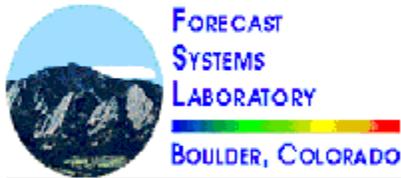


---

# AWIPS FORECAST PREPARATION SYSTEM



## AFPS NEWS

Volume 1, No. 1

March 22, 1996

---

Welcome to the first in a series of newsletters from the AFPS development team.

There are several reasons for publishing this newsletter. First, we want to keep you informed about new ideas, new features, and our progress. As always, your feedback is very important to us, so we want you informed so that you can comment on current issues for future improvement. Many times our specifications and design decisions depend on how AFPS will be used operationally. Since we are not operational meteorologists, we need your help to answer these questions. Many articles will ask you to use some component of AFPS and then comment.

We will continue to make this newsletter available on the World Wide Web (WWW). In this form we can present full color screen snapshots that will better illustrate our ideas. Those without WWW access will be sent a Postscript file via E-mail so that they can print their own copies. For those AFWG members who have neither WWW access or a Postscript printer, we'll be happy to send you black and white copies via standard mail.

## **SINCE YOU WERE HERE...**

Since the last AFWG meeting we've been quite busy. The WFO-Advanced forecasting exercise began in September and lasted six weeks. During the exercise, we trained 20 forecasters in the operational use of AFPS. For half of the exercise, AFPS was used to specify public weather elements to generate a zone forecast.

The AFPS component of the exercise was a qualified success. The AFPS editors were very reliable; not one crash was logged during the entire exercise. Integrating the TDL formatters with AFPS proved to be rather painful and not as successful. During the first half of the exercise, the formatters encountered numerous problems, leading to significant forecaster frustration. By the second half of the exercise, we substantially improved the grid sampler; increasing the reliability and accuracy of the zone formatters.

As you probably know by now, a very important IFP meeting was held in Silver Spring in January. During the meeting, the AFPS team was given permission to explore grid-based text formatting techniques and develop ideas for new grid-based products and data sets. So far, the

work done in these area shows great potential. We'll be discussing the details of this exploratory work in future editions of AFPS News.

In January we presented an FSL Technical Review of the AFPS project. The review included an overview, a demonstration, and a presentation of our software development methodology and quality assurance efforts. The entire AFPS staff was pleasantly surprised when the FSL Review Committee recommended that the entire lab consider adopting some of our AFPS development practices.

We've had a couple of personnel changes since the last AFWG meeting as well. Joe Wakefield, AFPS project lead, has been reassigned to the WFO-Advanced project as Systems Integration Coordinator. While we're all sorry to see Joe leave, we know he will still contribute to AFPS as a consultant, since he's just across the street and will remain as an AFWG member. Mark Mathewson has inherited the throne and now wears two hats: AFPS Project Lead and AFPS Technical Manager.

Joyce Watkins was hired in February as a quality assurance specialist to help Dave Howard in his Quality Assurance Duties. She is also responsible for all of our user documentation. Joyce's background includes user and system documentation and user/system dynamic help design and implementation.

## **NEW AFPS TOOL EDITS CONTOURS**

Near the end of the last AFWG meeting held in August of 1995, the group expressed a strong need for AFPS to develop a tool that adjusts the position of a contour and then recalculate the grid based on the new position. Mark thought that a tool based purely on contours would be a large effort (up to six person-months), since AFPS is fundamentally grid-based. Necessity being the mother of invention, we spent a few days developing a grid-based contour editing tool dubbed the Pencil tool. While grid-based contour editor may sound like an oxymoron, the Pencil tool actually works surprisingly well.

For the following sections, we would like you to use the Pencil tool and then tell us what you think. To do this, you must install the latest version of AFPS on your machine. In December, Dave Howard sent E-mail to you that included instructions on how to install AFPS at your site. If you haven't done so already, please perform the installation and start AFPS.

### **Using the Pencil Tool**

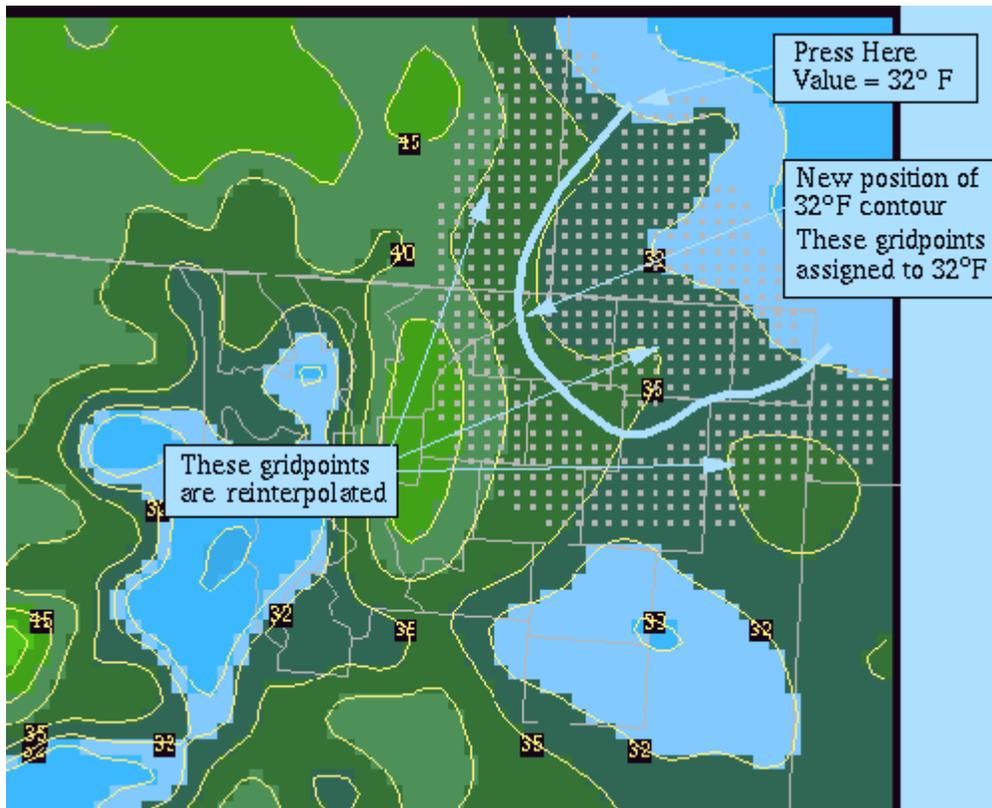
To begin, load a scalar parameter, such as temperature, into a spatial editor. For now, the Pencil tool only works on scalar data types. Select the pencil tool from the edit tool palette.

To use the Pencil tool perform the following operations using **button 1** on the mouse.

1. Position the mouse cursor on or near a contour that you wish to change.
2. Press and hold down button 1 on the mouse.

3. Move the mouse to define the new position of the contour. The white line will indicate the new position.
4. Release mouse button 1.

Now let's explain what's really going on as you use the pencil tool. In step 2, when you press button 1 on the mouse, the grid point value under the cursor is saved. During the third step, as you move the cursor, each grid point the cursor passes over is assigned the value saved in step 2. When you release the mouse button, the modified area is calculated and each grid point in this area, except the points assigned the saved value, is interpolated based on the assigned and surrounding values.



As it turns out, the interpolated area is a critical step in the interpolation and deserves further explanation. The interpolated area is actually a combination of two different areas. The first is the region defined by the new position (white line) with the end points connected by a straight line. We then add more grid points a specified distance away from both sides of the white line. This distance can be changed from the button 3 pop-up menu by selecting one of the options under InfluenceSize.

Advanced users of the AFPS system might realize that the pencil tool is a combination of the paint, area, point, and fill-in-hole tools. Despite its simple approach, the pencil tool works reasonably well most of the time. However it does suffer from two major drawbacks. The first is that the area that is reinterpolated is usually "noisy". This is due to the interpolation algorithm and the fact that in general, the value "painted" is at or near a contour interval. Some points are

interpolated a little below the contour value, while others end up a little above. When a field such as this is recontoured, areas about the size of a single gridpoint can be surrounded by a single contour. The other drawback is that sometimes not enough gridpoints are reinterpolated, which can leave a "hole" of "old" values that don't always mesh well with the new values. We believe that both of these problems can be eliminated with a better interpolation algorithm an improved method of choosing the points to be reinterpolated.

Despite its drawbacks, the Pencil tool offers a couple of advantages over other contour editors hat you may have used before. Since the pencil tool operates on grid points, there are no rules that restrict its use. For example, you can move a contour over existing contours with different values. In other words, you can cross over other contours and the tool correctly recalculates the grid based on the new contour position. Also, you're not required to start and end on the same contour (or any contour for that matter). While the results for this operation may be somewhat strange, there is no rule that forces you to operate the pencil tool in any particular way.

### **Try it out.**

Start up the AFPS, load a scalar parameter, such as temperature, into the spatial editor, and give the Pencil tool a try. Go ahead and cross a bunch of contours and look at the results. Change the display type to image only and use the tool. Note that the display type is not relevant to the operation of the Pencil tool. Remember you don't have to start on a contour for the tool to work.

### **Tell us what you think.**

After you have tried it out for a while, let us know what you think of it. Specifically, try to answer the following questions:

- Does the Pencil tool produce the results that you expected? If not, in what way are they different?
- Can you think of any improvements that you would make to the Pencil Tool other than what's been previously mentioned? What are they?

Please send your comments to us (e-mail preferred) to [afps@fsl.noaa.gov](mailto:afps@fsl.noaa.gov). Your feedback is always valuable and greatly appreciated.

### **Planned Improvements**

We have several improvements in store for the Pencil tool. We plan to fix the "noise" problem with a better interpolation algorithm. The "hole" problem can be fixed with a better way to choose the area to be interpolated. We also plan to add a new feature that lets you draw a brand new contour from scratch. Once you're done drawing, you'll have the option of recalculating the grid based on the value and position of the new contours. This function will replace the define grid tool.

### **In Our Next Issue...**

Next time, we'll talk about the changes that we're planning to make to the Graphical Forecast Editor. These changes include new ways in which the editors (spatial, temporal, and worksheet) interact automatically, reducing the number of window down to one (yes only one!), and the ability to combine forecast grids and model grids on the same display.