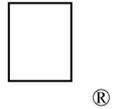


New Technical Notes

Macintosh



Developer Support

MultiFinder Frequently Asked Questions Toolbox

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This technical note provides answers to some of the more frequently asked questions about MultiFinder. The development name for MultiFinder was Juggler, so the term “juggle” is used in this technical note to denote a context switch.

How can I tell if WaitNextEvent is implemented?

Most applications should not need to tell if MultiFinder is running. Most of the time, the application really needs to know something like: “How can I tell if WaitNextEvent is implemented?” Here’s a Pascal fragment that demonstrates how to check to see if WaitNextEvent is implemented:

```
FUNCTION TrapAvailable(tNumber: INTEGER; tType: TrapType): BOOLEAN;

    CONST
        UnimplementedTrapNumber = $A89F; {number of "unimplemented trap"}

    BEGIN {TrapAvailable}

        {Check and see if the trap exists.}
        {On 64K ROM machines, tType will be ignored.}

        TrapAvailable := ( NGetTrapAddress(tNumber, tType) <>
            GetTrapAddress(UnimplementedTrapNumber) );

    END; {TrapAvailable}

FUNCTION WNEIsImplemented: BOOLEAN;

    CONST
        WNETrapNumber = $A860; {trap number of WaitNextEvent}

    VAR
        theWorld      : SysEnvRec; {to check if machine has new traps}
        discardError  : OSErr; {to ignore OSErr return from SysEnvirons}

    BEGIN {WNEIsImplemented}

        { Since WaitNextEvent and HFSDispatch both have the same trap
          number ($60), we can only call TrapAvailable for WaitNextEvent
          if we are on a machine that supports separate OS and Toolbox
          trap tables. We call SysEnvirons and check if machineType < 0.}

```

```
discardError := SysEnvirons(1, theWorld);

{ Even if we got an error from SysEnvirons, the SysEnvirons glue
  has set up machineType.}

IF theWorld.machineType < 0 THEN
  WNEIsImplemented := FALSE
  {this ROM doesn't have separate trap tables or WaitNextEvent}
ELSE
  WNEIsImplemented := TrapAvailable(WNETrapNumber, ToolTrap);
  {check for WaitNextEvent}

END; {WNEIsImplemented}

{Note that we call SystemTask if WaitNextEvent isn't available.}

...
  hasWNE := WNEIsImplemented;
...
  IF hasWNE THEN BEGIN
    {call WaitNextEvent}
    ...
  END ELSE BEGIN
    {call SystemTask and GetNextEvent}
    ...
  END;
...

```

Here's a C fragment:

```
Boolean TrapAvailable(tNumber, tType)
short    tNumber
TrapType tType
{

/* define trap number for old MPW or non-MPW C */
#ifdef _Unimplemented
#define _Unimplemented 0xA89F
#endif

/* Check and see if the trap exists. */
/* On 64K ROM machines, tType will be ignored. */

    return( NGetTrapAddress(tNumber, tType) !=
            GetTrapAddress(_Unimplemented) );

}

Boolean WNEIsImplemented()
{

/* define trap number for old MPW or non-MPW C */
#ifdef _WaitNextEvent
#define _WaitNextEvent 0xA860
#endif

    SysEnvRec theWorld; /* used to check if machine has new traps */

```

```
/* Since WaitNextEvent and HFSDispatch both have the same trap
number ($60), we can only call TrapAvailable for WaitNextEvent
if we are on a machine that supports separate OS and Toolbox
trap tables. We call SysEnvirons and check if machineType < 0. */

SysEnvirons(1, &theWorld);

/* Even if we got an error from SysEnvirons, the SysEnvirons glue
has set up machineType. */

if (theWorld.machineType < 0) {
    return(false)
    /* this ROM doesn't have separate trap tables or WaitNextEvent */
} else {
    return(TrapAvailable(_WaitNextEvent, ToolTrap));
    /* check for WaitNextEvent */
}

}

/* Note that we call SystemTask if WaitNextEvent isn't available. */

...
hasWNE = WNEIsImplemented();
...
if (hasWNE) {
    /* call WaitNextEvent */
    ...
} else {
    /* call SystemTask and GetNextEvent */
    ...
}
...
```

Note: Testing to see if WaitNextEvent is implemented is **not** the same as testing to see whether MultiFinder is running. Systems 6.0 and newer include WaitNextEvent whether or not MultiFinder is running.

How can I tell if the MultiFinder Temporary Memory Allocation calls are implemented?

The technique that's used to determine this is similar to the above technique. The TrapAvailable routine above is reused. In Pascal:

```
FUNCTION TempMemCallsAvailable: BOOLEAN;

CONST
    OSDispatchTrapNumber = $A88F; {number for temporary memory calls}

BEGIN {TempMemCallsAvailable}

{ Since OSDispatch has a trap number that was always defined
to be a toolbox trap ($8F), we can always call TrapAvailable.
If we are on a machine that does not have separate OS and
Toolbox trap tables, we'll still get the right trap address.}
```

```
TempMemCallsAvailable := TrapAvailable(OSDispatchTrapNumber, ToolTrap);
{check for OSDispatch}

END; {TempMemCallsAvailable}
```

In C:

```
Boolean
TempMemCallsAvailable()
{

/* define trap number for old MPW or non-MPW C */
#ifdef _OSDispatch
#define _OSDispatch 0xA88F
#endif

/* Since OSDispatch has a trap number that was always defined to
be a toolbox trap ($8F), we can always call TrapAvailable.
If we are on a machine that does not have separate OS and
Toolbox trap tables, we'll still get the right trap address. */

return(TrapAvailable(_OSDispatch, ToolTrap));
/* check for OSDispatch */

}
```

How can I tell if my application is running in the background?

To run in the background under MultiFinder, an application must have set the `canBackground` bit (bit 12 of the first word) in the `SIZE` resource. In addition, the `acceptSuspendResumeEvents` bit (bit 14) should be set. An application can tell it is running in the background if it has received a suspend event but not a resume event.

When exactly does juggling take place?

Juggling takes place at `WaitNextEvent/GetNextEvent/EventAvail` time. If you have the `acceptSuspendResumeEvents` bit set in the `SIZE` resource, you will receive suspend/resume events. When you get a suspend event (or, when you call `EventAvail` and a suspend event has been posted), you will be juggled out the next time that you call `WNE/GNE/EventAvail`. When you receive a suspend event, you are going to be juggled, so don't do anything to try to retain control (such as calling `ModalDialog`).

Speaking of `ModalDialog`, MultiFinder will **not** suspend your application when the frontmost window is a modal dialog, though background tasks will continue to get time.

Can I disable suspend/resume events by passing the appropriate event mask to `WNE/GNE/EventAvail`?

suspend/resume events are not queued, so be careful when masking out `app4Evts`. You will still get the event, all that will happen if you mask out `app4Evts` is that your application

won't know when it is going to be juggled out (your application will still be juggled out when you call `WNE/GNE/EventAvail`). If your application sets a boolean to tell whether or not it's in the foreground or the background, you definitely don't want to mask out `app4Evts`.

Should my application use `WaitNextEvent`?

Yes, this will enable background tasks to get as much time as possible. All user events that your program needs to handle will be passed to your application as quickly as possible. Applications that run in the background should try to be as friendly as possible. It's best to do things a small chunk at a time so as to give maximum time to the foreground application. "Cooperative multi-tasking" requires cooperation!

If your application calls `WaitNextEvent`, it shouldn't call `SystemTask`.

Is there anything else that I can do to be MultiFinder friendly?

It is very important that you save the positions of windows that you open, so that the next time the user launches your application, the windows will go where they had them last. This greatly enhances the usability of MultiFinder. With data files, the window positions can be stored in either the resource or the data fork.

If you have windows that aren't data windows (i.e. separate files), you can store information about their positions in one of two ways: in a separate configuration file or in a resource in your application. Using a separate configuration file is necessary if your application is shareable on AppleShare, since resource forks are not. The configuration file should be put in the folder that contains the currently open system folder (this is guaranteed to be a local, non-shared volume as opposed to a server volume). The `vRefNum/WDRefNum` of this folder can be obtained by calling `SysEnviron` (`SysEnvRec.sysVRefNum`).

Can I use a debugger with MultiFinder?

Yes, MacsBug will load normally, since it is loaded well before MultiFinder. Since TMON is currently installed as a startup application, you should Set Startup to it, then launch MultiFinder manually (by holding down Option-Command while double-clicking the MultiFinder icon) or use a program that will run multiple startup applications (such as Sequencer), making sure that TMON is run before MultiFinder. If you try to run TMON after MultiFinder has been installed, a system crash will result. The latest version of TMON (2.8) has an INIT that loads it before MultiFinder is present.

It is necessary to check `CurApName` (`$910`) when you first enter a debugger (TMON users can anchor a window to `$910`) to see which layer (whose code, which low-memory globals

and so on) is currently executing, especially if you entered the debugger by pressing the interrupt button.

What happened to animated icons under MultiFinder?

Finders 6.0 and newer no longer use the mask that you supply in an ICN# to “punch a hole” in the desktop. Instead, the Finder uses a default mask that consists of a solid black copy of the icon with no hole.

How can I ensure maximal compatibility with MultiFinder?

If you follow the guidelines presented in the MultiFinder Developer’s Package you will stand a very good chance of being fully compatible with MultiFinder.

Further Reference:

- M.OV.GestaltSysenvirons
- M.OV.ChkForFunction
- MultiFinder Developer’s Package