

## Segy Copier .... a very simple, but useful Segy utility

The Segy Copier is a very basic routine to copy and make some modifications to a Segy file. It will actually work on both pre-stack and post-stack data. On pre-stack data, I know one guy who uses it to copy out every other inline and xline in order to reduce the total input going to Hampson-Russell, for large gather volumes. This is intended to be a utility that is useful for preparing datasets for analysis by something else. Your ideas for things to add are probably much better than any at QEC. Also, if you run this and find errors or strange things, please let us know. This code is definitely changing with time.

### Output ... Another Segy File

The Segy Copier will output a Segy File with the same header byte locations used on input. You can also look at individual traces using the buttons "Trace Display," "Print to a Table" or "Plot FFT." Finally, there is a button to Segy Header Scan the output volume, after copying.

The screenshot shows the Segy Copier application window. The main interface includes the following sections:

- Input/Output Settings:**
  - Choose Input Directory: C:\Companies\Models
  - File Extension, no period: sgy
  - Input file name: plane\_1.sgy
  - Choose Output Directory: C:\Companies\Models
  - Output file name: none
  - New or Append to File: New file creation
  - Use same file for output: Input and Output distinct
  - Check output file: Check for output LNS file
  - Buttons: Execute Copy, Stop!
- File List:** Available plane\_1.sgy
  - Centerline\_GrAZ\_2260\_4702.sgy
  - Centerline\_GrAZ\_2260\_4702\_ff.sgy
  - plane\_1.sgy
  - plane\_1\_2.sgy
  - plane\_1\_3.sgy
  - plane\_1\_3D\_Filt\_00.sgy
  - plane\_1\_3D\_Filt\_00\_ff.sgy
  - plane\_1\_3D\_Filt\_00\_sgy\_Inline\_50.png
  - plane\_1\_abtest.sgy
  - plane\_1\_cluster.sgy
  - plane\_1\_copy.sgy
  - plane\_1\_cp.sgy
- Set Ranges Table:**

	Min	Max	Min	Max	Delta
Inline	10	84	10	84	1
Xline	200	274	200	274	1
Z or Time	0	1996	0	1996	4
- Trace Header Reading Parameters:**
  - Inline header byte: 221
  - Xline header byte: 21
  - X coordinate byte: 73
  - Y coordinate byte: 77
  - Z or Time zero byte: 109
  - XY Coordinate Scalar Byte: 71
  - Coordinates: X Integer, Y Integer, In-line-Xline Integer
  - XY Unit Conversion: No XY Unit Conversion
  - Manual Deltas: Inline increment 1, Xline increment 1, Z sample rate 4.0
- Processing Options:**
  - Trace Integration: No trace integration
  - A over B Scaling: No A over B Scaling
  - Window (Msec or Depth units): Length 400, Window Above, Offset 50
  - Clip: No clipping
  - Replacements: 0.000E00
  - Remove mean: No mean shift
  - Replace nulls & zeros: No null replacement
  - Replace all: No replacement
  - Scale to Constant: No scaling
  - Use minimum fitting frequency
- Trace Display:** Trace: Inline 47, Xline 237, Time 0 to 1996
- Filtering:** All Pass, Low Cut Filter On (5 Hertz), Low pass 100% value (9 Hertz), High pass 100% value (14 Hertz), High cut zero amplitude (28 Hertz)

## Input and running

The main thing that the Segy Copier needs is the byte locations for the Inlines, Xlines, Time-Zero and their formats. These are called the “Trace header reading parameters.” If you have previously Segy Header Scanned the input dataset, then reading the “.lns” file will bring in lots of initial settings (including the inline range, the xline range, the Z and amplitude ranges. These are useful to know up-front if some decimation or range limiting is planned.

To assist in this, after picking a file, you can “Scan N Traces Only.” This will read the first N traces (10 is the default) and the last trace in the dataset. You can look at the byte numbers on the left and the changing in the data fields (or lack of change) to help pick out byte locations.

To run, you hit the green button at the top on the left, “Execute Copy.”

## Allowed range or amplitude modifications

The modifications that have been included are an ad-hoc set needed by Quantum Earth to do some projects. If you need some other calculation added, please do not hesitate to suggest it.

These are the things you can change using the controls to the right, or lower left:

1. Inline, Xline and Z ranges
2. Inline and Xline increments.....no re-sampling in time or depth right now
3. Multiply by a constant
4. Integrate traces
5. Simple bandpass filter (lower left)
6. A over B volume scaling, using windows displaced in Z.
7. Clipping maxima, removing nulls, replacing zeros, etc.
8. Removing the mean of the data
9. Scaling to a maximum constant, useful for some workstation work.

## Note on pre-stack seismic data, i.e. gathers

This program will work on gather data, but as of now, it ignores all offset information. This means that if you take every other inline and xline, then all traces for each gather will be kept for each valid grid location. To do this, the best thing to do is to not Segy Header Scan the dataset, and rather to set the Inline and Xline Deltas to 2, for instance. The inline and xline ranges can be set to 0 to 100000, thus, keeping every other inline and xline with even integer values. Use 1 to 9999999 to keep odd values.

## Note on 2D seismic data

This program will work on 2D seismic lines. The xline byte location should be used for the shot point or CDP location. If there is more than one line in the file, they must be distinguishable by some sort of inline number. 2D data was never the original intent for this program. If you use it and have problems, please call.

## Java required

This program is written in Java (Sun Trademark now part of Oracle). It needs version 1.6.0.1 or later to run. Please download the JRE from Sun's website if you need to. As a Java program, it has been run for several years on Windows, Linux and Solaris 10.

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