L-22

B1000 COBOL74 DEBUGGER

C.U.B.E. L

SPRING 1987

PREPARED BY:

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Introduction:

The B1000 COBOL74B Test and Debug System is comprised of the COBOL74B Compiler, the COBOL74B/AID on-line DEBUGGER, two Interpreters: COBOL74B/INTERP and COBOL74B/DEBUG and an object code analysis program, COBOL74B/ANALYZER.

When used to their full advanatage these products provide an excellent resource for testing new systems and for troubleshooting problems in existing systems. Valuable time wasted in the past reading monitor and trace listings can now be spent productively fixing the problem!

If for no other reason but the speed of the compiler, COBOL74B is in my opinion, a must for any development oriented B1000 COBOL installation.

Anyone who has spent time putting in display statements, monitor statements, and taking memory dumps while trying to locate an obscure problem, will immediately fall in love with COBOL74B/AID!

COBOL74B Compiler -- A program that is going to be debugged interactively must be or have been compiled with the COBOL74B Compiler.

The "74B" Compiler is a single pass compiler and is therefore quite fast in comparison to the normal 74 Compiler. In order to gain speed, however, you lose something else, Resources, the 74B Compiler does use more memory and does a lot more overlays than the normal 74 Compiler.

A side effect of using the COBOL74B Compiler is the size of the code file. The produced 74B Object Code File is much larger than an normal COBOL74 Code File. This additional code file space is used to store the "ADDITIONAL SYMBOL TABLE" information needed for use with the on-line Debugger. Also, additional code is needed for the actual interface processing with the debugger.

A comparison chart has been provided on the following page.

COMPILE COMPARISON TABLE

SOURCE W/ 5,492 Lines of COBOL Code:

	74	74B	74B w/Reset TADS
CODE OVERLAYS:	293	288	317
DATA OVERLAYS:	Ø	5,423	4,604
CPU TIME:	9:23.4	2:55.2	2:43.2
WALL TIME:	22:50.4	8:43.3	7:16.4
AVG. PROC %:	41.1%	33.5%	37.4%
CODE FILE SIZE IN SEGMENTS:	421	1,009 (240% LARGER)	313
COMPILE LINES PER PROC MINUTE:	657	2,213 (337% FASTER)	2,354
COMPILE LINES PER WALL MINUTE:	241	636 (264% FASTER)	753

SOURCE W/ 28 Lines of COBOL Code:

	74	74B	74B w/$Reset Tads
CODE OVERLAYS:	110	97	61
DATA OVERLAYS:	Ø	8	8
CPU TIME:	11.7	8.3	7.5
WALL TIME:	53.8	29.4	31.3
AVG. PROC %:	21.7%	28.2%	24.0%
CODE FILE SIZE IN SEGMENTS:	8	25	9
COMPILE LINES PER PROC MINUTE:	143	202	224
COMPILE LINES PER WALL MINUTE:	31	57	54

Note: Our Compilers are modified for our average memory requirements a 74 Compile uses approximately 23K, a 74B Compile approximately 75K.

COBOL74B/AID is an on-line program which can be used to control the execution of a program which has been compiled with the COBOL74B Compiler.

This on-line program allows you to DISPLAY and/or MODIFY the value of any DATANAME, allows you to monitor paragraph execution by paragraph name, allows you to establish "Breakpoints" at which the exectuion of the program will be suspended, etc.

COBOL74B/AID can also be used to assume control of a program which was originally executed normally (ie outside of AID).

Programs which have gone DS/DP due to things like invalid Subscript can often be "REPAIRED" and allowed to terminate "NORMALLY" often preventing abort recoveries in DMS II environments.

Additional COBOL74B Considerations

* Security (Adoptable Programs, Move Verb, etc.)

* $ Reset TADS (No Debugging, but poor dumps)

* Actual Run Time/Efficiency

* Does not use "#" Files for DMSII databases actually decodes the dictionary

* Many new enhancements, not in the COBOL74 Compiler (File attributes, Reader Sorter, New DMSTRUCTURE & DMERROR TYPE, etc.)

* Syntax Errors are properly pointed to by 74B, no more checking lines above and below when an error is reported.

---- COBOL74B/AID COMMAND SUMMARY ----

Six Categories of Commands:

I. Job Execution and Control:

EXECUTE	-	Initiate a Program thru AID.
ADOPT	-	Gain Control of a 74B job already in the Mix.
ABANDON	-	Relinquish control of the program back to the MCP.

II. Environmental Commands:

FORMAT	-	Controls Format of Displayed Data (Hex or Translated).
OUTPUT	-	Controls Routing of Output (Printer and/or Terminal).
PRINT	-	Print Specific Items to Printer.
LOG	-	Create a command file for subsequent "Play Back".
DO	-	Reprocess or "Play Back" a previous LOG File.

III. Execution Control Commands:

STOP	-	Suspend the execution of a program Temporarily.
STEP	-	Allow the program to continue until the next Paragraph.
CONTINUE	-	Allow the program to continue execution, optionally until a certain condition occurs.
WHEN	-	Specify certain data conditions under which the program should be suspended. (Establish a BREAKPOINT)
AT	-	Specify certain program locations at which the program should be suspended. (Establish a BREAKPOINT)
DISCARD	-	Eliminate certain BREAKPOINTS from the list of reasons the program should be suspended.

IV. COBOL Like Verbs, For COBOL like Functions:

MOVE	-	Move a certain value to a certain Dataname, or change a Dataname back to its initial value at BOJ.
PERFORM	-	Perform a certain procedure, optionally thru an Exit.
EXIT	-	Exit a current perform and return control of the program back to the prior entry in the Perform Stack.
STOP RUN	-	Program will terminate as though a STOP RUN was encountered in the Code.

V. Review Mode Commands, used to review the TRACE BUFFER.

REVIEW	-	Enter the Review mode to view the Trace Buffer.
PAGE	-	Position at the Begining or the End of the Trace Buffer.
NEXT	-	Displays the next full screen of the Trace Buffer.
SAME	-	Re-displays the same page of the Trace Buffer.
BACK	-	Displays the previous full screen of the Trace Buffer.
+ <#>	-	Displays a full page -- Forward a Specified Number of Records.
- <#>	-	Display a full page -- Backward a Specified Number of Records.
CLEAR	-	Leaves the Review mode, and optionally clears the Trace Buffer.

VI. Miscellaneous Aid Commands:

BYE	-	Sign off of AID.
HELP	-	Request help on the use of a given command.
TRAIL	-	Enables a paragraph tracing function which displays each procedure name as it is entered.
HISTORY	-	Displays the equivalent of the Perform Stack that is currently in effect.
FREQUENCY	-	Enable the accumulation of statistics for subsequent analysis regarding the number of times each procedure is Executed.

B1000 COBOL74B/AID COMMANDS

ABANDON	CLEAR	EXECUTE	LOG	PRINT	TEACH
ADOPT	CONTINUE	EXIT	MOVE	REVIEW	TRAIL
AT	DISPLAY	FORMAT	NEXT	SAME	WHEN
BACK	DISCARD	FREQUENCY	OUTPUT	STEP	+<NUMBER>
BREAK	DO	HELP	PAGE	STOP	-<NUMBER>
BYE	END	HISTORY	PERFORM	STOP RUN	SPCFY

FOR SEMANTICS AND SYNTAX, ENTER: TEACH <COMMAND>

FOR SYNTAX OF <BRACKET-ITEMS> USED, ENTER: TEACH CONVENTIONS

TO BEGIN DEBUGGING A COBOL74B PROGRAM, ENTER: EXECUTE <TITLE>

TO CONTINUE PROGRAM EXECUTION, ENTER: CONTINUE

TO STOP A PROGRAM, ENTER: STOP

TO END A PROGRAM EARLY, ENTER: STOP RUN

B1000 COBOL74B/AID CONVENTIONS:

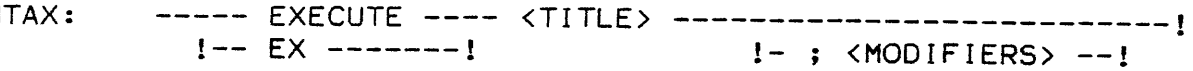
```
TITLE:     ----- <FAMILY> ------------------------------------!
                          !- "/" <FILE> -! !- ON <PACK> -!

CODE_ADDRESS:    "#" <SEG_NUMBER> "," <DISP_NUMBER>
COBOL_STMT:      [ DISPLAY, MOVE, STOP RUN ]
PARAGRAPH_NAME: PARAGRAPH NAME FOUND IN COBOL74B PROGRAM
DATANAME:        VARIABLE  NAME FOUND IN COBOL74B PROGRAM
CONDITION_NAME: CONDITION NAME FOUND IN COBOL74B PROGRAM
LABEL:           ANY IDENTIFIER VALID IN COBOL74B.

                      !<------------- OR -----------!
BOOLEAN_EXPR:    ------------ <BOOLEAN_PRIM> ----------------------!
                         !--- <CONDITION_NAME> ---!

                  !<------------------- AND ------------------------!
BOOLEAN_PRIM: -- <VALUE> ( "<","=",">","<>","<=",">=" ) <VALUE> ---!
                  !-------------- <DATANAME> MODIFIED -------------!

VALUE:            --- <DATANAME> -----------------------------------!
                   !- <CONSTANT> -------!
```

COMMAND: EXECUTE

WHEN: NO JOB RUNNING

SEMANTICS: CAUSE THE JOB RUNNING TO GO TO BOJ AND SUSPEND AT AN ASSUMED BREAKPOINT BEFORE EXECUTING THE FIRST COBOL STATEMENT. THE BREAKPOINT TABLE IS PURGED OF ANY OLD ENTRIES.

SYNTAX:

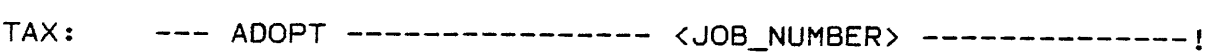


COMMAND: ADOPT

WHEN: NO JOB RUNNING

SEMANTICS: ESTABLISH COBOL74B/AID-CONTROL WITH A RUNNING COBOL74B JOB.

SYNTAX:

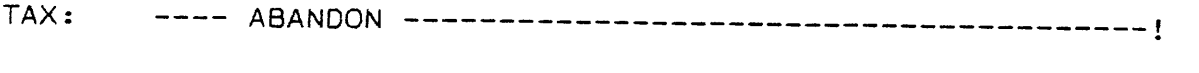


COMMAND: ABANDON

WHEN: JOB EXECUTING OR AT BREAKPOINT.

SEMANTICS: CAUSE COBOL74B/AID TO RELEASE CONTROL OF COBOL74B JOB. JOB STATUS OF COBOL74B/AID IS CHANGED TO 'NO JOB RUNNING'.

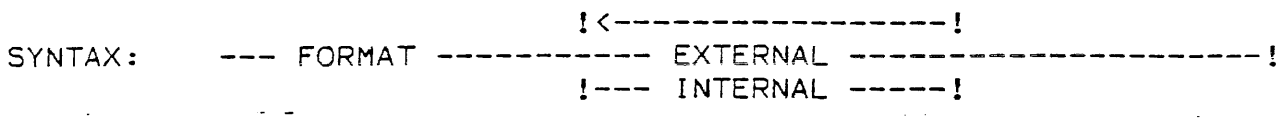
SYNTAX:



COMMAND: FORMAT

WHEN: AT BREAKPOINT

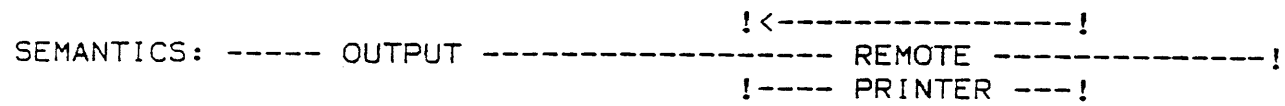
SEMANTICS: CHANGE THE DEFAULT DISPLAY FORMAT (INITIALLY EXTERNAL) TO THAT SPECIFIED. THE NEW SETTING WILL APPLY TO ALL FOLLOWING DISPLAY COMMANDS. DISPLAY CLAUSES ENTERED AS PART OF BREAKPOINTS, ENTERED EARLIER RETAIN THE FORMAT SETTING IN EFFECT WHEN THE BREAKPOINT WAS ENTERED. 'EXTERNAL' IMPLIES EDITED FOR DISPLAY. 'INTERNAL' IMPLIES HEX REPRESENTATION OF VALUE.



COMMAND: OUTPUT

WHEN: AT ANY TIME

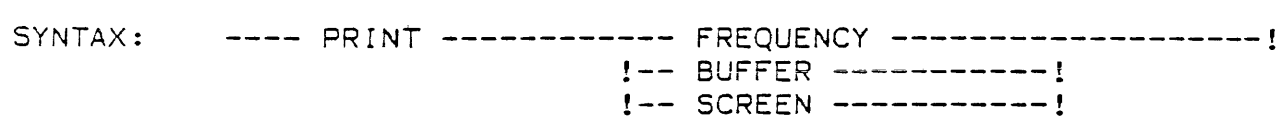
SEMANTICS: CHANGE THE DEFAULT OUTPUT ROUTING (INITIALLY TO REMOTE ONLY). THE OUTPUT ROUTING DEFAULT CAN BE OVERRIDDEN ON INDIVIDUAL COMMANDS THAT GENERATE OUTPUT.
SEE DISPLAY, HISTORY AND TRAIL.



COMMAND: PRINT

WHEN: AT BREAKPOINT OR WHEN NO JOB RUNNING.

SEMANTICS: CAUSE VARIOUS INFORMATION TO BE PRINTED IN A PRINTER FILE.



COMMAND: LOG

WHEN: AT ANY TIME

SEMANTICS: CONTROL THE CREATION OF A DO-FILE. WHILE THE LOG OPTION IS SET, SUBSEQUENT INPUT COMMANDS ARE ADDED TO THE FILE.

SYNTAX:

```
---- LOG ------- <TITLE> ----------------------------!
                !--- OFF -----------!
```

COMMAND: DO

WHEN: AT ANYTIME

SEMANTICS: CAUSE THE COMMANDS FOUND IN A DISK FILE TO BE DIRECTED TO COBOL74B/AID. THE COMMANDS WILL BE SEQUENTIALLY PROCESSED UNTIL END-OF-FILE IS ENCOUNTERED, AN ERROR CONDITION IS ENCOUNTERED OR REMOTE INPUT IS ENTERED BY THE USER. ALTHOUGH THIS COMMAND MAY BE EXECUTED AT ANY TIME, THE COMMANDS PROCESSED IN THE 'DO' FILE MAY CAUSE AN ERROR IF THE PROPER 'WHEN' CONDITION FOR THAT COMMAND IS NOT MET. RECORDS FROM THE DO FILE ARE NOT PROCESSED WHILE THE COBOL74B PROGRAM IS EXECUTING.

SYNTAX:

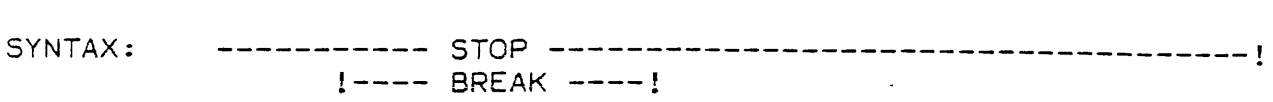
```
DO ---- <TITLE> --------------------!
```

COMMAND: STOP

WHEN: WHILE JOB EXECUTING

SEMANTICS: CAUSE THE COBOL74B JOB TO SUSPEND.

SYNTAX:

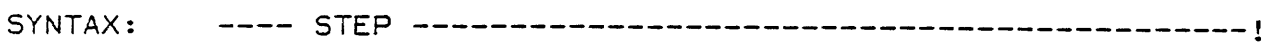


COMMAND: STEP

WHEN: AT BREAKPOINT

SEMANTICS: REINSTATES THE COBOL74B PROGRAM TO EXECUTE UNTIL ANOTHER PARAGRAPH IS ENTERED. ALL BREAKPOINTS REMAIN IN EFFECT.

SYNTAX:

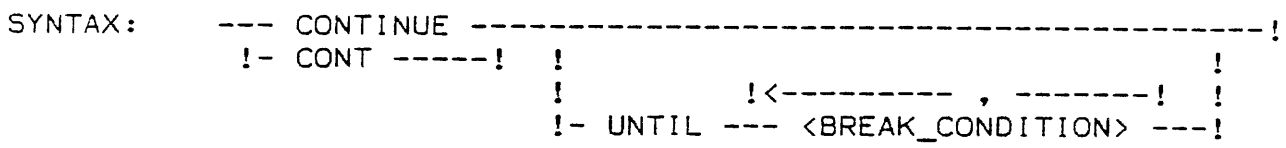


COMMAND: CONTINUE

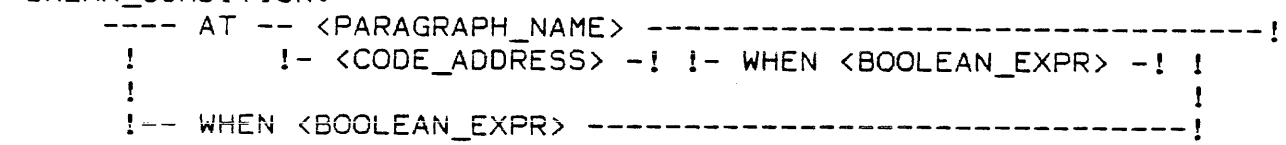
WHEN: AT BREAKPOINT.

SEMANTICS: CAUSES THE COBOL74B PROGRAM TO BE REINSTATED.
IF 'UNTIL' CONDITIONS ARE SPECIFIED, THESE CONDITIONS ARE TEMPORARILY ADDED TO THE BREAKPOINT TABLE UNTIL THE PROGRAM REACHES THE NEXT BREAKPOINT.

SYNTAX:



BREAK_CONDITION:

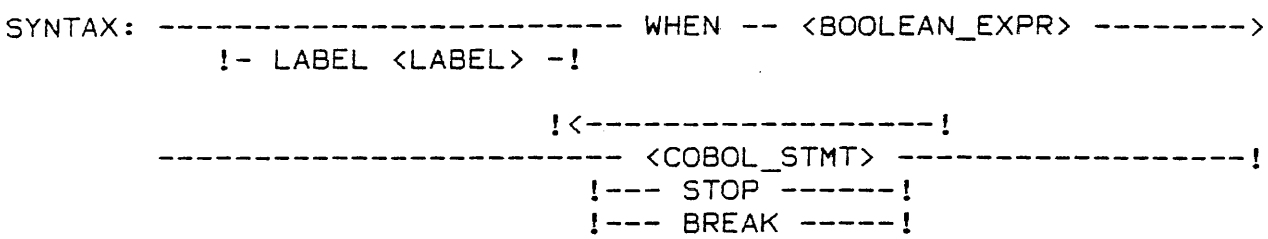


COMMAND: WHEN

WHEN: COBOL74B PROGRAM MUST BE HUNG OR AT BREAKPOINT.
COBOL74B/AID MAY NOT BE IN REVIEW MODE.

SEMANTICS: ENTER A DATA BREAKPOINT INTO THE BREAKPOINT TABLE, TO CAUSE THE COBOL PROGRAM TO PERFORM THE DESIRED TASK (<COBOL_STMT> AND/OR STOP) EACH TIME THE SPECIFIED CONDITIONS BECOME TRUE.

SYNTAX:

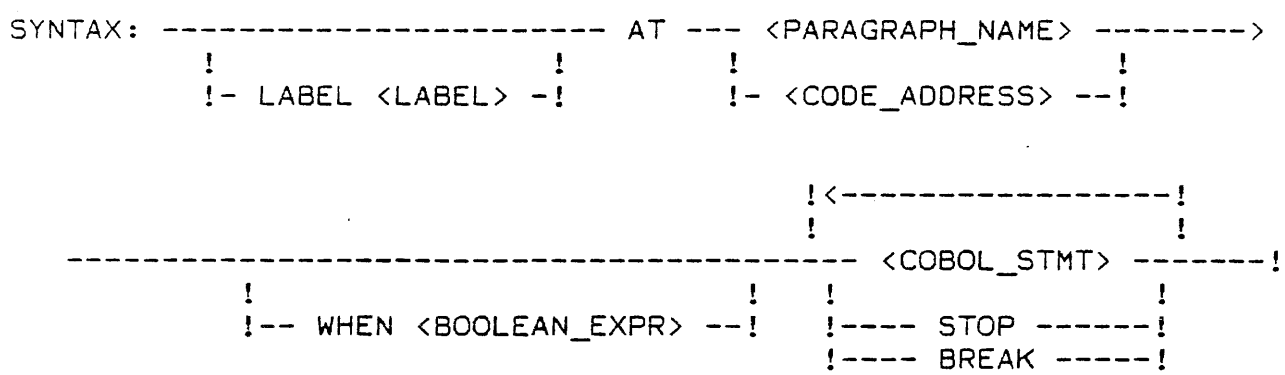


COMMAND: AT

WHEN: COBOL74B PROGRAM MUST BE HUNG OR AT BREAKPOINT.
COBOL74B/AID MAY NOT BE IN REVIEW MODE.

SEMANTICS: ENTER A CODE BREAKPOINT INTO THE BREAKPOINT TABLE, TO CAUSE THE COBOL74B PROGRAM TO PERFORM THE DESIRED TASK (<COBOL_STMT> AND/OR STOP) EACH TIME CONTROL REACHES THE SPECIFIED CODE ADDRESS. IF <BOOLEAN_EXPR> IS SPECIFIED, IT MUST BE TRUE AT THE CONTROL POINT FOR THE DESIRED TASK TO BE PERFORMED.

SYNTAX:

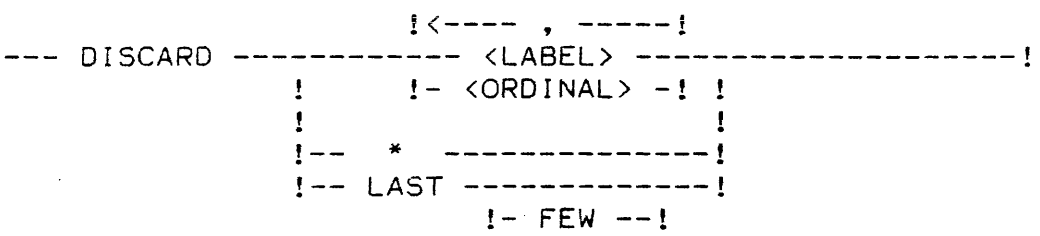


COMMAND: DISCARD

WHEN: AT BREAKPOINT.

SEMANTICS: DISCARD BREAKPOINTS FROM THE BREAKPOINT TABLE. BREAKPOINTS WITH THE SAME <LABEL> MAY BE DISCARDED AS A GROUP. 'LAST' DISCARDS THE LAST BREAKPOINT ENTERED. 'LAST FEW' DISCARDS ALL BREAKPOINTS ENTERED SINCE THE CURRENT BREAKPOINT WAS REACHED. 'DISCARD *' REMOVES ALL BREAKPOINTS. THE SYSTEM-SUPPLIED ORDINAL NUMBER MAY BE USED AS A <LABEL> WHEN REMOVING BREAKPOINTS.

SYNTAX:



COMMAND: MOVE

WHEN: COBOL74B PROGRAM AT BREAKPOINT.
COBOL74B/AID NOT IN REVIEW MODE.

SEMANTICS: CAUSE <VALUE> TO BE ASSIGNED TO <DATANAME>. IF "*" IS USED, <DATANAME> WILL BE RE-INITIALIZED TO THE VALUE IT HAD AT BOJ.
THIS COMMAND MAY EITHER BE ISSUED AS AN IMMEDIATE COMMAND, OR AS PART OF A BREAKPOINT (SEE 'AT' AND 'WHEN') TO BE DONE AT A SPECIFIED TIME WHILE THE COBOL74B PROGRAM IS EXECUTING.

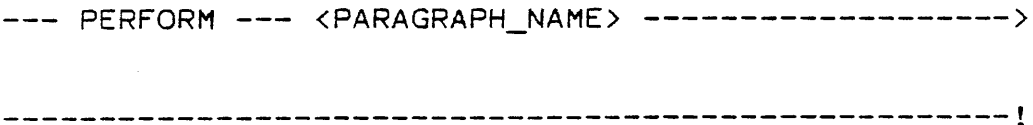
SYNTAX:

COMMAND: PERFORM

WHEN: COBOL74B PROGRAM AT BREAKPOINT.
COBOL74B/AID NOT IN REVIEW MODE.

SEMANTICS: CAUSE THE PARAGRAPH (RANGE) TO BE PERFORMED.
THIS COMMAND MAY ONLY BE ISSUED AS AN IMMEDIATE COMMAND. IT MAY NOT BE INCLUDED AS PART OF THE 'AT' OR 'WHEN' COMMANDS.

SYNTAX:

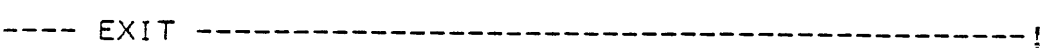


COMMAND: EXIT

WHEN: COBOL74B PROGRAM AT BREAKPOINT.
COBOL74B/AID NOT IN REVIEW MODE.

SEMANTICS: CAUSE AN EXIT FROM THE CURRENT PARAGRAPH TO OCCUR. IF THE P-STACK IS EMPTY, THIS IS EQUIVALENT TO A NO-OP.

SYNTAX:



COMMAND: STOP RUN

WHEN: AT BREAKPOINT.

SEMANTICS: CAUSE THE COBOL74B JOB TO TERMINATE.
THIS COMMAND MAY EITHER BE ISSUED AS AN IMMEDIATE COMMAND, OR AS PART OF A BREAKPOINT (SEE 'AT' AND 'WHEN') TO BE DONE AT A SPECIFIED TIME WHILE THE COBOL74B PROGRAM IS EXECUTING.

SYNTAX:

COMMAND: REVIEW

WHEN: AT BREAKPOINT OR NO JOB RUNNING.

SEMANTICS: ENTER REVIEW MODE AND DISPLAY UP TO THE LAST 22 ENTRIES PLACED IN THE TRACE BUFFER. ONCE IN REVIEW MODE, 'PAGE', 'NEXT', 'BACK' AND 'SAME', ARE PERMISSABLE. TO LEAVE REVIEW MODE, DEPRESS THE SPCFY KEY, OR TRANSMIT "CLEAR".

SYNTAX: ------ REVIEW ----------!

COMMAND: PAGE

WHEN: IN REVIEW MODE.

SEMANTICS: DISPLAY THE FIRST [OR LAST] PAGE OF THE TRACE BUFFER ON THE SCREEN. UP TO 22 LINES WILL BE DISPLAYED. SINCE THE TRACE BUFFER IS FILLED WITH WRAP-AROUND AFTER 256 ENTRIES, 'PAGE' WILL DISPLAY THE OLDEST ENTRIES IN THE TRACE BUFFER (NOT NECESSARILY THE FIRST ENTERED). REVIEW MODE REMAINS IN EFFECT.

SYNTAX: -------- PAGE ----------!
!- P ----! !- END -!

COMMAND: NEXT

WHEN: IN REVIEW MODE.

SEMANTICS: DISPLAY NEXT PAGE OF TRACE BUFFER ON SCREEN. IF THE LAST ENTRY HAS ALREADY BEEN DISPLAYED, THEN THE LAST FULL PAGE IS AGAIN DISPLAYED.
REVIEW MODE STAYS IN EFFECT.

SYNTAX: -------- NEXT ----------!
!- N ----!

COMMAND: SAME

WHEN: IN REVIEW MODE.

SEMANTICS: DISPLAY SAME PAGE OF TRACE BUFFER ON SCREEN AGAIN. REVIEW MODE STAYS IN EFFECT.

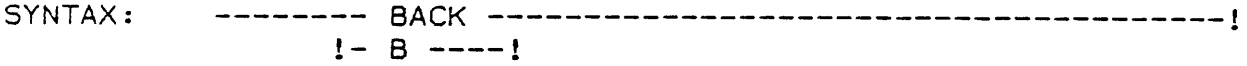
SYNTAX:

COMMAND: BACK

WHEN: IN REVIEW MODE.

SEMANTICS: DISPLAY PREVIOUS PAGE OF TRACE BUFFER ON SCREEN. IF LESS THAN 22 LINES PRECEDE THE CURRENT PAGE, THE FIRST 22 LINES OF THE TRACE BUFFER WILL BE DISPLAYED. REVIEW MODE STAYS IN EFFECT.

SYNTAX:



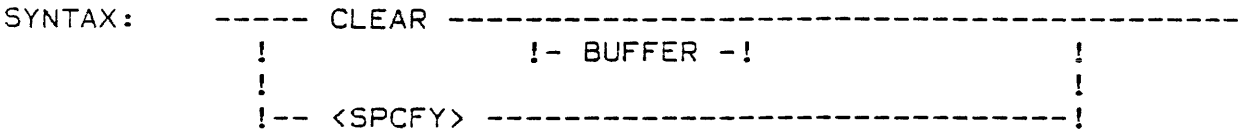
COMMAND: CLEAR

WHEN: ANY TIME.

SEMANTICS: IF A JOB IS EXECUTING, IT IS STOPPED. IF REVIEW MODE IS ON, IT IS TURNED OFF. ALL ENTRIES ARE REMOVED FROM THE TRACE BUFFER IF 'BUFFER' IS SPECIFIED; AND THE SCREEN IS REFRESHED.

DEPRESSING THE SPCFY-KEY IS EQUIVALENT TO 'CLEAR'.

SYNTAX:



COMMAND: BYE

WHEN: NO JOB RUNNING.

SEMANTICS: CAUSE COBOL74B/AID TO TERMINATE.

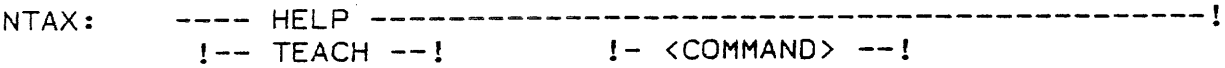
SYNTAX:

COMMAND: HELP

WHEN: AT ANY TIME

SEMANTICS: CAUSE A PORTION OF THE TEACHFILE TO BE DISPLAYED.

SYNTAX:

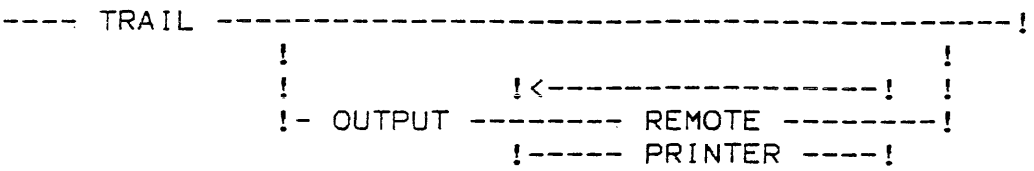


COMMAND: TRAIL

WHEN: AT BREAKPOINT.

SEMANTICS: WHEN A PROCEDURE IS ENTERED, EITHER BY BRANCHING TO IT OR FALLING INTO IT, CAUSE AN ENTRY TO BE OUTPUT TO THE SCREEN OR THE PRINTER OR BOTH. IF OUTPUT IS NOT SPECIFIED THE DEFAULT OUTPUT SETTING (SEE OUTPUT) IS USED.

SYNTAX:

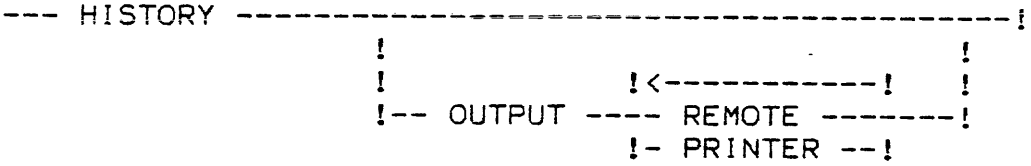


COMMAND: HISTORY

WHEN: AT BREAKPOINT

SEMANTICS: DISPLAY STACK OF ACTIVE PROCEDURE NAMES.

SYNTAX:

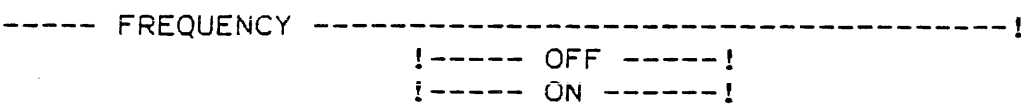


COMMAND: FREQUENCY

WHEN: AT BREAKPOINT.

SEMANTICS: CAUSE FREQUENCY INFORMATION TO BE GATHERED AS THE COBOL74B PROGRAM EXECUTES. FREQUENCY INFORMATION IS THE NUMBER OF TIMES EACH PARAGRAPH IS ENTERED EITHER BY BRANCHING TO IT OR FALLING INTO IT.
THE DATA GATHERED MAY LATER BE PRINTED (SEE PRINT).

SYNTAX:



SCREEN #1

EX REOBJ/TACS-UPD ON USER

LOADING SYMBOL INFORMATION_____

OUTPUT: REMOTE FORMAT: EXTERNAL

BREAKPOINT TABLE

USER/REOBJ/TACS-UPD (#8966) ADOPTION IN PROGRESS

SCREEN #2

DISPLAY RT-PARCEL-ID

AREA A

OUTPUT: REMOTE FORMAT: EXTERNAL

BREAKPOINT TABLE

AREA B

- _____ : DISPLAY RT-PARCEL-ID_____

AREA C

AT 0001-DRIVER-MODULE RT-PARCEL-ID="????????????"
REOBJ/TACS-UPD ON USER (#8966) AT 0001-DRIVER-MO

SCREEN AREAS ABOVE:

A - Command Input
B - Break Point Table
C - Bottom Lines of Trace Buff

SCREEN #3

FORMAT INTERNAL

OUTPUT: REMOTE FORMAT: INTERNAL

BREAKPOINT TABLE

\- _____ : DISPLAY RT-PARCEL-ID_____

AT 0001-DRIVER-MODULE RT-PARCEL-ID="????????????"
REOBJ/TACS-UPD ON USER (#8966) AT 0001-DRIVER-MO

SCREEN #4

DISPLAY RT-PARCEL-ID

OUTPUT: REMOTE FORMAT: INTERNAL

BREAKPOINT TABLE

\- _____ : DISPLAY RT-PARCEL-ID_____

AT 0001-DRIVER-MODULE RT-PARCEL-ID="????????????"
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@000000000000000000000000@
REOBJ/TACS-UPD ON USER (#8966) AT 0001-DRIVER-MO

SCREEN #5

FORMAT INTERNAL EXTERNAL

OUTPUT: REMOTE FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

- _____ : DISPLAY RT-PARCEL-ID _____

AT 0001-DRIVER-MODULE RT-PARCEL-ID="????????????"
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@0000000000000000000000000@
REOBJ/TACS-UPD ON USER (#8966) AT 0001-DRIVER-MO

SCREEN #6

DISPLAY RT-PARCEL-ID

OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

- _____ : DISPLAY RT-PARCEL-ID _____

AT 0001-DRIVER-MODULE RT-PARCEL-ID="????????????"
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@0000000000000000000000000@
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@0000000000000000000000000@ "????????????"
REOBJ/TACS-UPD ON USER (#8966) AT 0001-DRIVER-MO

SCREEN #7

• OUTPUT REMOTE PRINTER

OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

- _____ : DISPLAY RT-PARCEL-ID _____

AT 0001-DRIVER-MODULE RT-PARCEL-ID="????????????"
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@0000000000000000000000000@
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@0000000000000000000000000@ "????????????"
REOBJ/TACS-UPD ON USER (#8966) AT 0001-DRIVER-MO

SCREEN #8

LOG CRAIG/AID-CMDS

LOGGING TO CRAIG/AI

OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

- _____ : DISPLAY RT-PARCEL-ID _____

AT 0001-DRIVER-MODULE RT-PARCEL-ID="????????????"
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@0000000000000000000000000@
AT 0001-DRIVER-MODULE RT-PARCEL-ID=@0000000000000000000000000@ "????????????"
REOBJ/TACS-UPD ON USER (#8966) AT 0001-DRIVER-MO

SCREEN #9

STEP

LOGGING TO CRAIG/AI

OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

REOBJ/TACS-UPD ON USER (#8966) AT 0595-PARAM-TOT

SCREEN #10

CONTINUE UNTIL CONTROL-FILE-COMPLETLY-READ

LOGGING TO CRAIG/AID

OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

\- _____ : CONTINUE UNTIL CONTROL-FILE-COMPLETLY-READ _____

REOBJ/TACS-UPD ON USER (#8966) AT #0,44397 IN 05

CONTROL-FILE-COMPLETLY-READ is an 88 level of a switch set by a CONTROL FILE LOAD ROUTINE.

SCREEN #11

HISTORY

LOGGING TO CRAIG/AI

OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

- _____ : HISTORY _____

AT #0,44397 IN 0500-READ-CONTROL-FILE HISTORY =
PERFORM THRU K=6, RET.ADR = #0,16017 IN 0001-DRIVER-MODULE
REOBJ/TACS-UPD ON USER (#8966) AT #0,44397 IN 05

SCREEN #12

DISPLAY LENGTH-OF-FIELD-NAMES-TABLE

LOGGING TO CRAIG/AID

OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

- _____ : DISPLAY LENGTH-OF-FIELD-NAMES-TABLE _____

AT #0,44397 IN 0500-READ-CONTROL-FILE HISTORY =
PERFORM THRU K=6, RET.ADR = #0,16017 IN 0001-DRIVER-MODULE
AT #0,44397 IN 0500-READ-CONTROL-FILE LENGTH-OF-FIELD-NAMES-TABLE=@F0F5F0@ 50
REOBJ/TACS-UPD ON USER (#8966) AT #0,44397 IN 05

SCREEN #13

TRAIL

TRAIL TO OUTPUT LOGGING TO CRAIG/AID
OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

- _____ : DISPLAY LENGTH-OF-FIELD-NAMES-TABLE _____

AT #0,44397 IN 0500-READ-CONTROL-FILE HISTORY =
PERFORM THRU K=6, RET.ADR = #0,16017 IN 0001-DRIVER-MODULE
AT #0,44397 IN 0500-READ-CONTROL-FILE LENGTH-OF-FIELD-NAMES-TABLE=@F0F5F0@ 50
REOBJ/TACS-UPD ON USER (#8966) AT #0,44397 IN 05

SCREEN #14

AT 0575-EXIT DISPLAY FLAG-TABLE-FIELD-NAME(SUB)

TRAIL TO OUTPUT LOGGING TO CRAIG/AID
OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

1 : WHEN SUB > 50 BREAK
____ 3 _____ : AT 0575-EXIT DISPLAY FLAG-TABLE-FIELD-NAME(SUB) _____

AT #0,44397 IN 0500-READ-CONTROL-FILE HISTORY =
PERFORM THRU K=6, RET.ADR = #0,16017 IN 0001-DRIVER-MODULE
AT #0,44397 IN 0500-READ-CONTROL-FILE LENGTH-OF-FIELD-NAMES-TABLE=@F0F5F0@ 50
AT #0,44397 IN 0500-READ-CONTROL-FILE SUB=@F0F0F0F0F0F0@ 0
REOBJ/TACS-UPD ON USER (#8966) AT #0,44397 IN 05

SCREEN #15

CONTINUE

```
TRAIL TO OUTPUT                                                LOGGING TO CRAIG/AID
OUTPUT: REMOTE, PRINTER     FORMAT: INTERNAL, EXTERNAL

                              BREAKPOINT TABLE

                        : WHEN SUB > 50 BREAK
_____ 3 __________      : AT 0575-EXIT DISPLAY FLAG-TABLE-FIELD-NAME(SUB) __________
04040404040404040404040404040@ "RT-APPLY-VAL-ST                              "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360D1C1D5F160D6E6D5C5D940404040404040
04040404040404040404040404040@ "RT-JAN1-OWNER                                "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360D1C1D5F160C4C5C5C460D9C5C6404040
04040404040404040404040404040@ "RT-JAN1-DEED-REF                             "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360D1C1D5F160C4C5C5C460D4D4E8E84040
04040404040404040404040404040@ "RT-JAN1-DEED-MMYY                            "
                REOBJ/TACS-UPD ON USER (#8966) AT #0,16384 IN 00
```

SCREEN #16

```
BACK
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360C9D4D760C2E8404040404040404040404
04040404040404040404040404040@ "RT-IMP-BY                                    "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360C9D4D760C4E3404040404040404040404
04040404040404040404040404040@ "RT-IMP-DT                                    "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360C1D7D7D3E860E5C1D360E2E340404040
04040404040404040404040404040@ "RT-APPLY-VAL-ST                              "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360D1C1D5F160D6E6D5C5D940404040404040
04040404040404040404040404040@ "RT-JAN1-OWNER                                "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360D1C1D5F160C4C5C5C460D9C5C64040404
04040404040404040404040404040@ "RT-JAN1-DEED-REF                             "
ENTERING 0575-SET-SWITCHS-AND-ERRORS
ENTERING 0575-EXIT
AT 0575-EXIT FLAG-TABLE-FIELD-NAME(SUB)=@D9E360D1C1D5F160C4C5C5C460D4D4E8E840404
04040404040404040404040404040@ "RT-JAN1-DEED-MMYY                            "
     REVIEW OF TRACE BUFFER                    CLEAR TO EXIT REVIEW MODE
```

SCREEN #17

CLEAR BUFFER

TRAIL TO OUTPUT LOGGING TO CRAIG/AII
OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

1 : WHEN SUB > 50 BREAK
3 : AT 0575-EXIT DISPLAY FLAG-TABLE-FIELD-NAME(SUB)

REOBJ/TACS-UPD ON USER (#8966) AT #0,16384 IN 00

SCREEN #18

DISCARD *

TRAIL TO OUTPUT LOGGING TO CRAIG/AID
OUTPUT: REMOTE, PRINTER FORMAT: INTERNAL, EXTERNAL

BREAKPOINT TABLE

REOBJ/TACS-UPD ON USER (#8966) AT #0,16384 IN 00

SCREEN #19

-CONTINUE

OUTPUT: REMOTE FORMAT: EXTERNAL

BREAKPOINT TABLE

```
       1            : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-PRIME-DIST
       2            : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-TAX-CODE
       3            : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 BREAK
  ____ 4 __________ : WHEN EXCEPTION-FIELD-1 NOT = " " DISPLAY EXCEPTION-FIELD..
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS D1-MASTER-INDEX=35176
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="NO L,B,O  VALUES
"
AT #0,120138 IN 3000-UPDATE-REQUIRED-FIELDS D1-MASTER-INDEX=242
AT #0,120138 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="LEGAL RECORD =
"
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS D1-MASTER-INDEX=242
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="NO L,B,O  VALUES
"
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=637
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD"
                REOBJ/TACS-UPD ON USER (#9254) EXECUTING
```

SCREEN #20

FREQUENCY

FREQUENCY

OUTPUT: REMOTE FORMAT: EXTERNAL

BREAKPOINT TABLE

```
       1            : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-PRIME-DIST
       2            : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-TAX-CODE
       3            : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 BREAK
       4            : WHEN EXCEPTION-FIELD-1 NOT = " " DISPLAY EXCEPTION-FIELD..
  -  _____________  : STOP ____________________________________________________
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="NO L,B,O  VALUES
"
AT #0,120138 IN 3000-UPDATE-REQUIRED-FIELDS D1-MASTER-INDEX=242
AT #0,120138 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="LEGAL RECORD =
"
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS D1-MASTER-INDEX=242
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="NO L,B,O  VALUES
"
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=637
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD"
              REOBJ/TACS-UPD ON USER (#9254) AT #2,4614 IN LEF
```

SCREEN #21

```
PERFORM 3210-DISPLAY-CURRENT-VALUES

                                   FREQUENCY
 OUTPUT: REMOTE                    FORMAT: EXTERNAL

                                   BREAKPOINT TABLE

       1              : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-PRIME-DIS
       2              : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-TAX-CODE
       3              : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 BREAK
       4              : WHEN EXCEPTION-FIELD-1 NOT = " " DISPLAY EXCEPTION-FIELD.
   -  ________________: PERFORM 3210-DISPLAY-CURRENT-VALUES_____________________
"
AT #0,120138 IN 3000-UPDATE-REQUIRED-FIELDS D1-MASTER-INDEX=242
AT #0,120138 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="LEGAL RECORD =
"
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS D1-MASTER-INDEX=242
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="NO L,B,O  VALUES
"
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=637
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD'
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=1334
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD'
```

SCREEN #22

```
PRINT FREQUENCY

                                   FREQUENCY
 OUTPUT: REMOTE                    FORMAT: EXTERNAL

                                   BREAKPOINT TABLE

       1              : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-PRIME-DIST
       2              : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 DISPLAY D1-TAX-CODE
       3              : AT 5000-EXIT WHEN EXCEPTION-TYPE = 8 BREAK
       4              : WHEN EXCEPTION-FIELD-1 NOT = " " DISPLAY EXCEPTION-FIELD..
   -  ________________: STOP ____________________________________________________
AT #0,122513 IN 3000-UPDATE-REQUIRED-FIELDS EXCEPTION-FIELD-1="NO L,B,O  VALUES
"
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=637
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD"
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=1334
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD"
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=1613
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD"
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 D1-MASTER-INDEX=1617
AT #1,18466 IN 4150-PICK-RECORDS-FROM-D11 EXCEPTION-FIELD-1="D10 OR D11 RECORD"
                REOBJ/TACS-UPD ON USER (#9254) AT #2,5910 IN SQU
```

FREQUENCY INFO FOR REOBJ/TACS-UPD ON USER (#9254)

.....	0
0001-DRIVER-MODULE	0
0001-SKIP-FOR-RESTART-FOR-RPTS	0
0001-NORMAL-EOJ	0
0001-EXIT	0
0500-READ-CONTROL-FILE	0
0500-EXIT	0
0555-FIND-FIELD-NAME-IN-TABLE	0
0555-EXIT	0
0575-SET-SWITCHS-AND-ERRORS	0
0575-EXIT	0
0585-SET-SPECIFIC-FIELD-VALUES	0
0585-EXIT	0
0595-PARAM-TOTAL-RPT-PAGE-TOP	0
0595-EXIT	0
1000-MAIN-LOOP-MODULE	62
1000-EXIT	62
1100-INC-D1KEY-READ-TACS-FILES	62
1100-EXIT	62
1200-UPDATE-REDATA-BASE	62
1200-EXIT	62
1500-D1-CONTROL-RECORD-READ	0
1500-EXIT	0
3000-UPDATE-REQUIRED-FIELDS	62
3000-EXIT	62
3010-SET-UP-FIELDS-AND-REPORT	0
3010-EXIT	0
3050-CREATE-A-REDATA-BASE-REC	0
3050-EXIT	0
3100-STORE-RT-MAST-IN-DB	0
3100-EXIT	0
3200-AX-INPUT-GIVES-STATUS	62
3200-EXIT	62
3210-DISPLAY-CURRENT-VALUES	2
3210-EXIT	1
4000-CHECK-D10-BEFORE-D11-READ	62
4000-EXIT	62
4100-READ-ALL-D11-LINKS	246
4100-EXIT	246
4150-PICK-RECORDS-FROM-D11	308
4150-EXIT	308