
Subject: IDL (Interactive Data Language) FAQ
Posted by [pat](#) on Mon, 17 May 1993 13:22:54 GMT
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This is a list of Frequently Asked Questions about the Interactive Data Language or IDL. These questions pop up fairly regularly in the newsgroup comp.lang.idl-pvwave. This list is an attempt to cut down on net.traffic regarding commonly asked questions. Users are encouraged to read through this list before posting a query to the newsgroup.

A Note from the editor about PV~WAVE:

I do not have any direct experience with PV~WAVE. As such, I will try to minimize comments which appear to favor one package or the other. I will, however, welcome concise descriptions of technical and functional differences between the two packages.

If you are viewing this text in a GNU Emacs Buffer, you can type "M-2 C-x \$" to get an overview of just the questions. Then, when you want to look at the text of the answers, just type "C-x \$".

The following questions are answered:

- G01. What is IDL?
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T15. I get the error message "Code Area Full". What do I do?

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GENERAL:

G01. What is IDL?

IDL is the Interactive Data Language. It is a product of
Research Systems, Inc. (RSI).

The following is quoted from the README file at rsinc.com/pub/idl/README.
As such, it describes IDL's capabilities in an understandably subjective
manner. ;-)

{begin quote}

IDL, Interactive Data analysis Language, is a
complete package for the interactive reduction, analysis,
and visualization of scientific data and images. Optimized
for the workstation environment, IDL integrates a responsive
array oriented language with numerous data analysis methods
and an extensive variety of two and three dimensional
displays into a powerful tool for researchers.

IDL supports an extensive data import capability,
publication quality hard copy output, and user-defined Motif
graphical user interfaces.

Users can create complex visualizations in hours
instead of weeks with the aid of IDL's high level capabilities
and interactive environment.

IDL is useful in physics, astronomy, image and
signal processing, mapping, medical imaging, statistics,
and other technical disciplines requiring visualization of
large amounts of data.

{end quote}

Here is a short history of RSI:
[attributed to ali@rsinc.com (Ali Bahrami)]

{begin quote}

IDL is a product of Research Systems, Inc., founded in 1977 by David Stern. The origins of IDL were developed at the Laboratory for Atmospheric and Space Physics (LASP) at the University of Colorado. David was one of the people involved in efforts to make computers easier to use for the physicists at the Lab. The first program in the evolutionary chain to IDL was named Rufus (named after Dave's dog). Rufus was a very simple vector oriented calculator that ran on the PDP-12. It accepted 2 letter codes that specified (1) An arithmetic operation (2) The input registers to serve as operands, and (3) the destination register. The next version was the Mars Mariner Spectrum Editor (MMED) which was a version of Rufus that ran on the PDP-8.

The next program in this line was named SOL, and it also ran on the PDP-8. Unlike its predecessors, SOL was a real computer language with a real syntax (no more 2 letter codes). It was an APL influenced array oriented language with some primitive graphics capabilities. The resemblance to IDL was there, but very faintly.

In 1977, Dave left LASP to start Research Systems Inc. (RSI) with the intention of building on the ideas contained in SOL. The initial result of this endeavor was PDP-11 IDL, which was much more capable than SOL. Graphics was usually done on Tektronix terminals and outboard raster graphics displays. I used this version at LASP in 1981 on a PDP11/34 under RSX-11M in 1981 (I worked as a student at LASP from 1981 to 1987). I didn't use it for very long though, because 1981 was the year that Dave released the VAX/VMS version of IDL. This version, which was written in VAX-11 MACRO and FORTRAN, took advantage of the VAX virtual memory and 32-bit address space, and was a huge step beyond the PDP-11 version. It used essentially the same sort of graphics hardware as the PDP-11.

In 1987, Dave decided that Unix workstations were the direction in which IDL should progress, but porting the current VAX IDL to Unix didn't make much sense because of its MACRO and FORTRAN implementation. I had just finished my Masters degree and was looking for work. Dave hired me and together we wrote the current version of IDL for Unix on the Sun 3 taking advantage of the re-write to extend and improve the language. Since then, we've ported it to many Unix machines and moved it back to VMS. RSI has many other employees now, but our focus is still the continued development of IDL. Recently, IDL was ported to PC class systems running Microsoft Windows.

{end quote}

G02. Where can I contact them?

Their address is:

Research Systems, Inc.
777 29th Street, Suite 300
Boulder, CO 80303
(303) 786-9900 (Voice)

Email:

info@rsinc.com or support@rsinc.com # Internet
ORION::IDL # SPAN

G03. How do I get IDL?

RSI's distribution scheme is unique in that all of the binaries and IDL you need are available via anonymous ftp. IDL binaries and code are available at these sites:

gateway.rsinc.com (192.5.156.17)
pub/idl
boulder.colorado.edu (128.138.240.1)
pub/idl
lumpi.informatik.uni-dortmund.de (129.217.36.140)
pub/idl

The README file describes which files are needed, how to unpack them, and how to install them.

If you install IDL without a valid license, you will get IDL's 7 minute demo mode. This mode is designed for users who are considering buying the package.

To actually get IDL running for good, you must pay for a license from RSI and follow their instructions. You will be asked to fill out a form with information unique to your machine. RSI will create a license key which the license manager program (lmgrd) reads to validate your license.

[Rumor has it that RSI's distribution scheme is soon going to change in a big way. -pat]

For more details, contact RSI.

G04. What is the current version of IDL?

Version 3.0.0 is the current version. The next release is expected

around May, 1993.

G05. On what systems does IDL run?

The information below is from the file RELEASE_LEVEL located at
rsinc.com:/pub/idl/RELEASE_LEVEL:

{begin quote}

This release supports the following systems:

- Convex C2 and C3: ConvexOS 10.0.5.
 - Data General Aviiion: DG/UX 5.4.1 and later
 - HP 9000: HP-UX 8.0 on Series 300, 400 and 700.
 - IBM 6000: AIX 3.2.
 - MIPS: Risc/OS 4.52B.
 - Risc Ultrix: Ultrix 4.2.
 - SGI: IRIX 4.0
 - Sun 3: SunOS 4.1.0. Widgets are built using OpenWindows 2.0.
 - Sun 4 (sparc): SunOS 4.1.0. Widgets are built using OpenWindows 3.0.
 - VAX/VMS: The standard release which does not include widgets requires VMS 5.1 or later. The version including widgets requires VMS 5.4.
 - DOS based personal computers running Microsoft Windows 3.1
- {end quote}

There is also a version of IDL which runs on DEC Alphas under OpenVMS 1.0.

[This information received 4/6/93. -pat]

{begin quote}

The IDL port is now available for SUN Solaris 2.1 and for the DEC Alpha machine running OSF/1.

If you have questions or need more information please send e-mail to
info@rsinc.com or call Research Systems, Inc. at (303) 786-9900.

□ This special release is for these two platforms only and is known as IDL 3.0.2. It isn't compatible with the current 3.0.0 release, and can't be combined.

□ These platforms will be fully integrated into the next full IDL release, due in late May.

□ This release is available on the internet for anonymous FTP from our gateway in pub/idl_3_0_2. It is also available from

boulder.colorado.edu in pub/idl/SOLARIS_AND_ALPHA.
{end quote}

G06. What is PV~WAVE and how is it related to IDL?

Around the time that the Unix version of IDL first became available (1988), Precision Visuals Inc. (PVI) entered into an agreement with RSI under which they enhanced and resold IDL under the name PV~WAVE. In September of 1990, they exercised an option in that agreement that resulted in the following:

- They received a copy of the IDL source code as it existed in September 1990 in return for a one-time payment to RSI.
- The connection between RSI and PVI was severed.

IDL and PV~WAVE are now on separate development tracks. Each company enhances, supports, and maintains its own product.

PVI has since merged with IMSL and is now Visual Numerics, Inc. (VNI).

G07. Are there anonymous FTP sites for IDL?

The sites below contain public domain IDL code.

JHU/APL IDL library
fermi.jhuapl.edu [128.244.147.14]
/pub/idl-pvwave/jhuapl

NASA IDL Astronomy User's Library
idlastro.gsfc.nasa.gov [128.183.57.82]
/

IUE RDAF library
iuesn1.gsfc.nasa.gov [128.183.57.16]
cetus.colorado.edu [128.138.238.151]
/pub

ICUR Spectral Analysis Software
ftp.astro.psu.edu [128.118.147.28]
/pub/neffftp/icur

IDL ROSAT software
rosserv.gsfc.nasa.gov [128.183.8.43]
/pub/IDL

IDLmeteo library
ftp.sma.ch (141.249.3.33)
/pub/idlmeteo

G08. How can I get help?

RSI has excellent telephone and email support. You can contact them at:

(303) 786-9900 (Voice)
(303) 786-9909 (Fax)

Email:

info@rsinc.com or support@rsinc.com # Internet
ORION::IDL # SPAN

Keep in mind, however, that their phone support is primarily for their paying customers.

G09. Why are there two newsgroups for IDL?

Unfortunately, there are two very different packages with the abbreviation "IDL". The newsgroup comp.lang.idl is for the Interface Description Language. The newsgroup for discussing issues related to RSI's IDL and VNI's PV-WAVE and IMSL/IDL is comp.lang.idl-pvwave.

G10. Does anyone at RSI read this group? Is anyone there listening?

[This question was included at the request of RSI. The answer was provided by Ali Bahrami. -pat]

{begin quote}

Yes, many of us do. We're naturally curious what people think of our product. We make notes about what people like and dislike and this influences our decisions.

However, you usually won't get a direct response from us from a posting to this group. There are many reasons for this. Here are a couple of the more important ones:

[] We believe that this group should belong solely to the user community, and should be free of vendor bias and marketing. It should be noted that both RSI and Visual Numerics (formerly PVI) have shown great restraint in this matter, and that this group is largely left to the actual users. (Long term readers will recall some notable exceptions

to this, but in general it is true.)

It could be argued that as long as the topic stays technical, vendor postings are OK. The problem with this is that one persons technical posting is another's blatant product plug, and the line between them is not always obvious.

[] We provide support for our customers via the phone and email. If you would like an answer from us, you should call us directly. We have no objection to you sharing the information you get in this manner with the newsgroup as long as you quote us accurately and separate fact from conjecture.

In other words, you should view this newsgroup as a way to share questions and information with other users, not as a way to contact the vendor.

{end quote}

G11. When is the next version of IDL due out?

IDL 3.1 is due out sometime in June. The following information about comes directly from RSI.

{begin quote}

WHAT'S NEW IN IDL 3.1

This file describes the major changes and additions to IDL in version 3.1. For a more detailed list of changes, see the file "rel_note.doc" in the "notes" subdirectory of the IDL distribution.

Note that complete documentation for new routines and features can be found in the online help, IDL User's Guide, and/or IDL Reference Guide.

NEW MAJOR FEATURES

CONTOUR IMPROVEMENTS

Extensive revisions and improvements have been made to the CONTOUR procedure. CONTOUR can now create filled contour plots with a single command. Regions can be filled with either solid color or lines. The orientation and spacing of fill lines can be controlled with the C_ORIENTATION and C_SPACING keywords. Set the FILL keyword to create a filled contour plot. This functionality makes the POLYCONTOUR Users' Library routine obsolete.

Also, to make the direction of grade more obvious, perpendicular tick marks can be drawn pointing in the downhill direction by setting the DOWNHILL keyword.

The format of the file written by the PATH_FILENAME keyword has been changed slightly. The XY values are now written as the n X values followed by the n Y values. Previously, the XY values were interleaved.

The SPLINE keyword has been removed. In its place, use the MIN_CURVE_SURF user library function to smooth relatively small arrays. See the online help for complete documentation on MIN_CURVE_SURF.

See the online help or IDL Reference Guide for complete documentation for CONTOUR.

!PATH BEHAVIOR CHANGED

When IDL encounters a procedure or function call that it doesn't know, it searches the directories specified by the !PATH system variable for a .PRO file with that name. If no .PRO file is found, IDL searches for a .SAV file (an IDL SAVE/RESTORE file) of the same name in the hopes that restoring that file will define the needed routine.

This behavior is described in more detail on p. 2-13 of the June 1993 edition of the IDL User's Guide.

Note also that a new system function, EXPAND_PATH, can be used to simplify the specification of paths to be searched.

!HELP_PATH SYSTEM VARIABLE

The new system variable !HELP_PATH lists those directories where IDL should look for online help files. The same rules for syntax used for !PATH apply. Previously, the help subdirectory of the IDL distribution was the sole place searched. This change allows users to have their own help files without having to put them in the IDL distribution.

A environment parameter, IDL_HELP_PATH controls the value of !HELP_PATH at startup.

Complete documentation for this feature can be found on p. 2-21 of the IDL User's Guide.

NESTED CALLS TO EXECUTE

The EXECUTE function now allows nested calls to EXECUTE, removing the previous restriction that EXECUTE could not call a routine that used EXECUTE.

KEYWORD INHERITANCE

"Keyword inheritance" allows IDL routines to pass keyword parameters not defined in their declaration on to routines that they call. This feature greatly simplifies writing "wrapper" routines (variations on a system or user-provided routine).

If a routine is defined with a formal keyword parameter named "_EXTRA", pairs of unrecognized keywords and values are placed in an anonymous structure. The name of each unrecognized keyword becomes the tag name, and its value is the tag value.

A complete description and example of keyword inheritance can be found on p. 10-5 of the IDL User's Guide.

WDELETE AND WSHOW AFFECT DRAW WIDGETS

WDELETE and WSHOW now work with draw widgets on all platforms. If the argument sent to either of these procedures is the Widget ID

of a draw widget, the top level base for that widget is either destroyed (WDELETE) or brought to the front of the screen (WSHOW). Previously, this behavior was only seen in IDL for Windows.

ISO LATIN 1 FONT ENCODING

Added support to the PostScript driver for fonts using the Adobe ISO Latin 1 font encoding. Setting the ISOLATIN1 keyword causes IDL to use this encoding with any font that works with it. Use of the ISOLatin1 encoding allows rendering characters commonly found in Latin languages other than English. Two new user library procedures accompany this new feature:

PS_SHOW_FONTS - Display all the PostScript fonts that IDL knows about, with both the StandardAdobe and ISOLatin1 encodings. Each display takes a separate page, and each character in each font is shown with its character index.

PSAFM - Converts a standard Adobe AFM file to one more to IDLs liking. The AFM files in the ps subdirectory of the IDL distribution were all generated by PSAFM.

OBLIQUE SLICING

The IDL SLICER Widget Library procedure can now render oblique planes (i.e., planes at any angle through the volume).

NEW RPC EXAMPLE FILES

Any machine-specific RPC Makefile dependencies have been put into separate "XXX.def" files which are included in the Makefile (located in the "rpc" subdirectory of the distribution). This makes it easier for users to compile.

A new example (idl_client.c in the "examples" subdirectory of the "rpc" subdirectory) shows how to access an RPC server from IDL (i.e., how to use IDL as an RPC client). Also included is an example server (fake_server).

SCIENTIFIC DATA FORMAT EXAMPLES

A new subdirectory, called "data_fmt" has been added to the "misc" subdirectory. The "data_fmt" directory contains a number of examples that illustrate the use of the CDF, netCDF, and HDF interfaces.

GRAPHICS CAPTURE TO CLIPBOARD IN IDL FOR WINDOWS

IDL graphics can now be captured to the Microsoft Windows clipboard. Access this feature through the edit menu or type Ctrl-G. The palette and bitmap are copied separately. The interface asks the user to double-left-click on the appropriate window.

DYNAMIC DATA EXCHANGE CLIENT CAPABILITY IN IDL FOR WINDOWS

IDL for Windows now supports DDE *client* capability. This only works for *cold* DDE links. A number of new system calls, described in the IDL for Windows Installation Instructions and Release Notes, have been added to support this feature.

NEW BUILT-IN (SYSTEM) ROUTINES

See the online help and/or IDL Reference Guide for complete documentation on the new system routines listed below.

SYSTEM FUNCTIONS FOR ROUNDING

CEIL returns the closest integer greater than or equal to x.
FLOOR returns the closest integer less than or equal to x.
ROUND returns the closest integer to x.

EXPAND_PATH

EXPAND_PATH accepts a path-definition string (a scalar string argument that could be used for the IDL_PATH or IDL_HELP_PATH environment variables), and returns an expanded string, suitable for assignment to the !PATH or !HELP_PATH system variables.

GRID3

The GRID3 converts 3-dimensional irregularly-gridded data to a regular grid.

----- NEW USERS' LIBRARY ROUTINES -----

See the online documentation (the ? command) for complete documentation on these new Users' Library routines.

READ AND WRITE MICROSOFT WINDOWS BITMAP (.BMP) FILES

READ_BMP and WRITE_BMP allow you to read and write Microsoft Windows device-independent bitmap files (.BMP files).

MINIMUM CURVATURE SURFACE

The MIN_CURVE_SURF function fits a minimum curvature spline surface to a set of regularly or irregularly-gridded points. When used with the CONTOUR procedure and with low resolution arrays, this function produces more accurate and pleasing results than using the SPLINE keyword to CONTOUR.

NEW PULL-DOWN MENU COMPOUND WIDGET

A new Widget Library routine, CW_BSELECTOR, is a compound widget pull-down menu who's button label shows the menu item currently selected, creating a widget similar to an MS-Windows "combo" control.

FIND A SPHERE GIVEN 4 POINTS

The SPH_4PNT routine returns the center and radius of a sphere, given 4 points on the sphere's surface.

EASY CREATION OF ANONYMOUS STRUCTURES

The CREATE_STRUCT function creates an anonymous structure given pairs of tagnames and values, and also concatenates structures. Tagname parameters can be either scalar strings or string arrays.

FIX FOR ULTRIX XDR FILES FROM V. 3.0.0

In IDL 3.0.0 for the Ultrix DecStation, all XDR output of double-precision floating-point data has its least and most significant longwords reversed. This presents no problem as long as such files are only used on these machines. However, XDR files with double precision data cannot be moved between these machines and others without conversion using the new library procedure MIPSEL_DBLFIXUP to correct existing files containing such data.

This error exists in version 3.0.0 of IDL only. All other versions of IDL on the DECstation work correctly. This bug was introduced while correcting the similar bug described on 11/12/92.

IDL uses XDR for Save/Restore files, and for files opened

with the XDR keyword to OPENR, OPENW, and OPENU.

NEW KEYWORDS TO EXISTING ROUTINES

This section lists new keywords for existing built-in routines. See the online help or the IDL Reference Guide for complete documentation of these new keywords.

COLOR_QUAN

New keywords allow the use of the same color mapping for a series of images:

GET_TRANSLATION
TRANSLATION
MAP_ALL

DEFSYSV

Set the EXISTS keyword to sense if the specified system variable has already been created.

DEVICE

The SET_CHARACTER_SIZE keyword (available to all graphics devices) can be used to set an arbitrary character size.

The CURSOR_IMAGE and CURSOR_MASK keywords allow the use of custom cursors with the X Windows DEVICE command.

HISTOGRAM

The INPUT keyword sends an array to be added to the output of HISTOGRAM. Use this keyword to perform multiple histograms.

The REVERSE_INDICES keyword returns a list of lists containing, for each histogram bin, the subscripts of the original array

contributing to that bin.

IOCTL

The following keywords have been added for use with magnetic tape:

MT_OFFLINE, MT_REWIN, MT_SKIP_FILE, MT_SKIP_RECORD,
MT_WEOF

OPEN

The NOSTDIO keyword has been added for working with magnetic tape.

READU and WRITEU

The TRANSFER_COUNT keyword returns the number of elements actually transferred by an I/O operation.

SHADE_SURF

The MAX_VALUE keyword allows the creation of missing data plots.

SPAWN

The NOTTYRESET keyword allows the use of spawn on displays that suffer from dropped characters.

SURFACE

The SHADES keyword allows a multi-colored mesh.

WIDGET_CONTROL

The WIDGET_TIMER keyword replaces the background task functionality in XMANAGER.

The NO_COPY keyword can be used to set and get uservalues without duplicating memory.

The TLB_SET_TITLE keyword allows the title of a top level base to be changed.

NEW UPDATE POLICY

RSI is implementing a new telephone support and update policy with the release of IDL 3.1. In the past it was possible for users who did not purchase a maintenance contract to receive the latest version of the software simply by downloading it over the network. The newest IDL version would run with old license files. That is no longer the case, beginning with IDL 3.1.

Users may still download the latest version of IDL from the Network, but IDL 3.1 will not run with old license files. Users who have current maintenance and support contracts on their IDL licenses will receive new license files at no charge simply by asking for them.

Users who do not have support contracts and who wish to update to IDL 3.1 must purchase an update contract for each IDL license they wish to update. An update contract entitles you to free maintenance updates (what we think of as bug fixes and other minor updates) at no

additional charge for a period of one year for that license. Users having an update contract will be entitled to substantial discounts on major IDL

updates if one should occur during the year in which they have a contract.

The price of a update contract depends upon which machine version of IDL you are updating. IDL for Windows updates will be \$150. IDL updates for most Unix platforms will be \$250. IDL updates for DEC workstations will be

\$450. Users do not have to update to IDL 3.1, nor do they have to update all of their licenses to IDL 3.1. Only the licenses that are updated will run IDL 3.1. There will be no discounts for multiple licenses.

Telephone support will be priced separately at \$200 per person per year. To ensure quality phone support for our paying customers, RSI Technical Support Engineers will, beginning June 2nd, only answer telephone and email questions from those customers who have purchased a support contract. (New IDL workstation licenses will still come with six months of update maintenance and phone support.) There will be a requirement that at least one person at an installation site have a

current telephone support contract in order to purchase an update for

a license at that site.

The purpose of our new update and support policy is to make it possible for us to continue to provide quality technical support for IDL on multiple platforms and to continue to add to and improve IDL. RSI is moving forward with new ports (e.g., the Macintosh), new services (e.g., IDL Training and Smart Start Consulting), new products (to be announced this summer) and a new building (somewhere in Boulder) so that we can be the leader in data analysis and visualization software.

{end quote}

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TECHNICAL QUESTIONS:

Note for Sun users:

There is a mini FAQ for Sun IDL in \$IDL_DIR/notes, and the following questions are answered in the file openwin3.doc:

- (1) IDL complains about missing fonts when creating widgets.
- (2) IDL complains about missing bitmap files when creating widgets.
- (3) How to make IDL work with OpenWindows version 3.0.
- (4) 3-D appearance for OpenLook IDLwidgets.
- (5) Why does one of the widgets appear red?
- (6) Why does pressing the left button while pointing at a pulldown menu button cause the menu to pop up with the pushpin in? Older versions of IDL didn't to that.
- (7) The font used by the list widget is much larger than it used to be, and I don't like the result on my program.
- (8) Why do I get "Cannot allocate colormap entry" errors, and why do they kill IDL?
- (9) I've changed my .Xdefaults file, but nothing different happened. Why?

T01. Why doesn't polycontour fill open contours?

This problem is described in the POLYCONTOUR manual page.

{begin quote}

RESTRICTIONS:

This routine will NOT draw open contours. To eliminate open contours in your dataset, surround the original array with a 1-element border on all sides. The border should be set to a value less than or equal to the minimum data array value.

For example, if A is an (N,M) array enter:

```
B = REPLICATE(MIN(A), N+2, M+2) ;Make background  
B(1,1) = A ;Insert original data  
CONTOUR, B, PATH=Filename ... ;Create the contour file.  
{end quote}
```

Sources at RSI tell me that they are aware of the problem. It may or may not be fixed in the next release. It will probably take the form of a new version of CONTOUR that has a parameter to turn on filled contours.

T02. How do I increase the number of commands stored in the history buffer?

The system variable !EDIT_INPUT controls command recall. By default, it is set to 1, causing the last 20 commands to be saved. If it is 0, no commands are saved. To save more than 20 commands, just put !EDIT_INPUT=50 (or other large number) in your startup file.

It is important to realize that IDL looks at the value of !EDIT_INPUT the first time it reads anything from the keyboard, and the size of the history buffer is fixed after that. Hence, the command must be in a startup file because entering it at the keyboard is too late.

T03. How do I get IDL to call routines in language X, running under system Y?

Jeff Valenti has written a sizable document about calling external FORTRAN routines from IDL. You can find it at jaameri.gsfc.nasa.gov/pub/idl/idl-fortran.

T04. Why does XPALETTE edit my color table incorrectly?

Here is the answer from RSI support:

```
{begin quote}  
The color applications such as xpalette and xloadct use a common block  
called "colors" to keep track of the color vectors. When you call tvlct,  
your vectors are loaded into the colormap, but they are not put into the  
colors common block.
```

When xpalette starts, it checks to see if the colors have been defined in the common block and uses them if they have. Otherwise it sets them to the standard black and white colormap, in which r,g,b are each linear ramps. (The colors are as you expect because there is only one colormap.)

Admittedly, this is not the most desirable situation. You would like

your colors which you loaded with TVLCT to be recognized by xpalette. We modified xpalette (and xloadct) to use the current colormap when they start up by getting the current vectors with TVLCT.

Another alternative would be to use the following lines to define the common block prior to calling your current version of xpalette.

[assume here that you have a routine called "restore" which reads colors from a file somewhere and creates vectors r, g, and b. -pat]

```
IDL> restore, file='ryan.sav', r, g, b ;get the vectors from somewhere
IDL> tvlct, r, g, b
IDL> common colors, r_orig, g_orig, b_orig, r_curr, g_curr, b_curr
IDL> r_orig = r & r_curr = r
IDL> g_orig = g & g_curr = g
IDL> b_orig = b & b_curr = b
IDL> xpalette
```

{end quote}

T05. Is there on-line help for IDL?

Try ?.

T06. I run IDL under X in SunOS 4.x, and after I logout, the screen becomes completely blank. Typing in login names and passwords 'blindly' logs you in again with the 'correct' colors. How to prevent this?

[Note: This is only a problem under OpenWindows2. -pat]

Add the following to your .Xdefaults:

```
Idl*colors: -5
```

which reserves some colors for the colormap so that IDL does not exhaust all the available colors. (For a nice summary of Sun IDL interactions with OpenWindows, see \$IDL_DIR/notes/openwin3.doc)

Another solution is to put a call to clear_colormap in your .login file to be executed after OpenWindows start up.

T07. Sometimes my variables seem to disappear. Why is this?

Quoting the IDL User's Guide, page 10-8:

{begin quote}

IDL users may find that all their variables have seemingly disappeared

after an error occurs inside a procedure or function. The misunderstood subtlety is that after the error occurs, IDL's context is inside the called procedure, not in the main level. Typing RETALL or RETURN will make the lost variables reappear.

RETALL is best suited for use when an error is detected in a procedure and it is desired to return immediately to the main program level despite nested procedure calls. RETALL issues RETURN commands until the main program level is reached.

The HELP command can be used to see the current call stack (i.e., which program unit IDL is in and which program unit called it).
{end quote}

T08. Is there a major mode for editing IDL code in Emacs?

No and yes.

VNI has developed a PV~WAVE major mode, which they have made available under the FSF copyleft. Given the (remaining) strong similarity between PV~WAVE and IDL, it has many of the features that one would like in such a mode.

It is available by anonymous ftp from ftp.pvi.com (128.138.213.22) in the ./PVI/emacs directory

[wave-mode.el seems to work pretty well. Be warned, however, that it is a memory hog and it will do a lot of garbage-collection. -pat]

T09. How do I get 3-D widgets under OpenLook 3.0?

This subject is discussed on page 53 of the OpenWindows Version 3 User's Guide Release Manual.

OpenWindows 3.0 added 3-D appearance for widgets. In order for the 3-D look to work, it must be enabled and the background color must be a medium tone color such as "grey" or "wheat".

Add the following resources to your ~/.Xdefaults file:

For plain IDL:

```
Idl*threeD: TRUE
Idl*background: PeachPuff2
```

For IMSL/IDL:

```
Imslidl*threeD: TRUE
Imslidl*background: PeachPuff2
```

T10. Why does one of the widgets appear red under OpenWindows?

This subject is discussed on page 53 of the OpenWindows Version 3 User's Guide Release Manual.

The OLIT widget toolkit, which is used by IDL, added the concept of "mouseless focus" under version 3.0. The red widget indicates where the current mouseless focus is. Use the arrow keys to traverse the widgets, and the spacebar to make a selection.

T11. Where are all the IDL routines and userlib procedures?

The basic routines are not accessible, for obvious reasons. The userlib, statlib and widget procedures are in \$IDL_DIR/lib/. The procedure XDL also displays the full pathname. The system variable !path also contains the directory names for all accessible IDL procedures.

T12. Does anybody know how to put multiple image plots on one page in PostScript?

Because PostScript has scalable pixels, you must specify the xsize and ysize parameters, as well as the position parameter, in TV or TVSCL. I don't know about PV-Wave, but the following works in IDL:

```
; Display four images in a 2x2 grid
; Assume data(x,y,4) = array containing the 4 images

set_plot, 'ps'      ;request PostScript output
device, ...         ;modify page size, orientation, etc. as desired
ximsize = 0.5*!d.x_size ;define output image size
yimsize = 0.5*!d.y_size ;note: 0.5 assumes 2x2 grid
for i=0,3 do begin  ;display the 4 images, using i as position index
    tv, data(*,*,i), i, xsize=ximsize, ysize=yimsize
endfor
```

T13. Does case matter in IDL?

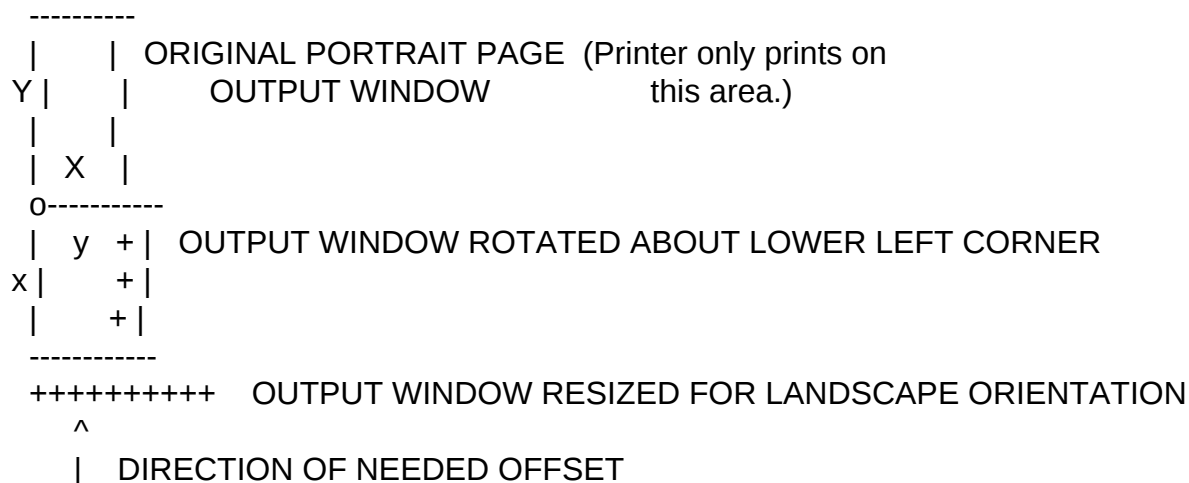
No.

Compiled routines are case insensitive. The only catch is that, on Unix systems, when executing a script via the .RUN command, the file name argument must exactly match the file name as it appears on the disk. Once the routines in the script are compiled, their names can be written in any case. This is not a problem in operating systems such as VMS that do not distinguish case for file names. This is usually not a problem under Unix either since, by convention, most people use lower case file names.

T14. How do I set up IDL to get precise control over plot window and text positioning with either portrait or landscape page orientation on a PostScript or HP-GL printer?

(This answer only applies to PostScript and HP-GL printers -- other printers may differ in having the X and Y offsets measured from the upper left corner of the portrait page instead of the lower left corner.)

IDL uses portrait page orientation as a default. (The x axis is along the shorter dimension of the paper.) In portrait orientation the lower left corner of the page is the origin for the XOFFSET and YOFFSET page offsetting keywords of the DEVICE command that determine the origin (lower left corner) of the output window. (Normally one uses XOFFSET=0 and YOFFSET=0 for portrait orientation.) Size of the output window is determined by the XSIZE and YSIZE keywords of the DEVICE command. The origin for graph positioning variables !P.POSITION and !P.REGION is the output window origin. X and Y coordinates for portrait page orientation are shown on the sketch below as upper case X and Y.



If device,/landscape is specified, then the output window is rotated 90 deg. clockwise about the lower left corner of the page. In this condition nothing will be plotted on the page, since the rotation has carried the output window entirely off the paper as shown in the sketch above. To correct this mismatch, the rotated output window must be offset. XOFFSET AND YOFFSET are still measured in the X and Y coordinates of the portrait page, but now represent the position of the lower left corner of the rotated (and resized) output window (marked by an o above) with respect to the lower left corner of the portrait (actual) page. Hence, one generally uses XOFFSET=0 and YOFFSET=long_dimension_of_page for landscape orientation.

In landscape orientation, the coordinates for graph positioning variables !P.POSITION and !P.REGION are the lower case x and y coordinates shown in the sketch above and having origin marked by the letter o. Position of output window origin o on the page is, of course, affected by the setting of XOFFSET and YOFFSET, as explained before. The XSIZE and YSIZE (output window size) keywords of the DEVICE command are also measured in the x and y directions when in landscape orientation. The resizing of the landscape page generally means interchanging the values of XSIZE and YSIZE appropriate for the portrait page.

Example of settings for a portrait page:

```
XPAGE=8.5 & YPAGE=11. & XOFFS=0. & YOFFS=0. ;Inches
DEVICE,/INCHES,XSIZE=XPAGE,YSIZE=YPAGE,XOFFSET=XOFFS,YOFFSET=YOFFS
```

Example of settings for a landscape page:

```
XPAGE=11. & YPAGE=8.5 & XOFFS=0. & YOFFS=XPAGE ;Inches
DEVICE,/LANDSCAPE,/INCHES,XSIZE=XPAGE,YSIZE=YPAGE,XOFFSET=XOFFS, $
YOFFSET=YOFFS
```

Example of setting position and size of a plot window:

```
X0=1.374 & Y0=1.283 & XLEN=3.622 & YLEN=6.157 ;Inches
!P.POSITION=[X0/XPAGE,Y0/YPAGE,(X0+XLEN)/XPAGE,(Y0+YLEN)/YPAGE]
```

Example of setting position and orientation of a text string:

```
x0=.35 & y0=.37 ;Inches
xyouts,x0/xpage,y0/ypage,!stime,orient=90,/normal ;Date, time
```

T15. I get the error message "Code Area Full". What do I do?

IDL sets aside a certain amount of memory area for compiling programs. The current code and area sizes can be seen with the HELP command, e.g.

```
IDL> help
% At $MAIN$ .
Code area used: 0% (0/16384), Symbol area used: 0% (2/4096)
```

These sizes can be increased with the .SIZE command. Quoting the IDL User's Manual, page 2-11:

{begin quote}

These sizes represent a compromise between an unlimited program space and

conservation of memory. User procedures and functions are compiled in this large program area. After successful compilation, a new memory area of the required size is allocated to contain the newly compiled program unit.

Resizing the code and data areas erases the currently compiled main program and all main program variables. For example, to extend the code and data areas to 30000 and 5000 bytes respectively:

```
.SIZE 30000 5000  
{end quote}
```

Getting "Code Area Full" is often an indication that the routine is large, and would benefit by decomposition into sub-procedures/functions. It's better to avoid use of .SIZE because your code will always work on other systems where the users don't use a large .SIZE setting.

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This file can always be found at jaameri.gsfc.nasa.gov [128.183.88.75] in pub/idl/idl-faq.

Additions and corrections should be sent to:

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