Debugging in Mainframe using Tracemaster

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Project Details :

Projects Involved : LIONSYCH
Hardware WPlatform : IBM OS/390
Software Enviornment : MVS,CICS,Cobol,VSAM,JCL
Project Type : Maintenance

Target readers : **All mainframe users**

Keywords:

mainframe,COBOL,CICS,debugging,Tracemaster,tools

Introduction:

TRACEMASTER is a tool for debugging and testing COBOL and assembler sources in mainframe. This document explains the step by step procedure for debugging the CICS program in CICS and the cobol program in foreground mode.

How to Debug a COBOL/CICS program using Tracemaster

Debugging a COBOL/CICS program in CICS

1. Compile and link the program for trace master
2. Load the programs and symbol files through CICS Trace master menu
3. Set the breakpoints
4. Run the transaction and Debug
5. Log off

Debugging a COBOL batch program (in Foreground)

1. Compile and link the program for trace master
2. Set Default libraries
3. Set symbol library and Convert the JCL
4. Run in debug mode

Debugging a COBOL/CICS program in CICS

STEP 1

Compile and link the program for trace master – First of all we need to do some preparation for testing the program in Tracemaster.We need to create a symbol file for Tracemaster. Hence, for running a program using Tracemaster, the program needs

to be compiled in a modified manner. The JCL ,Procedure or macros for compilation needs to undergo following changes:

- Change the program for compilation
  - IGYCRCTL → XT00VSC2 (Cobol II)
  - IKFCBL00 → XT000SCB (OS/VS Cobol)
- Add symbol library
  - *prefix.symbol.library*(*program name)*
- Add trace master load library
  - *prefix*.XTRESLIB – It should be trace master load library name specified during installation.

Example: The existing macro for compiling a cobol program has following step:

```
//COB      EXEC  PGM=IGYCRCTL,
//STEPLIB  DD DSN=SYS1.SIGYCOMP,DISP=SHR
//         DD DSN=SYSP.LL.CICSTS22.CICS.SDFHLOAD,DISP=SHR
```

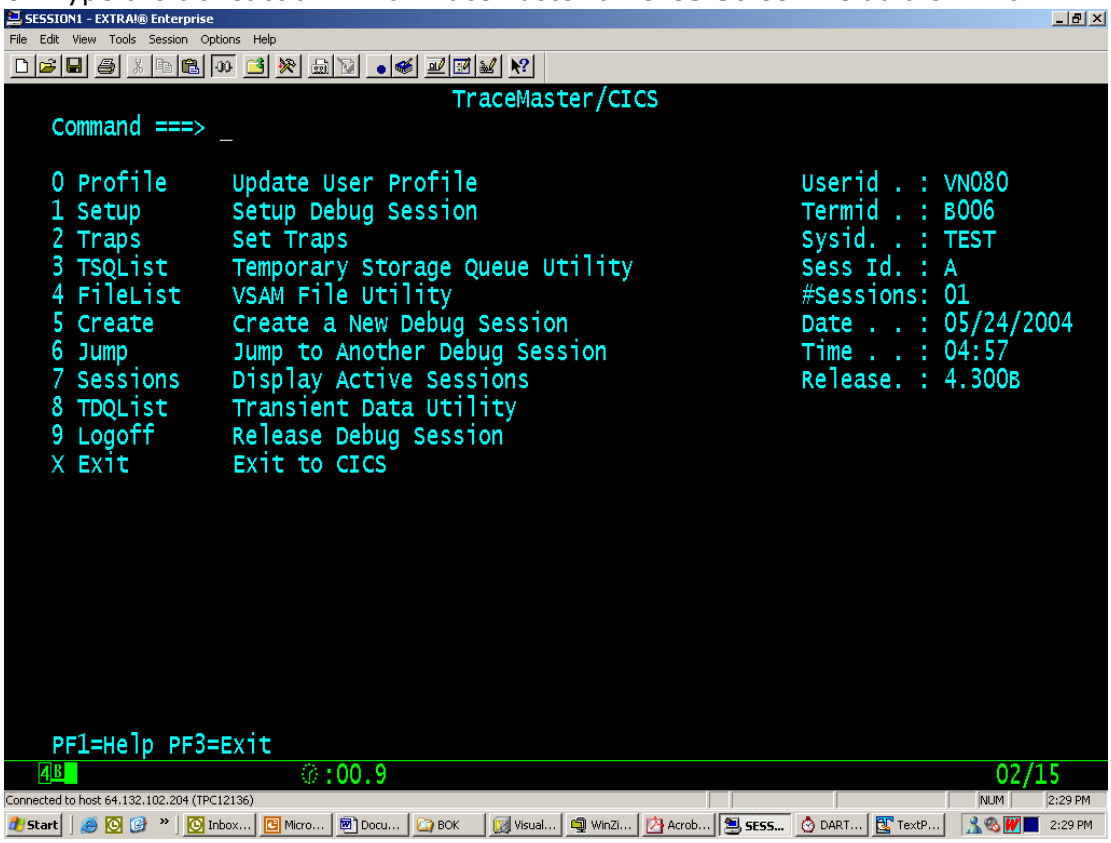
The above step is changed as follows for compiling a program to be tested in Tracemaster.

```
//COB    EXEC PGM=XT00VSC2
//STEPLIB  DD DSN=SYST.PD.TRACEMST.V4100M.XTRESLIB,DISP=SHR
//         DD DSN=SYS1.SIGYCOMP,DISP=SHR
//SYMOUT   DD DSN=TST1.FOODLION.SYMBOL.LIBRARY("MEM"),
//           DISP=SHR
```

STEP 2

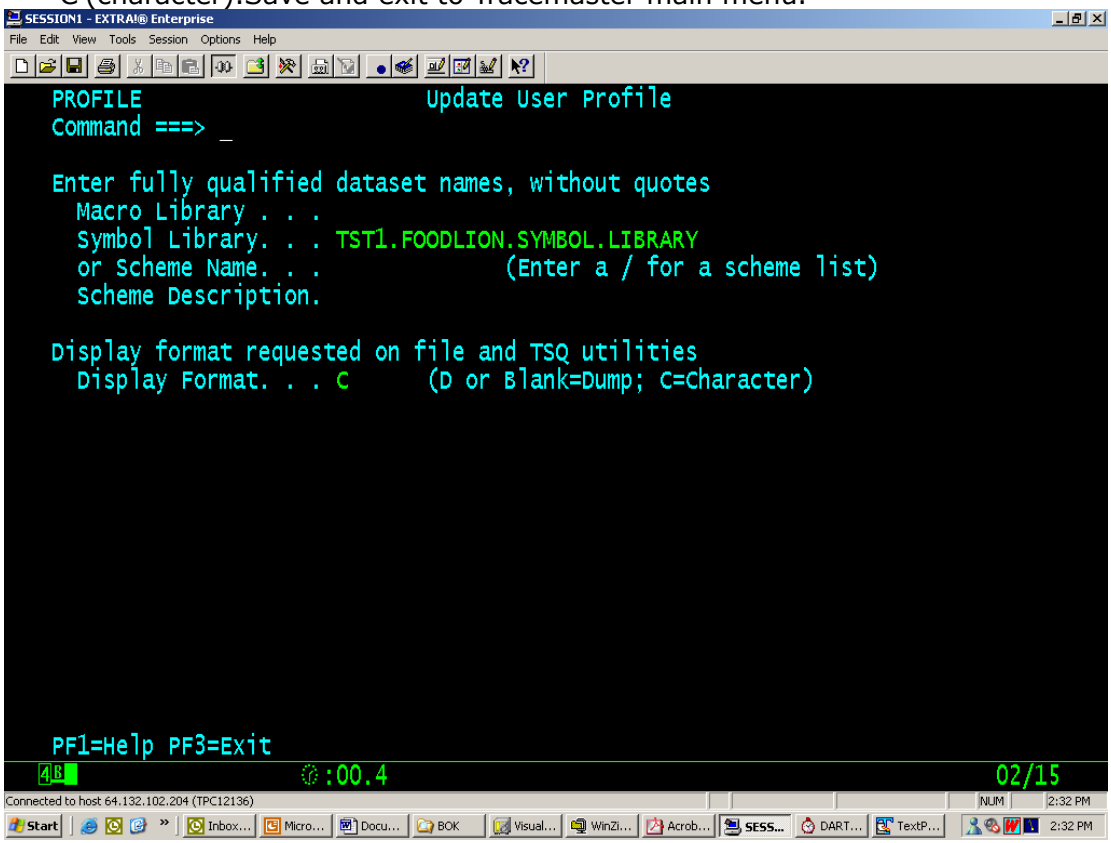
Load the programs and symbol files through CICS Trace master menu – After compiling and linking the program, following steps needs to be followed to load the program :

- do a new copy of the program in CICS screen.
- Type the transaction ID for Tracemaster on CICS Screen.Default is XXT0.

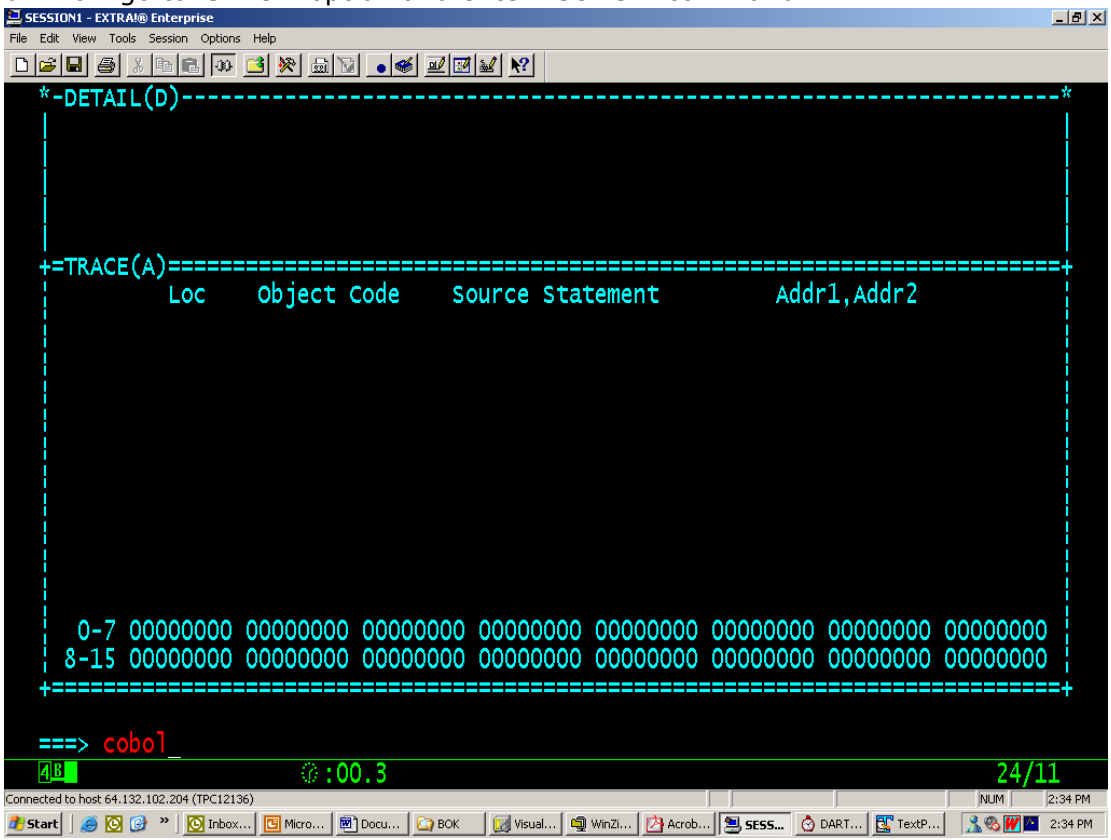


- When you are entering the Tracemaster menu for the first time, go to 'PROFILE' option and set the symbol library(*prefix.symbol.library* ->same

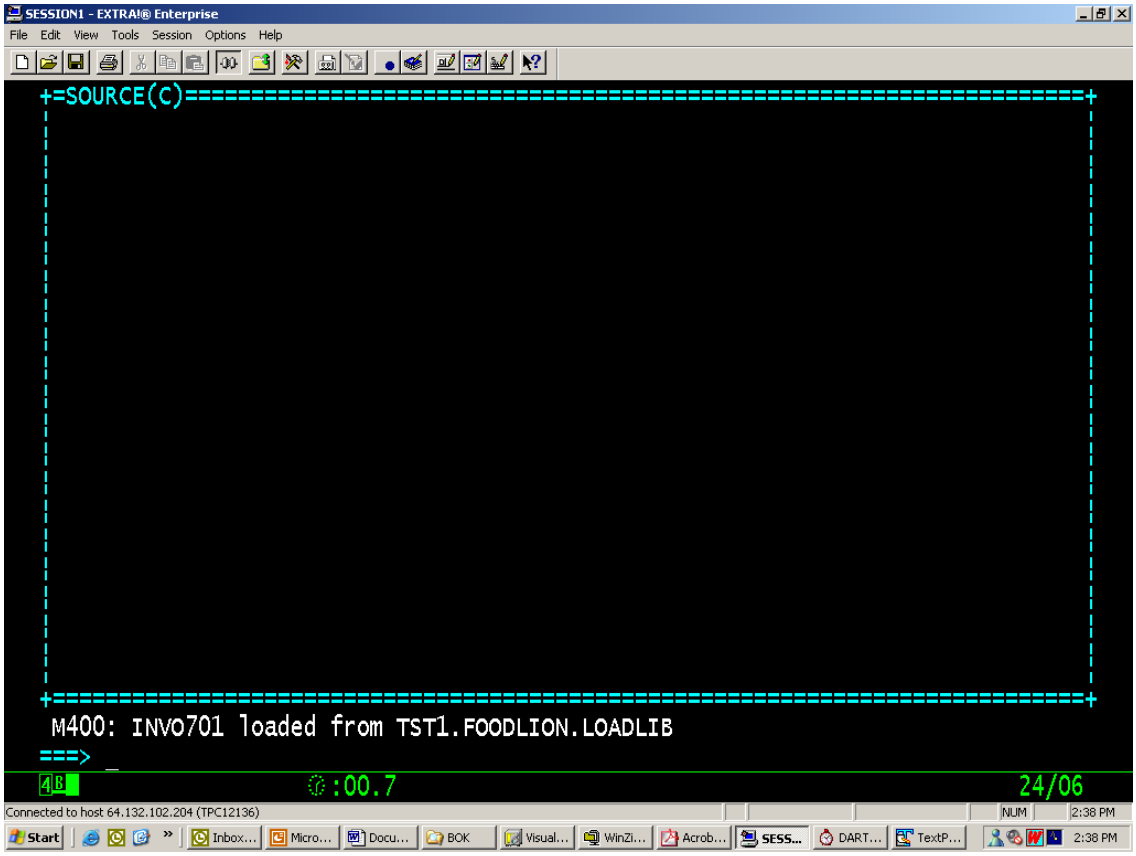
as in compilation procedure).Also set the Display format as 'C'(character).Save and exit to Tracemaster main menu.



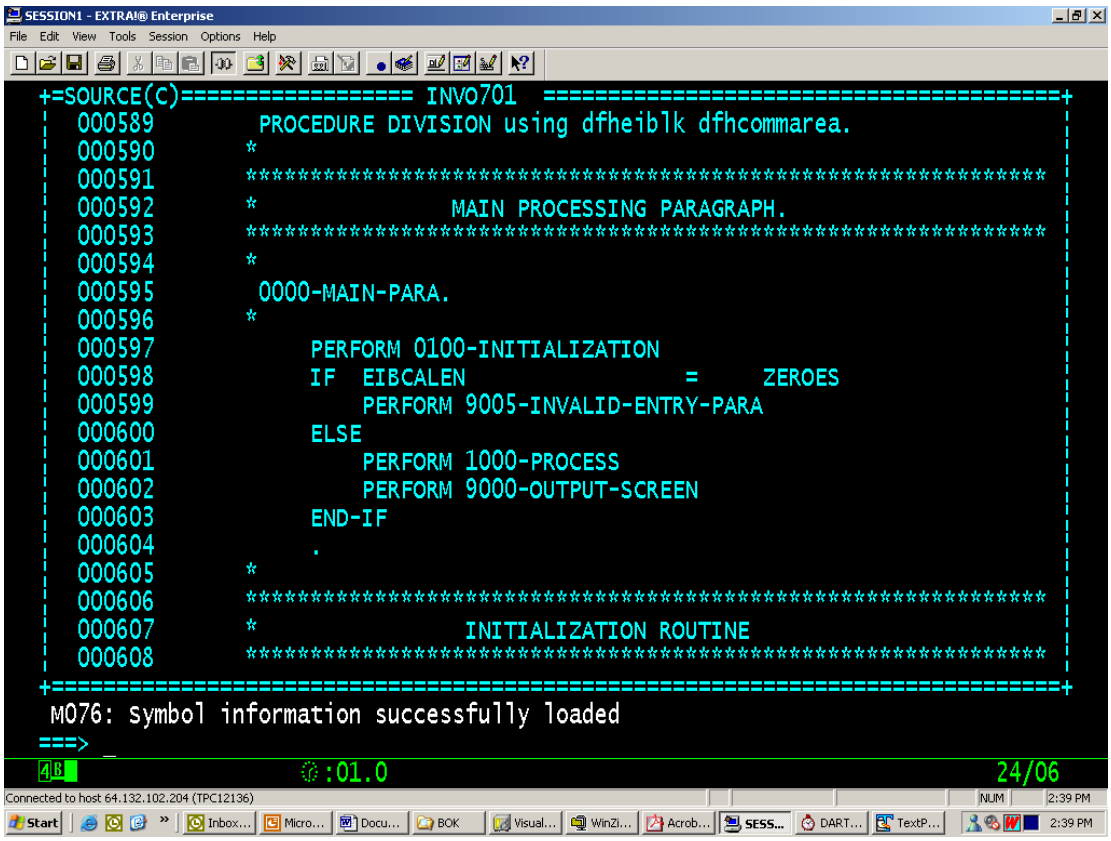
- Now go to 'SETUP' option and enter "COBOL" command



- Load the program by entering LOAD command followed by program name to be tested. E.g. LOAD INVO701.After successful load following msg would appear .


SESSION1 - EXTRA!® Enterprise
File Edit View Tools Session Options Help
+=SOURCE(C)==========+
M400: INVO701 loaded from TST1.FOODLION.LOADLIB
===>
:00.7
24/06
Connected to host 64.132.102.204 (TPC12136)
NUM
2:38 PM
Start
Inbox...
Micro...
Docu...
BOK
Visual...
WinZi...
Acrob...
SESS...
DART...
TextP...
2:38 PM

- Load the symbol files using the command XSYMBOLS followed by the program name.For e.g. XSYMBOLS INVO701.On successful load the program would be displayed on the screen.



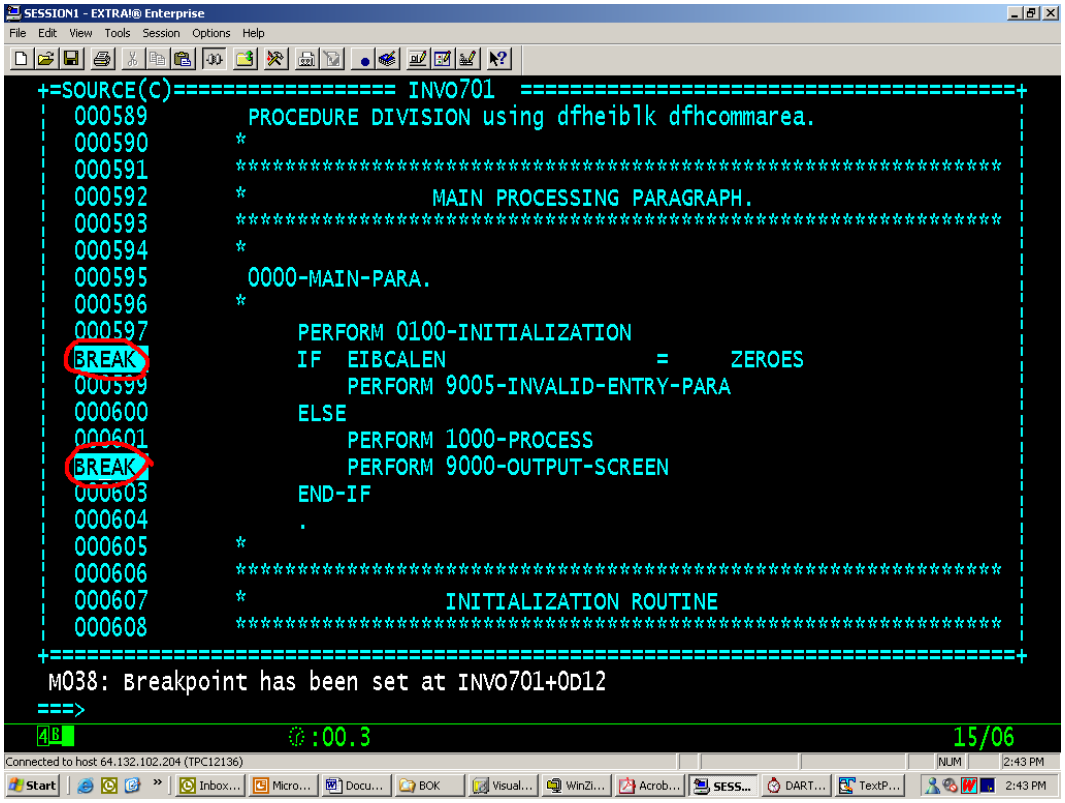
STEP 3

Set the breakpoints – After loading the program, set the breakpoints in the program, wherever required.

It can be done in following ways

- Place the cursor on line and press PF14
- BP *line number*
- BP *Paragraph name*

In the following screen shots two breakpoints are set.



STEP 4

Run the transaction and Debug – Now the program is ready for debugging. Come out of Tracemaster menu (use exit, not Log-off) and type the transaction id to run the program to be tested. After the encounter of first break in the program the Tracemaster screen would be displayed. From here you can execute the program in debugging mode.You can press PF1 and use the help for PF keys and commands to be used.Some of the basic functionalities:

- For executing line by line use PF12.
- Run/conditional run by PF10
- To see the value of a variable, place the cursor on it and press PF6

STEP 5

Log off – Enter 'Abend' command to terminate the program

- Abend x(any arbitrary character)

- 'End' command would only return back to the trace master menu.
- Remember to log off from trace master to free the resources

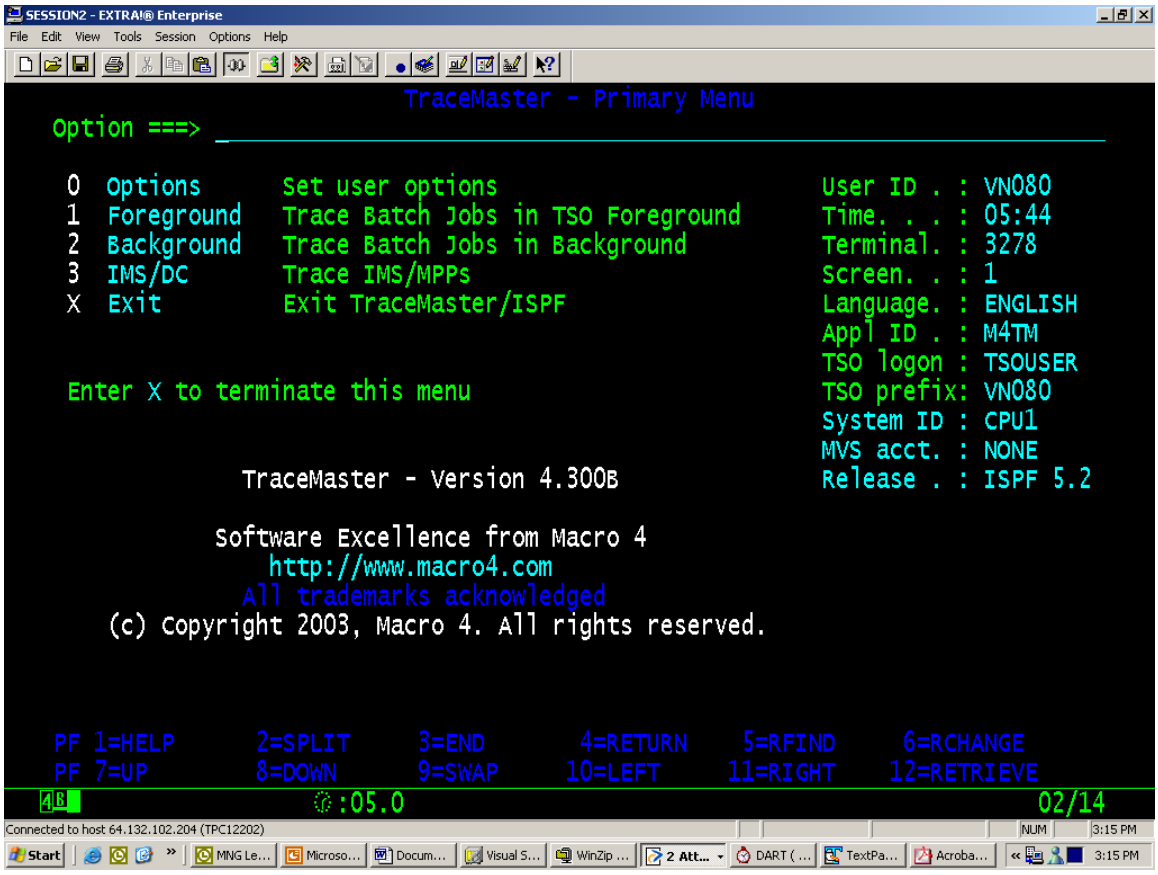
Debugging a COBOL batch program (in Foreground)

STEP 1

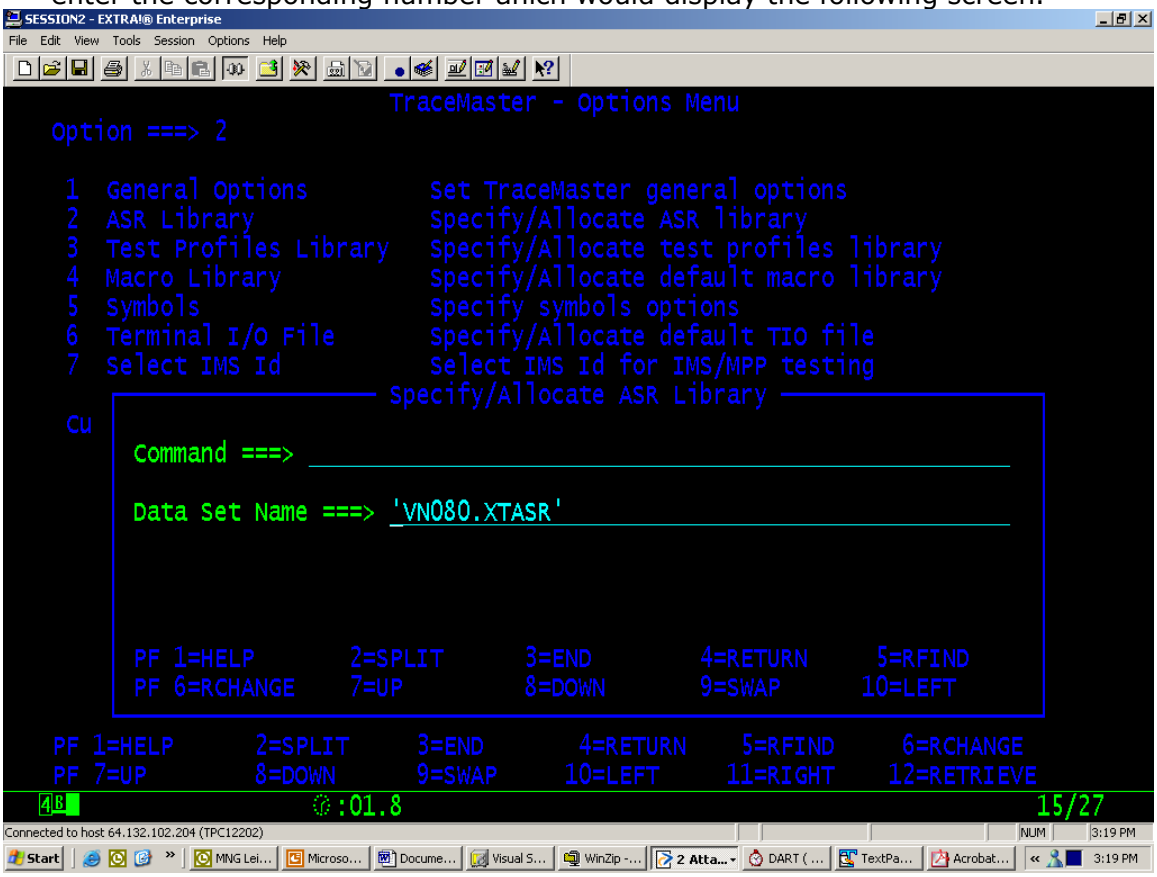
Compile and link the program for trace master – It would be same as that for CICS program. You need to make same changes in the compilation JCL procedure.

STEP 2

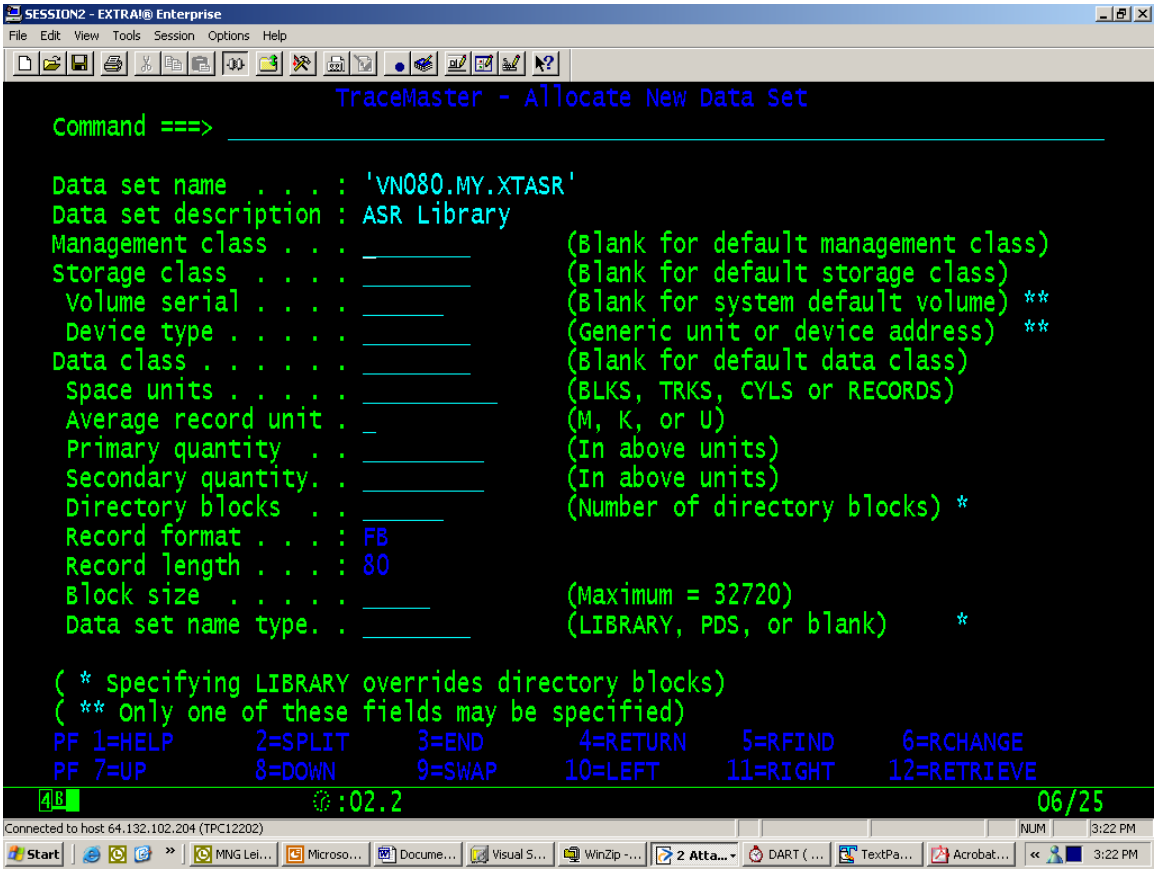
Set Default libraries – Open trace master menu by typing 'TSO TRMAST' command or using ISPF options(For example:option A.16 from ISPF panel brings the Tracemaster menu)



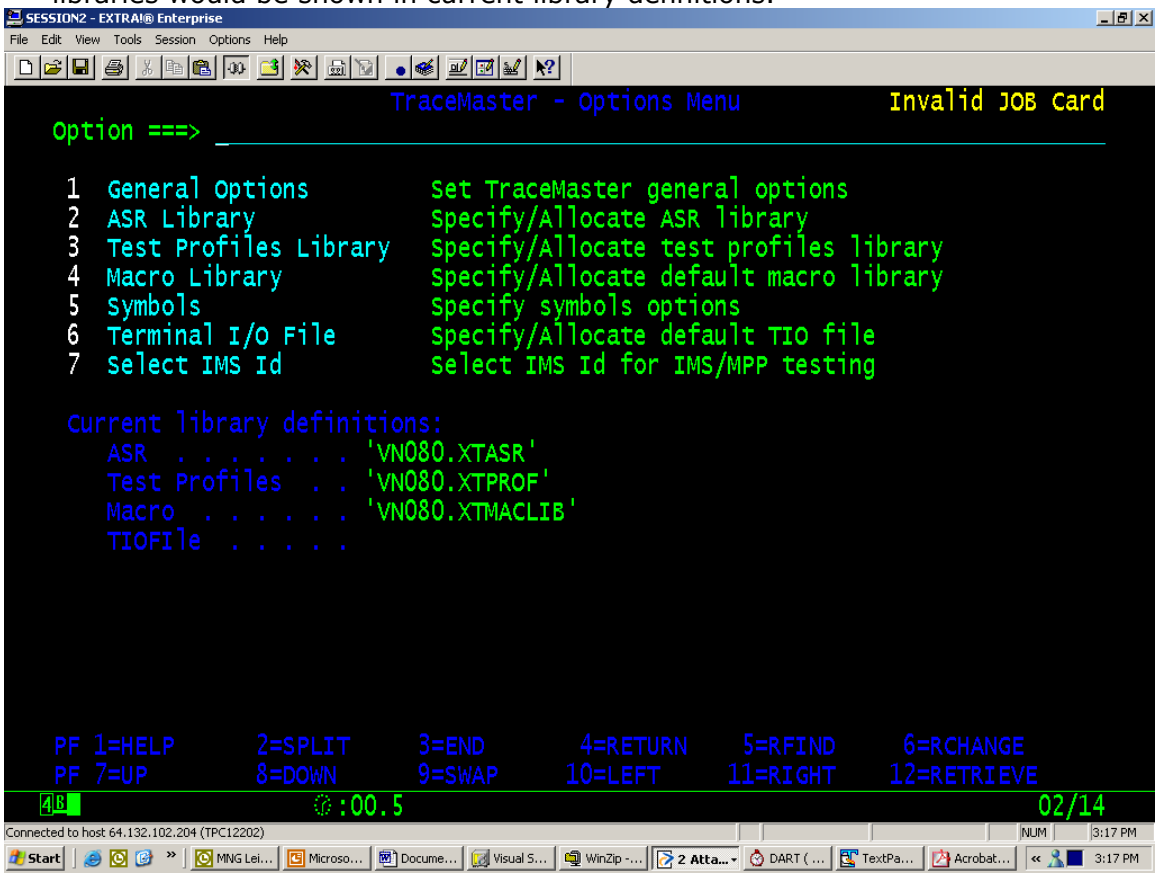
- First time users should set the default libraries using option 0(OPTIONS)on the menu.ASR,profile and macros libraries are mandatory. For setting a library enter the corresponding number ahich would display the following screen.



Here enter the dataset name as '*prefix*.XTASR' or simply XTASR. If the quotes are dropped, the prefix would be the default prefix. The default prefix could be changed using option 1(General Options) which is by default your userid. If the dataset does not exist then a screen for new dataset creation would appear:

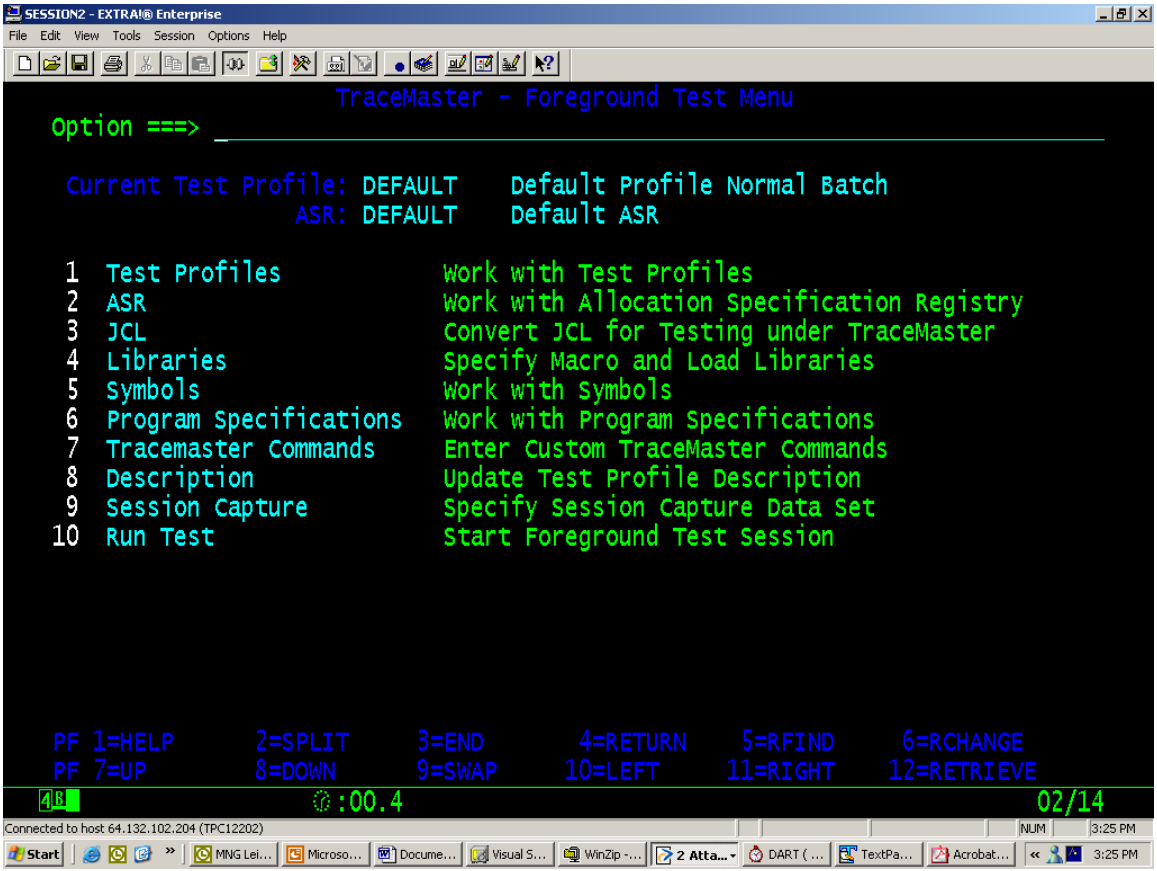


You need to fill in the required information.After setting all the libraries, the libraries would be shown in current library definitions.

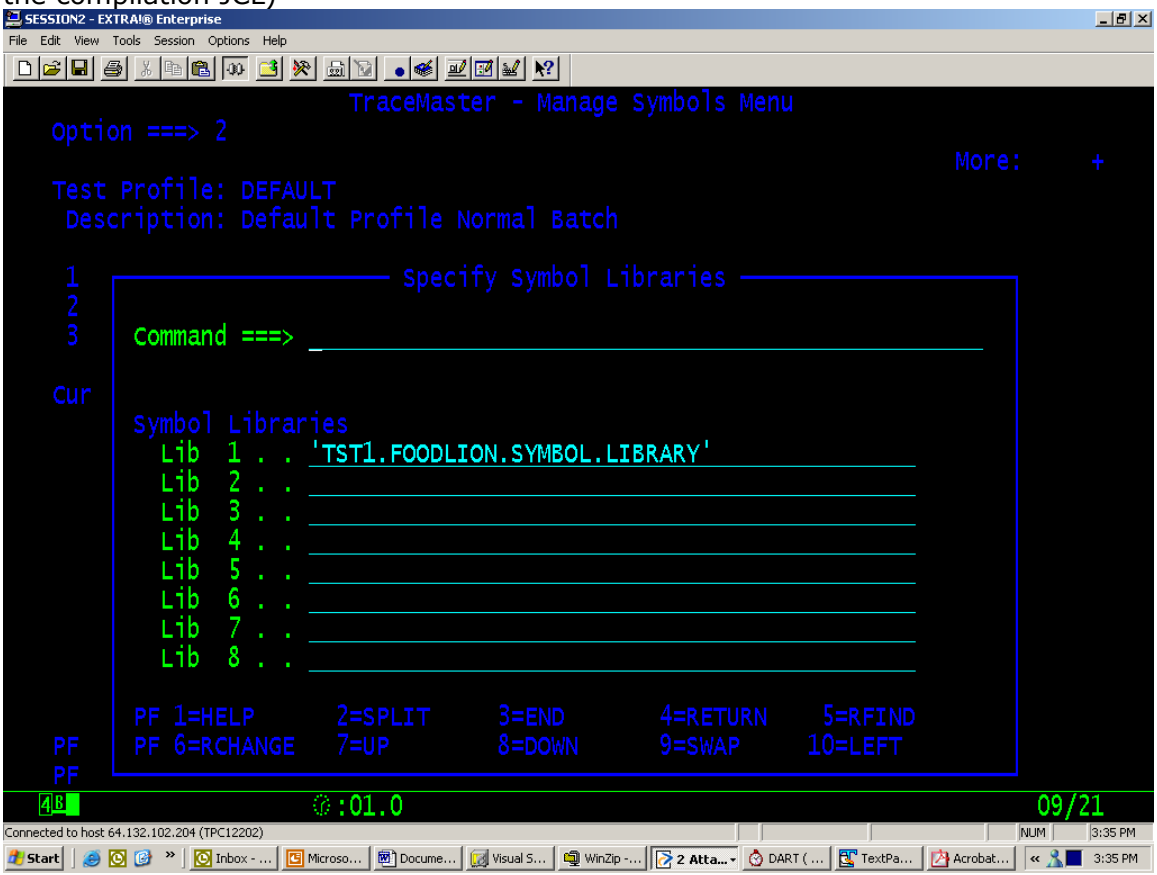


STEP 3

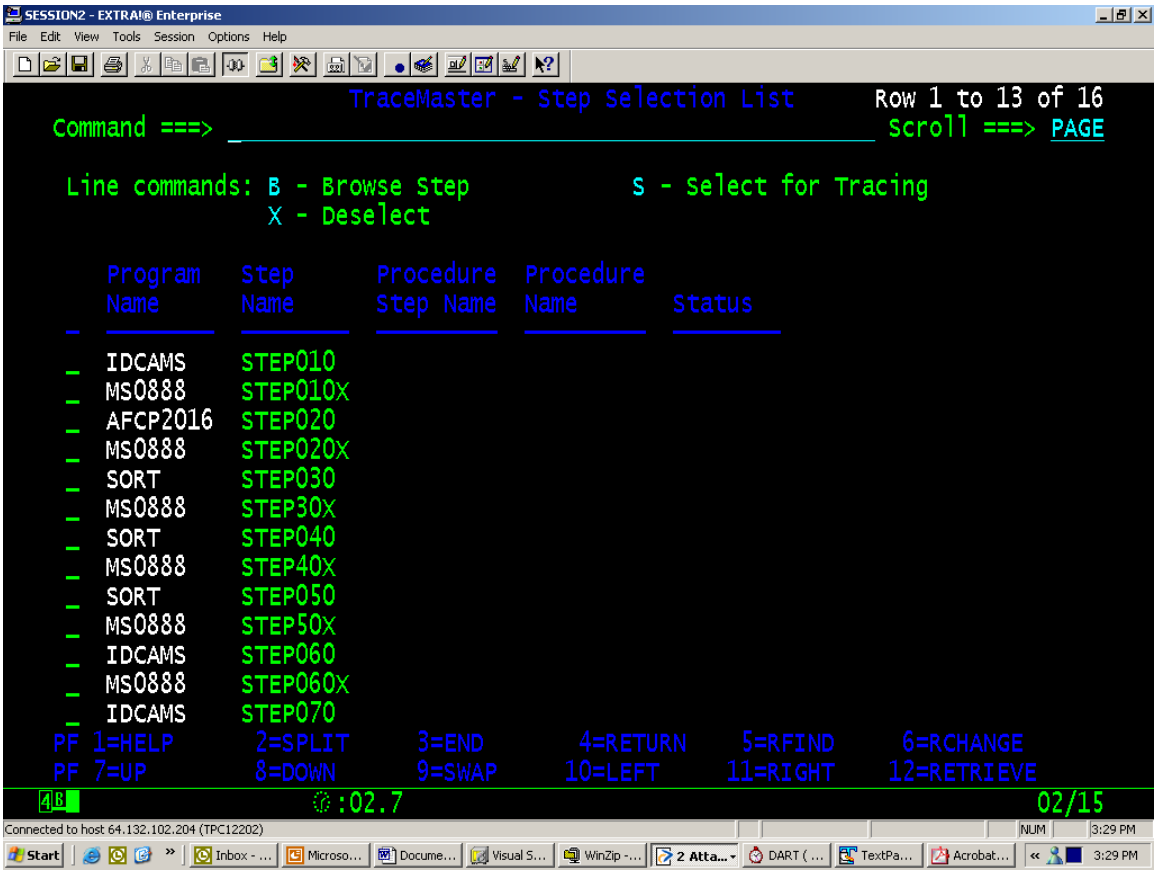
Set symbol library and Convert the JCL – Now go back to the main menu and enter the option for foreground testing.



Here select option 5(Symbols) and give the symbol library name(same as used in the compilation JCL)



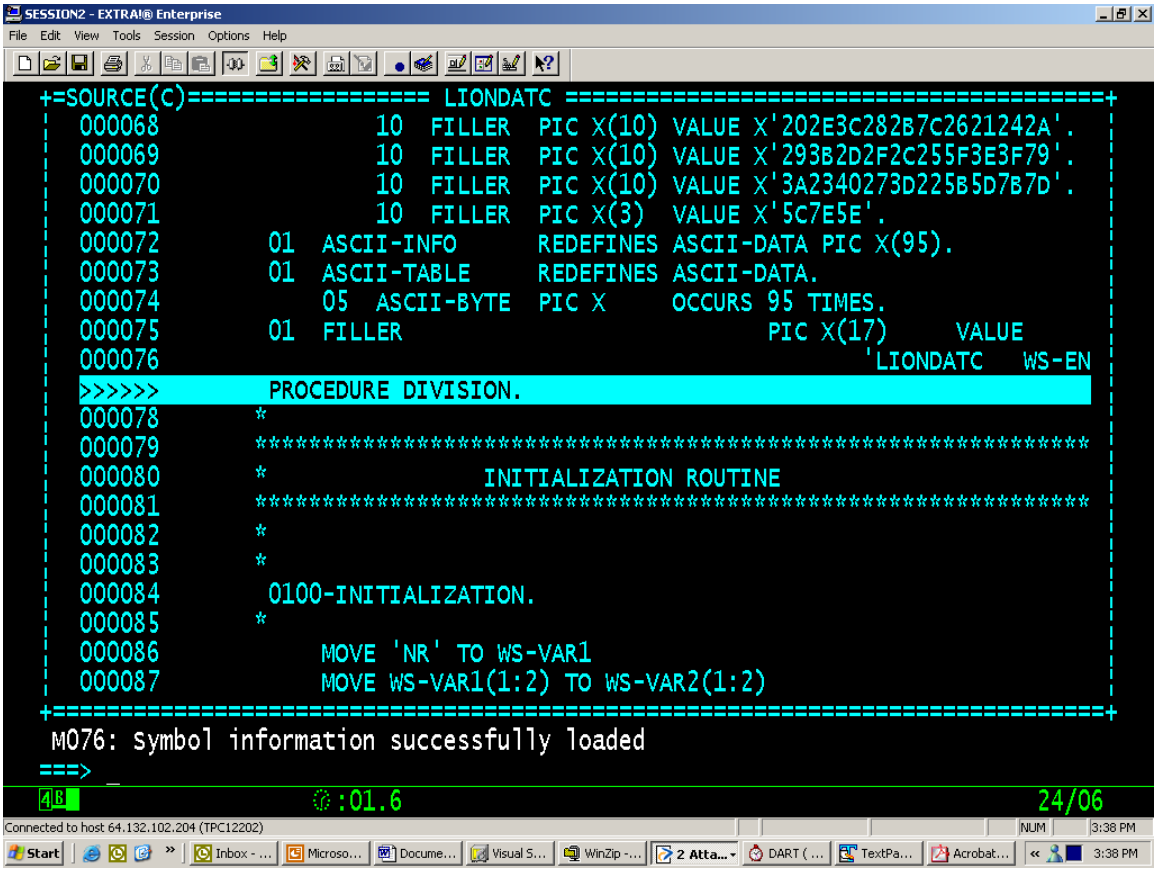
After setting the symbol library use option 3 for converting the JCL which executes the program for Tracemaster.Specify the member and the PDS and press enter to get the following screen.



It would list all the steps of the JCL. Select the program to be debugged by putting S in front of the step executing the program and press PF3.

STEP 4

Run in debug mode - : Now press option 10 (Run Test) to run the program in debug mode.The screen with source code would be displayed.



Here, you can set the breakpoints and start executing the program by pressing PF12 or typing RUN command on command line. Other options are same as those in CICS.
After the testing is over, exit by typing ‘END’ command.