

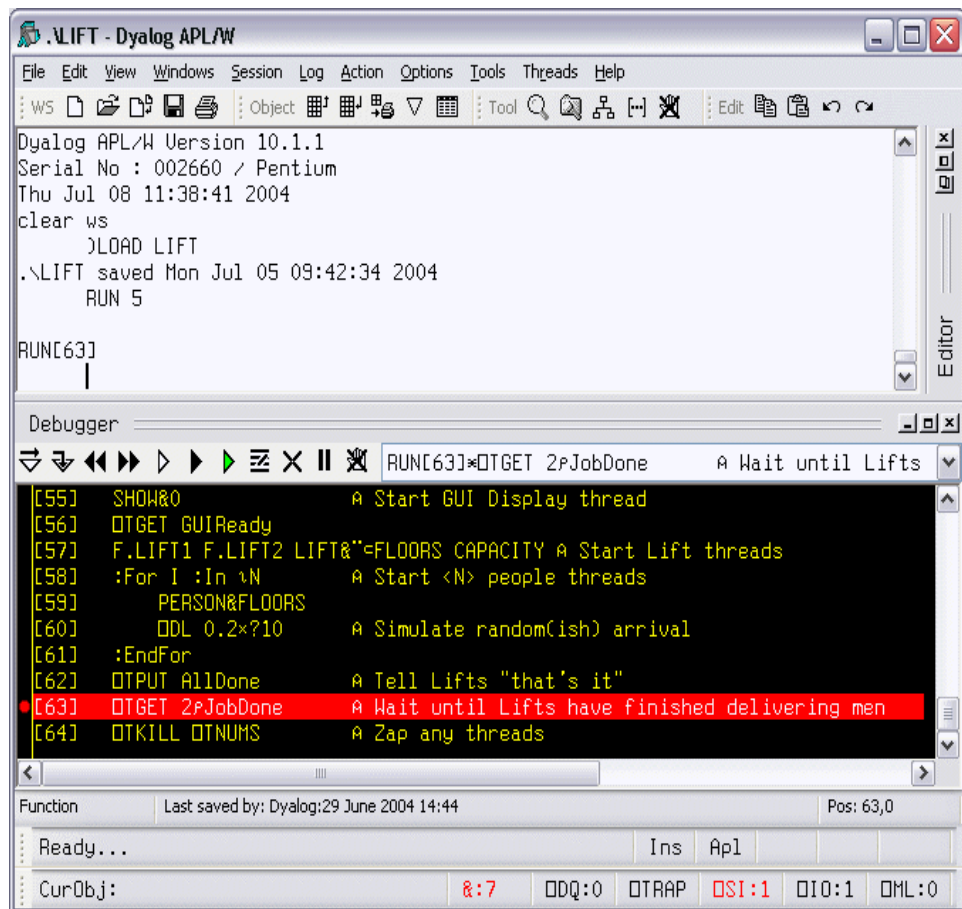


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Debugging Threads

The Debugger I Version 10.1 provides a tabbed interface that allows you to easily switch between suspended threads. To keep things simple for non-threaded applications, Tabs are only displayed if there is a thread suspended that is other than Thread 0.

The following picture shows the Debugger open on a multi-threaded application (LIFT.DWS) when only Thread 0 is suspended. This has been achieved by setting a stop on Run[63]



In the next picture, the user has chosen to display the Threads Tool and then dock it between the Session and Debugger windows. Note that only one thread, thread 0 (Run) is suspended. All the other threads are paused (because Pause on Error is enabled).

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In this picture, the user has chosen to display the Threads Tool and then dock it between the Session and Debugger windows. Note that only one thread, thread 0 (Run) is suspended. All the other threads are paused (because Pause on Error is enabled).

The screenshot shows the Dyalog APL/W interface with the Threads Tool docked between the Session and Debugger windows. The Threads Tool window displays a list of threads, with thread 0 (Run) highlighted. The Debugger window shows the execution of the program, with the current thread 0 (Run) highlighted.

Tid	Location	State	Flags	Treq
0: Run	*RUN[63] DTGET 2PJobDone ...	Session	Normal	
1: GUI	SHOW[22] DDQ'F'	DDQ	Paused	
2: Lift 1	LIFT[20] DTGET DeLifters...	DTGET (Ready ...	Paused	2001
3: Lift 2	GOTO[10] ODL 0.2	ODL	Paused	
4: Lady 4	PERSON[7] DTGET Lift REA...	DTGET (Ready ...	Paused	51
6: Lady 6	GETOUT[1] ODL 0.2	ODL	Paused	
8: Lady 8	PERSON[4] Lift+DTGET Goi...	DTGET (Ready ...	Paused	2

The Debugger window shows the execution of the program, with the current thread 0 (Run) highlighted. The current instruction is [63] DTGET 2PJobDone A Wait until Lifts have finished delivering men.

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In the next picture, the user brings up the Threads Tool pop-up menu to Switch To Thread 4 (whose name is Lady 4) which is currently paused on PERSON[7] in the middle of a `DTGET`.



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In this picture, the user has employed the Threads Tool pop-up menu to Switch To Thread 4 (whose name is Lady 4) which was Paused on `PERSON[7]` in the middle of a `DTGET`.

The act of switching to this thread caused it to be suspended at the beginning of its current line `PERSON[7]` and the Debugger now displays two Tabs to represent the two suspended threads. Note that both the thread id and the thread name are displayed on the Tabs.

The screenshot shows the Dyalog APL/W debugger interface. The main window displays the source code for a function named `RUN[63]` with the following lines:

```

MYFLOOR
5
|
    
```

The Threads tool is open, showing a list of threads:

Tid	Location	State	Flags	Treq
0: Run	*RUN[63] DTGET 2PJobDone ...	Suspended	Paused	
1: GUI	SHOW[22] DDQ'F'	DDQ	Paused	
2: Lift 1	LIFT[20] DTGET DeLifters...	DTGET (Ready ...	Paused	2001
3: Lift 2	GOTOC[10] ODL 0.2	ODL	Paused	
4: Lady 4	*PERSON[7] DTGET Lift REA...	Session	Normal	
6: Lady 6	GETOUT[1] ODL 0.2	ODL	Paused	
8: Lady 8	PERSON[4] Lift+DTGET Goi...	DTGET (Ready ...	Paused	2

The Debugger window shows two tabs: `0: Run` and `4: Lady 4`. The `4: Lady 4` tab is selected, and the debugger is paused at line 7 of the function:

```

[7] DTGET Lift REACHED MYFLOOR A Wait for lift to reach my floor
    
```

The Session window shows the current state of the thread:

```

CurObj: MYFLOOR (Variable)      &:7  DDQ:0  DTRAP  OSI:2  OIO:1  OML:0
    
```

Note also that the Session window is connected to the thread indicated by the selected Tab. In this case, typing `MYFLOOR` into the Session window displays the value of the local variable `MYFLOOR` in Thread 4 (Lady 4).

You can use the Tabs to switch between the suspended threads, so clicking the Tab labelled `0:Run` causes the display to change to the next picture

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You can use the Tabs to switch between the suspended threads, so clicking the Tab labelled 0:Run causes the display to change to the picture shown below.

The Session is now connected to Thread 0 (Run), so the value of `DLCL` is 63.

The screenshot shows the Dyalog APL/W debugger interface. The main window displays the code being debugged, which includes a loop for simulating lift arrivals. The 'Threads' pane shows several threads, with '0: Run' selected. The 'Debugger' pane shows the execution flow, with the current thread '0: Run' at line 63. The 'Debugger' pane also shows the current function 'MYFLOOR (Variable)' and the current position 'Pos: 63,0'.

Tid	Location	State	Flags	Treq
0: Run	*RUN[63] DTGET 2PJobDone ...	Session	Normal	
1: GUI	SHOW[22] DDQ'F'	DDQ	Paused	
2: Lift 1	LIFT[20] DTGET DeLifters...	DTGET (Ready ...	Paused	2001
3: Lift 2	GOTO[10] ODL 0.2	ODL	Paused	
4: Lady 4	*PERSON[7] DTGET Lift REA...	Suspended	Paused	
6: Lady 6	GETOUT[1] ODL 0.2	ODL	Paused	
8: Lady 8	PERSON[4] Lift+DTGET Goi...	DTGET (Ready ...	Paused	2

```

[55] SHOW&0          A Start GUI Display thread
[56] DTGET GUIReady
[57] F.LIFT1 F.LIFT2 LIFT&"=FLOORS CAPACITY A Start Lift threads
[58] :For I :In 1N      A Start <N> people threads
[59]   PERSON&FLOORS
[60]   ODL 0.2*?10      A Simulate random(ish) arrival
[61] :EndFor
[62] DTPUT AllDone     A Tell Lifts "that's it"
[63] DTGET 2PJobDone  A Wait until Lifts have finished delivering men
  
```

Function: Last saved by: Dyalog:29 June 2004 14:44 Pos: 63,0

Ready... Ins Apl

CurObj: MYFLOOR (Variable) &:7 DDQ:0 DTRAP OSI:1 OI0:1 OML:0

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