

New Technical Notes

Macintosh



Developer Support

“Bugs In MacApp? Yes, But I Love It!”

Platforms & Tools

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This Technical Note describes the latest information about bugs or unexpected “features” in MacApp. Where possible, solutions and fixes are noted. DTS intends this Note to be a complete list of all known bugs in MacApp and will update it as old bugs are fixed or new ones appear. If you have encountered a bug or unexpected feature which is not described here, be sure to let DTS know. Specific code examples and suggested fixes are useful.

This version of the Note reflects the state of MacApp 2.0.1. The latest version of this Note can always be found on AppleLink in the Developer Services Bulletin Board.

Changes since August 1990: Updated for MacApp 2.0.1. Revised line count of MacApp 2.0.

Added: TEditText #2; TEvtHandler #1; TGridView #3; TTEView #5, 7, 9; TView #6; Assorted TView.Focus #8; Globals #16; MABuild #13; Debug #10.

Updated: TApplication #3; TPopup #5; TScroller #1; TStdPrintHandler #2, 3; TTEView #3; TView #3; TWindow #3; Assorted TView.Focus #3; Globals #7, 8; MABuild #2, 11; Debug #4, 5; SADE Compatibility #1; THINK Pascal #2.

Removed: TApplication #5; TCommand #1; TCtlMgr #1; TDeskScrapView #1; TGridView #2; TIcon #1; TPopup #1, 2, 3; TStdPrintHandler #4; TTEView #1, 2, 6, 8; TView #5; TWindow #1, 2; Assorted TView.Focus #7; Globals #1-5, 9, 13-15; Debug #8, 9; THINK Pascal #1; Other #2.

The MacApp Management would like to note that MacApp is a high velocity ride with many twists and turns (all alike). Please keep your hands inside at all times.

There are 107,744 lines of Object Pascal, C++, Assembly, and Rez code that go into the MacApp Library and Build system. As such, it is inevitable that a few bugs creep in. The purpose of this Note is to inform you of these bugs, not to scare you away from MacApp. There are dozens of commercially available programs that lead normal everyday lives which are built on top of MacApp as it stands today. Most of the bugs listed here do not show up in regular use (at least, they don’t in our test programs), so they may not affect you. If they do, you can use the fixes or solutions identified here (“Fixes” are intended to be applied directly to the MacApp source, while “solutions” identify techniques to override or avoid a method the problem).

MacApp.Lib Bugs

TApplication

1. When being suspended in MultiFinder, MacApp commits command objects which affect the clipboard, rather than checking if the scrap has changed when switching back in.

Solution: Not yet determined. This is an area of serious consideration for the next version of MacApp.

2. MacApp should hide the clipboard window on a suspend event and redisplay it on a resume event.

Solution: Override the TApplication methods `AboutToLoseControl` and `RegainControl`. `AboutToLoseControl` should remember whether or not the clipboard window is currently open and call `gClipWindow.Close` if it is. `RegainControl` should look at the state of the clipboard window saved by `AboutToLoseControl`, and call `gClipWindow.Open` if the window needs to be reshowed.

3. There are problems with the value of the `mouseDidMove` parameter to `TCommand` when called by `TApplication.TrackMouse`. When the `TrackPhase` is `trackPress`, `TCommand.TrackMouse` is called with `mouseDidMove` set to `TRUE` even though the mouse hasn't had a chance to move. When the `TrackPhase` is `trackMove`, `mouseDidMove` is `FALSE` whenever the mouse moves back inside the hysteresis range. When the `TrackPhase` is `trackRelease`, `mouseDidMove` is `TRUE` even if the mouse never moved.

Fix: In `TApplication.TrackMouse` (file `UMacApp.TApplication.p`):

- The first call to `TrackOnce` should read:

```
TrackOnce(trackPress, FALSE);
```

- The assignment of `didMove` should read:

```
didMove := movedOnce & (NOT EqualVPt(previousPoint, theMouse)).
```

- The last call to `TrackOnce` should read:

```
TrackOnce(trackRelease, didMove);
```

Once those changes have been applied, the parts of MacApp that assume `mouseDidMove = TRUE` when `aTrackPhase = TrackPress` need to be updated. In the methods `TCellSelectCommand.TrackMouse` and `TRCSelectCommand.TrackMouse` (file `UGridView.incl.p`), replace:

```
IF mouseDidMove THEN
```

With:

```
IF mouseDidMove | (aTrackPhase = TrackPress) THEN
```

You should also make similar changes to your application's source, if applicable. For instance, in `UCalc.incl.p`, `TColumnSelector.TrackMouse` and `TRowSelector.TrackMouse` need to check for `aTrackPhase = TrackPress`.

4. With these changes, it is possible to experience some feedback problems. For example, when resizing the column widths in a spreadsheet, `Calc` draws the initial vertical line, waits until the mouse moved outside the hysteresis range, and then, before drawing the vertical line in its new location, erases the old vertical line in the wrong place. This leaves two vertical lines on the screen as garbage.

Fix: In `UMacApp.TApplication.p`, replace the fourth occurrence of:

```
previousPoint := theMouse;
```

With:

```
IF didMove THEN  
    previousPoint := theMouse;
```

5. The solution that previously occupied this spot caused more problems than it fixed. We removed it until we can get our act together.

TCommand (including subclasses)

1. Fixed in MacApp 2.0.1.
2. If a failure occurs in `TDocument.Revert`, `TRevertDocCommand.DoIt` tries to show the reverted document. This is the correct thing to do if the user canceled out of the revert if a silent failure is signaled (this could happen in `DiskFileChanged`). However if a real error occurred, you cannot leave the document open; you definitely must close it. Otherwise the application may bomb in the next operation involving the document (e.g., the next screen refresh).

We have to distinguish three classes of errors:

- 1) the user canceled out of the operation in `CheckDiskFile`,
- 2) a real error was discovered in `CheckDiskFile`,
- 3) a real error occurred during rebuilding the document in `DoInitialState` or `ReadFromFile`.

In the first and second cases, the memory-resident version of the document has not been changed when you reach `HdlRevertCmd`. In the third case, the document may be severely damaged. Therefore, in the first two cases there is no need to call `ShowReverted` (it doesn't hurt either), while in the third case you **must** close the document.

Case one is easy to recognize (`error = 0`), but for the second and third cases, `error <> 0`. To distinguish between them, you can pull a trick: you know that the Revert menu item is only enabled if `fDocument.fChangeCount` is greater than zero. Therefore, you move `SetChangeCount(0)` in `TDocument.Revert` before any operation that can clobber the document (i.e., before the call to `FreeData`). This way, you can distinguish between the second and third cases in `HdlRevertCmd` by checking `fChangeCount`.

Fix: Change the failure handling procedure in `TRevertDocCommand.DoIt` (file `UMacApp.TDocument.p`) to:

```
PROCEDURE HdlRevertCmd(error: OSErr; message: LONGINT);
BEGIN
    {Check whether the document has already been clobbered }
    IF fChangedDocument.GetChangeCount = 0 THEN
        fChangedDocument.Close {remove the debris left by fChangedDocument}
    END;
```

In `TDocument.Revert`, move the line

```
SetChangeCount(0);
```

before the line

```
FreeData;
```

3. It is potentially problematic having Page Setup as an undoable command, since the view and printer driver context can change. An example of this is shown with the following steps:

- 1) Launch any MacApp application.
- 2) Access the Page Setup dialog box from the File menu.
- 3) Take notice of which printer driver is currently being used and make a change to the dialog box (i.e., switch to “landscape” printing), click on the OK button.
- 4) Access the Chooser desk accessory and change to a different printer driver.
- 5) Now select Redo Page Setup Changes from the Edit menu, then select Undo Page Setup Changes.
- 6) Open the Page Setup dialog box from the File menu and notice that the “landscape” printing icon is no longer highlighted.
- 7) Although the Page Setup dialog box is unaffected by Undo and Redo, the document itself is affected, as it prints out in landscape mode, while the Page Setup dialog box shows it is in non-landscape mode.

Solution: Apple does not yet have a complete solution to this. If it bothers you, you could modify `IPrintStyleChangeCommand` to make page setup non-undoable.

TControl

1. MacApp’s subclasses of `TControl` (defined in the file `UDialog.incl.p`) don’t pass on their `itsDocument` parameter to the `INHERITED IRes` method. This causes the `fDocument` field to get initialized with `NIL` rather than the `TDocument` reference.

Solution: You can override the `IRes` method of your own controls to do an `INHERITED IRes` and then set the `fDocument` field to `itsDocument`:

```
PROCEDURE TMyButton.IRes(itsDocument: TDocument;
                        itsSuperView: TView;
                        VAR itsParams: Ptr); OVERRIDE;

BEGIN
  INHERITED IRes(itsDocument, itsSuperView, itsParams);
  fDocument := itsDocument;
END;
```

Then register your class in your `IYourApplication` method so that all Button references in your 'view' resources result in `TMyButtons` being created, rather than `TButtons`:

```
RegisterStdType('TMyButton', kStdButton);
```

However, this solution does not work if you depend on these views appearing in the document's `fViewList`.

Fix: Replace the calls to `INHERITED IRes` in the `IRes` methods of subclasses of `TControl`:

```
INHERITED IRes(NIL, itsSuperView, itsParams);
```

With:

```
INHERITED IRes(itsDocument, itsSuperView, itsParams);
```

-
2. Printing disabled controls, especially buttons, results in a gray pattern being printed over the control. This is not a bug in MacApp, but rather a limitation of the LaserWriter. The LaserWriter driver doesn't respect all QuickDraw transfer modes, including the one used to draw the grey text.

Solution: Not yet determined. It may involve imaging the button into an off-screen bitmap, and then copying it to its destination.

TCtlMgr

1. Fixed in MacApp 2.0.1.
2. Fixed in MacApp 2.0.1.

TDeskScrapView

1. Fixed in MacApp 2.0.1.

TDialogView

1. TDialogView calls DoChoice on a disabled button as the result of a key press. If one disables the default button and presses Return, for example, the button's DoChoice method still gets called.

Fix: The following lines of code appear in TDialogView.DoCommandKey and in TDialogView.DoKeyCommand (file UDialog.incl.p):

```
IF cancelView.IsViewEnabled THEN
    TControl(cancelView).Flash;
TControl(cancelView).DoChoice(cancelView, TControl(cancelView).fDefChoice);
```

Replace them with:

```
IF cancelView.IsViewEnabled THEN
    BEGIN
        TControl(cancelView).Flash;
        TControl(cancelView).DoChoice(cancelView,
                                        TControl(cancelView).fDefChoice);
    END;
```

Additionally, in TDialogView.DoKeyCommand, replace:

```
IF defaultView.IsViewEnabled THEN
    TControl(defaultView).Flash;
TControl(defaultView).DoChoice(defaultView, TControl(defaultView).fDefChoice);
```

Replace them with:

```
IF defaultView.IsViewEnabled THEN
    BEGIN
        TControl(defaultView).Flash;
        TControl(defaultView).DoChoice(defaultView,
                                        TControl(defaultView).fDefChoice);
    END;
```

Solution: You can do this as an OVERRIDE if you hesitate to change MacApp.

TDocument

1. TDocument.Save fails if you lock a file after opening it with read and write access and then try to save. The file is closed and fDataRefNum and fRsrcRefNum contain their old (and now invalid) values.

Solution: Not yet determined.

2. If GetFileInfo returns a result other than noErr, TDocument.DiskFileChanged maps it to errFileChanged, because there is no check for (err = noErr) in the ELSE IF branch. The resulting alert is misleading, as the file may also have been renamed, deleted, or the file server may have gone offline.

Fix: The error checking code in `TDocument.DiskFileChanged` (file `UMacApp.TDocument.p`) should look like:

```
err := GetFileInfo(fTitle^^, fVolRefNum, pb);
...
IF (err = noErr) THEN
    IF checkType & (pb.ioFlFndrInfo.fdType <> fFileType) THEN
        err := errFTypeChanged
    ELSE IF pb.ioFlMdDat <> fModDate THEN
        err := errFileChanged;
DiskFileChanged := err;
```

3. It is not possible to use the Pascal built-in filing function `Close` from within a `TDocument` method because the Object Pascal scoping rules always associate the name `Close` with `TDocument.Close`.

Solution: It is likely that Apple will change the name in the future. After all, there are three distinct objects that implement a `Close` method, none of which have any relation to another; something like that needs to be cleaned up. In the meantime, you could make a global routine `MyClose` that would be a wrapper for the `Close` routine.

TEditText

1. If the first or only `TEditText` in a dialog has auto-wrap turned on and is not initially selected, tabbing to it after opening the window selects it, but the selection is not visible until the window is refreshed. This does not occur if auto-wrap is turned off for that `TEditText`.

Solution: Not yet determined.

2. `TEditText` items in `TDialogViews` no longer get the first crack at events, as they used to in MacApp 2.0b9. The event handler chain is now `gTarget -> TDialogTEView -> TScroller -> TEditText -> TDialogView -> etc.`, so all events in which a subclass of `TEditText` might be interested are caught by `TDialogTEView`.

Solution: Create your own subclass of `TDialogTEView` that handles the interesting characters by overriding `TDialogView.MakeTEView` and returning your own subclass of `TDialogTEView`.

Fix: A clean fix to this problem might be to rearrange the event handler chain to `gTarget -> TEditText -> TDialogTEView -> TScroller -> TDialogView -> etc.` However, this approach is more work for `TDialogTEView.InstallEditText`, and the effects of rearranging the target chain are currently untested.

TEvtHandler

1. `TEvtHandler.DoCreateViews` now calls `TView.AdjustSize` on the root view it just created. This change was made to give views an early chance to make sure they are correctly sized. However, the change can cause your application to break if

you override routines that perform `AdjustSize` calls (like `TView.CalcMinSize`) and those routines rely on information that is not initialized until after `DoCreateViews` returns to `TYourDocument.DoMakeViews`.

Solution: Simply be aware of this change. If you initialize fields of your views in your `DoMakeViews` method, then overrides of methods such as `TView.Resize`, `TView.ComputeSize`, and `TView.CalcMinSize` should take into account that these fields may not yet be initialized. At the very least, `TYourView.IRes` should set these fields to `NIL`.

TGridView

1. Attempting to select a `TGridViewCell` for which `CanSelectCell` returns `FALSE` causes the current selection to be deselected.

Solution: Override `TGridView.DoMouseDown` to call `IdentifyPoint`. If a valid cell is returned, call `CanSelectCell`. If it returns `TRUE`, call `INHERITED DoMouseDown`. This inhibits all tracking if the user initially clicks in a disabled cell.

Fix: Replace the following line in `TCellSelectCommand.TrackMouse` (file `UGridView.incl.p`):

```
IF LONGINT(clickedCell) <> LONGINT(fPrevCell)
```

With:

```
IF (LONGINT(clickedCell) <> LONGINT(fPrevCell))  
  & fGridView.CanSelectCell(clickedCell)
```

2. Fixed in MacApp 2.0.1.
3. `TGridView.DrawCell` is called with the clip region set wide open, which allows any override of `DrawCell` to draw anywhere within the `TGridView`. It is likely that this is not desired, and the responsibility for clipping could be added to `TGridView`.

Fix: In `TGridView.DrawRangeOfCells` (file `UGridView.incl.p`), add a local `RgnHandle` called `oldClip`. Initialize `oldClip` with the following lines at the beginning of the method:

```
oldClip := MakeNewRgn;  
GetClip(oldClip);
```

Next, clip to the current cell by adding the following lines before the line that says `aCell.h := i`:

```
{ $IFC qDebug}  
    UseTempRgn ('TGridView.DrawRangeOfCells');  
{ $ENDC}  
RectRgn(gTempRgn, aQDRect);  
SectRgn(oldClip, gTempRgn, gTempRgn);  
SetClip(gTempRgn);  
{ $IFC qDebug}  
    DoneWithTempRgn;  
{ $ENDC}
```

Finally, add the following lines at the end of the method:

```
SetClip(oldClip);  
DisposeRgn(oldClip);
```

TIcon

1. Fixed in MacApp 2.0.1.

TList

1. If you have a `TList` subclass with a `String` instance variable, it is not possible to use the Pascal string built-in function `Delete` on it because the Object Pascal scoping rules always associate the name `Delete` with `TList.Delete`.

Solution: Apple will change the name in the future. In the meantime, you could make a global routine `MyDelete` that would be a wrapper for the string `Delete` routine.

TNumberText

1. When the length of the text in a `TNumberText` instance is 0, `GetValue` returns 0, and `Validate` returns `kValidValue`. The value is not checked against `fMinimum` or `fMaximum`, so your application may be fed with a value it is not prepared to handle.

Fix: Ideas for solutions or fixes are outlined in the comment in `TNumberText.Validate` (file `UDialog.incl.p`).

TPopup

1. Fixed in MacApp 2.0.1.
2. Fixed in MacApp 2.0.1.
3. Fixed in MacApp 2.0.1.
4. `TPopup` no longer calls `DoChoice` if the same item is reselected.

Fix: In `TPopup.DoMouseCommand` (file `UDialog.incl.p`) is the following line:

```
IF (HiWord(result) <> 0) & (newChoice <> fCurrentItem) THEN
```

Remove the “& (newChoice <> fCurrentItem)” part.

5. TPopup.SetCurrentItem neither restores the port colors correctly nor uses the right rectangle to obtain the menu colors for the popup box.

Fix: In TPopup.SetCurrentItem (file UDialog.incl.p), declare the following two new local variables:

```
newFColor:          RGBColor;
newBkColor:         RGBColor;
```

Then, replace:

```
IF redraw & Focus & IsVisible THEN
  BEGIN
    GetQDExtent(menuRect);
    GetMenuColors(menuRect, fMenuID, item, newFColor, newBkColor);
    SetIfColor(newFColor); SetIfBkColor(newBkColor);
    DrawPopupBox(menuRect);
  END;
```

With:

```
IF redraw & Focus & IsVisible THEN
  BEGIN
    GetIfColor(oldFColor); GetIfBkColor(oldBkColor);
    CalcMenuRect(menuRect);

    GetMenuColors(menuRect, fMenuID, fCurrentItem,
                  newFColor, newBkColor);
    SetIfColor(newFColor); SetIfBkColor(newBkColor);
    DrawPopupBox(menuRect);
    { Reset colors to their original state }
    SetIfColor(oldFColor); SetIfBkColor(oldBkColor);
  END;
```

TScroller

1. TScroller.RevealRect doesn't call INHERITED RevealRect. This has implications in situations where you have nested scrollers. If, for example, you run DemoDialogs, select the first menu item, press the Tab key, then begin typing, the TEditText item you are modifying is not scrolled into view. This is because while your selection is revealed within the context of the TEditText, the TEditText item itself is not scrolled into view.

Fix: Add an INHERITED RevealRect call to TScroller.RevealRect (file UMacApp.TScroller.p):

```
PROCEDURE TScroller.RevealRect(...);
  BEGIN
    ...
    ScrollBy(delta.h, delta.v, redraw);
    OffsetVRect(rectToReveal, -fTranslation.h, -fTranslation.v);
    INHERITED RevealRect(rectToReveal, minToSee, redraw); { add this line }
  END;
```

TStdPrintHandler

1. An extra blank page is printed if `TStdPrintHandler.fFixedSizePages = FALSE` and `fSizeDeterminer = sizeFillPages`. This is because `TView.ComputeSize` computes the view's size as a multiple of the printable page size for `sizeFillPages`, ignoring that the view need not use the full size of each page.

Solution: Always set both Boolean components of `fFixedSizePages` to `TRUE`. These are initialized from the last two parameters you pass to `IStdPrintHandler`.

Solution: Use `fSizeDeterminer = sizeVariable`.

2. Simply using the naked `DIV` operator for scaling `theMargins` in `TStdPrintHandler.CheckPrinter` introduces rounding errors. These errors may be disturbing if you need precise control over the margins used for printing.

Fix: Insert the following local procedure in `TStdPrintHandler.CheckPrinter` (file `UPrinting.incl.p`):

```
FUNCTION ScaleInteger(theValue, theMultiplier, theDivisor: Integer): Integer;
VAR
    intermediate: Longint;
BEGIN
    intermediate := IntMultiply(theValue, theMultiplier);
    IF intermediate >= 0 THEN
        intermediate := intermediate + ABS(theDivisor) div 2
    ELSE
        intermediate := intermediate - ABS(theDivisor) div 2;
    ScaleInteger := intermediate DIV theDivisor;
END;
```

In the implementation of `TStdPrintHandler.CheckPrinter`, replace the lines:

```
SetRect(theMargins, IntMultiply(theMargins.left, h) DIV oldMarginRes.h,
        IntMultiply(theMargins.top, v) DIV oldMarginRes.v,
        IntMultiply(theMargins.right, h) DIV oldMarginRes.h,
        IntMultiply(theMargins.bottom, v) DIV oldMarginRes.v);
```

With:

```
SetRect(theMargins,
        ScaleInteger(theMargins.left, fMarginRes.h, oldMarginRes.h),
        ScaleInteger(theMargins.top, fMarginRes.v, oldMarginRes.v),
        ScaleInteger(theMargins.right, fMarginRes.h, oldMarginRes.h),
        ScaleInteger(theMargins.bottom, fMarginRes.v, oldMarginRes.v));
```

3. `TStdPrintHandler.CheckPrinter` calculates `fMarginRes` incorrectly for scaled printing. It does not take into account any scaling factors imposed by the user in the `_PrStlDialog` dialog box.

Fix: Use the following until Apple can come up with something better. Note that this fix relies on the undocumented fields `prStl.iPageV` and `prStl.iPageH`. Additionally, it implements a dubious technique that gets around the assumption that any printer supporting landscape printing also supports `_PrGeneral`, which is not always the case; therefore, this fix is considered temporary. You should already have applied the fix to the second bug in the `TStdPrintHandler` section.

Insert the following local procedure after `ScaleInteger` in `TStdPrintHandler.CheckPrinter` (file `UPrinting.incl.p`):

```
PROCEDURE AdjustMarginRes;

    PROCEDURE DoAdjustMarginRes;

        VAR
            getRotationBlock: TGetRotnBlk;

        BEGIN
            WITH getRotationBlock DO BEGIN
                iOpCode := getRotnOp;
                lReserved := 0;
                hPrint := THPrint(fHPrint);
                bXtra := 0;
            END;
            PrGeneral(@getRotationBlock);
            IF (PrError <> noErr) | (getRotationBlock.iError <> noErr)
            THEN BEGIN
                WITH fPageAreas.thePaper DO
                    getRotationBlock.fLandscape := right - left >
                                                    bottom - top;
                PrSetError(noErr); { clear print error - Printing
                                    Manager won't do it }
            END;
            WITH fPageAreas.thePaper, fMarginRes, THPrint(fHPrint)^^ DO BEGIN
                {$PUSH} {$H-} { shut up, dumb compiler! }
                IF getRotationBlock.fLandscape THEN BEGIN
                    { The undocumented fields prStl.iPageH & prStl.iPageV seem
                      unaffected by rotation, so we have to rotate them }
                    fMarginRes.h := ScaleInteger(iPrPgFract, right - left,
                                                  prStl.iPageV);
                    fMarginRes.v := ScaleInteger(iPrPgFract, bottom - top,
                                                  prStl.iPageH);
                END
                ELSE BEGIN
                    fMarginRes.h := ScaleInteger(iPrPgFract, right - left,
                                                  prStl.iPageH);
                    fMarginRes.v := ScaleInteger(iPrPgFract, bottom - top,
                                                  prStl.iPageV);
                END;
                {$POP}
            END; { WITH }
        END;

    BEGIN
        DoInMacPrint(DoAdjustMarginRes);
    END;
```

In `TStdPrintHandler.CheckPrinter`, replace everything after `fPageAreas.thePaper := rPaper` and up to, but not including, the statement `fPrinterDev := iDev;` with the following lines:

```
AdjustMarginRes;  
WITH prInfo DO BEGIN
```

Next, you have to take into account the fact that `CheckPrinter` can open and close the print driver. This can be bad when you are in the middle of printing because you are closing a driver that needs to stay open.

An ideal solution would include some sort of mechanism to keep track of whether the printer was already open when you open it again, or maintain a reference count on the number of nested calls to `DoMacInPrint`. However, for now, we can put in a simple check to avoid the one place where nesting occurs. First, add the following line to the beginning of `CheckPrinter`:

```
if fPPrPort = nil then begin
```

Then, insert the following statement just before the end of `CheckPrinter`:

```
end;
```

Finally, you need to set `fPPrPort` to `NIL` when not printing. In `TStdPrintHandler.OneSubJob`, replace:

```
PrCloseDoc(fPPrPort);           { This will close the port! }  
SetPort(gWorkPort);
```

With:

```
PrCloseDoc(fPPrPort);           { This will close the port! }  
fPPrPort := NIL;                { Lose the reference }  
SetPort(gWorkPort);
```

4. Fixed in MacApp 2.0.1.

TTEView

1. Fixed in MacApp 2.0.1.
2. Fixed in MacApp 2.0.1.
3. In a `TTEView` with non-zero bottom inset, only part of the second line is displayed when text wraps to a new line.

Solution: Always have a bottom inset of zero.

Fix: Modify `TTEView.StuffTTERects` (file `UTTEView.TTEView.p`) to give the `TERecord` a bottomless `destRect` and `viewRect`. Replace:

```
right := MAX(right, left + aFontInfo.widMax);
```

With:

```
BEGIN
right := MAX(right, left + aFontInfo.widMax);
bottom := MAXINT;           { give us a bottomless destrect }
END;
```

4. TTEView.SynchView only updates the text if the line heights have changed. It calls CalcRealHeight, and if it has not changed, it doesn't do anything. If a program modifies the text directly, it must call ForceRedraw. For instance, say that you have a class TMyTTEView has the following routine:

```
PROCEDURE TMyTTEView.TweekText;
VAR
    myText : TextHandle;
BEGIN
    myText := ExtractText;
    { do some munging of the text (e.g., search and replace) }
    { make TTEView display changed text }
    RecalcText;
    SynchView(kRedraw);
    { !!! We shouldn't have to force a complete redraw !!! }
    ForceRedraw;
END;
```

Solution: Call ForceRedraw as above, until Apple has a solution. It could be that removing the fLastHeight <> theHeight comparison in SynchView does the trick, but it may also result in unnecessary updates and flashing.

5. You may find it useful to use a TTEView as a Read-Only view. To do this, disable the view and set fAcceptsChanges to FALSE. However, with these settings, the Select All menu item is still enabled.

Fix: In TTEView.DoSetupMenus (file UTEView.TTEView.p), replace the line:

```
Enable(cSelectAll, (fHTE^.teLength > 0));
```

With:

```
Enable(cSelectAll, IsViewEnabled & (fHTE^.teLength > 0));
```

6. Fixed in MacApp 2.0.1.
7. TTEView sometimes leaves the image of a caret behind as it scrolls. This is usually experienced when scrolling a left-justified TEditText item for the first time.

Fix: Modify TTEView.StuffTERects (file UTEView.TTEView.p) to give the Terecord a little more room on the left or right. Replace:

```
right := MAX(right, left + aFontInfo.widMax);
```

With:

```
IF (fSizeDeterminer[h] = sizeVariable) & NOT fStyleType & NOT fAutoWrap THEN
BEGIN
CASE GetActualJustification(fJustification) OF
teJustLeft,
teForceLeft: right := right + aFontInfo.widMax;
teJustRight: left := left - aFontInfo.widMax;
teJustCenter: right := MAX(right, left + aFontInfo.widMax);
END;
END
ELSE
right := MAX(right, left + aFontInfo.widMax);
```

Note: You should make this modification only after making the changes described in TTEView #3.

Because the size of viewRect and destRect of the TEREcord are now dependant on the justification being used, TTEView.SetJustification needs to call StuffTTERects. Add a local Rect variable called r. Then, after the line that says fJustification := newJust, add:

```
r.topLeft := fInset.topLeft;
r.right := fSize.h - fInset.right;
r.bottom := fSize.v - fInset.bottom;
StuffTTERects(r);
```

8. Fixed in MacApp 2.0.1.

9. Scrolling a TTEView quickly via cursor keys or by pasting new text does not immediately update the newly revealed regions, which can lead to unpleasant cosmetic artifacts.

Fix: In TTEView.ScrollSelectionIntoView (file UTTEView.TTEView.p), add a call to Update after the call to RevealRect.

TView

1. TEvtHandler.DoCreateViews doesn't work right if you build your view tree in the "wrong" order (i.e., breadth-first order). If you declare them as a hierarchy of levels, like this:

```
ViewA
ViewB
  SubViewA-1
  SubViewA-2
  SubViewB-1
    SubViewA-1-1
    SubViewA-1-2
```

DoCreateViews cannot find SubViewA-1 when creating SubViewA-1-1.

Solution: Declare your views in this order (walking the tree) in the Rez file:

```
ViewA
  SubViewA-1
    SubViewA-1-1
```



```
        SubViewA-1-2
      SubViewA-2
    ViewB
      SubViewB-1
```

2. `TView.Focus` does not always work correctly in long coordinate situations. When dealing with view systems that stay entirely within QuickDraw's 16-bit coordinate plane, focusing works correctly. However, when dealing with larger view systems, `TView.Focus` does not always correctly switch over to MacApp's 32-bit coordinate system.

Fix: In `TView.Focus` (file `UMacApp.TView.p`), replace:

```
IF fSize.vh[vhs] > kMaxCoord THEN
```

With:

```
IF (fSize.vh[vhs] > kMaxCoord) | (ABS(fLocation.vh[vhs]) > kMaxCoord)
  | (ABS(gLongOffset.vh[vhs]) > kMaxCoord) THEN
```

Daring Fix: You can try taking out short coordinate focussing altogether. This solution has not yet been fully tested, so there may be some side effects of which Apple is unaware. In `TView.Focus` (file `UMacApp.TView.p`), replace:

```
FOR vhs := v TO h DO
  IF fSize.vh[vhs] > kMaxCoord THEN
    BEGIN
      tempLongOffset := gLongOffset.vh[vhs] - fLocation.vh[vhs];
      relOrigin.vh[vhs] := tempLongOffset MOD kMaxOriginFixup;
      gLongOffset.vh[vhs] := tempLongOffset - relOrigin.vh[vhs];
    END
  ELSE
    BEGIN
      relOrigin.vh[vhs] := gLongOffset.vh[vhs] -
fLocation.vh[vhs];
      gLongOffset.vh[vhs] := 0;
    END;
```

With:

```
FOR vhs := v TO h DO
  BEGIN
    tempLongOffset := gLongOffset.vh[vhs] - fLocation.vh[vhs];
    relOrigin.vh[vhs] := tempLongOffset MOD kMaxOriginFixup;
    gLongOffset.vh[vhs] := tempLongOffset - relOrigin.vh[vhs];
  END;
```

3. `TView` calls `_InvalRect` and `_ValidRect` directly. These are Window Manager calls which assume that the current port (`thePort`) is a window. If `thePort` is not a window and these calls are made, all sorts of nasty fireworks happen. This bug only appears when a `TView` is placed in something other than a `TWindow` and the view calls `TView.InvalidRect`, `TView.InvalidRect`, or `TView.ValidVRect`.

For example, when using a TGridView as a subview of a TMenu, IGridView results in a call to TView.InvalidRect. Since TMenu carries its own GrafPort, the InvalRect on the TMenu GrafPort fails.

Fix: In the file UMacApp.TView.p, modify the methods TView.InvalidRect, TView.InvalidVRect, and TView.ValidVRect to UMacApp.TView.p, as shown.

```
{-----}
{$S MAViewRes}

PROCEDURE TView.InvalidRect(r: Rect);

    BEGIN
    IF IsShown & Focus THEN
        BEGIN
            VisibleRect(r);
            IF NOT EmptyRect(r) THEN
                InvalidateFocusedRect(r);
            END;
        END;
    END;

{-----}
{$S MAViewRes}

PROCEDURE TView.InvalidVRect(viewRect: VRect);

    VAR
        r:                Rect;

    BEGIN
    IF IsShown & Focus THEN
        BEGIN
            ViewToQDRect(viewRect, r);
            VisibleRect(r);
            IF NOT EmptyRect(r) THEN
                InvalidateFocusedRect(r);
            END;
        END;
    END;

{-----}
{$S MAViewRes}

PROCEDURE TView.ValidVRect(viewRect: VRect);

    VAR
        r:                Rect;

    BEGIN
    IF IsShown & Focus THEN
        BEGIN
            ViewToQDRect(viewRect, r);
            VisibleRect(r);
            IF NOT EmptyRect(r) THEN
                ValidateFocusedRect(r);
            END;
        END;
    END;
```

Next, in `UMacApp.TView.p`, add `TView.InvalidateFocusedRect` and `TView.ValidateFocusedRect`. These are the routines that forward up the view hierarchy until finding a `TWindow`. You also take this opportunity to add `TView.ValidateRect`—a QuickDraw version of `TView.ValidVRect`—for completeness.

```
{-----}
{$S MAViewRes}
PROCEDURE TView.InvalidateFocusedRect(r: Rect);

    BEGIN
    IF fSuperView <> NIL THEN
        fSuperView.InvalidateFocusedRect(r);
    END;

{-----}
{$S MAViewRes}

PROCEDURE TView.ValidateRect(r: Rect);

    BEGIN
    IF IsShown & Focus THEN
        BEGIN
            VisibleRect(r);
            IF NOT EmptyRect(r) THEN
                ValidateFocusedRect(r);
            END;
        END;
    END;

{-----}
{$S MAViewRes}

PROCEDURE TView.ValidateFocusedRect(r: Rect);

    BEGIN
    IF fSuperView <> NIL THEN
        fSuperView.ValidateFocusedRect(r);
    END;
```

In `TWindow`, you then override `TView.InvalidateFocusedRect` and `TView.ValidateFocusedRect` in `UMacApp.TWindow.p` to call the Window Manager routines.

```
{-----}
{$S MAWindowRes}

PROCEDURE TWindow.InvalidateFocusedRect(r: Rect); OVERRIDE;

    BEGIN
    InvalRect(r);          { Call the ToolBox routine. }
    END;

{-----}
{$S MAWindowRes}
```

```
PROCEDURE TWindow.ValidateFocusedRect(r: Rect); OVERRIDE;

BEGIN
    ValidRect(r);          { Call the ToolBox routine. }
END;
```

Finally, in UMacApp.p add the following declarations for the new routines:

```
PROCEDURE TView.InvalidateFocusedRect(r: Rect);
PROCEDURE TView.ValidateRect(r: Rect);
PROCEDURE TView.ValidateFocusedRect(r: Rect);
PROCEDURE TWindow.InvalidateFocusedRect(r: Rect); OVERRIDE;
PROCEDURE TWindow.ValidateFocusedRect(r: Rect); OVERRIDE;
```

With those changes in place, all calls to `_ValidRect` in the rest of MacApp should now be calls to `TView.ValidateRect`. The only methods this affects are `TSScrollbar.Activate` and `TDeskScrapView.Draw`.

4. When the focus is invalidated during printing, MacApp is not able to restore it properly. For example, you could move a subview during printing because you don't know where it's supposed to go until you need it. When MacApp tries to refocus, the clip region is set to an empty region, and nothing gets printed from that point on.

Solution: Not yet determined. It's not clear whether MacApp should handle such odd things as moving subviews during printing.

5. Fixed in MacApp 2.0.1.

6. When the call to `FocusOnSuperView` in `TView.Focus` returns `FALSE`, `Focus` tries to invalidate all focus information with the statements:

```
ClipRect(gZeroRect);
InvalidateFocus;
```

The problem with these statements is that `InvalidateFocus` sets `gFocusedView` to `NIL` only if the focus is on some view in the subview hierarchy of `SELF`. Thus, if the focus is on some completely unrelated view in the same port, the clip region of the port of that view is set to `gZeroRect`, but `gFocusedView` is unaffected. If the `Focus` method of `gFocusedView` is called later, its call to `IsFocused` returns `TRUE`, but drawing does not work because the clip region is empty.

Fix: In `TView.Focus` (file `UMacApp.TView.p`), remove the call to `_ClipRect`. It might also be a good idea to do the same in `TWindow.Focus` since the `_ClipRect` call is being made on an essentially random port.

TWindow

1. Fixed in MacApp 2.0.1.
2. Fixed in MacApp 2.0.1.

3. `TWindow.Center` can sometimes move large windows with title bars under the menu bar.

Fix: In `TWindow.Center` (file `UMacApp.TWindow.p`), replace the following lines:

```
IF forDialog THEN
    { Put it in the top third of the screen }
    top := ((screenSize.v - contentSize.v + fContRgnInset.v) DIV 3) + 20
ELSE
    top := ((screenSize.v - contentSize.v + fContRgnInset.v) DIV 2) + 20;
```

With:

```
IF forDialog THEN
    { Put it in the top third of the screen }
    top := ((screenSize.v - windowSize.v) DIV 3)      { calculate spare area }
           + gMBarHeight                             { add menu bar }
    { calculate the right offset of content inside the window }
    + ((windowSize.v - contentSize.v + fContRgnInset.v) DIV 2)
ELSE
    top := ((screenSize.v - windowSize.v) DIV 2)      { calculate spare area }
           + gMBarHeight                             { add menu bar }
    { calculate the right offset of content inside the window }
    + ((windowSize.v - contentSize.v + fContRgnInset.v) DIV 2);
```

Assorted Problems Due to a New `TView.Focus` Definition

The next items address a class of problems related to the fact that `TView.Focus` is defined to return `TRUE` if a drawing environment can be obtained (e.g., a `GrafPort`). Thus it now returns `TRUE` even if the view is invisible. The various problems are: 1) invisible controls in dialog boxes accepting mouse-down events and doing things; 2) children of invisible controls being asked to draw or handle a mouse-down event; 3) scroll bars of hidden scrollers appearing; 4) hidden scroll bars of scrollers not appearing; and 5) calls to `IsShown` for an arbitrary view returning incorrect results.

1. `TView.IsShown` contains the following line:

```
IsShown := fShown;                {??? Shouldn't we ask our superview? }
```

It turns out that the answer to this question is yes. There are many problems that occur in `MacApp` that are caused by views who are themselves not hidden, but whose superviews are. For instance, it is possible for a click to be registered on a view whose superview is hidden. This can cause the previously hidden control to appear.

Fix: In `TView.IsShown` (file `UMacApp.TView.p`), replace the line above with the following:

```
IF fSuperView <> NIL THEN
    IsShown := fShown & fSuperView.IsShown { By definition, a view cannot be
                                           shown if its superview isn't.}
ELSE
    IsShown := fShown;
```

2. Having `TView.IsShown` reflect the willingness of all its superviews to be shown causes one problem in `MacApp`. When a `TScroller` creates its scroll bars, it sets the `fShown` field of the `TSScrollBar` to the result of `TScroller.IsShown`. However, at the time a scroller creates its scroll bars, the window they are in is invisible. Its `IsShown` method returns `FALSE`, which is propagated down to the `TScroller`, causing `TScroller.CreateTemplateScrollBar` to initialize `TSScrollBar.fShown` to `FALSE`.

Fix: Cause the `TSScrollBar` to inherit the `fShown` field of its `TScroller` **only**. In `TScroller.CreateTemplateScrollBar` (file `UMacApp.TScroller.p`), replace:

```
anSScrollBar.fShown := IsShown;
```

With:

```
anSScrollBar.fShown := fShown;
```

3. There is no `TCtrlMgr.Show` to control the setting of `fCMgrControl^^.ctrlVis`. Neglecting to do so results in certain silly things happening, like an activate event triggering the drawing of your invisible scroll bars.

Fix: Override `TView.Show` with the following version of `TCtrlMgr.Show` (file `UMacApp.TControls.p`). Don't forget to also update the declaration of `TCtrlMgr` in `UMacApp.p`:

```
PROCEDURE TCtrlMgr.Show(state, redraw: BOOLEAN);
```

```
    BEGIN
    SetCMgrVisibility(state);
    INHERITED Show(state, redraw);
    END;
```

Additionally, `TScrollBar` needs to override `Show` to implement its special appearance when shown in an inactive window. Add the following method to `UMacApp.TControls`, and add the appropriate declaration to `UMacApp.p`:

```
PROCEDURE TScrollBar.Show(state, redraw: BOOLEAN);
```

```
    VAR
        itsWindow: TWindow;

    BEGIN
    INHERITED Show(state, redraw);
    itsWindow := GetWindow;
    SetCMgrVisibility(state & (itsWindow <> NIL) & itsWindow.fIsActive);
    END;
```

4. `TControl.ContainsMouse` needs to call `TCtrlMgr.IsShown`. Otherwise, it's possible for those controls to receive mouse clicks.

Fix: Use the following version of `TControl.ContainsMouse` (file `UMacApp.TControls.p`):

```
FUNCTION TControl.ContainsMouse(theMouse: VPoint): BOOLEAN; OVERRIDE;
VAR
    aRect: Rect;
BEGIN
    IF IsShown THEN
        BEGIN
            ControlArea(aRect);
            ContainsMouse := PtInRect(VPtToPt(theMouse), aRect);
        END
    ELSE
        ContainsMouse := FALSE;
    END;
END;
```

5. `TView.Focus` used to return `FALSE` if the view was invisible. It no longer does this, and many routines in MacApp relying on this behavior now need to check this explicitly:

Fix: The following routines should be modified to check `IsShown` before calling `Focus`. Note that the changes to `TView.InvalidVRect`, `TView.InvalidVRect`, and `TView.ValidRect` need not be made if the modifications to the third bug in the `TView` section have been made.

```
TView.IsViewEnabled                                (file UMacApp.TView.p)
    IsViewEnabled := fViewEnabled & IsShown;

TGridView.HighlightCells                           (file UGridView.incl.p)
    IF (fromHL <> toHL) & IsShown & Focus THEN

TCtrlMgr.WhileFocused                             (file UMacApp.TControls.p)
TTEView.SynchView                                 (file UTEView.TTEView.p)
    IF redraw & IsShown & Focus THEN

TView.InvalidRect ( see above comment )            (file UMacApp.TView.p )
TView.InvalidVRect ( see above comment )           (file UMacApp.TView.p )
TView.ValidVRect ( see above comment )             (file UMacApp.TView.p )
TGridView.InvalidateSelection                      (file UGridView.incl.p)
TScroller.ScrollDraw                              (file UMacApp.TScroller.p)
    IF IsShown & Focus THEN

TSScrollBar.Activate                              (file UMacApp.TControls.p)
    add this check before WhileFocused:
    IF IsShown THEN
```

6. With the changes from bug five in place, a problem appears when a `TScroller` is resized. The scroller hides its scroll bars, resizes itself, adjusts its scroll bars, and shows them again. `AdjustScrollbars` potentially asks a scroll bar to invalidate itself. However, at that time, the scroll bar is invisible, thus its contents cannot possibly be wrong, as they have yet to be drawn. It is the scroll bar itself that is wrong, and therefore the contents of its superview (in that rectangle) that must be invalidated.

Fix: To patch the bug, modify the final few lines of `TScroller.Resize` (file `UMacApp.TScroller.p`):

```
FOR vhs := v TO h DO
    IF sBarWasVisible[vhs] THEN
        BEGIN
            fScrollBars[vhs].SetCMgrVisibility(TRUE);
```

```
fScrollBars[vhs].ForceRedraw; { this is new }  
END;
```

This is not a real fix, this is only a patch. The final fix probably requires modification to `TView.Locate` and `TControl.Resize`.

7. Fixed in MacApp 2.0.1.

8. Assorted `TView.Focus` fixes #1 and #5 together have ramifications on `TDialogTEView.InstallEditText`. Because a view is now considered invisible if any of its superviews are invisible, and a view is now considered disabled if it is invisible, all views are effectively disabled in an invisible window. The effect of this is that `InstallEditText` disables the floating `TDialogTEView` and its scroller if called before the window is opened.

Fix: You can most likely experience the problem when calling `TDialogView.SelectEditText` before the window is opened. Thus, modify `SelectEditText` to check if the window is shown or not. If so, call `TDialogView.DoSelectEditText` as normal (which eventually calls `InstallEditText`). If the window is not open, simply set the specified view as the window's target, to be selected when the window is eventually opened. Thus, in `TDialogView.SelectEditText` (file `UDialog.incl.p`), add the following local variable:

```
itsWindow: TWindow;
```

Then, replace:

```
DoSelectEditText(TEditText(aSubView), selectChars);
```

With:

```
IF IsShown THEN  
    DoSelectEditText(TEditText(aSubView), selectChars)  
ELSE  
    BEGIN  
        itsWindow := GetWindow;  
        IF itsWindow <> NIL THEN  
            itsWindow.SetTarget(aSubView)  
        ELSE  
            ProgramBreak('found no way to select the edit text');  
    END;
```

Global Routines and Interfaces

1. Fixed in MacApp 2.0.1.

2. Fixed in MacApp 2.0.1.

3. Fixed in MacApp 2.0.1.

4. Fixed in MacApp 2.0.1.

5. Fixed in MacApp 2.0.1.

6. WithApplicationResFileDo needs a failure handler. Since the method's **normal** behavior is to preserve the current resource file, in case of a failure it should do the same thing. The problem is that if WithApplicationResFileDo contains a failure handler, it must be moved to another unit; UMacAppUtilities cannot access UFailure without introducing a circular reference.

Fix: Move WithApplicationResFileDo to the file UMenuSetup.inc1.p and change it to the following:

```
PROCEDURE WithApplicationResFileDo (PROCEDURE DoWithResFile);  
  
    VAR  
        fi:          FailInfo;  
        oldResFile: INTEGER;  
  
    PROCEDURE HdlFailure (error: OSErr; message: LONGINT);  
  
        BEGIN  
            UseResFile (oldResFile);  
        END;  
  
    BEGIN  
        oldResFile := CurResFile;  
        CatchFailures (fi, HdlFailure);  
        UseResFile (gApplicationRefNum);  
        DoWithResFile;  
        Success (fi);  
        UseResFile (oldResFile);  
    END;
```

7. VisibleRect returns the intersection of the specified rectangle along with the bounding boxes of the visRgn and clipRgn. When called during a window update, however, the visRgn can be smaller than expected. This difference can cause VisibleRect to return different sized rectangles when called inside or outside of an update event.

Fix: The final fix has not yet been determined; however, you may be able to kludge things by modifying TWindow.Update in the file UMacApp.TWindow.p. Just before _BeginUpdate, add the following line:

```
gUpdating := TRUE;
```

Next, add the following line immediately after both calls to _EndUpdate:

```
gUpdating := FALSE;
```

Then, in VisibleRect (file UMacApp.Globals.p), change:

```
IF NOT gPrinting THEN  
    SectRgn (gTempRgn, thePort^.visRgn, gTempRgn);
```

To:

```
IF NOT (gPrinting | gUpdating) THEN  
    SectRgn (gTempRgn, thePort^.visRgn, gTempRgn);
```

Finally, add `gUpdating` to the file `UMacApp.p`, and initialize it to `FALSE` in `InitUMacApp`. Or you can just live dangerously and take out the `_SectRgn` call altogether.

8. Patching a trap with the routines in `UPatch` can cause a crash under the Finder (when `MultiFinder` is not present) if that trap is already patched by `MacApp`, because the `CleanUpMacApp` routine incorrectly restores that trap to point at the `MacApp` patch, rather than at the original routine.

Solution: Do not patch traps that `MacApp` patches (currently: `_ExitToShell`, `_InitCursor`, `_SetCursor`, `_SetCCursor`, `_GetNextEvent`, `_EventAvail`, `_StillDown`, and `_WaitMouseUp`).

Fix: Rewrite `UnpatchTrap` (file `UPatch.incl.p`) as follows, so it does the right thing when unpatching traps that have “newer” patches:

```
PROCEDURE UnpatchTrap (VAR thePatch: TrapPatch);

VAR
    aPatchPtr:      TrapPatchPtr;
    newerPatchPtr:  TrapPatchPtr;

FUNCTION GetPreviousPatchPtr (thePatchPtr: TrapPatchPtr):
    TrapPatchPtr;
{ Walks the patch list backwards to return the patch record
  just prior to thePatchPtr^ in the patch list }

VAR
    tempPatchPtr:  TrapPatchPtr;

BEGIN
    tempPatchPtr := pPatchList;
    WHILE (tempPatchPtr <> NIL) & (tempPatchPtr^.nextPatch <>
        thePatchPtr) DO
        tempPatchPtr := tempPatchPtr^.nextPatch;
    GetPreviousPatchPtr := tempPatchPtr;
END;

FUNCTION GetNewerPatchPtr: TrapPatchPtr;
{ returns a newer patch record in the patch list which has
  the same trapNum as thePatch }

BEGIN
    aPatchPtr := GetPreviousPatchPtr (@thePatch);
    WHILE (aPatchPtr <> NIL) & (aPatchPtr^.trapNum <>
        thePatch.trapNum) DO
        aPatchPtr := GetPreviousPatchPtr (aPatchPtr);
    GetNewerPatchPtr := aPatchPtr;
END;

BEGIN
{ If this trap has a newer patch than the patch we're removing,
  then we have to take some extra special precautions. We have
  to muck with that patch's oldTrapAddr to point to this patch
  record's oldTrapAddr (for both the patch record and the
  jumpPtr code). We can pretty well ignore the case of an
  older patch on this same trap since the trap address in our
  patch record will be correct. }
```

```
newerPatchPtr := GetNewerPatchPtr;
IF (newerPatchPtr = NIL) THEN
    WITH thePatch DO
        NSetTrapAddress(OldTrapAddr, trapNum,
                        GetTrapType(trapNum))
ELSE
    BEGIN
        { set up newerPatchPtr patch record so that it points to
          thePatch's OldTrapAddr }
        newerPatchPtr^.oldTrapAddr := thePatch.oldTrapAddr;

        { set up newerPatchPtr^.jmpPtr so that it jumps to where
          thePatch's code jumps to }
        IF (newerPatchPtr^.jmpPtr <> NIL) THEN
            BEGIN
                IF LongIntPtr(newerPatchPtr^.jmpPtr)^ = $2F2F0004 THEN
                    T1PBlockPtr(newerPatchPtr^.jmpPtr)^.OldTrapAddr :=
                        thePatch.oldTrapAddr
                ELSE IF IntegerPtr(newerPatchPtr^.jmpPtr)^ = $2F3C THEN
                    TPBlockPtr(newerPatchPtr^.jmpPtr)^.OldTrapAddr :=
                        thePatch.oldTrapAddr

                ELSE
                    BEGIN
                        {$IFC qDebug}
                        Writeln('###In UnpatchTrap: can''t figure out ',
                            'what kind of patch ', ORD(newerPatchPtr),
                            ' is!');
                        DebugStr('Can''t unpatch trap. ');
                        {$ENDC}
                    END;
                END;
            END;

        { Unlink the patch from the linked list of patches }
        IF @thePatch = pPatchList THEN
            pPatchList := thePatch.nextPatch
        ELSE
            BEGIN
                aPatchPtr := pPatchList;
                WHILE (aPatchPtr <> NIL) & (aPatchPtr^.nextPatch <>
                    @thePatch) DO
                    aPatchPtr := aPatchPtr^.nextPatch;
                { Couldn't find thePatch, so don't try to unpatch it. }
                IF aPatchPtr = NIL THEN
                    EXIT(UnpatchTrap);
                aPatchPtr^.nextPatch := thePatch.nextPatch;
            END;

            { If the patch allocated a block in the system heap,
              deallocate it }
            WITH thePatch DO
                jmpPtr := DisposeIfPtr(jmpPtr);
            END;
        END;
```

9. Fixed in MacApp 2.0.1.
10. IsClassIDMemberClass does not range check for negative class IDs. This could result in some extremely rare cases where a handle appears to be an object when it really is not.

Solution:

In the file UObject.a, replace:

```
Cmp.W      (A0),D0      ; make sure class ID is in range
Bge.S      isFALSE
Cmp.W      (A0),D1      ; make sure class ID is in range
Bge.S      isFALSE
```

With:

```
Cmp.W      (A0),D0      ; make sure class ID is in range
Bge.S      isFALSE

Tst.W      D0           ; make sure class ID is non-negative
Bltn.S     isFALSE

Move.W     D0,D2        ; make sure class ID is even
And        #1,D2
Tst.W      D2
Bnz.S      isFALSE

Cmp.W      (A0),D1      ; make sure class ID is in range
Bge.S      isFALSE

Tst.W      D1           ; make sure class ID is non-negative
Bltn.S     isFALSE

Move.W     D1,D2        ; make sure class ID is even
And        #1,D2
Tst.W      D2
Bnz.S      isFALSE
```

11. Discipline signals a problem on a `_Get1NamedResource` call when it tries to load `CODE("GMain")`. This segment is listed in 'seg!' and 'res!', but it does not exist.

Fix: This bug is ultra-benign, but can be fixed by removing the reference to GMain in the file MacApp.r

12. The number of calls to `RegisterStdType` has increased from 17 to 25 since the MacApp 2.0b9 release; however, the limit (`kMaxSignatures`, defined in the file UMacApp.p) remains at 32. This difference means your application can only register seven additional types instead of the 15 previously allowed.

Fix: Recompiling MacApp with a limit of 40 should suffice for now. Future versions of MacApp will implement a dynamic list so that no limits would be imposed.

13. Fixed in MacApp 2.0.1.
14. Fixed in MacApp 2.0.1.
15. Fixed in MacApp 2.0.1.
16. `MATextBox` may have problems if you are drawing with a wide font into a small box in a right-justified script system.

Fix: In `UMacAppUtilities.incl.p`, add a local `Integer` variable called `minWidth`. Then, replace:

```
WITH destRect DO
    right := left + Max(Max(right - left, widMax), 20);
```

With:

```
WITH destRect DO
    BEGIN
        minWidth := Max(Max(right - left, widMax), 20);
        CASE GetActualJustification(itsJust) OF
            teJustLeft,
            teForceLeft: right := left + minWidth;
            teJustRight: left := right - minWidth;
            teJustCenter:
                BEGIN
                    left := (right+left-minWidth) DIV 2;
                    right := left + minWidth;
                END;
        END;
    END;
```

MABuild Bugs

1. MABuild does not support both `AppName.r` and `AppName.rsrc` files as part of a MacApp project. Actually, the problem is a more general one: the file `Build Rules and Dependencies` defines the default dependency “`.rsrc f .r`”. Therefore, if `AnyFile.rsrc` is mentioned either in the file `Basic Definitions` or your own `.MAMake` file, Make produces a command that compiles `AnyFile.r` into `AnyFile.rsrc`, or complains if `AnyFile.r` does not exist.

Solution: Avoid the `.rsrc` suffix for files that are not compiled from `.r` files.

Fix: Globally replace “`.rsrc`” with “`.r.o`” in the files `{MATools}Basic Definitions` and `{MATools}Build Rules and Dependencies`. This change causes Make to create `Anyfile.r.o` files instead of `AnyFile.rsrc` files, removing the conflict and preserving any `.rsrc` files that you may have created with `ResEdit` or `ViewEdit`. Be sure to update your `.MAMake` file similarly.

2. MABuild doesn’t support spaces or multiple files in the `OtherViewTypesSrc` Make variable, because of the following line in the file `Build Rules and Dependencies`:

```
IF "{OtherViewTypesSrc}" != ""
```

Assuming `OtherViewTypesSrc` is set to something like `"My Hard Disk:My Folder:My File.r"`, that line gets expanded to:

```
IF ""My Hard Disk:My Folder:My File.r"" != ""
```

The double quotes on either end cancel each other out, and any pathname with spaces is treated as separate items. Compounding the problem is the fact that “`OtherViewTypesSrc`” is the name of both a Make variable and a Shell variable.

Fix: Support for spaces in OtherViewTypesSrc can be easily added. In {MATools}Basic Definitions, replace:

```
OtherViewTypesSrc =
```

With:

```
OtherViewTypesSrc = ""
```

In {MATools}Build Rules and Dependencies, replace:

```
IF "{OtherViewTypesSrc}" != ""
    SET XOtherViewTypesSrc "{OtherViewTypesSrc}"
    SET XIncludeOtherViewTypes 1
    EXPORT OtherViewTypesSrc
```

With:

```
IF {OtherViewTypesSrc} != ""
    SET XOtherViewTypesSrc {OtherViewTypesSrc}
    SET XIncludeOtherViewTypes 1
    EXPORT XOtherViewTypesSrc
```

This stuff occurs three times, replace it in all three locations. Next, in {MARIncludes}ViewTypes.r, replace the line:

```
#Include $$Shell("OtherViewTypesSrc"); // let end users extend the view
// type
```

With:

```
#Include $$Shell("XOtherViewTypesSrc"); // let end users extend the view
// type
```

3. MABuild doesn't support more than one user library.

Solution: Not yet determined. Requires a change to MABuildTool.p.

4. Creating an application with qNeedsROM128K set to TRUE and running it on a 512KE under System 3.2 causes it to bomb with an ID = 12 error, because the traps that MacApp needs are not present. However, the application runs properly under System 3.4, as the traps are implemented under that system.

Fix: Tell MacApp to use the set of glue routines that check for the presence of the needed trap before it is called. In {MAPInterfaces}UPrinting.p, replace the following lines:

```
{$IFC NOT qNeedsROM128K}
{$IFC UNDEFINED UsingPrinting} {$I Printing.p} {$ENDC}
{$ELSEC}
{$IFC UNDEFINED UsingPrintTraps} {$I PrintTraps.p} {$ENDC}
{$ENDC}
```

With:

```
{$IFC UNDEFINED UsingPrinting} {$I Printing.p} {$ENDC}
```

In {MALibraries}PrivateInterfaces:UPrinting.p, replace:

```
{ $IFC NOT qNeedsROM128K }
Printing,
{ $ELSEC }
PrintTraps,
{ $ENDC }
```

With:

```
Printing,
```

5. At the top of the file UMacAppUtilities.inc1.p are the following compiler options:

```
{ $W+ }
{ $R- }
{ $Init- }
{ $OV- }
{ $IFC qNames }
{ $D+ }
{ $ENDC }
```

The intent here is that these routines should not have debugger probes (%_BP, %_EP, %_EX) inserted into them, allowing them to run at full speed. Unfortunately, if you compile with something like MABuild -NoDebug -Trace, the debugger probes are inserted.

Fix: Add {\$D-} before {\$IFC qNames}

6. The Commando dialog box for MABuild is out of date. For example, -NeedsSystem6 and -NoDebug are now the MABuild default and cannot be turned off through the Commando dialog box.
7. The help button in the debug options dialog box in the MABuild Commando interface is partially obscured.
8. The Commando dialog has a three-state button “Show Times”, that sets the flag “-T”. The help text for this is “Have all tools show elapsed time.” Actually, “-T” tells only MABuildTool to show elapsed time; to have all tools do this, you need the “-TT” flag.
9. There is a small problem in the file {MAPInterfaces}UTEView.p that causes your compiles to be imperceptibly slower than you would expect. Several references to __TEView__ at the top of the file should really be __UTEView__, thus:

```
{ $IFC UNDEFINED __UTEView__ }
{ $SETC __UTEView__ := FALSE }
{ $ENDC }

{ $IFC NOT __UTEView__ }
{ $SETC __UTEView__ := TRUE }
```

10. In the file UViewCoords.h, #ifndef __UVIEWCOORDS__ should be #ifndef __UViewCoords__.

Fix: Change the header file.

11. MacApp uses CPlusLib instead of CPlusLib881 when compiling for C++ and FPU support.

Fix: In the file Basic Definitions, remove "{CLibraries}CPlusLib.o" from the definition of 31CPlusSupport, add it to 31CPlusNonFPUSANELib, and add "{CLibraries}CPlusLib881.o" to 31CPlusFPUSANELib. Thus, replace:

```
#####
# For MPW 3.0, 3.1
#####
31CPlusSupport = @
    "{CLibraries}CRuntime.o" @
    "{CLibraries}CInterface.o" @
    "{CLibraries}CPlusLib.o" @
    "{CLibraries}StdCLib.o" @
    "{PLibraries}PasLib.o"

31CPlusNonFPUSANELib = @
    "{CLibraries}CSANELib.o" @
    "{PLibraries}SANELib.o" @
    "{CLibraries}Math.o" @
    "{CLibraries}Complex.o"

31CPlusFPUSANELib = @
    "{CLibraries}CLib881.o" @
    "{CLibraries}CSANELib881.o" @
    "{PLibraries}SANELib881.o" @
    "{CLibraries}Math881.o" @
    "{CLibraries}Complex881.o"
```

With:

```
#####
# For MPW 3.0, 3.1
#####
31CPlusSupport = @
    "{CLibraries}CRuntime.o" @
    "{CLibraries}CInterface.o" @
    "{CLibraries}StdCLib.o" @
    "{PLibraries}PasLib.o"

31CPlusNonFPUSANELib = @
    "{CLibraries}CPlusLib.o" @
    "{CLibraries}CSANELib.o" @
    "{PLibraries}SANELib.o" @
    "{CLibraries}Math.o" @
    "{CLibraries}Complex.o"

31CPlusFPUSANELib = @
    "{CLibraries}CPlusLib881.o" @
    "{CLibraries}CLib881.o" @
    "{CLibraries}CSANELib881.o" @
    "{PLibraries}SANELib881.o" @
    "{CLibraries}Math881.o" @
    "{CLibraries}Complex881.o"
```


12. “MABuild’s mechanism for handling C++ Load/Dump is sort of lame. Why not support FPU and Load/Dump simultaneously? It’s not that hard to get working.”

Fix: Yeah, but it used to be. So there. MABuild is trying to work around a problem that exists in CFront 3.1b3 and earlier. If you are using a later version, you can remove the safety check. Go into the file MABuildTool.p, remove the following lines, then rebuild MABuildTool.

```
{ C++ external symbol table files support }
IF fCPlusLoad & fNeedsFPU THEN
    BEGIN
        Echo(''###'' MABuild: Warning: CPlusLoad and NeedsFPU
            are incompatible. Using NoCPlusLoad.');
```

13. This is not a bug with MABuild, but this change belongs in the MABuild section. With all the changes and fixes suggested here, one of MacApp’s segments—GRes—becomes uncomfortably close to 32K.

Fix: Move the routines originally mapped to MAControlRes and MADocumentRes into GRes2 by opening the file {MATools}Basic Definitions. Change the occurrence of MAControlRes=GRes to MAControlRes=GRes2 and MADocumentRes=GRes to MADocumentRes=GRes2.

Bugs Only In Debug Mode

These bugs occur only in debug versions of your program, and do not affect the final production version.

1. DisposeIfHandle fails if called with a valid, but purged, handle:

```
h := NewHandle(20);
IF h <> NIL THEN
    BEGIN
        EmptyHandle(h);
        DisposIfHandle(h); {<--PBreak: 'handle is so bad, couldn't get handle bits'}
    END;
```

Fix: In DisposeIfHandle (file UMacAppUtilities), add:

```
IF IsHandlePurged(aHandle) THEN { h might have been purged }
    BEGIN
        DisposHandle(aHandle);
        EXIT(DiscardIfHandle);
    END
```

Just before:

```
handleBits := GetHandleBits(aHandle);
```

This fix is not the cleanest, but it is the easiest.

2. Doctor, doctor. My application hangs if Print... is chosen while stopped in the debugger.

Solution: Don't do that.

3. With a desk accessory open in the application heap (e.g., Option-Alarm Clock), you can enter the MacApp debugger, but it does not accept any keystrokes.

Solution: Click in the Debug Transcript window to jumpstart it.

4. If the performance tools are on, you must turn them off with "Toggle" before "Ending". Failure to do so leaves the performance tools active, although their data has been disposed.

Solution: Always "Toggle" the performance tools off before "Ending".

Fix: Modify `PerfCmd` to turn off the performance tools when "Ending".

5. `TTranscriptView` does not initialize `fFontInfo` in `CommonInit`.

Fix: Before the `{SPop}` statement in `TTranscriptView.CommonInit` (file `UTranscriptView.inc1.p`), add:

```
InstallTextStyle(fTextStyle);
```

6. `TList.GetSameItemNo` fails in debug if looking for `NIL`. With previous versions of MacApp, it was perfectly acceptable to check for a `NIL` object in a list. `GetSameItemNo` would return zero, as expected. With MacApp 2.0, there is an explicit check in debug mode that the object is valid, so passing `NIL` does not work.

Solution: Call `GetSameItemNo` with the following wrapper:

```
IF obj = NIL then
    index := 0
ELSE
    index := GetSameItemNo(obj)
```

Fix: Modify `TList.GetSameItemNo` (file `TList.inc1.p`) to make the same check.

7. If a failure occurs in `IApplication`, the debugger incorrectly issues the following warning:

"You're leaving a routine without calling Success for a handler that will be destroyed."

This message occurs because the routine `MADebuggerMainEntry` checks `gTopHandler` to see if the `FailInfo` record it points to is below the stack. However, this test doesn't work properly if `gTopHandler` is `NIL`, as it is in `IApplication`.

Fix: Add a check for `(gTopHandler = NIL)` in `MADebuggerMainEntry` (file `UDebug.inc1.p`). Replace the line:

```
forgotSuccess := ((which = tEnd) | (which = tExit))
                & (StripLong(LongIntPtr(pLink)^) >=
                  StripLong(gTopHandler));
```

With:

```
forgotSuccess := ((which = tEnd) | (which = tExit)) & (gTopHandler <> nil)
                & (StripLong(LongIntPtr(pLink)^) >=
                  StripLong(gTopHandler));
```

8. Fixed in MacApp 2.0.1.
9. Fixed in MacApp 2.0.1.
10. There are two problems with `DebugGetActiveWindow`. These affect you only if you try to inspect the labels `GetActiveWindow` or `GetActiveDocument`.

Fix: In `UDebug.incl.p`, replace the following lines in `DebugGetActiveWindow`:

```
pDebugWindow.fFloats := FALSE;           { so the debugger window doesn't get
                                           reported }
DebugGetActiveWindow := gApplication.GetActiveWindow;
pDebugWindow.fFloats := FALSE;
```

With:

```
pDebugWindow.fFloats := TRUE;             { so the debugger window doesn't get
                                           reported }
DebugGetActiveWindow := pSavedState.gApplication.GetActiveWindow;
pDebugWindow.fFloats := oldFloats;
```

MPW 3.2 Compatibility

This section describes problems that occur when trying to build MacApp 2.0 under MPW 3.2. MacApp 2.0 was developed under MPW 3.0 and 3.1 and could not take into account changes made to MPW 3.2.

Note: Even at the time of this writing, it is unclear which of the following items will be compatibility problems. For example, item four is a problem with MPW 3.1a1, but not with MPW 3.2b1. On the other hand, item three is a problem with MPW 3.2b1, but not with MPW 3.2a1. Apple will update the status of these items when MPW 3.2 is final.

1. The file `{MALibraries}PrivateInterfaces:UDebug.p` needs symbol information from the file `Packages.p`. Under MPW 3.1, this file was automatically included when the file `UDebug.p` included the file `Script.p` in its `USES` statement. Under MPW 3.2, this is no longer the case, and `UDebug` does not compile.

Fix: Add a reference to `Packages` before `Script` in the file `UDebug.p`:

```
USES
    <etc.>
    Desk, DiskInit, ToolUtils, Retrace, Memory, Resources, FixMath,
    Packages,
    Script, PasLibIntf, OSEvents, Traps, Perf, DisAsmLookUp, Notification;
```

2. The file UDebug.incl.p contains the definition for the following procedure:

```
PROCEDURE JTOffProc(A5JTOffset: UNIV INTEGER;
    VAR s: UNIV DisAsmStr80);
```

DisAsmStr80 is declared in the file {PInterfaces}DisAsmLookup.p under MPW 3.1. It is no longer used under MPW 3.2.

Fix: Change DisAsmStr80 to Str255.

3. In the NMRec record defined in the files Notification.c and Notification.p, nmSIcon has been changed to the infinitely clearer nmIcon.

Fix: In UDebug.incl.p, change the occurrence of nmSIcon to nmIcon.

4. At the bottom of the file UDebug.a, there is a line that looks like the following:

```
Case#.S          FIOINTERACTIVE,TIOFLUSH
```

TIOFLUSH is not supported under MPW 3.2a1, and the Assembler aborts with an error when it gets to this line.

Fix: Comment out or remove the reference to TIOFLUSH:

```
Case#.S          FIOINTERACTIVE ;,TIOFLUSH
```

SADE Compatibility

1. In the SADEScripts folder (part of the SADE product) is a file called StepMethod. This file contains the definition of a procedure called stepIntoMethod, which includes the following lines:

```
break %_NEWMETHOD020.CacheOut
break %_NEWMETHOD020.TableOut
go
unbreak %_NEWMETHOD020.CacheOut
unbreak %_NEWMETHOD020.TableOut
```

MacApp 2.0 no longer defines the symbol %_NEWMETHOD020 and SADE is not able to find it when you attempt to step into an overridden method.

Fix: Replace those lines with the following:

```
break %_NEWMETHOD.CacheOut
break %_NEWMETHOD.TableOut
go
unbreak %_NEWMETHOD.CacheOut
unbreak %_NEWMETHOD.TableOut
```

THINK Pascal Compatibility

1. Fixed in MacApp 2.0.1.
2. This isn't really a bug, but you might incorporate the following: in the file `UMacAppUtilities.p`, place a `{ $PUSH } { $D- }` in front the `BlockSet` routine and a `{ $Pop }` after it. This change speeds up the execution of programs which are compiled with the MacApp debugger when running under the THINK Pascal environment. (Doing this may not be necessary if you incorporate the fix to problem #5 in the MABuild section.)

MacApp Samples Bugs

1. In the C++ version of `DemoText`, strings which normally appear in the About box show up in the color picker, because `kPromptStringsID` is declared differently between the Rez file and the C++ file.
2. In the file `UIconEdit.incl.p`, the procedure `TIconBitMap.Free` does not call `INHERITED Free`. It should call `INHERITED Free` or the space in the heap used for the object never gets freed.
3. Instead of referring to `@fShowInvisibles`, `TTabTEView.Fields` actually refers to `@ShowInvisibles`.

Other

1. The script `{MATools}CleanupDeRezzedViews` misses a situation where it needs to quote a Shell variable. This problem causes the script to abort if the file you are processing contains a space in it.

Fix: Replace the second line of the script:

```
IF {1} == ""
```

With:

```
IF "{1}" == ""
```

2. Fixed in MacApp 2.0.1.

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