REPL-AMT of 01 LAB1DB:>HOUSE-RECORD = 00050.00
0111 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0112 02 LAB1DB:>FILLER of 01 LAB1DB:>HOUSE-RECORD = ' '
0113 02 LAB1DB:>ITEMNO of 01 LAB1DB:>HOUSE-RECORD = '00013'
0114 02 LAB1DB:>DESCR of 01 LAB1DB:>HOUSE-RECORD = 'SCREEN PRINTS '
0115 02 LAB1DB:>PURCH-LOC of 01 LAB1DB:>HOUSE-RECORD = 'POMPEII, ITALY '
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A019+
```

IBM DEBUG TOOL

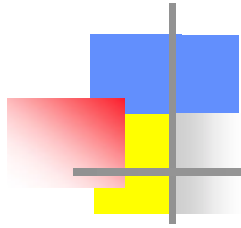
```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 101.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 154 OF 171
0154 103.1 = 15
0155 104.1 = 15
0156 105.1 = 15
0157 106.1 = 15
0158 107.1 = 15
0159 108.1 = 15
0160 109.1 = 15
0161 110.1 = 15
0162 111.1 = 15
0163 112.1 = 15
0164 114.1 = 15
0165 116.1 = 1
0166 117.1 = 1
0167 118.1 = 1
0168 119.1 = 1
0169 120.1 = 1
0170 122.1 = 1
0171 Total Statements=34 Total Statements Executed=29 Percent Executed=85
***** BOTTOM OF LOG *****
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A019+
```


IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB :> 101.1
Command ==> Scroll ==> CSR
LOG 0-----1-----2-----3-----4-----5----- LINE: 2 OF 115
0002 04/16/2002 10:04:07 AM
0003 5688-194 (C) Copyright IBM Corp. 1992, 1995
0004 SET FREQUENCY ON ;
0005 AT 101
0006 LIST FREQUENCY * ;
0007 AT GLOBAL LABEL
0008 PERFORM
0009 LIST LINES %LINE ;
0010 GO ;
0011 END-PERFORM ;
0012 STEP ;
0013 STEP ;
0014 72 100-INITIAL-PROGAM.
0015
0016 102 300-DETAIL.
0017
0018 113 300-DETAIL-EXIT.
0019
0020 102 300-DETAIL.
PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A129+
```



- **CICS considerations**
 - **Log file not started automatically**
 - **Must issue SET LOG ON FILE log.file**
 - **Make sure LOG file is Large Enough**
 - **Truncation occurs if log is full**
 - **Message IS issues**
 - **CICS does NOT support attention interrupt from keyboard**
 - **No “animation”, no way to stop it**
 - **Applications that issue EXEC CICS POST cannot use “dual terminal” mode**



- **DB2/VSE and Debug Tool**
 - **No special programming considerations**
 - **Pre-compile as typical (no special Debug Tool requirements)**
 - **Compile at least 1 part of your program with the TEST compiler option**
 - **In Single User Mode you must INCLUDE a CEEUOPT to get the Debug Tool TEST run-time option**
 - **Multiple User Mode allows passing parm in JCL (no CEEUOPT LINK)**

The main consideration is the use of the TEST option at compile time, and the requirement to get the TEST run-time option specified!

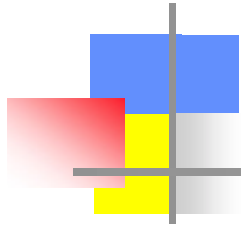
IBM DEBUG TOOL

```
Passport - A
Terminal Edit Windows Functions Setup Help
COBOL LOCATION: LAB1DB initialization
Command ==> Scroll ==> CSR
MONITOR ---1---+---2---+---3---+---4---+---5---+---6 LINE: 0 OF 0
***** TOP OF MONITOR *****
***** BOTTOM OF MONITOR *****

SOURCE: LAB1DB ---1---+---2---+---3---+---4---+---5---+ LINE: 1 OF 123
1 IDENTIFICATION DIVISION.
2 PROGRAM-ID. LAB1DB.
3 ENVIRONMENT DIVISION.
4 CONFIGURATION SECTION.
5 INPUT-OUTPUT SECTION.
6 FILE-CONTROL.

LOG 0---1---+---2---+---3---+---4---+---5---+---6- LINE: 1 OF 3
***** TOP OF LOG *****
0001 IBM Debug Tool Version 1 Release 2 Mod 0
0002 04/18/2002 09:54:11 AM
0003 5688-194 (C) Copyright IBM Corp. 1992, 1995
***** BOTTOM OF LOG *****

PF 1:? 2:STEP 3:QUIT 4:LIST 5:FIND 6:AT/CLEAR
PF 7:UP 8:DOWN 9:GO 10:ZOOM 11:ZOOM LOG 12:RETRIEVE
4B a:Connected Port A047+
```



IBM DEBUG TOOL

- It's a start....lots to learn so look for more information here...
 - **DEBUG TOOL other places/resources:**
 - **Debug Tool User's Guide and Reference SC26-8797**
 - This contains **COMMANDS AND MESSAGES** and some **HOW TO**
 - **Debug Tool Customization SC26-8798**
 - **VSE Hints & TIPS**
 - Has a chapter on **Debug Tool for VSE/ESA**
 - **APAR PQ74201** for the **TEST(NONE,SYM,SEPARATE)** option (**not yet supported by DEBUG TOOL, but supported by COBOL**)
 - **ON-LINE manuals:**
 - <http://www-1.ibm.com/servers/s390/os390/bkserv/vse/> has **ALL** the **VSE manuals**
 - **REDBOOKS:** <http://www.redbooks.ibm.com/>
 - Then search on **DEBUG TOOL** (again, more **MVS** but might be useful!)