

**TEXAS A&M UNIVERSITY  
PETROLEUM ENGINEERING**

**ECLIPSE**

**(HOW TO USE IT - THE FIRST START)**



Prepared by: Manuel RODRIGUEZ, January 1998

Updated by: Eric Laine, August 1998 and December 1999

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## **1.- OVERVIEW**

ECLIPSE 100 is a fully-implicit, three phases, and three dimensional, general purpose black oil simulator with gas condensate options. The program is written in FORTRAN77 and operates on any computer with ANSI standard FORTRAN77 compiler and either virtual storage or sufficient real storage.

Ancillary programs included in ECLIPSE 100 package are:

- |           |   |
|-----------|---|
| 1. EDIT   | a screen editor specially designed for ECLIPSE data preparation.    |
| 2. FILL   | a corner-point geometry pre-processor & sparse-data array builder,  |
| 3. GRAF   | a device independent graphics post-processor.                       |
| 4. GRID   | an integrated map and (corner-point) simulation-grid package.       |
| 5. OFFICE | a Windows application specially designed for ECLIPSE data assembly. |
| 6. PSEUDO | a three dimensional pseudo function generator.                      |
| 7. PVTi   | a PVT package for converting lab results into the ECLIPSE format.   |
| 8. VFPI   | an interactive program for wellbore hydraulics calculations, and    |
| 9. VI     | a generic line editor available with all UNIX operating systems.    |

ECLIPSE uses fully-implicit method to provide stability over long time steps. Care is taken to ensure that the non-linear fully-implicit equations are solved precisely by reducing all residuals to very fine tolerance. Material balance errors are extremely small. Newton's method is used to solve the non-linear equations. The Jacobian matrix is fully expanded in all variables to ensure quadratic (fast) convergence. Various special methods are used to accelerate convergence in highly non-linear problems. The linear equations arising at each Newton iteration are solved simultaneously by Nested Factorization accelerated by Orthomin.

Although the Fully Implicit method is the standard solution procedure used by ECLIPSE it sometimes advantageous to use IMPES (Implicit Pressure Explicit Saturation) method, and this option is available.

## **2- ANCILLARY PROGRAMS**

Ancillary programs included as parts of ECLIPSE system are describe below.

### **- EDIT (create simulation data files):**

It provides an interactive full screen editor specially designed to simplify the construction of input data files. At the top level EDIT shows an overview of the input file, displaying keywords but not their attendant data. It is then possible to zoom into a selected keyword to display the appropriate data form.

On line access to the EDIT manual may be obtained by entering HELP command displayed at the top or bottom of the screen, where several other menu options are also displayed on the screen.

### **- FILL (assign values to grid blocks):**

Fill is specially designed to interpolate sparse data that may only be known at few points on the grid. Missing Values are "filled" in to generate complete grid data files for ECLIPSE. Furthermore, FILL generates unconventional grid system based on corner point geometry. Sloping displacement faults, scissors faults, distorted wedge shape grids, etc. may be generated easily using FILL.

### **- GRAF (plot results):**

GRAF provides an easy to use, menu driven graphics capability.

Typical uses of GRAF are:

- Line graphics showing, for example, field pressure against time.
- Grid graphics showing the reservoir grid including faults.
- Dynamic solutions displays showing animated color time displays of saturations or pressures etc.

A printed, review-draft version of the new GRAF tutorial is available from Bryan Maggard.

### **- GRID (create maps and reservoir-simulation grids):**

GRID creates and edits property-map contours.

Typical uses of GRID are:

- Import digitized maps
- Edit or create contours

A printed, review-draft version of the new GRID tutorial is available from Bryan Maggard.

- OFFICE (assemble simulation data files):  
It does the same job as EDIT; however, OFFICE was written especially for use with Windows. On line access to the OFFICE manual may be obtained by entering HELP command displayed at the top or bottom of the screen, where several other menu options are also displayed on the screen.
- PSEUDO (adjust relative-permeability curves for coarse grids):  
PSEUDO is the ECLIPSE Pseudo Package for generating coarse grid pseudo functions for low-cost sensitivity
- PVTi (convert lab data to input data):  
PVTi is for building PVT data in the ECLIPSE format. It works for black oil and for compositional simulation. A printed, review-draft version of the new PVTi tutorial is available from Bryan Maggard.
- VFPi (vertical two-phase flow):  
It calculates pressure drops in wells and pipelines, and generates vertical flow performance tables for input into ECLIPSE. The programs contains extensive graphical facilities for examining fluid properties, individual pressure traverses, vertical flow performance curves, and cross sections of vertical flow performance tables. A well IPR can be superimposed on the curves to provide estimated of the flow rate at given set of conditions. Different correlations may be used for different sections of tubing, enabling VFPi to handle horizontal and undulating pipelines as well as vertical well bores and risers. The calculations can include the effects of gas lift, a down-hole pump, a gas compressor, and a surface choke.
- VI (and other text editors):  
VI is a generic, line editor that owes its usefulness to its universal availability on UNIX computers. VI is also an extremely powerful editor. In contrast there are many, fine, newer, easier-to-use full-screen editors. A power-point version of the VI tutorial is available from Bryan Maggard.

### **3- PROGRAMS**

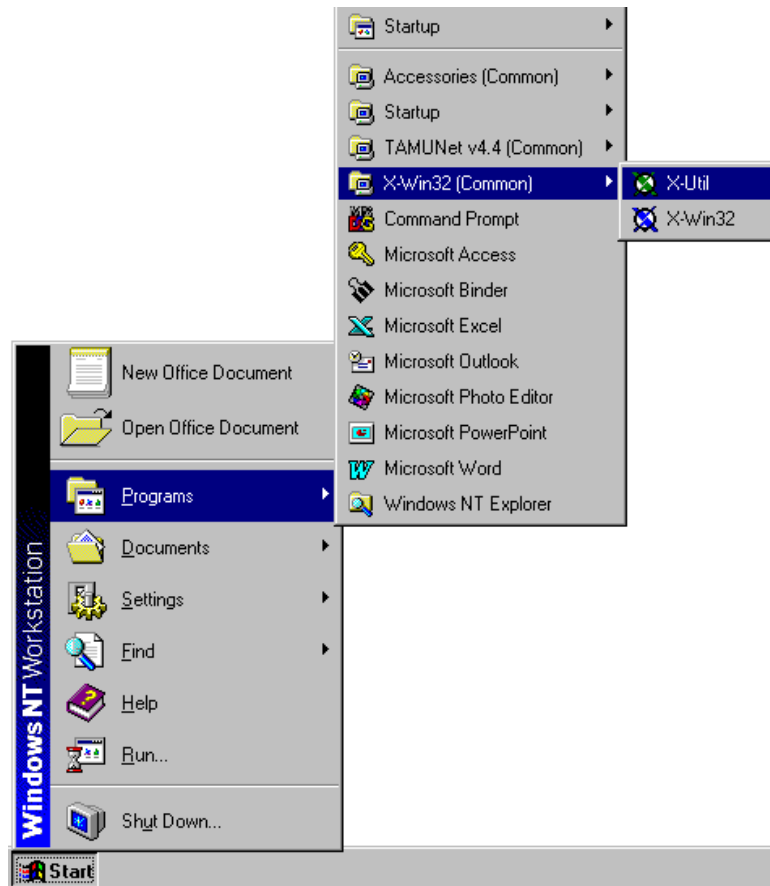
- ECLIPSE 100 (black oil and dry gas):  
It is the most commonly used simulator in the Eclipse family. ECLIPSE 100 models black oil or dry gas. Typical applications are matching production history, prediction oil, gas, and water production rates (or cumulative production), and matching pressure build-up tests are:
- ECLIPSE 200 (special extensions for E100):  
It consists of series of special extensions to ECLIPSE 100 that increase the modeling capability of the program. These are:
 

<ul style="list-style-type: none"> <li>- Polymer Flood Model,</li> <li>- Surface Networks,</li> <li>- Flux Boundary Conditions,</li> <li>- Local Grid Refinement and Coarsening,</li> <li>- Wellbore Friction Option,</li> <li>- Gas Field Operations Model,</li> <li>- Solvent Model,</li> </ul>	<ul style="list-style-type: none"> <li>- GI Pseudo-compositional Model,</li> <li>- Surfactant Model,</li> <li>- Gas Lift Optimization,</li> <li>- Parallel options,</li> <li>- Environmental Tracers,</li> <li>- Coal Bed Methane option,</li> <li>- Reservoir Coupling.</li> </ul>
---	---
- ECLIPSE 300 (compositional):  
It is a compositional simulator with a cubic equation of state, pressure dependent K-value and black oil treatments.  
Adaptive Implicit, IMPES and fully implicit modes are available. The production system model is of the multi-level hierarchical type used in ECLIPSE 100. Controls may be impose at the well, group or field level. Surface rate, reservoir rates, bottom-hole pressures, etc. may be controlled. It is possible to re-inject a fraction of the production of specified well or group. In the compositional case the injected stream may be specified explicitly, or taken from another well or group.
- ECLIPSE 500 (thermal):  
It is a thermal simulator that models the flow of steam as well as the flow of hot or cold water in an oil reservoir. ECLIPSE 500 runs in fully implicit mode. The production system model is the multi-level hierarchy in ECLIPSE 300, with an implicit cross-flow well model. The 96a version of ECLIPSE 500 only models hydrocarbon components in the phase oil. The gas phase is pure steam.

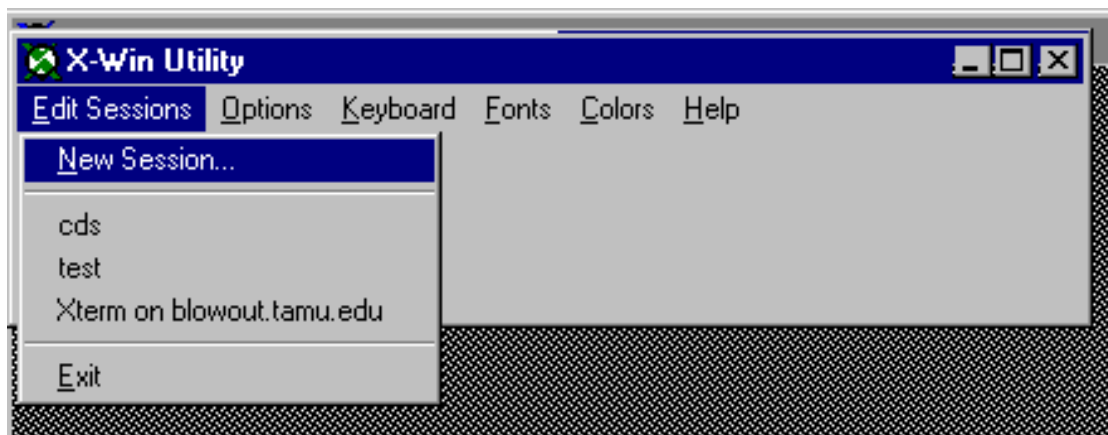
#### **4.- SET-UP YOUR X-Win 32 SESSION (emulate UNIX from a Windows pc)**

This section assumes you have already installed X-Win32 on your pc. Once installed, X-Win32 still needs a session customized for you and your pc. You only need to do this once. Thereafter you can skip this procedure.

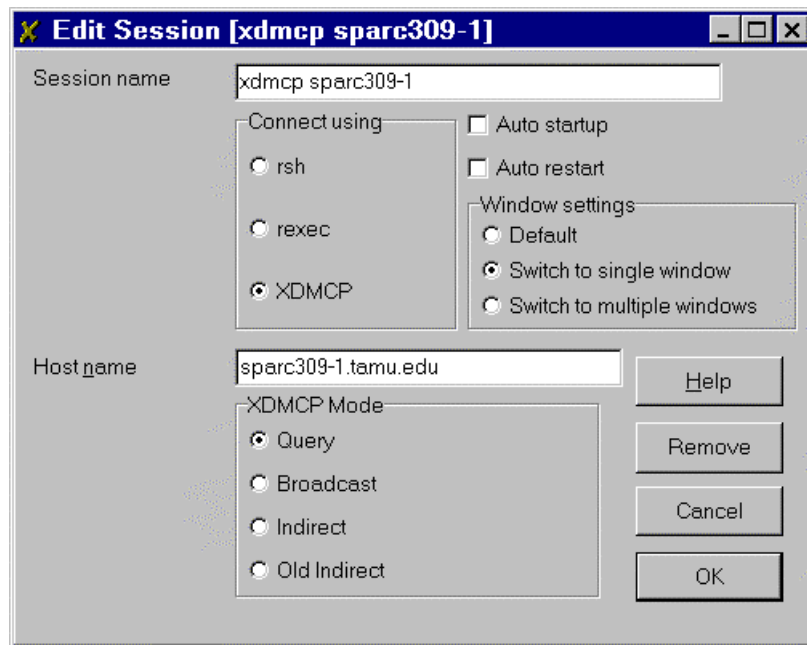
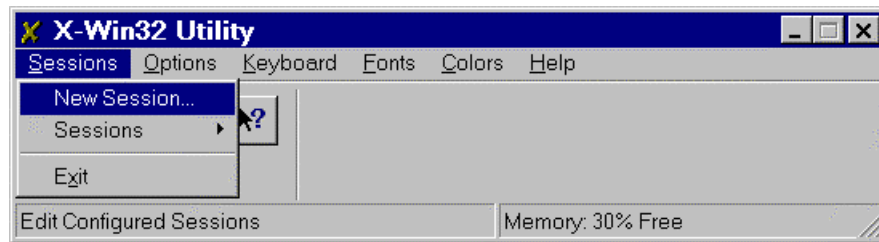
**STEP 1:** Click Start button, point Programs and point X-Win 32 (Common) then click X-Util



**STEP 2:** Click Edit Sessions and New Session to create it.

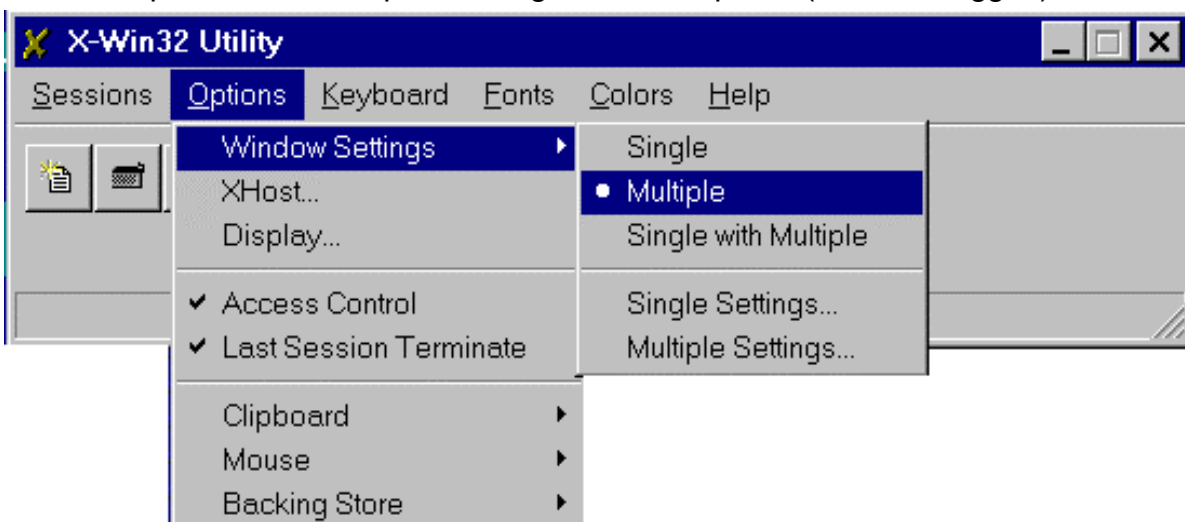


**STEP 3:** Type your preferred session name. Select the XDMCP connection. Select the switch to single window setting. Type the host name as sparc309-1.tamu.edu. Click the OK button.

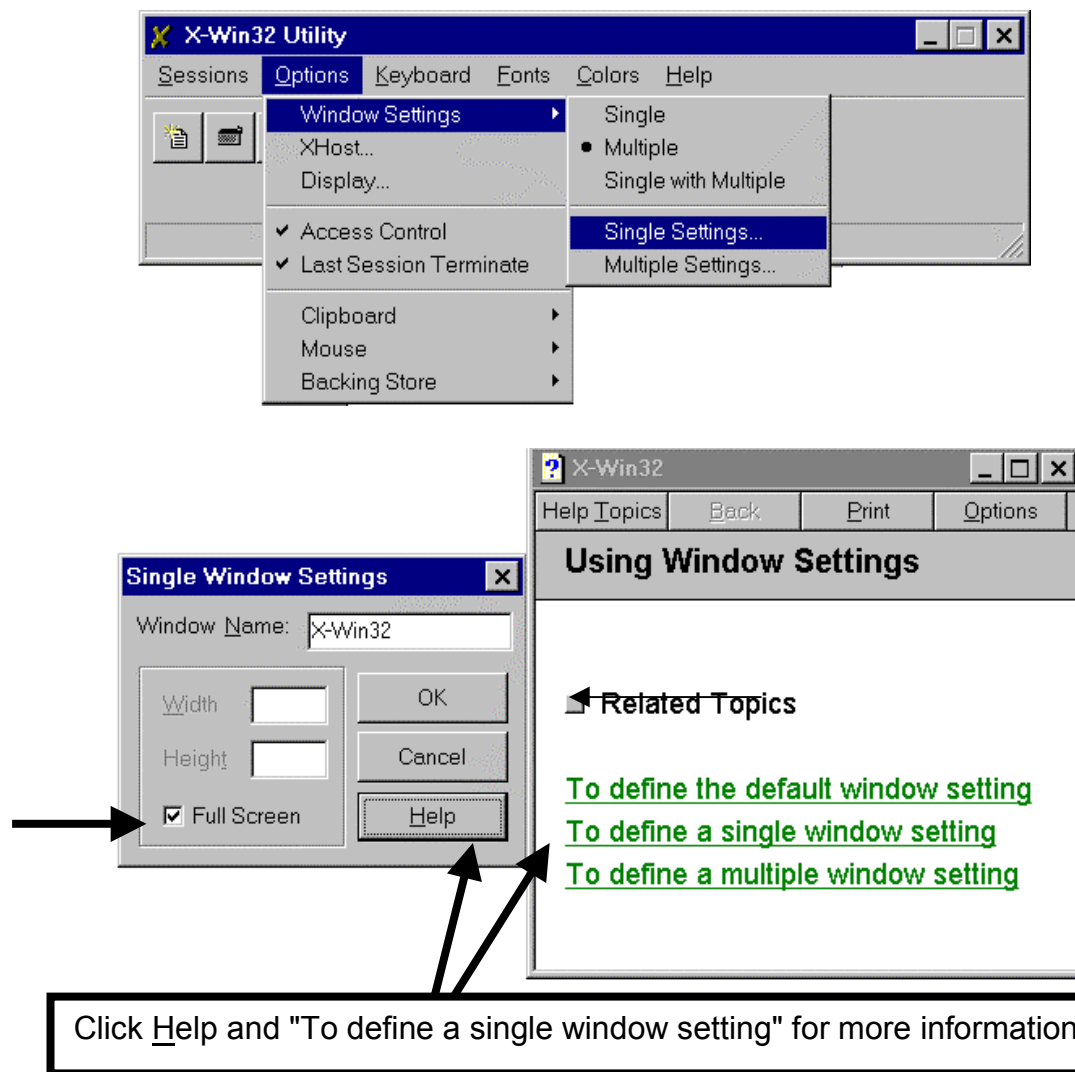


**STEP 4:** On Options Menu click Window mode

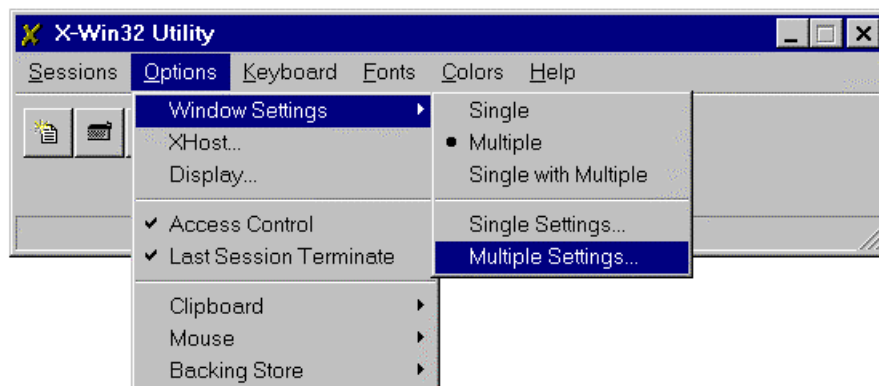
You can pick either "Multiple" or Single with Multiple.". (This is a toggle.)



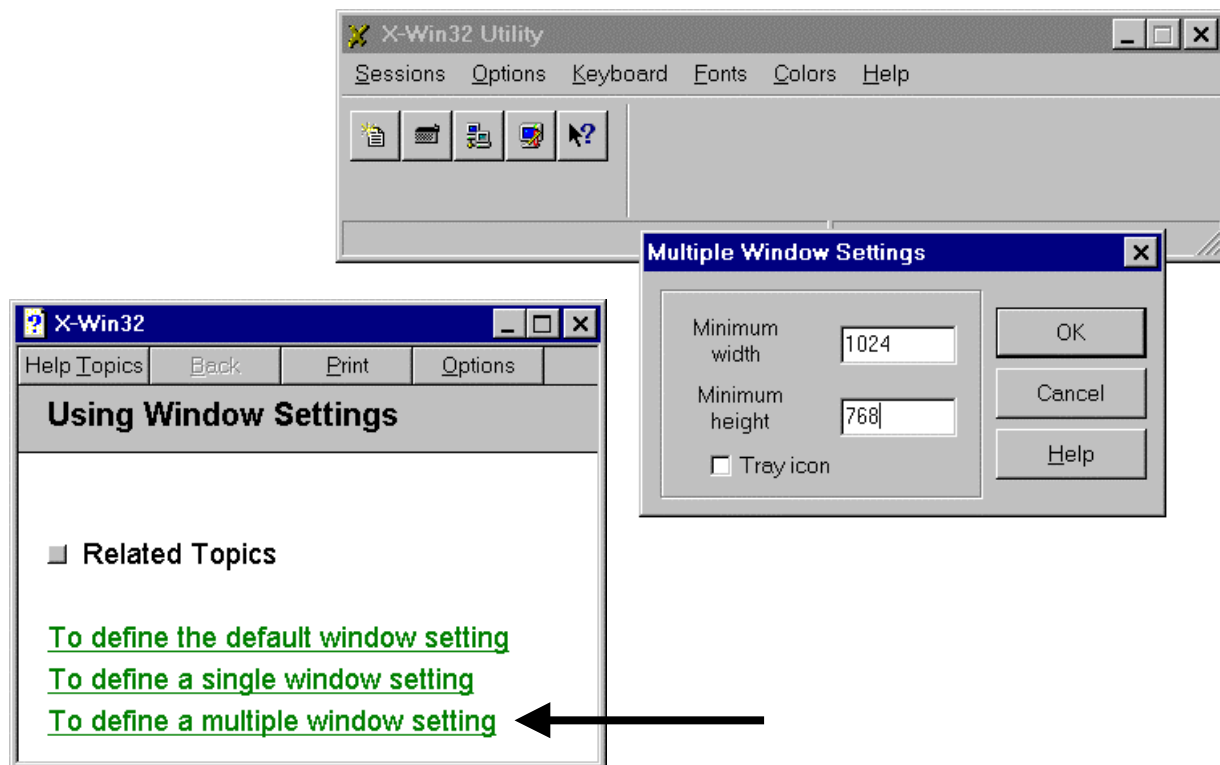
**STEP 5:** Specify the "Single Settings" options.



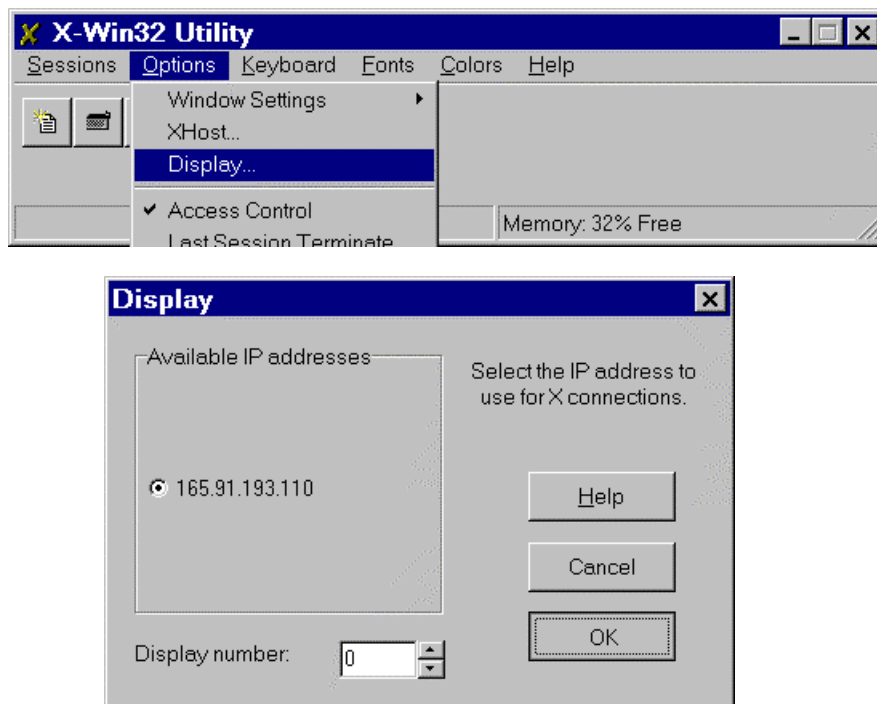
**STEP 6:** Specify the "Multiple Settings" options.



Try a few sizes. Use the one you like best. (It may depend on you monitor resolution.)



**STEP 7:** Specify the IP address for your UNIX computer. The IP address for sparc309-1 is 165.91.193.110.

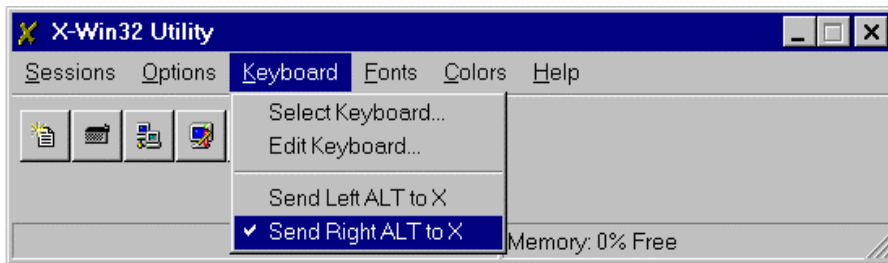




**STEP 8:** Use the right "Alt" key with X-Win32. (The left "Alt" key still works with Windows.)

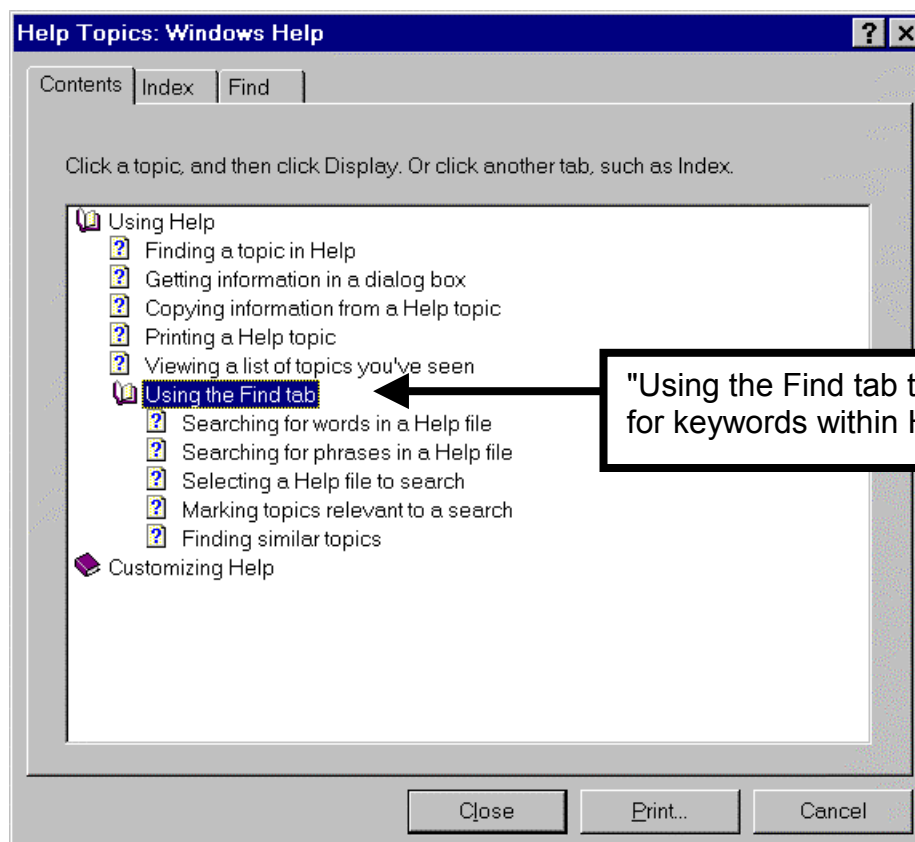
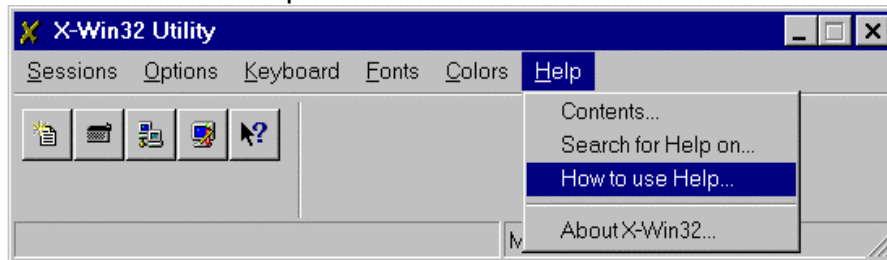
Use the right alternate key for X-Win32.

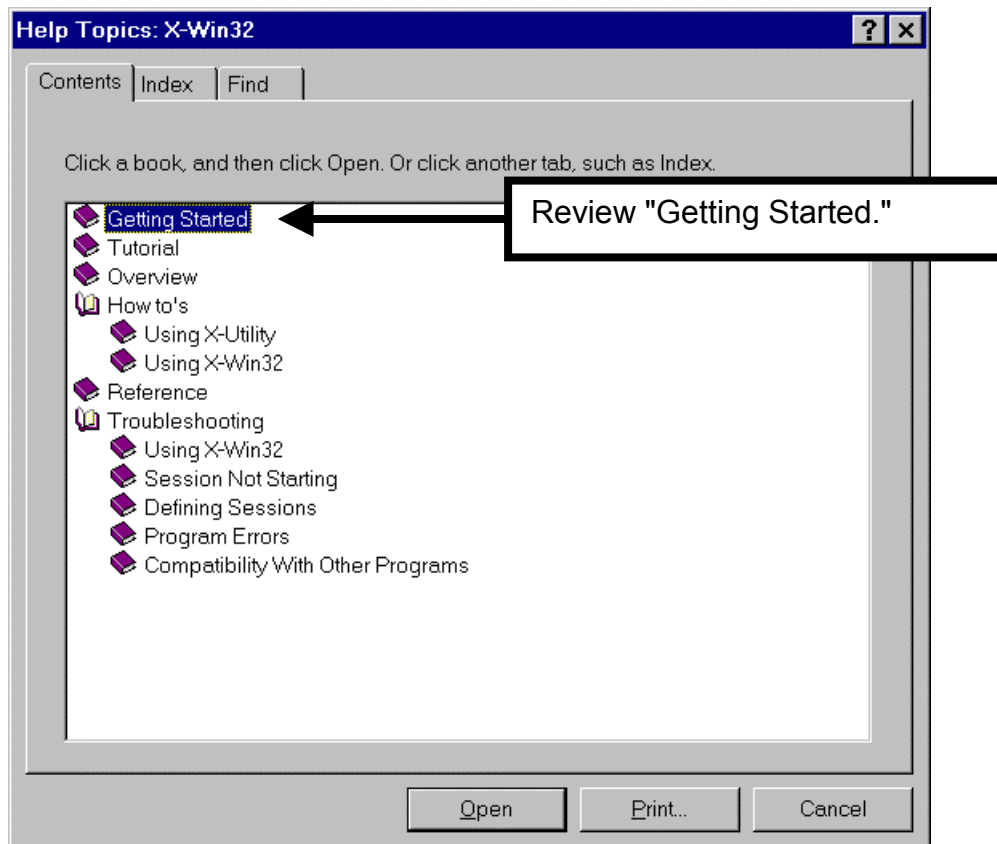
(The left alternate key works with Win95, NT,



**STEP 9:** Read the Help files for details on the other menu choices.

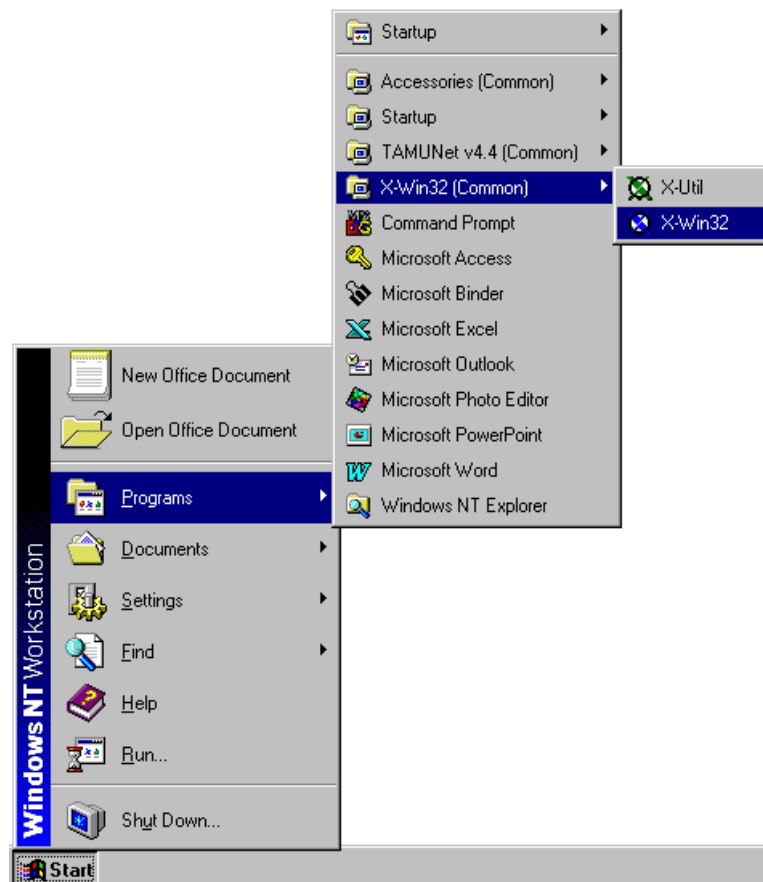
Read the online help for more details.





##### 5.- RUNNING ECLIPSE IN AN X-WIN 32 SESSION (use ECLIPSE from a Windows pc)

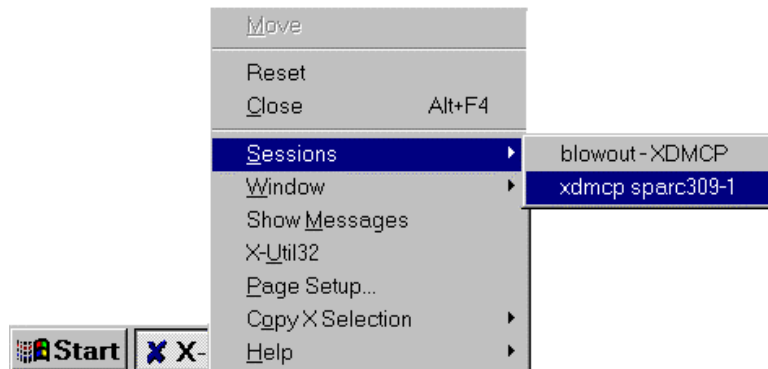
**STEP 1:** In order to start X-Win 32 session Click Start button, point Programs and point X-Win 32 (Common) then click X-Win 32



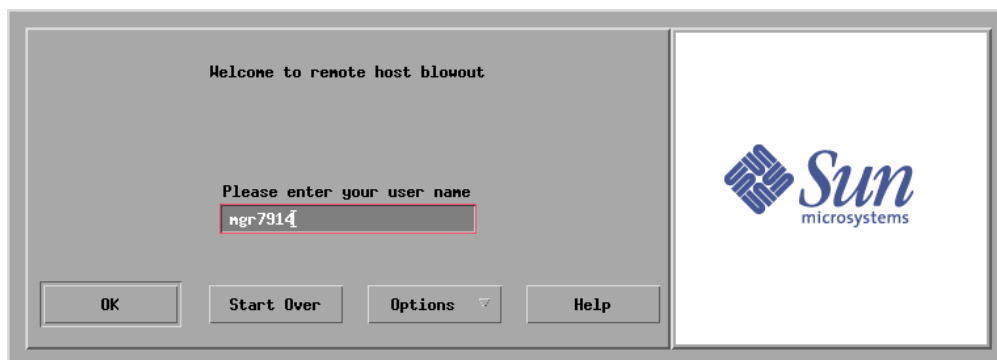
It may be necessary to click the X-Win32 icon on the task bar.



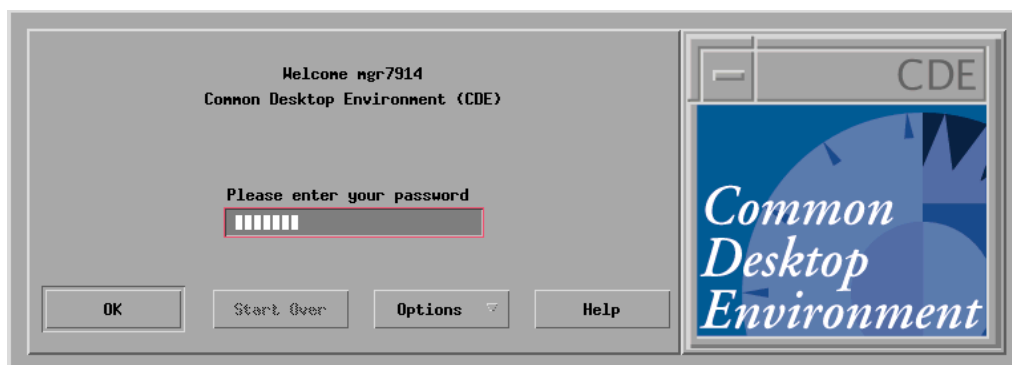
**STEP 2:** On X-win menu, point Session and select the session you created:



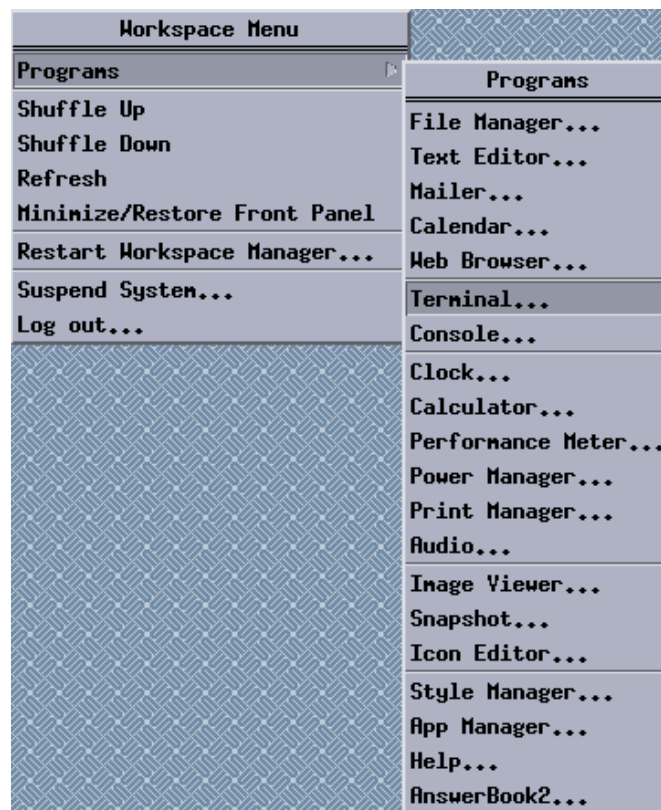
**STEP 3:** Type your User Name:



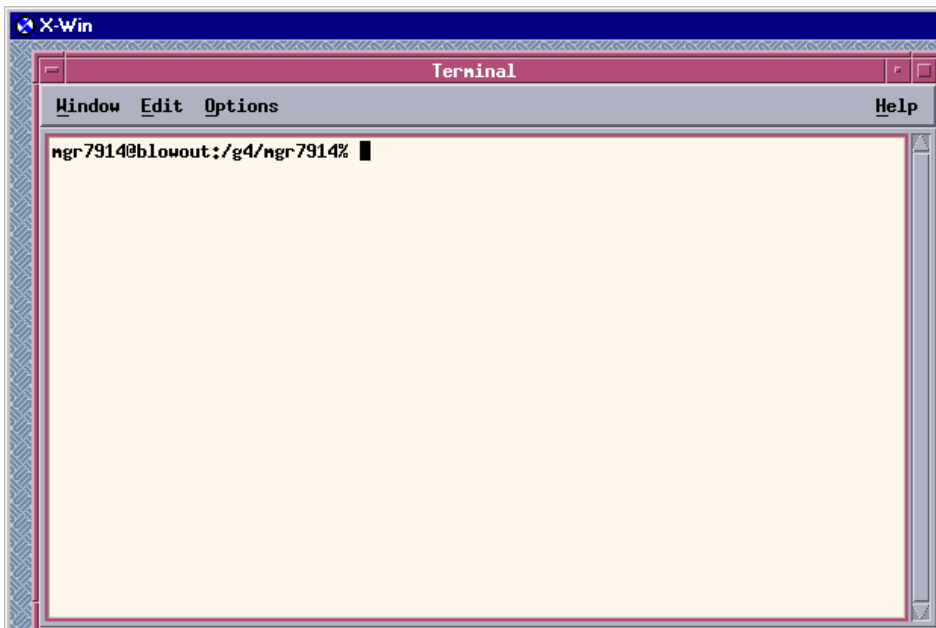
**STEP 4:** Type your password:



**STEP 5:** Click the right button of the mouse, click Programs on the Workspace Menu, and click Terminal on the Programs menu.



**STEP 6:** At this step you are ready to run ECLIPSE on your UNIX computer.



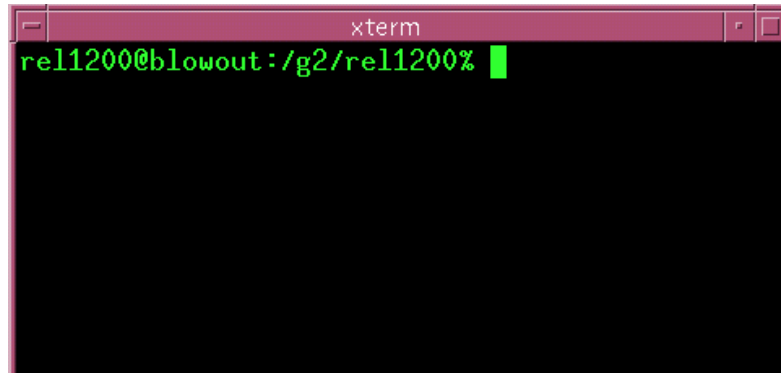
Opening a Console instead of a Terminal is about the same.

### **STEP 7: Setup your terminal window.**

A good rule of thumb is to use the lowest-common-denominator.”

In this case, type `xterm -bg black -fg green -fn 10x20`.

This opens an XTERM window (black background and large, green font).



### **STEP 8: Activating your Session**

You may need to exit (logout and close) X-Win32 and then restart X-Win32 to activate your session settings.

## **6.- COMMANDS TO SET UP ECLIPSE IN YOUR ACCOUNT**

The next procedure attends to set up your account in order to run ECLIPSE. This procedure only is required the first time that you are running ECLIPSE. Type the following command of Unix in your account (assuming that you are at the session established on STEP 11 of Setting of Setting your X-Win 32 Session): The symbol for the enter key is "↵"

**C: echo \$PATH ↵** ( In order to show where the sequence of directories are) ???

R: /usr/bin:/usr/sbin:/usr/local/hpnp/bin:/usr/local/bin:/usr/ucb:/usr/etc:/usr/ccs  
/bin:/usr/ccs/lib:/usr/openwin/bin:/usr/openwin/demo:/usr/openwin/bin/xview:/opt  
/bin:/opt/SUNWspro/bin:/usr/local/rc2:/usr/local/ecl/macros:/usr/local/was/dto  
p/v330/cshell

**C: cd /t1 ↵** (Change directory to t1)

R: abc1234@blowout:/t1%

**C: cd setup.files ↵** (Change directory to setup.files)

R: abc1234@blowout:/t1/setup.files%

**C: ls -a ↵** (Shows the hidden files. NOTE: "ls -la ↵" shows more details than "ls -a ↵")

R: ./ ../ .cshrc\* .eclrc\* .exrc\* .login\*

**C: cp .\* ~ ↵** (Use the wildcard [\*] to copy all the hidden files [./, ../, .cshrc\*, eclrc\*, .exrc\*, & .login\*] from setup.files to your home directory [~])

R: cp: ./ is a directory

cp: ../ is a directory

**C: exit**

- The texts of the four hidden files are listed for your reference.

- .cshrc ("c" shell)

```
# Setup for ALL csh.
set noclobber
set ignoreeof
umask 077

# Setup for INTERACTIVE csh only.
if ($?USER == 0 || $?prompt == 0) exit
set history=22
alias pwd      'echo $cwd'
alias copy     'cp'
alias mv       'mv -i'
alias ren     'mv -i'
alias rd      'rmdir'
alias del     'rm'
alias md      'mkdir'
alias cd      'cd !*;set prompt = "$USER@`hostname`: $cwd% "'
alias cls     'clear'
alias dir     'ls -FC'
alias ls      'ls -FC'
alias hi      'history'
alias grep    'grep -i -n'
alias psg     'ps -ef |grep $USER'
set prompt = "$USER@`hostname`: $cwd% "
```

- .eclrc (license)

```
#!/bin/csh -f
setenv ECLPATH /usr/local/ecl
setenv ECLEXE exe
setenv LM_LICENSE_FILE $ECLPATH/macros/license.dat
setenv FMHOME $ECLPATH/frame
set path=($path $FMHOME/bin)
```

- .exrc

```
set ap bf smd nows
```

- .login

```
setenv TMPDIR /tmp
setenv LICENSE_TYPE FLEXLM
echo $PATH | grep "/usr/local/ecl/macros" > /dev/null
if ($status != 0) then
  if (`echo -n $PATH | tail -1c` == ".:")then
    setenv PATH "${PATH}/usr/local/ecl/macros:"
  else
    setenv PATH "${PATH}:/usr/local/ecl/macros:"
  endif
endif
# Add current directory (.) to path if not already. Should be LAST in $PATH.
echo $PATH | grep ":@" > /dev/null
if ($status != 0) then
  if (`echo -n $PATH | tail -1c` == ".:")then
    setenv PATH "${PATH}."
  else
    setenv PATH "${PATH}:@"
  endif
endif
```

## **7.- RUNNING ECLIPSE**

Follow good practice and make a sub-directory in your UNIX account. This helps you keep all the files generated by ECLIPSE in convenient places.

Helpful hints: <CR> means press the Enter key.

Be sure to use upper-case and lower-case letters exactly as shown below.

Use the following commands to create such a sub-directory.

```
cd ~ <CR>
mkdir e100 <CR>
cd e100 <CR>
ls -FC <CR>
```

There are many sample ECLIPSE files. Use the following commands to see a listing of the available files:

```
cd /usr/local/ecl <CR>
ls -FC <CR>
```

As you can see, there are sample for several versions of GeoQuest's software. Use the following commands to see a listing of the software with sample files.

```
cd /99a_1 <CR>
ls -FC <CR>
```

As you can see, there are sample for several GeoQuest's programs. Use the following commands to see a listing of the available black-oil files for Eclipse 100.

```
cd /eclipse/data <CR>
ls -FC <CR>
```

The data files are based on the SPE comparative-study cases. The second comparative study covered coning. Use the following commands to copy the single-well coning study into your e100 directory.

```
cp CHAP.DATA ~/e100 <CR>
ls -FC ~/e100 <CR>
cd ~/e100 <CR>
ls -FC <CR>
```

If you see a single file (named CHAP.DATA) then you are now ready to run a black-oil simulation.

### **- Background or Foreground**

**STEP 1:** To run ECLIPSE (BLACK OIL SIMULATOR) type @eclipse in. Slightly different commands are needed to run ECLIPSE 300 or ECLIPSE 500. (type @e300 or @e500 instead of @eclipse.)

**C: mgr7914@blowout:/g4/mgr7914/temp1% @eclipse ↵**

**R: Please enter version [98a, 98b, 98b\_1, 99a, 99a\_1 (default)] : 99a ↵**

**R: Please enter file name (without suffix) :**

**STEP 2:** Type the name of the data input to run without extension:

**C: Please enter file name (without suffix) : CHAP ↵**

**R: Secondary title [default mgr7914] :**

**STEP 3:** Enter the secondary title (recommended: none)

**C: Secondary title [default mgr7914] : ↵**

**R: Foreground or background ? (f/b) [default f] :**

**STEP 4:** Select the mode you wish to run ECLIPSE (Recommended: background 'b')

**C: Foreground or background ? (f/b) [default f] : b ↵**

R: No local config file exists.

Master configuration file copied to current directory.

Background job will be put in batch queue

Enter priority of job: high, medium, low (h, m, l) [default m]

**STEP 5:** Type the priority of the job to run (Recommended: medium 'm')

**C: Enter priority of job: high, medium, low (h, m, l) [default m] m ↵**

R: [1] 3766

mgr7914@blowout:/g4/mgr7914%

- **Foreground Shortcut**

A way to skip steps 2, 3, 4, and 5. NOTE: this defaults to running in the foreground.)

**STEP 1 (shortcut):** To run ECLIPSE (BLACK OIL SIMULATOR) type @eclipse "data-file-name". In order to run ECLIPSE 300 or ECLIPSE 500 type @e300 or @e500 instead of @eclipse.

**C: mgr7914@blowout:/g4/mgr7914/temp1% @eclipse CHAP ↵**

R: Please enter version [98a, 98b, 98b\_1, 99a, 99a\_1 (default)] : **99a** ↵

**STEP 2 (shortcut):** GOOD NEWS: you will learn to read the monitor as eclipse runs.

**8.- MAKING A GRAPH (review the output)**

**STEP 1:** Type @graf

**C: mgr7914@blowout:/g4/mgr7914/temp1% @graf ↵**

R: Please enter version [98a, 98b, 98b\_1, 99a, 99a\_1 (default)] : **99a** ↵

**STEP 2:** Select the mode you wish to run GRF (Recommended: foreground 'N')

**C: Do you want to run a GRF in the background (y/N) [default n]?: ↵**

R: No local config file exists.

Master configuration file copied to current directory.

---

| Unsupported X emulation package vendor :- StarNet Communications Corp.  
| All program functions may not work correctly.  
| Please contact GeoQuest for advice on supported X Emulators.

---

GRAF Version 99a. Week 9920. Build Number 129  
graf Locked - Expiry Date 1-Jul-2002

Run-Time Monitoring Available  
Please choose type of run :  
0 : Exit  
1 : Interactive, no graphics  
2 : Interactive, with graphics  
3 : Run summaries only  
4 : Execute GRF only  
5 : Show version size and dates



:  
**STEP 3:** Choose the Run-Time Monitoring Available (Recommended: '2' Interactive with graphics)

C: 2 ↵

R: Drivers available from configuration file are:-

Device 40 : 'NULL DRIVER' with hardcopy  
Device 41 : 'TEKTRONIX 41XX' colour TEKTRONIX  
Device 42 : 'TEKTRONIX 41XX' colour TEKTRONIX (H.COPY)  
Device 51 : 'X-Windows' for Dec Alpha  
Device 52 : 'X-Windows' for Sun (SunOS 4.1.3)  
Device 53 : 'X-Windows' for Sun (Solaris 2)  
Device 54 : 'X-Windows' for Silicon Graphics  
Device 55 : 'X-Windows' for RS/6000  
Device 56 : 'X-Windows' for hp700  
Device 57 : 'X-Windows' for MacIntosh MacX  
Device 58 : 'X-Windows' for PC/XVIEW  
Device 98 : 'X-Windows' for Weltest200  
Device 99 : 'X-Windows' for RTView

Please input the required device number:  
or -1 to repeat the list

**STEP 4:** Use the driver available (Recommended: '58' X-windows for PC/XVIEW)

C: 58 ↵

R: GRAF Version 99a\_1

0 PRIMARY MENU

- 1 Read ECLIPSE or user data
- 2 Print or index loaded information
- 3 Create a picture
- 4 Modify a picture
- 5 Display a picture
- 6 Load or save workspace
- 7 Copy one picture to another
- 8 Write or execute graphics run file
- 9 Modify Granite settings
- 10 End session
- 11 Additional facilities

:  
**STEP 5:** Pick menu-choice number '1' (Read ECLIPSE or user data) in order to read the data.

C: 1 ↵

R: GRAF Version 99a\_1

1 LOAD INFORMATION TO BE DISPLAYED

Will use non-unified unformatted files

(NOTE: this assumes RUNSPEC section uses defaults.  
ODEHIMPES.DATA, ODEHIMPLI.DATA, and  
KAZEMI.DATA specify unified, formatted output.)

- 0 Return to primary menu
- 1 Read from ECLIPSE summary file
- 2 Read from user data file
- 3 Read from ECLIPSE grid file
- 4 Read from ECLIPSE restart file
- 5 Read from ECLIPSE initial file
- 6 Change to formatted input
- 7 Change to unified files
- 8 Read from VFP file (always formatted)
- 9 Read from ECLIPSE RFT file
- 10 Define simulation run for monitoring

:

**STEP 6:** Pick menu-choice number '1' (Read from ECLIPSE summary file).

C: 1 ↵

R: Enter name of summary file  
(Return for BASE)

:

**STEP 7:** Type the name of the field, if it is not BASE. (This example will plot results from 'CHAP')

C: CHAP ↵

R: CHAP.SMSPEC exists (NOTE: CHAP.FSMSPEC is formatted)  
Enter origin mnemonic to be used.  
(Return for CHAP)

:

**STEP 8:** Default to the first report step.

C: ↵

R: Enter number of first report step to be loaded  
(Return for first report step.)

:

**STEP 9:** Default to the last report step found.

C: ↵

R: Enter number of last report step to be loaded  
(Return for last report step found.)

:

**STEP 10:** Open all the report steps

C: ↵

R: Summary file CHAP.S0001 opened  
Summary file CHAP.S0002 opened  
Summary file CHAP.S0003 opened  
Summary file CHAP.S0004 opened  
Summary file CHAP.S0005 opened  
Summary file CHAP.S0006 opened  
Summary file CHAP.S0007 opened  
Summary file CHAP.S0008 opened  
Summary file CHAP.S0009 opened  
Summary file CHAP.S0010 opened  
Summary file CHAP.S0011 opened  
Hit any key to continue

:

**STEP 11:** Hit any key.

C: ↵

R: GRAF Version 99a\_1

1 LOAD INFORMATION TO BE DISPLAYED  
Will use non-unified unformatted files

- 0 Return to primary menu
- 1 Read from ECLIPSE summary file
- 2 Read from user data file
- 3 Read from ECLIPSE grid file
- 4 Read from ECLIPSE restart file
- 5 Read from ECLIPSE initial file
- 6 Change to formatted input

- 7 Change to unified files
- 8 Read from VFP file (always formatted)
- 9 Read from ECLIPSE RFT file
- 10 Define simulation run for monitoring

:

**STEP 12:** Return to primary menu

C: 0 ↵

R: GRAF Version 99a\_1

0 PRIMARY MENU

- 1 Read ECLIPSE or user data
- 2 Print or index loaded information
- 3 Create a picture
- 4 Modify a picture
- 5 Display a picture
- 6 Load or save workspace
- 7 Copy one picture to another
- 8 Write or execute graphics run file
- 9 Modify Granite settings
- 10 End session
- 11 Additional facilities

:

**STEP 13:** Enter '2' to 'Read from user data file.'

C: 2 ↵

R: GRAF Version 99a\_1

2 PRINT OR INDEX LOADED INFORMATION

- 0 Return to primary menu
- 1 Index of data vectors
- 2 Index of field data
- 3 Index of solution data
- 4 Index of pictures
- 5 Print index
- 6 Print data
- 7 Index of wells
- 8 Index of VFP tables
- 9 Index of calculations

:

**STEP 14:** Enter '1' to see the 'Index of data vectors.' (See the mnemonic names.)

C: 1 ↵

R: GRAF Version 99a\_1

2.1 INDEX OF DATA VECTORS IN WORKSPACE

MNEMONIC	ORIGIN	UNITS	WELL OR GROUP	AQUIFER CELL LGR OR REGION	NUMBER OF VALUES
1 TIME	CHAP	DAYS			32
2 YEARS	CHAP	YEARS			32
3 FOPR	CHAP	STB/DAY	FIELD		32
4 FWPR	CHAP	STB/DAY	FIELD		32
5 FLPR	CHAP	STB/DAY	FIELD		32
6 FVPR	CHAP	RB/DAY	FIELD		32

7	WBHP	CHAP	PSIA	P1	32
8	FWCT	CHAP	FIELD		32
9	FGOR	CHAP	MSCF/STB	FIELD	32
10	FPR	CHAP	PSIA	FIELD	32
11	IRPTSTEP	CHAP			32

END OF FILE. Enter E to exit

**STEP 15:** Select the mnemonic to be graphed (e.g., FGOR). Then type 'E' to exit of this menu.

C: E ↵

R: GRAF Version 99a\_1

## 2 PRINT OR INDEX LOADED INFORMATION

- 0 Return to primary menu
- 1 Index of data vectors
- 2 Index of field data
- 3 Index of solution data
- 4 Index of pictures
- 5 Print index
- 6 Print data
- 7 Index of wells
- 8 Index of VFP tables
- 9 Index of calculations
- :

**STEP 16:** Type '0' to return to primary menu

C: 0 ↵

R: GRAF Version 99a\_1

## 0 PRIMARY MENU

- 1 Read ECLIPSE or user data
- 2 Print or index loaded information
- 3 Create a picture
- 4 Modify a picture
- 5 Display a picture
- 6 Load or save workspace
- 7 Copy one picture to another
- 8 Write or execute graphics run file
- 9 Modify Granite settings
- 10 End session
- 11 Additional facilities
- :

**STEP 17:** Enter '3' (Create a picture) to plot a graph.

C: 3 ↵

R: Enter picture number  
(Return for next available, 1)  
:

**STEP 18:** Enter a carriage return (↵) to accept the next available picture number (which is '1' in this example).

C: ↵

R: Enter window number  
(Return for next available, 1)  
:

**STEP 19:** Enter a carriage return (↵) to accept the next available window number (which is '1' in this example).

**C:** ↵

**R:** GRAF Version 99a\_1

3 CREATE DISPLAY 1 IN PICTURE 1

- 0 Return to primary menu
- 1 Enter line graph
- 2 Enter grid display
- 3 Enter line from grid data
- 4 Enter special line displays
- 5 Enter arbitrary cross-section display
- 6 Next window
- 7 Display picture
- :

**STEP 20:** Enter '1' (Enter line graph) as the desired plot type.

**C:** 1 ↵

**R:** Enter X-mnemonic  
(Return for TIME)  
:

**STEP 21:** Enter a carriage return (↵) to accept TIME for the independent (x-axis) variable.

**C:** ↵

Mnemonic TIME found  
Enter Y-mnemonic  
(Return for TIME)  
:

**STEP 22:** Enter the mnemonic selected from STEP 15 (e.g., FGOR)

**C:** FGOR ↵

**R:** Mnemonic FGOR found  
TYPE RETURN TO CONTINUE

**STEP 23:** Enter a carriage return (↵) to move to the next step.

**C:** ↵

**R:** GRAF Version 99a\_1

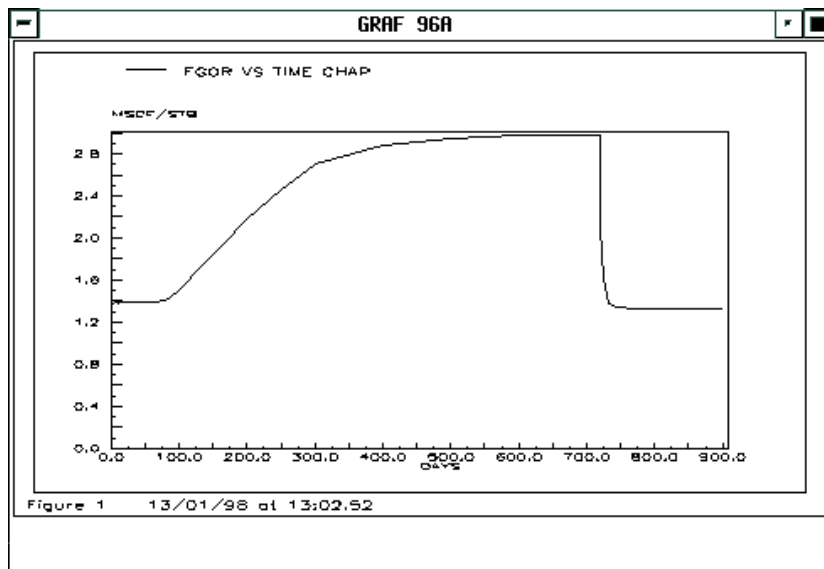
3 CREATE DISPLAY 1 IN PICTURE 1

- 0 Return to primary menu
- 1 Enter line graph
- 2 Enter grid display
- 3 Enter line from grid data
- 4 Enter special line displays
- 5 Enter arbitrary cross-section display
- 6 Next window
- 7 Display picture
- :

**STEP 24:** Enter '7' (Display picture) to display the graph

C: 7 ↵

R:



**STEP 25:** Enter a carriage return (↵) to return to the previous menu.

C: ↵

R: GRAF Version 99a\_1

3 CREATE DISPLAY 1 IN PICTURE 1

- 0 Return to primary menu
- 1 Enter line graph
- 2 Enter grid display
- 3 Enter line from grid data
- 4 Enter special line displays
- 5 Enter arbitrary cross-section display
- 6 Next window
- 7 Display picture
- :

**STEP 26:** Enter '0' to return to primary menu.

C: 0 ↵

R: GRAF Version 99a\_1

0 PRIMARY MENU

- 1 Read ECLIPSE or user data
- 2 Print or index loaded information
- 3 Create a picture
- 4 Modify a picture
- 5 Display a picture
- 6 Load or save workspace
- 7 Copy one picture to another
- 8 Write or execute graphics run file
- 9 Modify Granite settings
- 10 End session
- 11 Additional facilities

**STEP 27:** Enter '10' (End session) to stop graf and return to the Unix prompt.

C: 10 ↵

R: mgr7914@blowout:/g4/mgr7914/temp1% @graf ↵

## 9.- EDITING A DATA FIELD

**STEP 1:** Type @edit

C: mgr7914@blowout:/g4/mgr7914/temp1% @edit ↵

R: Please enter version [98a, 98b, 98b\_1, 99a, 99a\_1 (default)] : 99a ↵

No local config file exists.

Master configuration file copied to current directory.

---

| Unsupported X emulation package vendor :- StarNet Communications Corp.

| All program functions may not work correctly.

| Please contact GeoQuest for advice on supported X Emulators.

---

EDIT Version 99a. Week 9809. Build 187.

## EDIT - NO FEATURE EXISTS

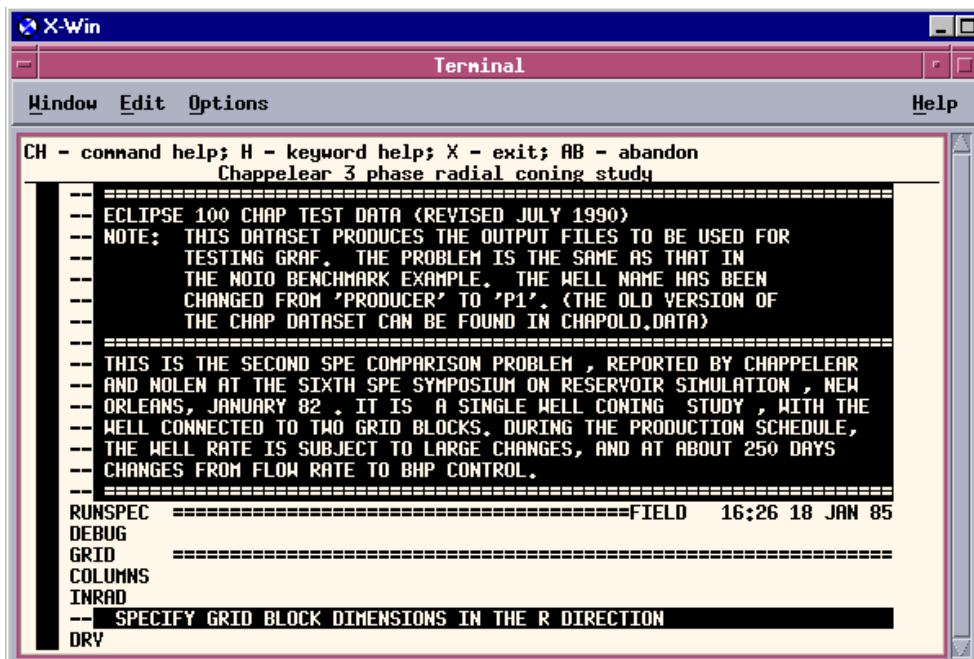
edit Locked - Expiry Date 1-Jul-2001???

Input the name of the file to be edited:

**STEP 2:** Type the name of the in our case CHAP.DATA

C: CHAP.DATA ↵

R:x



After this step you can start making your modifications.

## **10.- USEFUL MACROS**

The following macros are available to run the programs:

@e300	Compositional Simulator
@e500	Thermal Simulator
@eclipse	Black Oil Simulator
@edit	Eclipse keyword Editor
@fill	Corner Point Geometry Generation
@graf	Post Processor
@grid	Gridding and mapping
@schedule	Well Production analysis
@frame	On line Manual Reader
@post	Convert Textfile to Postscript
@rename	Change Eclipse filename case and extensions
@split	Split merged file
@change_prefix	Change file name prefixes
@change_suffiix	Change file name suffixes
@lower	Change case of files to lower case
@upper	Change case of files to upper case