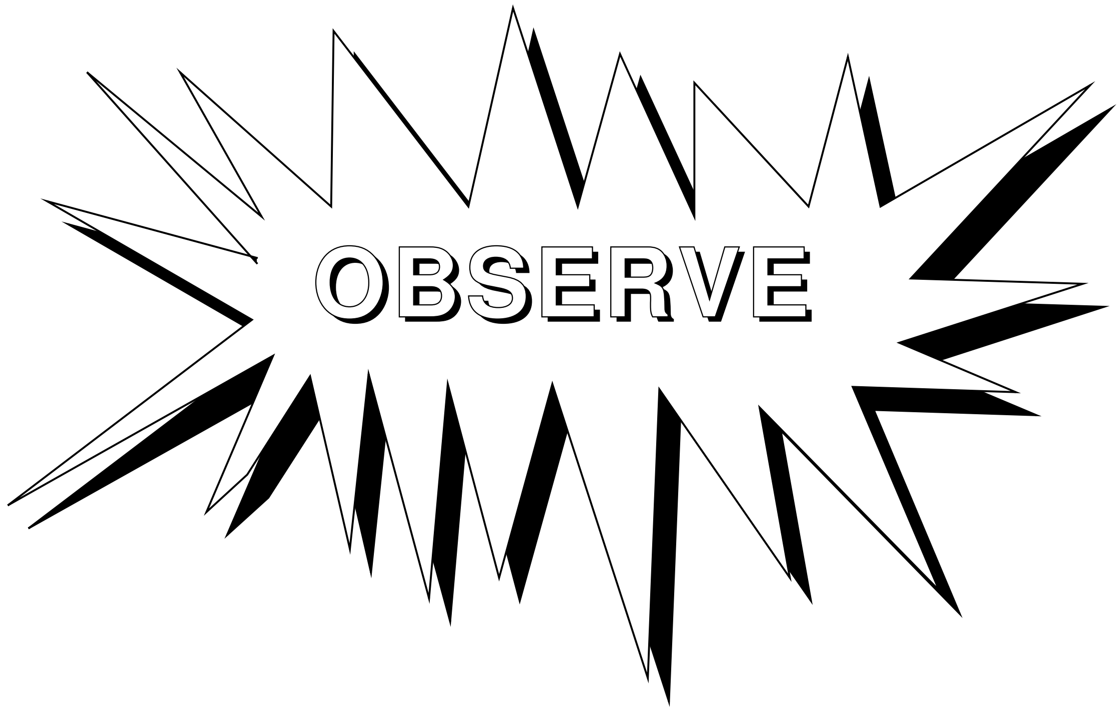
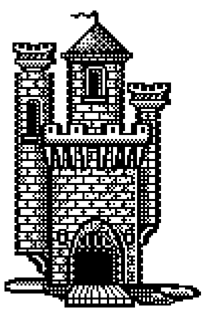
A Graphical User's Guide To





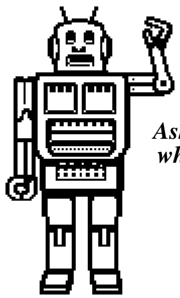
The Fantasy Adventure Game for VLA observers

Brought to you by the National Radio Astronomy Observatory

Open the door, go north, ask the wizard for the knife, go east, kill the dwarf, go east, drink the potion

OBSERVE Program by: **Al Braun and Wes Young**
Graphical User's Guide by: **Doug Wood**
Version: **3.0**

Face to Face with Observe



Ask the robot which key to press

User defaults

Create items in this list that describe the basic defaults you want use. You can have different defaults for different set-ups you want to use in your file.

Observe List

This is where you actually compose your observe file. You can copy and paste into this list from the other lists or enter "Source Insert/Lookup" mode to type here directly.

Source List

Use this list to enter the information about your sources: their coordinates, and exactly how to observe them. You can copy and paste from this list.

Calibrator List

The calibrator list is a data base of all the VLA calibrators. To find out more about a calibrator select it and press the **SRC** key.

NRAO DEFAULTS

The items in this list are some useful setups for some standard observations. You can examine their definitions by selecting one and typing the **SRC** key

NRAO Defaults	User Defaults	Observe Lists	Source Lists	Calibrator J2000
44		█		0003-174
PP				0006-063
LL				0006-00?
CC				0010+109
XX				0010+174
UU				0010-418
KK				0011-262
HH				0014+612

```
Source selection and editing.

Left and right arrows move between columns.
Up and down arrows scroll within a column.
Insert will create a new item.
Del will remove an item.
PgDn to edit the data structure.
PgUp to display the menu bar.
Cntrl-W saves the workspace.
```

```
Help |Menus|Src  |
-----+-----+-----+-----
Top  |Up   |PgUp |
-----+-----+-----+-----
Left |     |Right|Cancl
-----+-----+-----+-----
Botm |Down |PgDn |
-----+-----+-----+
  Insert   |Del  |
```

The Src key

Press the **Src** key to edit the selected source. To return to list mode when you are editing a source, press the **Src** key again.

Navigation Window

Be sure to read the text of this window when you go to different sections of OBSERVE. It provides helpful information about how to get around.

The HELP key

Press the Help key at any time to get help information. This is a *very* useful feature —take advantage of it.

The Keypad Map

In different parts of observe the keys on the keypad perform different functions. This map in the lower left corner of the screen tells you what each key will do.

The Menus key

Press the **Menus** key at any time to activate Observe's pull down menus.

The menus are described of the following page.

What’s on the menu?

File Menu

Save working environment	Save all of the information about your session so you can resotre it later.
Restore working environment	Restore a previously saved session
----------------------------	-------------------------------------
Write OBSERVE file	Write the contents of the observe list to the file you submit to the VLA operators
Read OBSERVE file	Read an old observe file. (It is better to use Save/Restore working environment if you can).
----------------------------	-------------------------------------
Save/Read lists.	Save/Read a list to a file that Observe can understand.
Import text files.	Read in data for the lists from simple input files.
----------------------------	-------------------------------------
Exit from OBSERVE	Quit the program

Options Menu

Starting conditions	Set up various infomration about your run. Select this item when you start a new file
J2000 calibrator names	Choose this item to write all calibrator names in J2000 cooridnates
B1950 calibrator names	Choose this item to write all calibrator names in B1950 cooridnates
Solar Warnings	Select this to choose how close the sun can be before a warning is generated
Planetary Warnings	Select this to choose how close planets can be before a warning is generated

Edit Menu

Edit Lists	Leave menu mode and enter list editing mode (same as pressing the SRC key on the keypad).
Enter Source Insert/Lookup mode.	In Insert/Lookup mode Observe looks up the source when you type its name in a list
Enter Cut/Copy Paste Mode	In Copy/Paste mode Observe lets you copy and paste entries between lists
Edit new source initial values	Choose the default parameters to use when a new source is created
Global Edits	Enter a mode where you can make changes to the entire observe file
Block Edits	Enter a mode where you can make changes to a particular block of sources
Clear a list.	Erase the entire contents of a list (be careful!)
Edit a file	Open your favorate editor to edit or view a file

Databases Menu

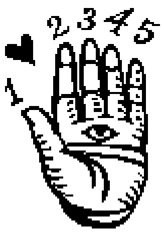
Find nearby calibrators	Select a source in a list then select this menu item to find the calibrators nearest the selected source.
Observe Summary	Display a summary of the various lists

Reports Menu

Summary report	Prepare a short report that giv es an over view of the entire file
Scheduling report	A report with more details about each observation
Frequency report	A report with the sky frequency observed for each source
Time-on-Source report	A report with the time spent on each source and the hour angle coverate for each.
Analysts' report	A different kind of report
Full report	A hamburger with everything on it (very long!)

Schedule Menu

Compute observing schedule	Compute the observing schedule using the current data in the Observe List
Set dwell times	Choose this to perform all calculations and write the schedule using on source dwell times.
Set durations	Choose this to perform all calculations and write the schedule using durations on each source.
Set stop times	Choose this to perform all calculations and write the schedule in terms of LST stop times



Press the menus key and have your fortune told by the wizard

Modes, modes and more modes

LIST MODE

Use List mode to examine and edit the lists.
When you have an item selected, press the SRC key to edit it.

NRAO Defaults	User Defaults	Observe Lists	Source Lists	Calibrator J2000
44 PP LL CC XX UU KK HH		█		0003-174 0006-063 0006-000 0010+109 0010+174 0010-418 0011-262 0014+612

```
          Source selection and editing.

   Left and right arrows move between columns.
   Up and down arrows scroll within a column.
          Insert will create a new item.
            Del will remove an item.
         PgDn to edit the data structure.
          PgUp to display the menu bar.
          Cntrl-W saves the workspace.
```

```
Help |Menus|Src  |
-----+-----+-----+-----
Top  |Up   |PgUp |
-----+-----+-----+-----
Left |     |Right|Cancl
-----+-----+-----+-----
Botm |Down |PgDn |
-----+-----+-----+
   Insert  |Del  |
```

Key Pad Key Funtions in **LIST** mode

Help Get help information
Menus Enter menu mode
Src Edit or view the currently item
Top Move to the top to the list
Up Move up the list (same as up arrow)
PgUp Move one page up the list
Left move to the list to the left (save as left arrow)
Right Move to the list on the right (same as right arrow)
Cancl Cancel the current operation
Botm Move to the bottom of the list
Down Move one item down (same as down arrow)
Insert Add a new item to the list
Del Remove the selected item from the list

MENU MODE

Use menu mode to activate OBSERVE's menu bar and pull down menus.
Use the arrow keys or key pad to move around.

```
 File Options Edit Databases Reports Schedule
```

44 PP LL CC XX UU KK HH				0003-174 0006-063 0006-000 0010+109 0010+174 0010-418 0011-262 0014+612

```
                Menu Selection

       Left and right arrows move among menus.
      Up and down arrows move among menu items.
             Menus to return to top level
       Enter pulls down a menu or selects an item.
         Help for information on menu or item.
             Cntrl-W saves the workspace.
```

```
Help |Menus|Lists|
-----+-----+-----+-----
     | Up  |     |
-----+-----+-----+-----
Left |     |Right|Cancl
-----+-----+-----+-----
     |Down |     |
-----+-----+-----+
           |     |
```

Key Pad Key Funtions in **MENU** mode

Help Get help information
Menus Return to the menu bar
Lists Exit menu mode, go to list mode
Up Move to the next item up in the menu (same as up arrow)
Left Move to the menu to the left (save as left arrow)
Right Move to the menu to the right (save as right arrow)
Cancl Cancel the current menu operation.
Down Move to the next item down in the menu (same as down arrow)

Press the **Return** or **Enter** keys to make a menu selection

...and many more modes...

INSERT/LOOKUP MODE

Use insert lookup/mode to add observations to your observe list by typing names of sources or calibrators.

```
NRAO       User       Observe    Source     Calibrator
Defaults   Defaults   Lists      Lists      J2000

44                                          0003-174
PP                                          0006-063
LL                                          0006-000
CC                                          0010+109
XX                                          0010+174
UU                                          0010-418
KK                                          0011-262
HH                                          0014+612
```

When you are in Insert/Lookup mode, type the name of the source or calibrator you want to observe and Observe will look for it in the other lists and insert the observation in your observe list.

```
                  Menu Selection

     Left and right arrows move among menus.
    Up and down arrows move among menu items.
           Menus to return to top level
   Enter pulls down a menu or selects an item.
       Help for information on menu or item.
            Cntrl-W saves the workspace.
```

```
Help |Menus|Lists|
-----+-----+-----+-----
     | Up  |PgUp |
-----+-----+-----+-----
Left |     |Right|Cancl
-----+-----+-----+-----
     |Down |PgDn |
-----+-----+-----+
  Insert   | Del |
```

Key Pad Key Funtions in **INSERT/LOOKUP** mode:

The keypad is not used in this mode. If you press any of the active keys on the keypad Observe exits Insert/Lookup mode.

COPY/PASTE MODE

Use copy/paste mode to copy and paste between lists in order to edit a list or to paste source-cal cycles in your observation.

```
NRAO       User       Observe    Source     Paste
Defaults   Defaults   Lists      Lists      List

44
PP
LL
CC
XX
UU
KK
HH
```

This list is the paste buffer

```
                  Copy Cut Paste

              Arrows move the cursor
             Clear erases the paste list
          Copy copies an item to the paste list
           Cut moves an item to the paste list
           Return goes back to the normal mode
        On a PC use ^X to return to normal mode
```

```
Help |     |     |
-----+-----+-----+-----
Copy |Up   |Cut  |
-----+-----+-----+-----
Left |Retrn|Right|
-----+-----+-----+-----
     |Down |Clear|
-----+-----+-----+
  Paste    | Del |
```

Press the return key to exit

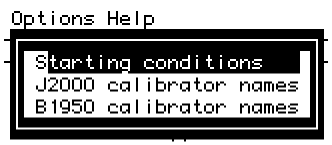
Key Pad Key Funtions in **COPY/PASTE** mode

Help Get help information
Copy Enter menu mode
Up Move up the list (same as up arrow)
Cut Cut the selected item to the paste buffer
Left Move to the list to the left (save as left arrow)
Retrn Exit copy/paste mode and return to menu mode
Right Move to the right (same as right arrow)
Down Move one item down (same as down arrow)
Clear Clear the contens of the paste buffer
Paste Insert the paste buffer following the selected source
Del Delete the selected source from the list

Getting started

Before you can start using Observe, you must specity some starting conditions.

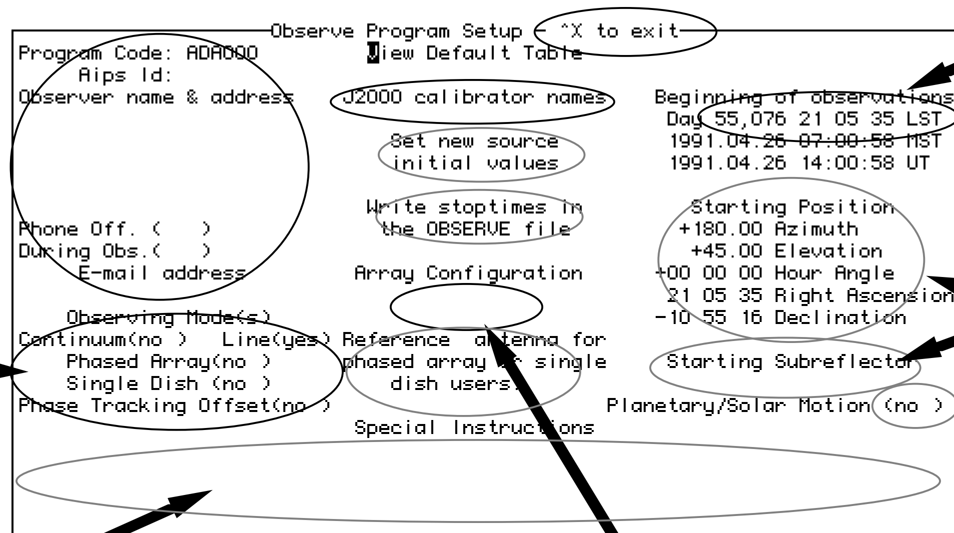
To activate this display, press the Menus key on the keypad, and select Starting Conditions from the Options Menu.



= something you will probably want to set

= something that is optional

Type control-x to get out of the start-up page



Start time

Enter the Julian date (from the VLA schedule) and start time of your observations in LST. Observe will calculate the other times for you.

Observing mode

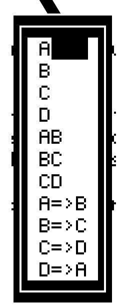
Be sure to set the basic observing mode. Observe uses this information to decide what information you will need to specify later.

Start Positions

If you enter a starting position for the array and a starting subreflector, Observe will know how to estimate the move time to the first source. This is optional.

Special instructions

The comments you enter here will appear at the top ofyour observe file.
They can alert the operators to special needs



Observe needs to know the array you are using so it can calculate shadowing and the default integration time.

? Are you preparing an observe file for CONTINUUM observations?

Be sure that you have selected Continuum mode in the Starting Conditions set up (see previous page)

Go to page 13

? Are you preparing an observe file for SPECTRAL LINE observations?

Be sure that you have selected Line mode in the Starting Conditions set up (see previous page)

Go to the next page.

The Source Page

in Spectral Line Mode

Put on the mask before you type in the source coordinates

Defaults
Type the name of an NRAO default or one of your default setups and Observe will fill in all of the fields specified in the default. It is a good idea to use defaults for consistency.

A few, common line observations have been set up as NRAO defaults
HI for galactic HI
XGHI for extra galactic HI
OH for a OH Zeeman line observation
etc....
Others may be added with each new release of Observe. You might use these defaults directly or use them as a starting point to create your own user default.

SOURCE NAME

This is the name that will appear in your observe file.

The name of this item is 'Example'—that is what appears in the Observe List.

```
                                Item Example / Source NGC????
 Source    Qualifier  Calibrator      ObservingMode                    Defaults
NGC????                                                        User
                                                               NRAO HI
  Epoch Right Ascension   Declination     Error       Flux
 2000.0   12 02 33.6959  +09 43 17.971                           IF  Band  Bandw
 1991.3   12 02 06.9446  +09 46 12.020                            A   L    0.78
 1950.0*  12 00 00.0000  +10 00 00.000                File        B   L    0.78
                                          FE/Subref               C   L    0.78
        Integration Time  60.0            IF/Rcvr                 D   L    0.78
Comment
```

Band and Bandwidth

Specify the band and bandwidth you want to use in each of the IFs.

(This is also on the LO page).

```
                 Declination

       Edit the displayed numeric pattern
```

```
Help |Menus|Lists|
-----+-----+-----+-----
SrcUp| Up  |PgUp |
-----+-----+-----+-----
Left |Srch |Right|
-----+-----+-----+-----
SrcDn|Down |PgDn |
-----+-----+-----+
   Insert  | Del |
```

Page Up/Down

Use the **PgUp** and **PgDn** keys to go between the different screens that describe the observational setup for this source.

Comment

Add a comment to entries in the source List and Observe adds them to the observe file. Comments can help identify calibrators or program sources.

Integration Time

This is the basic integration time in the correlator for each record, not the total integration time on source. (also on the Correlator Page).

Source Up/Down

Use the **SrcUp** and **SrcDn** keys to move up and down the list of sources and view their setups for this screen.

```
Goto Item #
Skip Items
Find Source Named backward
Find Source Named forward
Find Band backward
Find Band forward
Top
Bottom
```

Press the **Srch** key for a handy menu that helps you get arround.

The Scheduling Page

in Spectral Line Mode

Observation Time

After you compute the schedule (in the schedule menu) this page will be filled in with all information about this observation.

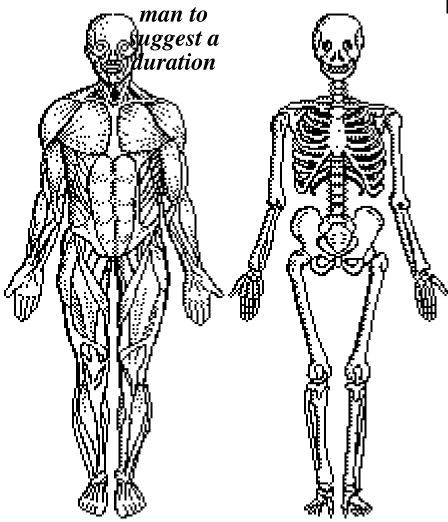
```
Schedule
  Compute observing schedule
  Set dwell times
  Set durations
  Set stop times
```

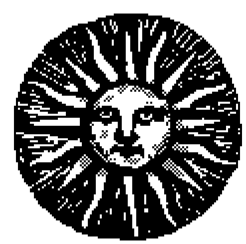
Observation Time

Choose how long you want to observe this source by
duration (obs + move time)
or
dwell time (time on source)
or
stop time (exact LST)

```
-------------------------Item Example / Source NGC????----------------------
 Reschedule                              Scheduling

 Start             StartingDate/Time    Move      Begin     Dwell     Stop
 Duration  00 30 00  0,000 00 00 00   00 00 00  00 00 00  00 00 00  00 00 00
 Dwell
 Stop                H.A.  +00 00 00            +00 00 00           +00 00 00
                     Dec.  +00 00 00            +00 00 00           +00 00 00
 Wrap
 Plunge     down      Azimuth     0.00                0.00                0.00
                     Elevation    0.00                0.00                0.00
 Display Shadowing
                     Parallactic angle                0.00                0.00

       Edit the di

                                                  Left |Srch |Right|
                                                  -----+-----+-----+-----
                                                  SrcDn|Down |PgDn |
                                                  -----+-----+-----+
                                                     Insert  | Del |
```

Ask the skeleton and the skinless man to suggest a duration





Don't get too close to the sun!
(Especially at L band)

The Frequency Page

in Spectral Line Mode

Choose how you want the specified frequency to be observed.

```
rail
center
set
no change
```

Put the specified frequency at the the edge of the band
Put it at the band center
Use on- line doppler tracking to set the sky frequency
Use the sky frequency of the previous observation.

Choose how you want to calculate the sky frequency

```
absolute frequency
frequency offset
radio velocity
optical velocity
```

Don't do any calculation, use the specified rest frequency
Add the specified frequency offset
Use the radio definition and the specified velocity
Use the optical definition and the specified velocity

```
                    Item Example / Source NGC????
                        Local Oscillator Options
                                                     Trans          Line Rest Freq
                                                                         MHz
Synthesizer setting option set                       A  H             1,420.405752
Frequency/Velocity option  radio velocity            B  H             1,420.405752
Apparent sky frequency is  band centers              C  H             1,420.405752
Rest frame for DOPSET is   LSR                       D  H             1,420.405752
```

```
                 Declination

      Edit the displayed numeric pattern
```

```
Help |Menus|Lists|
-----+-----+-----+-----
SrcUp| Up  |PgUp |
-----+-----+-----+-----
Left |Srch |Right|
-----+-----+-----+-----
SrcDn|Down |PgDn |
-----+-----+-----+
   Insert  | Del |
```

Rest Frequency

Type in the line rest frequency for each of the IFs here or go to the left and use the Trans popup menu to have Observe enter the rest frequency for you.

```
H
OH(1-2)
OH(1-1)
OH(2-2)
OH(2-1)
H2CO(101-111)
H2CO(211-212)
H2O
NH3(1,1)
NH3(2,2)
NH3(3,3)
NH3(4,4)
NH3(5,5)
```

Some common spectral lines observed with the VLA are listed in this menu. When you select one its rest frequency will be entered for you.

Choose the rest frame for the doppler tracking calculation

```
topocentric
barycentric
LSR
geocentric
```

No correction
Velocities are referenced to the center of the solar system
Velocities are referenced to the local standard of rest
Velocities are referenced to the center of the earth

Choose how you want to center the line in the band

```
band edge
band centers
```

Put the line at the edge of the band
Put the line at the center channel

LO settngs

Do not enter anything in these fields if you want Observe to choose LO settings for you, otherwise specify the LO seetings you want to use.

Velocity

Enter the velocity offset for this observation. After you do this, Observe calculates the 2-4 GHz and Front end LO setting for you if you haven't already specified them.

Sky Frequency

This is the sky frequency of the observation.

If you are using Dopper tracking **do not alter this field**. Observe will calculate the sky frequency for you using the line rest frequency, velocity offset and velocity defintion you have specified. Since the sky frequency changes with time, you will have to recalculate the observe schedule in order for the sky frequency to be updated for the time of this observation.

If you edit this field, Observe will calculate the LO settings that will produce this sky frequency.

Band and Bandwidth

Specify the band and bandwidth you want to use in each of the IFs.

(This is also on the Source page).

```
Item Example / Source NGC????
Frequency Calculations

Bnd  Bw    Front End  2-4 GHz  Freq Vel  IF Filter  Bandwidth  Frequency
           LO GHz     LO MHz   km/s      MHz        MHz        MHz
A    L  0.78   -3.2    3610     -45.000   50.0   0.781250   1,420.618961
B    L  0.78   -3.2    3610     -45.000   50.0   0.781250   1,420.618961
C    L  0.78   -3.2    3610     -45.000   50.0   0.781250   1,420.618961
D    L  0.78   -3.2    3610     -45.000   50.0   0.781250   1,420.618961
```

```
Declination

Edit the displayed numeric pattern
```

```
Help |Menus|Lists|
-----+-----+-----+-----
SrcUp| Up  |PgUp |
-----+-----+-----+-----
Left |Srch |Right|
-----+-----+-----+-----
SrcDn|Down |PgDn |
-----+-----+-----+
  Insert   | Del |
```

Decode the hieroglyphics then set your LOs

The Correlator Page

in Spectral Line Mode

Correlator Mode

Select the basic correlator mode you want to use.

```
                    Continuum
        Single IF  spectrum, correlation AA
        Single IF  spectrum, correlation BB
        Single IF  spectrum, correlation CC
        Single IF  spectrum, correlation DD
        Dual IF spectrum, correlation AA, BB
        Dual IF spectrum, correlation AA, CC
        Dual IF spectrum, correlation AA, DD
        Dual IF spectrum, correlation BB, CC
        Dual IF spectrum, correlation BB, DD
        Dual IF spectrum, correlation CC, DD
    Four IF spectra, correlations AA, BB, CC, DD
Two IF, polarization spectra, correlation AA, AC, CA, CC
Two IF, polarization spectra, correlation BB, BD, DB, DD
```

```
                        Item Example / Source NGC????
                        Correlator and Array Processor

                              Correlator Mode
                  Dual IF spectrum, correlation AA, CC

                                                             Channels
Array Processor Mode          Integration Time          IF  Count    Starting
1 Hanning smoothing             60.0                     A    64        32
2                                                        B    64        32
3                                                        C    64        32
                                                         D    64        32
```

```
                 Declination                          Help |Menus|Lists|
                                                      -----+-----+-----+-----
      Edit the displayed numeric pattern              SrcUp| Up  |PgUp |
                                                      -----+-----+-----+-----
                                                      Left |Srch |Right|
                                                      -----+-----+-----+-----
                                                      SrcDn|Down |PgDn |
                                                      -----+-----+-----+
                                                         Insert  | Del |
```

Array Processor Modes

Choose what on-line processing you want the array processor to do, if any. None, 1 2 or 3 modes can be turned on at any time.

```
bandpass normalize
Hanning smoothing
sum of baselines
lag spectrum
```

Channels

Count = the number of channels you want to record
Start = the starting channel to record.

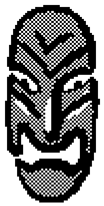
If you don't use all the available channels make sure you specify the starting channel!

Integration Time

This is the basic integration time in the correlator for each record, not the total integration time on source. (also on the Source Page).

The Source Page

in Continuum Mode



Put on the mask before you type in the source coordinates

Defaults
Type the name of an NRAO default or one of your default setups and Observe will fill in all of the fields specified in the default. It is a good idea to use defaults for consistency.

It is a good idea to start by specifing the one of the following NRAO defaults:

44 75HMz
PP 90cm
LL 21cm
CC 6cm
XX 3.6cm
UU 2cm
KK 1.3cm

Observe will fill in default values for the LO and Frequency pages for you and you can modify those values if you want.

SOURCE NAME

This is the name that will appear in your observe file.

The name of this item is 'Example'—that is what appears in the Observe List.

```
                              Item Example
 Source    Qualifier  Calibrator      ObservingMode                Defaults
NGC????                                                  User
                                                         NRAO LL
  Epoch Right Ascension   Declination        Error       Flux
 2000.0   12 02 33.6959  +09 43 17.971                            IF Band Bandw
 1991.3   12 02 06.9698  +09 46 11.855                             A    L  50.00
 1950.0*  12 00 00.0000  +10 00 00.000                   File      B    L  50.00
                                             FE/Subref             C    L  50.00
       Integration Time  10.0                IF/Rcvr               D    L  50.00
Comment
```

Band and Bandwidth

Specify the band and bandwidth you want to use in each of the IFs.

(This is also on the LO page).

```
                 Declination

      Edit the displayed numeric pattern
```

```
Help |Menus|Lists|
-----+-----+-----+-----
SrcUp| Up  |PgUp |
-----+-----+-----+-----
Left |Srch |Right|
-----+-----+-----+-----
SrcDn|Down |PgDn |
-----+-----+-----+
   Insert  | Del |
```

Page Up/Down

Use the **PgUp** and **PgDn** keys to go between the different screens that describe the observational setup for this source.

Comment

Add a comment to entries in the source List and Observe adds them to the observe file. Comments can help identify calibrators or program sources.

Integration Time

This is the basic integration time in the correlator for each record, not the total integration time on source. (also on the Correlator Page).

Source Up/Down

Use the **SrcUp** and **SrcDn** keys to move up and down the list of sources and view their setups for this screen.

```
Goto Item #
Skip Items
Find Source Named backward
Find Source Named forward
Find Band backward
Find Band forward
Top
Bottom
```

Press the **Srch** key for a handy menu that helps you get arround.

The Scheduling Page

in Continuum Mode

Observation Time

After you compute the schedule (in the schedule menu) this page will be filled in with all information about this observation.

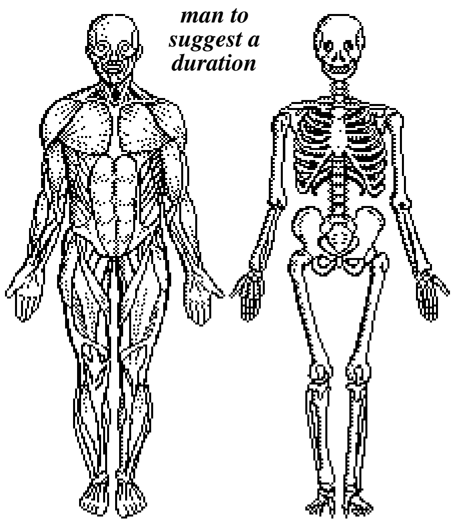
```
Schedule
 Compute observing schedule
 Set dwell times
 Set durations
 Set stop times
```

Observation Time

Choose how long you want to observe this source by duration (obs + move time)
or
dwell time (time on source)
or
stop time (exact LST)

```
Item Example / Source NGC????
Reschedule                        Scheduling

Start              StartingDate/Time     Move      Begin     Dwell      Stop
Duration  00 30 00  0,000 00 00 00    00 00 00  00 00 00  00 00 00  00 00 00
Dwell
Stop                H.A.  +00 00 00              +00 00 00            +00 00 00
                    Dec.  +00 00 00              +00 00 00            +00 00 00
Wrap
Plunge     down      Azimuth      0.00                0.00                 0.00
                    Elevation     0.00                0.00                 0.00
Display Shadowing
                    Parallactic angle                 0.00                 0.00

        Edit the di

                                                 Left |Srch |Right|
                                                 -----+-----+-----+-----
                                                 SrcDn|Down |PgDn |
                                                 -----+-----+-----+
                                                   Insert   | Del |
```

Ask the skeleton and the skinless man to suggest a duration



Don't get too close to the sun!
(Especially at L band)

Choose how you want the specified frequency to be observed.

```
rail
center
set
no change
```

- rail — Put the specified frequency at the the edge of the band
- center — Put it at the band center
- set — Set the sky frequency to the specifed absolute frequency
- no change — Use the sky frequency of the previous observation.

Choose how you want to calculate the sky frequency

- absolute frequency — Don't do any calculation, use the specified rest frequency
- ~~frequency offset — Add the specified frequency offset~~
- ~~radio velocity — Use the radio definition and the specified velocity~~
- ~~optical velocity — Use the optical definition and the specified velocity~~

} line mode only

```
Item Example / Source NGC????
Local Oscillator Options

                                                Trans         Line Rest Freq
                                                                    MHz
Synthesizer setting option set                  A
Frequency/Velocity option  absolute frequency   B
Apparent sky frequency is                       C
Rest frame for DOPSET is                        D
```

```
Declination

Edit the displayed numeric pattern
```

```
Help |Menus|Lists|
-----+-----+-----+-----
SrcUp| Up  |PgUp |
-----+-----+-----+-----
Left |Srch |Right|
-----+-----+-----+-----
SrcDn|Down |PgDn |
-----+-----+-----+
   Insert  | Del |
```

The LO Page

in Continuum Mode

LO settngs

Do not enter anything in these fields if you want Observe to choose LO settings for you, otherwise chose the LO seetings you want to use.

Frequency Offset
[available in **set** mode only]

Enter the frequency offset for this observation. The sky frequency will be calculated for you.

Sky Frequency

This is the sky frequency of the observation.

In **set** mode Observe calculates the sky frequency for you using the LO settings and the velocity offsets you have specified. If you edit this field, Observe will adjust the LO settings to obtain the sky frequency you specify.

In **center** or **rail** mode you can enter the frequency you want to observe and Observe will calcualte the LO settings for you.

Band and Bandwidth

Specify the band and bandwidth you want to use in each of the IFs.

(This is also on the Source page).

```
Item Example / Source NGC????
Frequency Calculations

  Bnd  Bw     Front End  2-4 GHz   Freq Vel   IF Filter Bandwidth     Frequency
                LO GHz    LO MHz     MHz         MHz      MHz            MHz
A  L  50.00    -3.2        3640   100.00000     50.0   50.000000   1,464.900000
B  L  50.00    -3.2        3690   200.00000     50.0   50.000000   1,514.900000
C  L  50.00    -3.2        3640   250.00000     50.0   50.000000   1,464.900000
D  L  50.00    -3.2        3690   150.00000     50.0   50.000000   1,514.900000
```

```
Declination

Edit the displayed numeric pattern
```

```
Help |Menus|Lists|
-----+-----+-----+-----
SrcUp| Up  |PgUp |
-----+-----+-----+-----
Left |Srch |Right|
-----+-----+-----+-----
SrcDn|Down |PgDn |
-----+-----+-----+
  Insert   | Del |
```

Decode the hieroglyphics then set your LOs