

TECHNOTE :

Adding Items to the Printing Manager's Dialogs

By Lew Rollins & Ginger Jernigan
Revised by Ingrid Kelly & Dave Polaschek
inge@apple.com
Apple Developer Technical Support (DTS)

This Technote, originally *Technote PR 09 - Print Dialogs: Adding Items*, discusses how to add items to the Printing Manager's dialogs.

When the Printing Manager was initially designed, great care was taken to make the interface to the printer drivers as generic as possible in order to allow applications to print without being device-specific. There are times, however, when this type of non-specific interface interferes with the flexibility of an application. An application may require additional information before printing which is not part of the general Printing Manager interface. This Note describes a method that an application can use to add its own items to the existing style and job dialogs.

This revised Technote reflects the current Macintosh Printing Manager and uses C code instead of the original Pascal.

You can download a complete version of the code in this Technote, PDlog Expand *f* sample code, by clicking on the icon in the Downloadables section at the very end of this Note.

Printing Manager Compatibility Guidelines for the Future

To begin with, you need to be aware of some guidelines that will increase your chances of being compatible with future revisions of Macintosh Printing Manager:

- Only add items to the dialogs as described in this technical note. Any other method will decrease your chances of compatibility in the future.
- Do not change the position of any item in the current dialogs. This means don't delete items from the existing item list or add items in the middle. Add items **only at the end** of the list.
- Don't count on an item retaining its current position in the list. If you depend on the Draft button being a particular number in the ImageWriter's style dialog item list, and we change the Draft button's item number for some reason, your program may no longer function correctly.
- Don't use more than half the screen height for your items. Apple reserves the right to expand the items in the standard print dialogs to fill the top half of the screen. Even though LaserWriter 8.4 changes the print dialogs, in order to be compatible with older drivers, you still need to maintain this half-screen rule.
- Under LaserWriter 8.4.x the print dialogs have been completely redesigned. If you add items to the print dialog 'legally', your items are added to a pane that has the name of your application. If you don't add them as recommended in this Note, there will be problems. Please see *develop 27 - Print Hints: The All-New LaserWriter Driver Version 8.4* for more details.
- Applications should not assume that the print dialog's foreground color is black or that the background color is white when they erase their controls. Furthermore, applications should not change the foreground or background colors because other items in the dialog rely on these colors. If an application changes them, the print dialog may end up with strange colors.

The Heart of the Print Dialogs: The TPrDlg Record

Before discussing how the dialogs work, it is important to know that *at the heart of the print dialogs is a little-known data structure partially documented in Printing.h*. It's a record called TPrDlg and it looks like this:

```
struct TPrDlg {
    DialogRecord   Dlg;                /*The Dialog window*/
    ModalFilterUPP pFiltrProc;        /*The Filter Proc.*/
    PItemUPP       pItemProc;        /*The Item evaluating proc.*/
    THPrint        hPrintUsr;        /*The user's print record.*/
    Boolean         fDoIt;
    Boolean         fDone;
    long           lUser1;            /* Four longs reserved by Apple for
                                     global data */
    long           lUser2;            /* to hang global data.*/
    long           lUser3;            /* More stuff needed by the */
    long           lUser4;            /*printing dialog.*/
};

typedef struct TPrDlg TPrDlg;
typedef TPrDlg *TPPrDlg;
typedef TPrDlg *TPPrDlgRef;
```

All of the information pertaining to a print dialog is kept in the TPrDlg record. This record will be referred to frequently in the discussion below.

How the Dialogs Work

When your application calls PrStlDialog and PrJobDialog, the printer driver calls a routine called PrDlgMain. This function is declared as follows:

```
extern pascal Boolean PrDlgMain(THPrint hPrint, PDlgInitUPP pDlgInit);
```

PrDlgMain first calls the pDlgInit routine to set up the appropriate dialog (in Dlg), dialog hook (pItemProc) and dialog event filter (pFilterProc) in the TPrDlg record (shown above). For the job dialog, the address of PrJobInit is passed to PrDlgMain. For the style dialog, the address of PrStlInit is passed. These routines are declared as follows:

```
extern pascal TPPrDlgRef PrJobInit(THPrint hPrint);
extern pascal TPPrDlgRef PrStlInit(THPrint hPrint);
```

After the initialization routine sets up the TPrDlg record, PrDlgMain calls ShowWindow (the window is initially invisible), then it calls ModalDialog, using the dialog event filter pointed to by the pFiltrProc field. When an

item is hit, the routine pointed to by the `pItemProc` field is called and the items are handled appropriately. When the OK button is hit (this includes pressing Return or Enter) the print record is validated. The print record is not validated if the Cancel button is hit.

Adding Your Own Items

To modify the print dialogs, you need to change the `TPrDlg` record before the dialog is drawn on the screen. You can add your own items to the item list, replace the addresses of the standard dialog hook and event filter with the addresses of your own routines and then let the dialog code handle the necessary functions to make the items visible in your print dialog.

The example code's initialization function adds items to the dialog item list, saves the address of the standard dialog hook (in our global variable `prPItemProc`) and puts the address of our dialog hook into the `pItemProc` field of the `TPrDlg` record. Please note that your dialog hook **must** call the standard dialog hook to handle all of the standard dialog's items.

Note: If you wish to have an event filter, use the same method that you would for a dialog hook.

The C Example Program

Here is an example (written in C) that modifies the job dialog.

Note: The same code works for the style dialog if you globally replace 'Job' with 'Stl'.

```
#include <Printing.h>
#include <Dialogs.h>
#include <Gestalt.h>
#include <MixedMode.h>
#include <SegLoad.h>
#include <Resources.h>
#include <ToolUtils.h>
#include <Fonts.h>
#include <Lists.h>

static TPrDlg PrtJobDialog;    /* pointer to job dialog */

/* Declare 'pascal' functions and procedures */
```

```

extern short   Append_DITL(TPPrdlg, short);           /* Our AppendDITL
function.      */
extern pascal TPPrdlg MyJobDlgInit(THPrint);         /* Our extension to
PrJobInit.    */
extern pascal void MyJobItems(TPPrdlg, short);      /* Our modal item
handler.      */
extern OSErr   Print(void);
pascal void MyListDraw(WindowPtr theWindow, short itemNo); //mxm

#define MyDITL 256 /* resource ID of my DITL to be spliced onto job
dialog */

ListHandle gList = nil;                             /* mxm */
UserItemUPP myDrawListUPP = nil;                   /* mxm */

THPrint hPrintRec; /* handle to print record */
long prFirstItem; /* save our first item here */
PItemUPP prPItemProc; /* we need to store the old itemProc here */

/*-----
*/
WindowPtr MyWindow;
OSErr err;
Str255 myStr;

#if PRAGMA_ALIGN_SUPPORTED
#pragma options align=mac68k
#endif

typedef struct dialog_item_struct {
    Handle handle; /* handle or procedure pointer for this item */
    Rect bounds; /* display rectangle for this item */
    char type; /* item type - 1 */
    char data[1]; /* length byte of data */
} DialogItem, *DialogItemPtr, **DialogItemHandle;

typedef struct append_item_list_struct {
    short max_index; /* number of items - 1 */
    DialogItem items[1]; /* first item in the array */
} ItemList, *ItemListPtr, **ItemListHandle;

typedef union signed_byte_union {
    short integer;
    char bytes[2];
} ByteAccess;

static Boolean append_exits(void);
static Boolean append_exits(void)
{
    long response;

    if (Gestalt(gestaltDITLExtAttr, &response) == noErr) {
        return !(response & (1 << gestaltDITLExtPresent));
    }
}

```

```

    } else {
        return false; /* simple-minded, but hey, so am I. -DaveP */
    }
}

/* This routine appends all of the items of a specified DITL */
/* onto the end of a specified DLOG - We don't even need to know the
format */
/* of the DLOG */

/* this will be done in 3 steps: */
/* 1. append the items of the specified DITL onto the existing DLOG
*/
/* 2. expand the original dialog window as required */
/* 3. return the adjusted number of the first new user item */

short Append_DITL(TPPPrDlg dialog, short item_list_ID)
{
    ItemListHandle append_item_list; /* handle to DITL being appended
*/
    ItemListHandle dlg_item_list; /* handle to DLOG's item list */
    short first_item;

    dlg_item_list = (ItemListHandle)((DialogPeek)dialog)->items;
    first_item = (**dlg_item_list).max_index + 2;

    append_item_list = (ItemListHandle)GetResource('DITL', item_list_ID);
    if ( append_item_list == NULL ) {
        DebugStr("\pError loading DITL resource");
        return first_item;
    }

    if (append_exits()) {
        AppendDITL((DialogPtr)dialog, (Handle) append_item_list,
appendDITLBottom);
        return first_item;
    } else {
        Point offset;
        Rect max_rect;
        DialogItemPtr item; /* pointer to item being appended */
        short new_items, data_size, i;
        ByteAccess usb;
        OSErr err;

        /*
        Using the original DLOG

        1. Remember the original window Size.
        2. Set the offset Point to be the bottom of the original window.
        3. Subtract 5 pixels from bottom and right, to be added
back later after we have possibly expanded window.
        4. Get working Handle to original item list.
        5. Calculate our first item number to be returned to caller.

```

```

        6. Get locked Handle to DITL to be appended.
        7. Calculate count of new items.
    */

    if (dialog == NULL) ExitToShell();

    max_rect = ((DialogPeek)dialog)->window.port.portRect;
    offset.v = max_rect.bottom;
    offset.h = 0;
    max_rect.bottom -= 5;
    max_rect.right -= 5;

    HLock((Handle)append_item_list);
    new_items = (**append_item_list).max_index + 1;

    /*
    For each item,
    1. Offset the rectangle to follow the original window.
    2. Make the original window larger if necessary.
    3. fill in item handle according to type.
    */

    item = (**append_item_list).items;
    for ( i = 0; i < new_items; i++ )
    {
        OffsetRect(&item->bounds, offset.h, offset.v);
        UnionRect(&item->bounds, &max_rect, &max_rect);
        usb.integer = 0;
        usb.bytes[1] = item->data[0];

        switch ( item->type & 0x7F )
        {
            case ctrlItem + btnCtrl :
            case ctrlItem + chkCtrl :
            case ctrlItem + radCtrl :
                item->handle = (Handle)NewControl((DialogPtr) dialog,
                    &item->bounds, (StringPtr)item->data, true,
                    0, 0, 1, item->type & 0x03, 0);
                break;

            case ctrlItem + resCtrl :
            {
                item->handle = (Handle)GetNewControl(*(short*)(item-
                >data + 1), (DialogPtr) dialog);
                (**(ControlHandle)item->handle).contrlRect = item-
                >bounds;
            }
            break;

            case statText :
            case editText :
                err = PtrToHand(item->data + 1, &item->handle,
                usb.integer);

```

```

        break;

        case iconItem :
            item->handle = GetIcon(*(short*)(item->data + 1));
            break;

        case picItem :
            item->handle = (Handle)GetPicture(*(short*)(item-
>data + 1));
            break;

        default :
            item->handle = NULL;
    }

    data_size = (usb.integer + 1) & 0xFFFFE;
    item = (DialogItemPtr)((char*)item + data_size +
sizeof(DialogItem));
    }

    /* We need to subtract the short below because otherwise the size of
the DITL count
    ** gets factored in twice, and the resulting DTIL has two bytes of
garbage appended
    ** to it. This is a problem with the original TN#95 code as well.
    */

    err = PtrAndHand(**append_item_list).items,
                (Handle)dlg_item_list,
                GetHandleSize((Handle) append_item_list)
                - sizeof(short));

    (**dlg_item_list).max_index += new_items;
    HUnlock((Handle) append_item_list);
    ReleaseResource((Handle) append_item_list);

    max_rect.bottom += 5;
    max_rect.right += 5;
    SizeWindow((WindowPtr) dialog, max_rect.right, max_rect.bottom,
true);

    return first_item;
    }
}

/*-----
-*/

OSErr Print(void)
{
    TPrPort    pPrPort;
    Rect       aRect;
    TPrStatus  theStatus;

```

```

    /* call PrJobInit to get pointer to the invisible job dialog */
    hPrintRec = (THPrint)(NewHandle(sizeof(TPrint)));
    PrintDefault(hPrintRec);
    PrValidate(hPrintRec);
    if (PrError() != noErr)
        return PrError();

    PrtJobDialog = PrJobInit(hPrintRec);

    if (PrError() != noErr)
        return PrError();

    if (!PrDlgMain(hPrintRec, NewPDlgInitProc(MyJobDlgInit))) /* this
line does all the stuff */
        return iPrAbort;

    if (myDrawListUPP) { /* get rid of our user item draw proc mxm */
        DisposeRoutineDescriptor(myDrawListUPP);
    }
    if (PrError() != noErr)
        return PrError();

    pPrPort = PrOpenDoc(hPrintRec, NULL, NULL);
    PrOpenPage(pPrPort, NULL);

    aRect = (*hPrintRec)->prInfo.rPage;
    InsetRect(&aRect, 20, 20);
    PenSize(4, 4);
    FrameRect(&aRect);

    PrClosePage(pPrPort);
    PrCloseDoc(pPrPort);

    if (!PrError() && (*hPrintRec)->prJob.bJDocLoop == bSpoolLoop)
        PrPicFile(hPrintRec, NULL, NULL, NULL, &theStatus);

/* that's all for now */

    if (hPrintRec) DisposeHandle((Handle) hPrintRec);

    return(noErr);
} /* Print */

//-----
-----
pascal void MyListDraw(WindowPtr theWindow, short itemNo)
//-----
-----
{
#pragma unused (theWindow,itemNo)

```

```

short itemType;
Handle itemH;
Rect itemBox,r;
Point pt;
ControlRef cr;
RgnHandle clip = NewRgn();

GetDialogItem((DialogPtr)
PrtJobDialog,itemNo,&itemType,&itemH,&itemBox);
r = theWindow->portRect;
pt.h = itemBox.left;
pt.v = itemBox.top;
cr = gList[0]->vScroll;
MoveControl(cr,itemBox.right-15,itemBox.top-1);
ShowControl(cr);
if (PtInRect(pt,&r)) {

    gList[0]->rView = itemBox;
    gList[0]->rView.right -=15; //inset for scroll bar

    ShowControl(cr);
    LSetDrawingMode(true,gList);
    if (clip) {
        RectRgn(clip,&itemBox);
        LUpdate(clip,gList);

        InsetRect(&itemBox,-1,-1);
        FrameRect(&itemBox);
        DisposeRgn(clip);
    }
}

}

/*-----
*/

pascal TPrDlg MyJobDlgInit(THPrint hPrint)
/*
    this routine appends items to the standard job dialog and sets up the
    user fields of the printing dialog record TPrDlg

    This routine will be called by PrDlgMain
*/
{
#pragma unused(hPrint)

    short firstItem; /* first new item number */

    short itemType, item;
    Handle itemH;
    Rect itemBox;

```

```

    firstItem = Append_DITL(PrtJobDialog, MyDITL); /* call routine to do
this */

    prFirstItem = firstItem; /* save this so MyJobItems can find it */

    /* now we'll set up our DITL items -- The radio buttons */

    for (item = 5; item <= 7; item++)
    {
        GetDialogItem((DialogPtr) PrtJobDialog,firstItem + item -
1,&itemType,&itemH,&itemBox);
        SetCtlValue((ControlHandle) itemH, (item == 5));
    }

    /* now we'll set up the second of our DITL items -- The checkbox */

    GetDialogItem((DialogPtr) PrtJobDialog,firstItem
+2,&itemType,&itemH,&itemBox);
    SetCtlValue((ControlHandle) itemH,1);

    // here is the list stuff (mxm)
    {
        Rect bounds ;
        Point theCell = {16,200};

        GetDialogItem((DialogPtr) PrtJobDialog,firstItem
+8,&itemType,&itemH,&itemBox);

        SetRect(&bounds,0,0,1,0);
        itemBox.right -=15;

        gList =
LNew(&itemBox,&bounds,theCell,0,(GrafPtr)PrtJobDialog,false,false,false,t
rue);
        if (gList) { // this is how you need to do the scroll-bar so
it'll
later // move off correctly with LaserWriter 8.4 and
which //
scrollbar // The theory is that we have another user item
redrawn // has the handle for the control item for the
the panel // for the list. This way, the scroll bar gets
scroller // in the right order, so it realises it's off
get a // when it is. If you don't have this code, the
// gets drawn, then the list gets moved, so you

```

```

// phantom scroller in the dialog. -DaveP 9/3/96
short scrollType;
Handle scrollHandle;
Rect scrollRect;
GetDialogItem((DialogPtr)PrtJobDialog,firstItem + 9,
&scrollType,
    &scrollHandle, &scrollRect);
SetDialogItem((DialogPtr)PrtJobDialog,firstItem + 9,
ctrlItem,
    (Handle) (**gList).vScroll, &scrollRect);
}
LAddRow(9,0,gList);
SetPt(&theCell,0,0);
// Lets add some data
LSetCell("Testing 1",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 2",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 3",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 4",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 5",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 6",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 7",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 8",9,theCell,gList);
theCell.v ++;
LSetCell("Testing 9",9,theCell,gList);

LActivate(true,gList);
myDrawListUPP = NewUserItemProc(MyListDraw);

SetDialogItem((DialogPtr) PrtJobDialog,firstItem +
8,itemType,(Handle)myDrawListUPP,&itemBox);

}

/*
Now comes the part where we patch in our item handler. We have to
save
the old item handler address, so we can call it if one of the
standard
items is hit, and put our item handler's address in pItemProc field
of
the TPrDlg struct
*/

prPItemProc = PrtJobDialog->pItemProc;

/* Now we'll tell the modal item handler where our routine is */
PrtJobDialog->pItemProc = NewPItemProc(MyJobItems) ;

```

```

/* PrDlgMain expects a pointer to the modified dialog to be returned...*/
return PrtJobDialog;

} /*myJobDlgInit*/

/*-----
*/

static pascal Boolean testFilter(DialogPtr theDialog, EventRecord
*theEvent, short *itemHit)
{
#pragma unused(theDialog)
#pragma unused(theEvent)
#pragma unused(itemHit)
// DebugStr("\pMy filter proc got called"); // This gets called a lot
if you uncomment it
return false;
}

static pascal void testDialogUserItem(WindowPtr theWindow, short itemNo);
static pascal void testDialogUserItem(WindowPtr theWindow, short itemNo)
{
if (itemNo != 4) return;
else {
short oldFont = ((GrafPtr)theWindow)->txFont;
short oldSize = ((GrafPtr)theWindow)->txSize;
short itemType;
Handle h;
Rect r;

SetPort(theWindow);
TextFont(GetAppFont());
TextSize(9);
GetDialogItem((DialogPtr)theWindow,4,&itemType,&h,&r);
MoveTo(r.left,r.bottom);
DrawString("\p<http://www.winternet.com/~dask/poohsnif.html>");
TextFont(oldFont);
TextSize(oldSize);
}
}

static void TestDialog(void);
static void TestDialog(void)
{
DialogPtr theDialog = GetNewDialog(257,nil,(WindowPtr)-1L);
short itemHit = 0;
ModalFilterUPP mySubDialogFilterProc = nil; //
NewModalFilterProc(testFilter); // for testing
UserItemUPP mySubDialogUserProc =
NewUserItemProc(testDialogUserItem);

{ // set up the user item to draw the outline around the ok

```

```

button
    short    t;
    Handle  h;
    Rect    r;

    GetDialogItem(theDialog,4,&t,&h,&r);
    SetDialogItem(theDialog,4,t,(Handle)mySubDialogUserProc,&r);
}

SetDialogDefaultItem(theDialog,1);
while((itemHit != 1) && (itemHit != 2)) { // a WAY bad way of
seeing if we're done, but I'm in a hurry
    ModalDialog(mySubDialogFilterProc, &itemHit);
}
DisposeDialog(theDialog);
if (mySubDialogFilterProc != nil)
    DisposeRoutineDescriptor(mySubDialogFilterProc);
if (mySubDialogUserProc != nil)
    DisposeRoutineDescriptor(mySubDialogUserProc);
}

/* here's the analogue to the SF dialog hook */

pascal void MyJobItems( TPrDlg theDialog, short itemNo )
{ /* MyJobItems */
    short    myItem;
    short    firstItem, item, itemType, theValue;
    Handle  itemH;
    Rect    itemBox;

    firstItem = prFirstItem; // remember, we saved this in
myJobDlgInit */
// DebugStr("\p Looking at the item...");
myItem = itemNo-firstItem+1; // "localize" current item No */
if (myItem > 0) /* if localized item > 0, it's one of ours */
{
    /* find out which of our items was hit */

    switch (myItem)
    {
        case 1: // Static text. */
            break;
        case 2: // Edit text. */
            break;
        case 3: // Check box. */
            GetDialogItem((DialogPtr) theDialog,firstItem
+2,&itemType,&itemH,&itemBox);
            theValue = GetCtlValue((ControlHandle) itemH);
            SetCtlValue((ControlHandle) itemH, theValue != 1);
            break;
        case 4: // Push button. */
            TestDialog();
            break;
        case 5: // Radio buttons */

```

```

        case 6:
        case 7:
            for (item = 5; item <= 7; item++) {
                GetDialogItem((DialogPtr) theDialog,firstItem +item -
1,&itemType,&itemH,&itemBox);
                SetCtlValue((ControlHandle) itemH, item == myItem);
            }
            break;
        case 8:          /* Edit text.          */
        case 9:          /* Our List.          */
            {
                Point pt;
                GetMouse(&pt);
                LClick(pt,0,gList);
            }
            break;
        case 10:         /* our list's scroll bar. We don't need to do
anything, but we need
                        * to have some code here so we don't hit the
default case */
            break;
        default: Debugger(); /* OH OH */
    } /* switch */
} /* if (myItem > 0) */
else /* chain to standard item handler, whose address is saved in
prPItemProc */
{
    CallPItemProc(prPItemProc,(DialogPtr)theDialog, itemNo);

    if (theDialog->fDone) {
        // we're going away, need to clean up our scroll bar and list
        if (gList) {
            (**gList).vScroll = 0L;
            LDispose(gList);
        }
    }
}
} /* MyJobItems */

```

```

void main(void)
{
    Rect    myWRect;

    InitGraf(&qd.thePort);
    InitFonts();
    InitWindows();
    InitMenus();
    InitDialogs((long)nil);
    InitCursor();
    SetRect(&myWRect,50,260,350,340);

    /* call the routine that does printing */
    PrOpen();
}

```

```
err = Print();

PrClose();
} /* main */
```

Summary

That's all there is to it. Now you can add items to the print dialogs.

Further Reference

- *Inside Macintosh: Imaging With QuickDraw, Chapter 9*
- *Inside Macintosh: Macintosh Toolbox Essentials, Chapter 6*
- PDlog Expand sample code, included with this Technote.
- StdFileSaver sample code, available on the Developer CD Series: Tool Chest Edition.
- *develop 27 - Print Hints: The All-New LaserWriter Driver Version 8.4* by Dave Polaschek.

Change History

Originally written in November 1986, as TechNote #95 "Print Dialogs: Adding Items."

Revised in March 1988, TechNote PR09 "Print Dialogs: Adding Items."

Accompanying code revised by Dave Hersey (1991), Dave Polaschek (1995,1996), Matt Mora (1996) and Ingrid Kelly (1996).

In October, 1996, this Technote was updated to reflect the current Macintosh Printing Manager and to use C code.

Acknowledgements

Special thanks to Rich Blanchard, Paul Danbold, Matt Mora, and Dave Polaschek.