# SeaSonde Radial Suite Release 7
## Configuration File Formats
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*AnalysisOptions.txt*  Radial Suite Processing Controls
*Header.txt*  Radial Suite Processing Parameters

Many of these settings are set through **SeaSondeRadialSetup.app**.
Occasionally, you might have a need to hand edit these files for new settings.
*Be careful not to remove or add/insert any lines.*

## AnalysisOptions.txt

AnalysisOptions file controls major processing options of turning Cross Spectra into Radials Maps and Wave Data. AnalysisOptions is read by the Spectra Processing scripts and tools. Spectra Processing refers to the SeaSonde tools, which analyze cross spectra into radial and/or wave data.

The file is text based using smRoman ASCII font.
There must be no missing lines.
Each line must end with a linefeed character (Other common characters like carriage return will not work.); this is common for most OS X text files.
The last line must also have an end of line (linefeed character).

## Default Standard Radial Site:

```
1 2 0        ! 1 Radial Processing: 0(Off),1(On); OBSOLETE RadPtFilter: 0(Off),>=1(min pts); RadSmooth: 0
(None),1(Gauss)
0            ! 2 Wave Processing:  0(Off),1(Model),2(Spectral),3(Both)
0            ! 3 OBSOLETE File Archiving
0 0          ! 4 Antenna Pattern: 0(Ideal),1(Measured),2(Both); ForceAmplitudes: 0(Off),1(Header Ampl
Adj),2(SeaEcho)
0            ! 5 Spectra Header Override: 0(Use CS Info),1(Use Header Info)
1            ! 6 CSA Processing: 0(CSA->'Rad_'),1(CSS only)
0 0 0        ! 7 Wave Processing: Offshore Waves: 0(Off),1(On); Bragg Symetry 0(Off),1(On); InnerWaves 0
(Off),1(On)
0            ! 8 Elliptical Processing: 0(Off),1(On)
1            ! 9 Ionosphere Noise: 0(Ignore), 1(Reject Offending Bragg/RangeCells)
0            !10 ShortTime Rad/Ellipticals: 0(Off), 1(Output)
0            !11 Special FirstOrder: 0(Off), 1(Enable)
0            !12 Average CS FirstOrder: 0(On), 1(Disable)
0            !13 Merging Method: 0(Default:Median), 1(Median), 2(Averaged)
0            !14 Pattern Method: 0(Default:Pattern), 1(Pattern), 2(Water Only), 3(Anywhere)
0            !15 Waves Follow Wind Direction: 0(Don't), 1(Do)
0            !16 FirstOrder Method: 0(standard), 1(notNearBragg), 2(innerBragg),3(innerBragg
+notNearBragg)
1            !17 WaveModelSlider Method: 0(Average), 1(Median)
0            !18 PatternEndPoints: 0(Remove), 1(Keep for 360deg coverage)
1            !19 DopplerInterpolation: 0(Off),1(Double), 2(Double), 3(Triple), 4(Quadruple)
0            !20 Use Bragg: 0(Both), 1(Pos/Left), 2(Neg/Right), 3(Both)
0            !21 Enable Radial Metric Output: 0(Off), 1(Enable), 2(Metric for maximum velocity)
0            !22 Enable Radial Filter Output: 0(Off), 1(Area Filter+Interp), 2(Area Filter Only)
0            !23 Override WaveModel Period limits: 0(default), 1(Use Header limits L32)
```

**Line 1: Parameter 1:**          *Radial Processing Enable*

This parameter if 0(zero) disables radial processing and no radials file will be produced. Should be 1(one) to process cross spectra into radials. The default is 1(one).

**Line 1: Parameter 2:**          *Minimum Radial Vector Filter*

This parameter for radial merging is used by RadialMerger tool to set the minimum number of radial vectors that should appear at each range and bearing location in order to be merged into the final radial output. Warning, if this value is less than the number of CSS files that processed into a radial then the output radial will always be empty of vectors. A value of 0(zero) or 1(one) will allow all vectors found in CSS files to be included into the output radial file. The default value is 2.

Warning: CODAR does not currently recommend setting this value higher than 2.

**Line 1: Parameter 3:**          *OBSOLETE. Radial Smoothing Type*

*OBSOLETE: This parameter is no longer used for Radial Release 7. There is a new Radial Filler output option which creates filtered and filled radials in addition to standard output radials.*

This parameter sets the type of smoothing applied by the RadialMerger tool to the output radial. A 0(zero) leave the radials untouched (no smoothing). A value of 1(one) or 2(two) applies a linear interpolation over angle to fill gaps in the radial coverage. The smoothing function uses 4 parameters from line 19 in the '**Header.txt**' file to control its actions. The default is 0(zero).

**Line 2: Parameter 1:**          *Wave Processing Enable*

This parameter if 0(zero), the default, disables wave processing and no wave files will be produced.
If 1(one) the new Wave Model processing will process CSS into wave model history files.
If 2(two) the Wave Spectra processing will process CSA files into wave spectra files. This method only works for 12 and 25 MHz systems.
If 3(three) both processing methods are enabled.

*In order to process waves, the coastline angles in the **Header.txt** file must be entered.*
A Spectra Processing WaveForFive tool checks to see if any changes have been made to the operating frequency or coastline angles. If so, then a new WaveModelForFive.txt or WaveForFive.txt file is created in the RadialConfigs folder.
Also the Wave Direction Limit in Header.txt should be entered.

**Line 3: Parameter 1:**          *File Archiving Enable*

*This parameter is not used by SeaSonde 10. File Archiving is handled by the Archivalist application.*
On SeaSonde4 it specified how to handle archiving of the CSS, CSA and Rad files. A 0(zero) specifies to keep all files, which is useful for reprocessing. On a Radial Site, this will eventually fill up the hard disk and all data collection and processing will come to a halt. A 1(one) specifies that after the limits specified in the Header file are exceeded then the oldest files will be deleted. The default is 1(one).

**Line 4: Parameter 1:**          *Antenna Pattern Type*

This parameter if 0(zero) specifies to use an ideal antenna pattern in processing cross spectra into radials. A value of 1(one) specifies to use a measured antenna pattern in processing. A value of 2(two) will tell the Spectra Processing to run both ideal and measured antenna pattern processing (This is only for diagnostic purposes). To use measured patterns you must first do an Antenna Pattern Measurement (consult the APM manual). The default is 0(zero).

**Line 4: Parameter 2:**          *Amplitude Correction Type*

This parameter used with Antenna Pattern Type selects the type of antenna amplitude correction for use with Spectra Processing. Setting this value to 0(zero) applies a measured sea echo correction for ideal patterns and leaves the measured patterns unchanged. Setting this value to 1(one) applies a fixed amplitude correction using values from the Header file Line 17. Setting this value to 2(two) applies an amplitude correction using the measured sea echo amplitude for ideal & measured patterns. (If using sea-echo and measured patterns, they should be close to ideal) The default is 0(zero)

If using ideal antenna pattern:

| Ampl. Correction | Correction |
| --- | --- |
| 0(default) | Use measured sea-echo amplitudes. |
| 1(forced) | Use ideal forced amplitudes from Header file. |
| 2(sea echo) | Use measured sea-echo amplitudes. |

If using measured antenna pattern:

| Ampl. Correction | Correction |
| --- | --- |
| 0(default) | None. Uses amplitude correction built into the pattern. |
| 1(forced) | Use meas forced ampl from Header relative to meas pattern adjustment. |
| 2(sea echo) | Use measured sea-echo amplitudes relative to meas pattern adjustment. |

**Line 5: Parameter 1:** *Spectra Header Override Enable*
This parameter if 0(zero), the default, tells Spectra Processing to use the embedded settings in the cross spectra like transmit center frequency, Hz per Doppler bin, and number of Doppler bins. If 1(one) or the cross spectra file settings not valid, then Spectra Processing gets the settings from the Header.txt file. On ancient software that did not run the SeaSondeController application, the cross spectra files do not have the actual settings used and the processing software always gets the necessary values from the Header.txt file. On newer systems, SeaSondeController queries the receiver for the actual settings used and tells SeaSondeAcquisition, which stores them into the cross spectra files. Also, in SeaSondeController, when a user does the 'Store' button the settings are also written to the Header.txt file.

**Line 6: Parameter 1:** *CSA Processing Enable*
This parameter if 0(zero), the default, prevents CSA from being processed into 'RDLi'(ideal pattern) and 'RDLm'(measured pattern) radials. If 1(one) then CSA files are processed into radials. This parameter is for compatibility/comparison with older SeaSonde systems, which produced one-hour radial files from one-hour averaged CSA cross spectra files. On newer systems, CSAs are used only for Wave Spectra processing.

**Line 7: Parameter 1:** *Offshore Waves from Any Direction.*
This parameter if not 0(zero) then wave processing will allow long period (>5sec) wave to come from any direction, otherwise they are only allowed to come from offshore. Default is 0(zero)

**Line 7: Parameter 2:** *Spectra Symmetry Processing Enable*
This parameter if not 0(zero) then offshore processing software will combine spectral values with positive and negative Doppler frequencies to optimize wave processing. Default is 0(zero). *This parameter is not currently in use by any SeaSonde 10 release.*

**Line 7: Parameter 3:** *Use Inner Bragg Sidebands for Waves*
This parameter if not 0(zero) then wave processing will also use the inner sidebands of the Bragg energy for results. Typically they are not used due to greater possibility of interfering signals. Default is 0(zero).

**Line 8: Parameter 1:** *Elliptical Processing*
This parameter if not 0(zero) will enable SeaSondes installed with the **Bistatic** option to produce elliptical vectors. The Bistatic Setup document will describe how to configure this.

**Line 9: Parameter 1:** *Ionosphere Contamination Removal*
This parameter, if set to 1 (one), enables automatic removal of Bragg peaks that are contaminated with ionospheric echoes. Recommended to be enabled for LongRange SeaSonde operation.
*See Ionospheric factor in Header.txt*

**Line 10: Parameter 1:** *Short time radial output*
This parameter, if set to 1 (one), enables output of the short time (unmerged) radials made from individual CSSs. The radial files are stored into /codar/seasonde/data/RadialShorts/. Their LLUV filenames will start with 'RDLx' for ideal and 'RDLy' for measured patterns. *This feature is only available in SeaSonde 10 Release 3 Update 3 or later. If enabled, be sure to configure Archivalist to archive these files.* The default is 0(zero).

**Line 11: Parameter 1:** *Special First Order Limits*

This parameter, if set to 1 (one), enables special processing of First Order Limits. This parameter is not in use before SeaSonde10 Release4 Update1. See the Special FirstOrderLimit document on how to use. The default is 0(zero).

**Line 12: Parameter 1:**     *Disable CS Averaging for First Order Limits.*
This parameter, if set to 1 (one), disables the standard feature of averaging a previous hours worth of CSS to calculated First Order Limits from and applying to latest CSS when creating a short-time radial. The default is 0 (zero).

**Line 13: Parameter 1:**     *Radial/Elliptical Merging Method*
This parameter tells Radial Processing which method to use when merging vectors at the same range and bearing across short-time sources. If set 1(one), the vectors are median filtered. If set to 2(two) the vectors are averaged. The default is 1(one). If set to 0(zero)

**Line 14: Parameter 1:**     *Pattern Application Method*
This parameter tells Radial Processing which method to use when applying a antenna pattern. If set to 0(zero) or 1 (one), vectors are allowed to fall at any location in the pattern. If set to 2(two), vectors are limited to over water. The default is 0(zero).

**Line 15: Parameter 1:**     *Waves Follow Window*
This parameter tells Wave Processing whether the wave direction should come from the wind direction. This is a site specific hint to help wave processing. If set to 0(zero) then waves are calculated as if they do not follow the wind direction. If set to 1(one) then wave direction will be the same as the wind direction. The default is 0(zero). The default is 0(zero).

**Line 16: Parameter 1:**     *First Order Method*
This parameter tells Radial Processing which first order type to apply. If set to 0(zero) then the default method is used. If set to 1(one) or 3(three) then First Order method will allow the first order selection to farther away from the Bragg center than the first order selection width. If set to 2(two) or 3(three) then first order selection will wander closer to the zero doppler bin (or Inner Bragg region) than it normal would. The default is 0(zero).

**Line 17: Parameter 1:**     *Wave Model Slider Method*
This parameter tells WaveModelSlider tool which kind of averaging to use on Wave Model Fit results. If set to 0 (zero), a standard averaging is used. If set to 1(one), a median filter is used to select wave height, period, direction and wind direction over the averaging period. The default is 1(one).

**Line 18: Parameter 1:**     *Keep Pattern Endpoints*
This parameter tells SpectraToRadial tool whether to remove or keep the first and last angle bearings in the antenna pattern. The default is 0(zero) to remove them. For partial patterns (less than 360 deg coverage), results that don't fit the pattern very well will end up on one of the two endpoints of the pattern, for this reason, they are typically removed. When a site has 360deg coverage, then the endpoints should be kept.

**Line 19: Parameter 1:**     *Doppler Interpolation*
This parameter, if set to 2(two), tells SpectraToRadial tool to internally double the number of doppler points (using linear interpolation) and then calculate radial velocity and bearing. This results in a typical 10 to 15 percent increase in the number of vectors. The theory behind this is that real world signals do not typically fall exactly onto a doppler cell and instead will split power between two doppler cells; so this technique helps the software better discern between adjoining vectors.

**Line 20: Parameter 1:**     *Use Bragg For Radials*
This parameter should typically be 0 to process both positive and negative Bragg peaks.  If set to 1, only the positive(left) Bragg peak is processed and if set to 2, only the negative(right) Bragg peak is processed into radials.

**Line 21: Parameter 1:**     *Enabled Radial Metric Output*
This parameter enables output of a new R7 radial metric. These special radial files contain detailed MUSIC output for each doppler within the first order boundaries (if set to 1) or within the maximum velocity setting (if set to 2). These extra output files are intended for advanced studies on the MUSIC processing and not meant for standard radial currents. Default is 0 (off)

**Line 22: Parameter 1:**     *Enable Radial Filter Output*

This parameter parameter enables output of a new R7 radial which are spatially filtered and filled. Note, output resolution is fixed at 5 degrees. Default is 0(off). Set to 1 to enable with filtering and interpolated fill or set to 2 for filtering only. Line 30 of Header.txt contains parameters for controlling the filter and interpolation.

**Line 23: Parameter 1:** *Override WaveModel Period Limits*
This parameter parameter (if set to 1) overrides the built in defaults for the Wave Model Fitter minimum and maximum wave periods. The new period limits are set in Line 32 of Header.txt. Default is 0(default periods)

# Header.txt

The Header file controls many aspects turning Cross Spectra in to Radials Maps and Wave Data.

The file is text based using smRoman font.
There must be no missing lines.
Each line must end with a linefeed character (Other common characters like carriage return will not work.); this is common for most OS X text files.
The last line must also have an end of line (linefeed character).

# Default Standard Radial Site:

```
0 XXXX "Standard 12"          ! 1 Site#, 4Char SiteCode,"Site Desc."
00°00.000'N,000°00.000'W      ! 2 Receiver Antenna Latitude,Longitude
360                           ! 3 Antenna Loop1 Bearing °T
30 3.023 3.023                ! 4 Radial Last Range Cell. ALTERNATE RangeCell Info, 1st (km), Step (km)
90.0                          ! 5 OBSOLETE Baseline Angle. Always 90.0
1.0                           ! 6 OBSOLETE CSS Average for FirstOrderCalc
  0.000000                    ! 7 ALTERNATE Tx Center Freq MHz
512                           ! 8 ALTERNATE Doppler Points
0.003908526                   ! 9 ALTERNATE Doppler Resolution in Hz
                              !10 Time Zone Abbr., fromGMT, CityZone
180. 2                        !11 Max. Velocity Limit, Num Pts Smoothing For FirstOrderCalc
100.00 1 100.00               !12 Factor Down Peak limit 1st order Radials , 1=use peak null, Factor down
                               1rst order Waves
0                             !13 Reserved
10 17.                        !14 Wave Process Range Cell, Estim. Max Wave Period (seconds)
10.00 3.98  10.00 3.16        !15 Radials:Factor down peak nulls, Noise factor, Waves:Factor down peak
                               nulls, Noise factor
 0 0 0                        !16 OBSOLETE (Was Keep CSA,Rad,CSSs)
1.00 1.00 1.00 1.00           !17 Ampl Factors Ideal:Amp1,Amp2   Patt:Amp1,Amp2
000 000                       !18 Coastline bearings, °T, Right/left hand facing sea.
40. 20. 2.  0. 0. 0. 0.       !19 Music params eigrat,sigprat,diagrat. OBSOLETE Smooth Med,Smear,Vel,Gap.
                              !20 OBSOLETE FileName Rad,Tot Separators date,space chars (Use \'-_\' or
                               \'__\')
75. 60. 0. 0.                 !21 Rads:  Coverage min., Output Interval min., Interval Offset min.,
                               0=Watch Timespan
5.0                           !22 Bearing Resolution
00. 10. 0. 0.                 !23 Waves:  Coverage min., Output Interval min., Interval Offset min.,
                               0=Watch Timespan
1.0                           !24 Ionosphere Noise Rejection Factor
0                             !25 Doppler Cell Noise Limit Adjustment
0 0                           !26 OBSOLETE Wave direction limits, °T, Right/left hand facing wave fronts
1 1                           !27 Radial First Range Cell, WaveModel First Range Cell.
360.                          !28 Amplitude Factor Averaging Period min.
10                            !29 WaveModel Minimum Dopper Points
2.1 10. 30. 30. 3.            !30 RadialFiller RCLim AngLim CurLim AngGap RngGap
0 360                         !31 WaveModel Waves From Direction limit Center Bearing True, Sector Width
                               deg.
5 17                          !32 WaveModel Wave Period override limits.
```

**Line 1: Parameter 1:** *Site Number*
*This parameter is not used by SeaSonde. The SiteCode is what differentiates all the sites.*
This OBSOLETE parameter was the number of the radial site 1 to <n> used to keep track for older Combine Site processing.

**Line 1: Parameter 2:**        *Site Code*
This very important parameter is a four character alphanumeric label, which is used in marking the filenames of spectra, radials, waves, total vectors, plus other files that are site-specific output files. It must be four alpha-numeric characters. The first character should not be a number. Do not use and other symbols.
Example If the Site code is 'SFBY' then an output radial filename might be "RDLm_SFBY_2012-01-23_1200.ruv"

**Line 1: Parameter 3:**        *Site Description*
This parameter is general description of the site and will be included in most output files. It should be wrapped in quotes and can contain spaces. For example a description could be "Bodega Bay Marine Lab"

**Line 2: Parameter 1:**        *Site Location*
This parameter is the latitude, longitude of the installed Radial Site. This string is copied into the radial and total vector files. It must be of the format 00°00.000'N,000°00.000'W which is latitude, longitude in degrees and fractional minutes. Use three decimal places for minutes. *Warning, do not add a space after the comma between latitude and longitude.* Use capitals N for north, S for south, E for East and W for west. The degree symbol can be entered by typing <option><shift>8.

**Line 3: Parameter 1:**        *Antenna Bearing*
This parameter is the measured bearing of Loop1 clockwise (CW) from True North in degrees. Warning, this value must be updated when a Radial Site is installed, or if the receive antenna is rotated; otherwise, the radial files will be incorrect. Use the SeaSondeRadialSetup or MagneticDeclination application to **convert** from a compass measurement of the antenna **directional arrow** to the Antenna Bearing to be entered here.

**Line 4: Parameter 1:**        *Process Range Cell*
This parameter is the last range cell to process into radials. The maximum value must be one less than the number of range cells processed by the Cross Spectra Averaging application (Standard SeaSonde default is 30; Long-Range default is 36).

**Line 4: Parameter 2:**        *First Range Distance*
This parameter is the distance in kilometers to the center of the first range cell. This value is only used if AnalysisOptions Spectra Header override is set. This value is dependent on the bandwidth set by SeaSondeController or SeaSondeRadialSetup. SeaSondeController will modify this value when the settings are stored permanently. Typically, processing software will use the meta data found in the cross spectra.

**Line 4: Parameter 3:**        *Step Range Distance*
This parameter is the distance in kilometers from range cell to range cell. This value is only used if AnalysisOptions Spectra Header override is set. This value is dependent on the bandwidth set by SeaSondeController or SeaSondeRadialSetup. SeaSondeController will modify this value when the settings are store permanently. Typically, processing software will use the meta data found in the cross spectra.

**Line 5: Parameter 1:**        *Baseline Reference*
This OBSOLETE parameter was the Radial vector file reference angle in degrees CCW (counter-clockwise) from East. *Warning, this value must always be 90.*

**Line 6: Parameter 1:**        *Average Period*
This OBSOLETE parameter was the hours used by to average CSS cross spectra files to calculate first order Bragg regions used by the SpectraToRadial processing tool. The default is 1.0 hour

**Line 7: Parameter 1:**        *Transmit Center Freq*
This parameter is the center frequency Transmitted by the SeaSonde in MHz. This value is only used if AnalysisOptions Spectra Header override is set. This value is necessary to be correct for Wave Spectral processing. SeaSondeController or SeaSondeRadialSetup will modify this value when the receiver settings are stored permanently. Typically, processing software will use the meta data found in the cross spectra.

**Line 8: Parameter 1:**        *Doppler Bins*
This parameter is the number of Doppler bins in the cross spectra. . This value is only used if AnalysisOptions Spectra Header override is set and it must match the cross spectra being processed. On a standard SeaSonde the default is 512. Typically, processing software will use the meta data found in the cross spectra.

**Line 9: Parameter 1:**        *Doppler Hz/Bin*

This parameter is used to calculate the velocity of each radial vector. This value is the receiver sweep rate divide by the number of Doppler bins. This value is only used if AnalysisOptions Spectra Header override is set. SeaSondeController will modify this value when the receiver settings are store permanently. Typically, processing software will use the meta data found in the cross spectra.

**Line 10: Parameter 1:**          *Timezone Abbreviation*
This parameter is a 2 to 8 character label of the timezone for the output data. Example, 'UTC' for Universal Time or 'PST' for Pacific Standard Time.

**Line 10: Parameter 2:**          *From GMT*
This parameter is the hours from GMT time.

**Line 10: Parameter 3:**          *City Zone*
This parameter is OS X style city time zone name. When this is not empty "" then it is used first to automatically determine the timezone offset from GMT. The reason for this is that a number of Timezone Abbreviations are duplicated in various places around the world. Example "IST" could be India, or Ireland while their city zone name would be "Asia/Calcutta" and "Europe/Dublin"


**Line 11: Parameter 1:**          *Maximum Current*
This parameter is the maximum current velocity in centimeters per second (cm/s) used to delimit the boundaries of the first-order Bragg regions. The default is 150.

**Line 11: Parameter 2:**          *Bragg Smoothing Points*
This parameter is the number of Doppler points used by the Currents tool for smoothing to calculate the Bragg first order regions. Too large a value will cause erroneous second order information to be included in first order. Too small a value may cause loss of first order information, as the boundaries can be set too close in. The default value is 2(two).

**Line 12: Parameter 1:**          *Radial Factor Down*
This parameter is the factor down from both sides of Bragg peak to delimit first order region for Currents processing. The default value is 15.

**Line 12: Parameter 2:**          *Has Second Order*
This parameter is set to 0(zero) if you do not expect the site to have significant second order energy impinging on the first-order region (e.g. in harbors or for low radar transmit frequencies). The default value is 1(one) for a standard SeaSonde, 0(zero) for a Long Range SeaSonde.

**Line 12: Parameter 3:**          *Wave Factor Down*
This parameter is the factor down from both sides of Bragg peak to delimit first order region for Wave processing. The default is 100.

**Line 12: Parameter 4:**          *Ionospheric Removal Factor*
This parameter is the factor use by processing spectra into radials to determine, if enabled in Analysis Options, how aggressively to reject Ionospheric noise. See the 'SSIonosphericNoise' document. The default value is 1 (one).

**Line 13: Parameter 1:**          *Spectra Averaged*
This OBSOLETE parameter is not used. This used to be the value used to average raw cross spectra produced by Acquisition into CSA files. The Cross Spectra Averaging application maintains its own settings.

**Line 14: Parameter 1:**          *Wave Processing Range*
This parameter is the last cross spectra range cell to use for Wave processing. The default is 7.

**Line 14: Parameter 2:**          *Maximum Wave Period*
This parameter is the maximum expected wave period in seconds. Wave processing produces wave spectral information for ocean wave periods less than this value. The default value is 17.

**Line 15: Parameter 1:**          *Radial Factor Down Null*
This parameter is the factor down from Bragg peak to start looking for nulls in current processing. The default is 7.5

**Line 15: Parameter 2:**         *Radial Factor Above Noise*
This parameter is the factor above noise floor for valid Bragg peak data in current processing. The default is 4.0

**Line 15: Parameter 3:**         *Wave Factor Down Null*
This parameter is the factor down from Bragg peak to start looking for nulls in wave processing. The default is 10.0

**Line 15: Parameter 4:**         *Wave Factor Above Noise*
This parameter is the factor above noise floor for valid Bragg peak data in wave processing. The default is 2.0

**Line 16:**                    *OBSOLETE File Archiving*
This *OBSOLETE line* used to contain the number of files to archive on SeaSonde4 for OS 9. It specified with three parameters the number of CSA to keep, number of Radials/Waves to keep, and the number of CSS files to keep.

**Line 17:**                    *Amplitude Correction Factors*
This line is used to force amplitude corrections for ideal and measure patterns, if so configured in Analysis Options. Do not change these values unless you have consulted with COS.

**Line 17: Parameter 1:**         *Ideal Force Loop1 Ampl*
This parameter is the factor to use when adjusting the amplitude correction for Loop1 using an ideal antenna pattern.

**Line 17: Parameter 2:**         *Ideal Force Loop2 Ampl*
This parameter is the factor to use when adjusting the amplitude correction for Loop2 using an ideal antenna pattern.

**Line 17: Parameter 3:**         *Meas Force Loop1 Ampl*
This parameter is the factor to use when adjusting the amplitude correction for Loop1 using a measured antenna pattern.

**Line 17: Parameter 4:**         *Meas Force Loop2 Ampl*
This parameter is the factor to use when adjusting the amplitude correction for Loop2 using a measured antenna pattern.

**Line 18: Parameter 1:**         *Coastline Stop*
This parameter is bearing of the right hand coastline looking out to sea in degrees from clockwise true North. From Coastline Start going clockwise to Coastline Stop indicates to the wave processing where sea-echo can be expected. The coastline bearings should be approximate best fit out to the number of range cells used to process waves.

**Line 18: Parameter 2:**         *Coastline Start*
This parameter is bearing of the left hand coastline looking out to sea in degrees from clockwise true North. From Coastline Start going clockwise to Coastline Stop indicates to the wave processing where sea-echo can be expected. The coastline bearings should be approximate best fit out to the number of range cells used to process waves.

**Line 19: Parameters 1,2,3:**    *Music Params*
These parameters are the eigrat, sigprat, and diagrat values used by the Current Processing tool using the MUSIC algorithm to determine dual vs single angle solutions. Consult the CODAR MUSIC document for more information. These values do not normally need to be changed. The default values are "40. 20. 2."

**Line 19: Parameters 4,5,6,7:**  *OBSOLETE Merging/smoothing/interpolation*
These OBSOLETE parameters were the values used by the RadialMerger Processing tool. When merging, the radial velocity at each point is taken to be the median of the unmerged radial velocities falling on that point. After this, smoothing or interpolation is applied when enabled by the 'Analysis Options' Line1 Parameter3 *Radial Smoothing Type* . When *Radial Smoothing Type* is 1, a gaussian smoothing is performed as specified by parameters 4,5,7 below. When *Radial Smoothing Type* is 2, a linear interpolation over angle is performed as limited by parameters 7 below.

**Line 19: Parameter 4:**        *Gaussian Width*
This parameter is angular width in degrees of the Gaussian smoothing function applied to the data in each range cell. The default is 20.

**Line 19: Parameter 5:**        *Smear Width*
This parameter is the angular width in degrees over which the data is smoothed.  The default is 20.

**Line 19: Parameter 6:**        *Velocity Threshold*
This parameter is the velocity bound in cm/s used to eliminate wild vectors.  Any vector that deviates from the median (calculated from the radial velocities within the *Smear Width*) by more than *Velocity Threshold* is discarded. The default is 25

**Line 19: Parameter 7:**        *Gap Width*
This parameter is the maximum gap in degrees over which smoothing/interpolation is performed. The default is 15.

**Line 20: Parameter 1:**        *OBSOLETE File Separators*
These parameters are two characters to use as the date and space separators in the wave, radial and totals filenames. Do not use illegal filename characters such as **@*:;.**  The default is '-_' a hyphen and an underscore characters. The hyphen and underscore will make the output file names compatible with most external file systems like Windows and UNIX. Note that some UNIX applications use the hyphen as a command line parameter; for such cases you might want to change the hyphen '-' to an underscore. If using '-_' then a typical radial name would be 'RadsXXXX_01-10-16_1200'

**Line 21:**                      *Radial Time Coverage*
These parameters specify the how the CSS files are timed into an output radial file.

**Line 21: Parameter 1:**        *Coverage Time*
This parameter is the minutes worth of CSS files to include into a radial file. The default is 75. If *Ignore CSS Timespan* is 0 (meaning don't ignore) then this value should include the CSS coverage time (standard SeaSonde uses 15 minutes coverage) which means that for an hourly output this value should be 60 plus 15 for 75 minutes. For LongRange SeaSondes, the default value is 360.

**Line 21: Parameter 2:**        *Output Interval Time*
This parameter is the minutes to output a new radial file. The default is 60. Changing this value will change how often a new Radial is created that spans the Coverage Time. This value should not be less than the interval that CSS files are created (ten minutes on Standard SeaSonde).

**Line 21: Parameter 3:**        *Offset Interval Time*
This parameter is the minutes after the interval time to output the new radial file. The default is 0. This value should be less than the Output Interval Time. The default has radial files that cover the previous half-hour to the following half-hour with a date stamp on the hour mark. If you change this value to 30, then the radials will cover from the beginning of the hour to the end of the hour and will be date stamped with the half-hour mark.

**Line 21: Parameter 4:**        *Ignore CSS Timespan*
This parameter if not 0(zero) tells Radial Processing to ignore the CSS time span. The default is 0. On a standard SeaSonde, CSS files are created every ten minutes and span 15 minutes. If set to ignore, then Radial processing will use only the CSS date stamp to determine if there's enough data to form the output radial. The output radials will still contain a coverage time using the CSS time span.

**Line 22: Parameter 1:**        *Radial Degree Resolution*
This parameter sets the radial resolution in degrees. Acceptable values are 1(one) and 5(five) degrees. If set to 5 degrees and the antenna pattern in use is 1 degree the output radials will be merged down to 5 degrees resolution. If set to 1degree and the antenna pattern contains 5degree resolution then the output radial will only be every 5 degrees.

**Line 23:**                      *Wave Model Fit Time Coverage*
These parameters specify the how the CSS files are averaged into each Wave Model entry.
If this line is missing then Line21 will be used for Wave Model timing.

**Line 23: Parameter 1:**   *Wave Model Coverage Time*
This parameter is the minutes worth of CSS files to include into each Wave Model entry. The default is 0, which means that it will use Line21 Parameter 1 coverage. If *Ignore CSS Timespan* is 0 (meaning don't ignore) then this value should include the CSS coverage time (standard SeaSonde uses 15minutes coverage) which means that for an hourly output this value should be 60 plus 15 for 75 minutes.

**Line 23: Parameter 2:**   *Wave Model Output Interval Time*
This parameter is the minutes to output each Wave Model entry. The default is 10. Changing this value will change how often each Wave Model entry is added that spans the Coverage Time. This value should not be less than the interval that CSS files are created (ten minutes on Standard SeaSondes). If zero, then the Line21 Parameter2 interval will be used.

**Line 23: Parameter 3:**   *Wave Model Offset Interval Time*
This parameter is the minutes after the interval time to add each Wave Model entry. The default is 0. This value should be less than the Output Interval Time. The default has entries that cover the previous half-hour to the following half-hour with a date stamp on the hour mark. If you change this value to 30, then the wave model entries will cover from the beginning of the hour to the end of the hour and will be date stamped with the half-hour mark.

**Line 23: Parameter 4:**   *Wave Model Ignore CSS Time Span*
This parameter if not 0(zero) tells Wave Model Processing to ignore the CSS time span. The default is 0. On a standard SeaSonde, CSS files are created every ten minutes and span 15 minutes. If set to ignore, then Wave Model processing will use only the CSS date stamp to determine if there's enough data to form the output Wave Model entry.

**Line 24:**      *Ionospheric Noise Removal Factor*
This parameter sets the limiting factor on Bragg to noise energy for deciding whether to use range cell Bragg for radial processing, only if AnalysisOptions.txt has *Ionosphere Contamination Removal* set to one.

**Line 25:**      *Doppler Noise Limit*
This parameter is not currently in use.

**Line 26:**      *OBSOLETE Wave Model Bearing Limits*
These *OBSOLETE* parameters set the limits for Wave Model wave direction result. These limits help ensure that the software does not get an answer to an improbable direction. The default of (0 0) will allow waves from any direction. These parameters have been replaced with newer center, width settings on Line 31.

**Line 26: Parameter 1:**   *Wave Model Direction Limit Stop*
This parameter set the Wave Model Fit wave direction result stop limit in degrees True. From Limit Start going clockwise to Limit Stop indicates to the wave model processing where wave from directions are allowed to be calculated.

**Line 26: Parameter 2:**   *Wave Model Direction Limit Start*
This parameter set the Wave Model Fit wave direction result start limit in degrees True. From Limit Start going clockwise to Limit Stop indicates to the wave model processing where wave from directions are allowed to be calculated.

**Line 27: Parameter 1:**   *Radial First Range Cell*
This parameter sets first possible range cell output in the radial results. Typically the first range cell is 1(one), but if the first few range cells are too shallow for operating frequency, then this value is set higher to exclude those range cells. The default is 1(one).

**Line 27: Parameter 2:**   *Wave Model First Range Cell*
This parameter sets first possible range cell output in the wave results. Typically the first range cell is 1(one), but if the first few range cells are too shallow for operating frequency, then this value is set higher to exclude those range cells. . The default is 1(one).

**Line 28: Parameter 1:**   *Amplitude Factor Averaging*

This parameter sets how far back in minutes that SpectraToRadial tool uses previous amplitude factors to average for use on spectra. The default is 360. There are a few cases where sites with sandy beaches and lots of rain can have a very fast effect on the antenna amplitudes. Typically, amplitudes are only used for ideal patterns but can be used for measured pattern also if AnalysisOptions Amplitude Correction Type is set to Sea-Echo.

**Line 29: Parameter 1:**          *Wave Model Minimum Doppler Points*
This parameter sets a threshold for the minimum number of second order doppler points required in order to output a result from a CSS. Setting this value too low will increased erroneous results. The default is 10.

**Line 30:**          *Radial Filter Area and Interpolation controls*
These parameters control the Radial Filter spatial area and interpolation limits.

**Line 30 Parameter 1:**          *Radial Filter RC Limit*

**Line 30 Parameter 2:**          *Radial Filter Angle Limit*

**Line 30 Parameter 3:**          *Radial Filter Current Limit*

**Line 30 Parameter 4:**          *Radial Filter Angular Gap*

**Line 30 Parameter 5:**          *Radial Filter Range Gap*

**Line 31:**          *Wave Model Fit Bearing Limits*
This line uses a sector defined as center True and width degree to limit the wave bearing from direction that Wave Model Fitting calculates. This line supersedes obsolete line 26  which used a start,stop to define the same sector. SeaSondeRadialSetup will automatically update from line 26 and will currently set both lines 26 and 31

**Line 31 Parameter 1:**          *Wave Model Fit Sector Center*
This parameter sets the center in degrees True of the sector that limits where wave bearings are calculated to come from.

**Line 31 Parameter 2:**          *Wave Model Fit Sector Width*
This parameter sets the width in degrees of the sector that limits where wave bearings are calculated to come from. The sector covers from center minus width/2  clockwise to center plus width/2.

**Line 32 Parameters 1,2:**          *Wave Model Fit Wave Period Limits*
This line set the Wave Model Fit minimum and maximum wave periods, if Line 23 of Analysis Option is set to one.