

Αλφα

```
*****  
*                                     *  
*          (C) Copyright IBM Corp. 1992          *  
*                                     *  
*****
```

ALPHA V1.5

Lionel de Lambert - Iunius MMDCCXLIII AUC

IBM United Kingdom Laboratories Ltd.

This document describes the installation, function and commands of the ALPHA code analysis and browse programme which runs under the OS/2 operating system.

The languages supported are :-

370 and 386 assembler, PASCAL(Ada), PL/AS(PL/I, REXX) and C.

Introduction.

This program may be of interest to those people who examine 370, 386 assembler, PASCAL(Ada), PL/AS(PL/I, REXX) and C etc. under OS/2.

This programme will provide basic browse functions for all files with a record size ≤ 132 as well as highlighting specified keywords and allowing user defined **Marker** references and flow lines, and for language files such as 370 & 386 Assemble, PASCAL, C, PL/AS etc. ALPHA will also draw branch flow lines from 'Jump/GOTO' instructions to labels in the same window, will display the programme call structure, and expand the procedure call in a secondary window.

The programme is written in PASCAL and MASM for OS/2 using Presentation Manager calls.

Installation

The minimum requirement is to transfer the binary file 'ALPHA EXEBIN' to a directory on your PS/2 as 'ALPHA.EXE'.

If you want different colours, fonts etc. you can copy the text file 'ALPHA PRF' to the PS/2 as 'ALPHA.PRF' and edit the file. You can also install the 'Alpha' fonts by transferring the binary file 'ALPHA FONBIN' to the PS/2 as 'ALPHA.FON' and using the 'Add font' command of the Installation menu on the 'Control Panel'.

On OS/2 V2.0 select 'System Setup' from 'OS/2 System' and use 'Add' in the 'Edit font' of the 'Font Palette'. If you wish to access files from the host then you should also install ALMCOPY. You can send commands to the host if you also install OS2CMD.

Starting up Alpha

The syntax for starting up the Alpha programme is :-

```
[C:\].<START> ALPHA <file name> </p <profile name>> </m>
```

Where the option **/m** may be specified to cause the programme to be started minimised. This is intended for use in the 'STARTUP.CMD' file as an alternative to having the programme in the "Group - main" window, e.g.

```
START ALPHA /p /m
```

The option **/p** may be specified to cause the file of initial values of colours, font etc. to be read. The default file name for this profile is 'ALPHA.PRF'. This file may be used to set alternative start up values such as the keyword colours. If a file name is not supplied on the OS/2 command line then the first display will ask for the file name to be browsed. The Enter key or **Enter** button should be used to terminate the string, e.g.

C:\WORK\TEST.A37<Enter_key>

If Alpha is minimised or active with or without a file allocated and the file manager window is active then a selected file may be moved from the file manager window by dragging mouse button 2 and releasing it over the α icon or main window. This will cause the new file to be allocated.

note

If the window fails to appear the error, WinGetLastError, is written to the OUTPUT device. This should be directed to a printer or file e.g. ALPHA >PRN | >file_name

Description

This programme may be used to browse any file with a record size ≤ 132 and may also be used with language files such as :-
370, 386 assembler, PASCAL(Ada), C, or PL/AS(PL/I, REXX) programmes etc. on a PS/2 under OS/2 to help in analysing their structure.

The basic browse functions are :-

- 1) Home - Move to top of file
- 2) End - Move to end of file
- 3) Page_up - scroll up 1 screen
- 4) Page_down - scroll down 1 screen
- 5) F7 - scroll up 1/2 screen
- 6) F8 - scroll down 1/2 screen
- 7) F19 (Shift+F7) - scroll left 1/2 screen
- 8) F20 (Shift+F8) - scroll right 1/2 screen
- 9) The Horizontal and Vertical scroll bars.

The mouse button 1 when pressed will isolate the addressed string using ' ', ',', '+' etc. as separators, and highlight it and all references in the window or as the file is browsed.

In **Locate** mode if mouse button 1 is pressed twice (double clicked) then the isolated string will become a search argument. If mouse button 2 is pressed once (clicked) then the next occurrence of the search argument will be located. If mouse button 2 is double clicked then the search will start at the top of the file.

In **Expand** mode if mouse button 1 is double clicked then the search string is assumed to be a label or procedure name and a second window is opened with the procedure code provided the label/routine name can be found.

Search commands may be issued from the command window, which may be invoked by the F6 key or the system menu icon α {Code Page 437; the icon will be \acute{O} for Code Page 850 etc.}. When the main window is displayed keywords which are associated with the file extension will be highlighted using the colours specified in the profile.

Note

Up to 128 language keywords may be specified with their corresponding colour and the length of the record to be scanned. Only the first 16 key words on the line will be highlighted and the search order is the order specified in the profile. The keyword must be ≤ 12 characters.

The **File_type** keyword in the profile may be used to introduce extra file types but the first 5 types are assumed to refer to :- 370 assembler, 386 assembler, PASCAL, PL/AS, and C in that order. With **Flow** on for language files branch flow lines will be drawn from 'Branch/GOTO' instructions to labels in the same window.

If the profile specifies **Read_file**=Yes, the default, then the file may be browsed as soon as the window is opened, performance then improves once the file is read in.

Note

Only the first 132 characters of a record are read. Once the file is read in there is an internal switch over. If a locate etc. was in progress at the time of the switch over the window may not display the line found; it may be necessary to repeat the command e.g.F5.

If the profile specifies **Read_file**=No then only 120 records from the file are read in to storage and scrolling takes place within this buffer unless F4+Ctrl is pressed when the whole file is read in to memory asynchronously. As the file is scrolled up/down extra pages are read in to the buffer. The affect is that on scrolling upwards, after the window is displayed, there may be a pause (hour glass symbol) while extra data is read in.

Small parts (\leq window size) of the file may be remembered and redisplayed by using the Clipboard function. Drag the mouse with button 1 down over the lines to be saved and press Ctrl+Insert to save the highlighted lines. To redisplay the saved lines press Shift+Insert. The lines are displayed from the cursor position onwards. The highlighted records may be printed on LPT1 by pressing Insert+Alt.

Function keys

The following keys are effective for the programme:-

Mouse button 1 will isolate and highlight the text. If button 1 is pressed twice then the highlighted string may then be used as a search argument by button 2.

Mouse button 2 will scan from the current position to the end of file for the locate string, i.e. the string isolated by button 1 or by use of a locate command from the command window (F6). If the mouse button 2 is pressed twice then the scan will start from the top of the file.

F1 is the help key.

F1+Alt will display/hide the current status {The statement number is displayed in the MINMAX menu. **R** indicates that the file is being read in to memory, **S** indicates that the programme structure is being recorded.} of the programme.

F2 will change the font. The System Monospaced font is the default font, unless the Alpha font is installed.

F3 will terminate programme.

F4 will allocate a new file

F4+Ctrl will read the currently assigned file in to memory.

Note

A separate thread is attached to read in the file whilst the file may continue to be browsed within the 120 record buffer. The scrolling of the file will be much faster but there may be some degradation of performance while the file is read in to store. A maximum of 21,844 records can be read in if there is enough memory available. The start of the process is signalled by a 130HZ beep and when the file is read in there is a beep of 1760HZ and 880HZ, provided that "Quiet=No" is specified in the profile.

F5 will repeat the previous command
F6 will issue a command.

Note

This window may also be created from the system menu icon α . A child window is created in to which may be typed the command.

F7 scroll up 1/2 screen.
F8 scroll down 1/2 screen.
F9 switch on/off comment suppression.

A sequence of blank or comment lines will be compressed to a single line of \leftrightarrow provided that the file is read in. The comment lines must begin with characters specified in **Comment_start**.

F10 not used.

F11 not used.

F12 will move the mouse button 1 focus line {The line on which mouse button 1 was last pressed.}

to the centre of screen.

F12+Ctrl will switch on/off the scale line in the centre of the window.

F13 (shift+F1) will display the programme structure.

F14 (shift+F2) will change the text colours.

F17 (shift+F5) will locate the next Marker.

F19 (Shift+F7) will scroll left 1/2 line.

F20 (shift+F8) will scroll right 1/2 line.

F24 (shift+F12) will reset the horizontal scroll, clear line markers etc.

Page_Up will scroll up one page.

Page_Down will scroll down one page.

Home key will move to top of file.

End key will move to end of file.

Insert+Ctrl will place mouse Button 1 drag area in Clipboard.

Insert+Shift will copy Clipboard text to mouse Button 1 position - cursor.

Insert+Alt will write the highlighted records to LPT1.

Delete will remove the highlighted records, mouse button 1 display area, from the window display.

\uparrow and \downarrow keys will move the cursor.

The scroll arrows, slider etc. and Page up or Page down keys may be used for browsing.

Note

If the mouse button 1 is kept depressed then the lines or characters will scroll at 1 per second until the button is released. If the file is not read in then the file size is estimated by adding 1000 every time the internal array is filled. In this case the slider may be move to the end of the vertical scroll bar before end_of_file is reached and then move up.

Enter key will terminate an input string or refresh the screen.

Help window

This window may be invoked by the F1 key or the Help button on the command window.

The window may be scrolled by :-

Page_up - scroll up 1 screen

Page_down - scroll down 1 screen

Home - scroll to the top of the Help data

End - scroll to the end of the Help data

F7 - scroll up 1/2 screen

F8 - scroll down 1/2 screen

The **Page_Up** key word at the bottom of the window will scroll up 1 screen if selected by mouse button 1.

The **Page_Down** key word at the bottom of the window will scroll down 1 screen if selected by mouse button 1.

The Help window may be cancelled by F3, the Cancel button or by Enter.

Allocate window

The File Allocate window will be created by the F4 key or from the Allocate menu item of the command window. The file may be selected from the List box or typed in to the Entry box.

The drive may be changed by selecting [a] from the List box or typing the drive letter followed by a ':' e.g. 'a:' in the Entry box. The Path may be changed by selecting a directory name from the List box or by typing the path name in the Entry box e.g. 'C:\WORK'.

The COMBO box will hold the last three allocate texts which have been entered.

A host file may be received and allocated by entering '>H:fn ft fm PC_file_name'; this string is passed to ALMCOPY {without the '>' and with '/Q' appended} which must be installed on the PS/2. If ALMCOPY fails the return code is displayed in red and the Entry text is left to be edited. If the requested file can not be allocated then the allocate window together with an error message will be displayed.

A host command may be executed by entering '<host command'; this string is passed to OS2CMD {without the '<'} which must be installed on the PS/2.

If the DosExecPgm call fails for either OS2CMD or ALMCOPY then the error code is displayed in black.

Note

If the Allocate window can not be contained in the main window then it will be made sysmodal; i.e. it must be closed before other windows can be used. For 8515 type screens a more suitable value for

the Window keyword in the profile would be Window=(0,60,1000,600) for example.

Command window

This window may be invoked by the F6 key or the system menu icon α .

{Code Page 437; the icon will be \acute{O} for Code Page 850 etc.}

The following commands may be issued :-

+n - scroll down n lines

-n - scroll up n lines

<n - scroll left n characters

>n - scroll right n characters

:n - go to record n

/ - Search for string, not case dependent, from the current position in the file.
" - Search for string, as typed, from the current position in the file
' - Search for string, as typed, from the current position in the file but only in column 1
(s-e)>file_name - will copy records from the current file starting at s and ending with e to the file
file_name. **file_name** may be 'LPT2' etc., an existing file or a new file. If the end record
number
is '*' then the file is copied to end-of-file.
(s-e)- - will remove the records from the window.
↑↓ will cycle through the last 6 commands.
The Delete|Backspace key will delete a character from the input text.

If the first character is invalid then the line will be filled red until it is deleted.
F3 or ENTER will close the window and enter the command.
The cancel button will remove the window; only this child window will receive input until it is
terminated.
The **Flow** button will switch on/off the drawing of flow lines. These lines are drawn for language
files from 'Branch/GOTO' instructions to labels within the window.

The **Expand/Locate** button will switch on/off the label expansion. The isolated label is expanded
by locating the routine and opening a second window containing the code. The mouse button 1
must be pressed twice (double clicked) to cause the label to be located. A depth of 8 expand
windows is allowed, and each window may be scrolled using the scroll bar, Page_Up,
Page_Down, etc.

The file must be read in to storage to use this facility. The Expand window may be closed by F3
or

the **CALL** menu item when the main window will remain at the CALL. If the **Routine** menu is
clicked then the main window will scroll to the expand text, i.e. the called code line may be
passed back to the higher level window. The **Locate** menu or F6 will perform a case sensitive
forward search from the current line+1.

F5 will repeat the previous locate. If Button 2 is double clicked after moving to the expanded
label then the window will be moved back to the previous line, i.e. return to point of call.
The label searched for is succeeded by ":" for PLS and preceded by "FUNCTION" or
"PROCEDURE" in PASCAL. The label searched for is preceded by "char", "extern", "far", "int",
"long", "pascal", "pointer", "short", "static" or "void" if the language type is C.

The **Mark** button will switch on/off the drawing of user flow lines defined by the mouse button 1,
or the setting of a marker. Up to 16 user lines or markers may be associated with the file. If
mouse button 1 is double clicked then a marker will be associated with the line. If mouse button 1
is pressed once then it will delimit the ends of a flow line. The markers or flow lines remain
associated with the record until F24 (Shift+F12) is pressed. The markers enable places within the
file to be remembered and recalled by (Shift+F5).

The **Options** menu may be selected to change the state of the following options :-

Transient Options - reset when a new file is allocated.

Comment Suppression - replace a block of comment lines by one highlighted line of ↔.

Scale - place a scale line in the middle of the window.

Status - indicate in the top left of the window the current status of file reading etc.

Permanent Options - remain set when a new file is allocated.

Quiet - suppress the beep which indicates that the file is read in to storage.

Read_file_when_allocated - when the file has been allocated read it in to storage by attaching a subtask. The file may be browsed whilst this is in progress but the reading of the file in to storage will be slower.

Record_structure - For language files this will cause the recording of the calling structure when the file has been read.

Tab - recognize tab characters, X'09', and skip to n*8.

Proportional - use the font spacing for writing the characters rather than the character size; this will allow proportional fonts to be used however these are not suitable for displaying code.

The **Allocate** menu will create the Allocate window

The **Structure** menu may be used to display the call structure for 370, 386 assembler, PASCAL, C and PL/AS programmes provided that the *Record_structure* option is effective when the file is read in. For 370 assembler the structure is based on BAL, BAS, DFHSTACK, for 386 assembler CALL, PROC instructions, for PASCAL PROCEDURE, FUNCTION, keywords, for C char, extern, far, int, long, pascal, pointer, short, static or void keywords, and for PL/AS PROC, CALL, keywords {Labels ≥ 27 characters are ignored}. If an entry is selected from the *Programme Structure* List Box then the main window is scrolled to that line.

The **Font** menu may be used to dynamically change the font and character size; the change is not saved in the profile.

The **Colour** menu may be used to dynamically change the text colours. The language keyword colours must be specified in the profile.

FONTs

You can specify the initial/default font in the profile by using the **Font** keyword in the profile, or you can change the font dynamically by invoking the Font window.

You can use the System Monospaced, Helvetica, Roman and Courier fonts but the Courier font and the System Monospaced are the only monospaced fonts supplied with OS/2. A monospaced font with point sizes 8,9,10 & 11 is supplied with the ALPHA PACKAGE, which may also be used. The fonts are then requested by specifying **Font**="Alpha", (10) etc. in the profile.

The font type or face_name and size may be selected by the **Font** and **Character_size** keywords in the profile. If a profile is not supplied then the "Alpha", (10) font will be used if it is installed and a character_size of (8,14) else the "System Monospaced", (10) font will be used and a character_size of (8,16). Outline fonts are not selectable.

If the point size is not specified then the font is selected by using the **Character_size**.

Point sizes (1/72") are :-

Courier (8,10,12), Roman (8,10,12,14,18,24),

Helvetica (8,10,12,14,18,24),

System (8,10,12, {8x8, 8x16,9x20),

"Alpha" (8,9,10,11).

If the point size is specified but an image font does not exist for this nominal point size then the outline font, if available, will be used and scaled by the **Character_size**.

The font may be requested by face_name, e.g. Font="Alpha", (8).