Interpreting Dr. Jack's BLIPSPOT for Garner and Other Locations

Background

BLIPSPOT refers to a specific forecast for one location (spot). BLIPMAP refers to a map that displays an area BLIP forecast in contour form, e.g all points of equal thermal updraft strength are joined by a contour much like an isobar on a weather map joins points of equal atmospheric pressure.

The parameters are averages over 20km grid squares forecast by NOAA's Forecast Systems Laboratory RUC model.

From a NOAA web site:

> ***The Rapid Update Cycle (RUC)***
> ***A NOAA operational weather prediction system comprised primarily of***
>
> - ***a numerical forecast model and***
> - ***An analysis system to initialize that model.***
>
> ***Research counterpart to the RUC = MAPS***
> ***Developed to serve users needing short-range weather forecasts, including those in the US aviation community.***

EXPLANATION OF SELECTED BLIPSPOT TERMS

Header Information

Line 1 - The actual data point Dr. Jack uses for Garner is shown on the first line of his forecast - no. 30347 at the coordinates given.

Line 2 - Dr. Jack has made a surface temperature adjustment of 0.2 degF to account for the altitude difference between the actual data point

(at 32ft MSL) and the Garner field altitude (80ft MSL).

Line 4 - Dr. Jack uses data from the 20km MAPS system (see above). The **Last Analysis/Validation Time** is the time the forecast was generated.

Forecast Window

1) **VALIDATION TIME** at the top of the forecast window refers to the time in zulu that the forecast applies to. Hence 18Z is 2.00 P.M. EDT or 1.00 P.M.. EST.

2) **FCST PERIOD** – This is the elapsed time between when the forecast was generated and the actual forecast condition.

Thermal Related Items

3) **Hcrit** – This is the height at which the thermal strength drops to 225 fpm (approximately 2 knots) in cloudless conditions (dry thermal). It is assumed that the glider sink rate and thermal updraft rate balance at this height. Dr. Jack states "that present assumptions tend to under predict the max. thermalling height" He also goes on to state that clouds may limit the max thermalling height.

4) **BL Top** – This is the top of the boundary layer at the Thermal Index TI=0 height for dry thermal conditions. The boundary layer is the layer where all the thermals exist – from the surface to the TI=0 height. See Dr. Jack's description for the effect of clouds on thermal tops.

5) **Hgt.Variab** – This is the amount in height terms that the BL Top can vary due to forecast uncertainty. (It is actually the difference between the predicted TI=+4 and TI=0 heights). Dr Jack makes two

points about large values

(i) they “indicate better thermalling over local hot spots”, and
(ii) they also “indicate greater sensitivity to error in the predicted surface temperature”.

6) **W*** - Average dry thermal updraft strength in the middle of the boundary layer.

7) **B/S** – B relates to thermal buoyancy and S relates to wind shear. High B/S means strong thermals and/or weak wind shear. Dr. Jack states that a B/S ratio at 5 or above indicates that the thermals win out.

<u>Cloud Related Items</u>

8) **CLOUDpotent** – We will skip forward to **sfcLCL** then come back to this line.

9) **sfcLCL** – This is the height at which “puffy cloud” (cumulus) is predicted to form – the “level to which humid air must ascend before it cools enough to reach the dew point temperature” . If this height is greater than the TI=0 (BL Top) height then no puffy cloud formation is expected. If it is less then expect puffy cloud formation.

10) **CLOUDpotent** – The number here is the difference between the **sfcLCL** and **BL Top** heights (see point 9 above). The more positive this number the greater the likelihood of puffy clouds, the more negative the less likely puffy clouds will occur (+ve = within the thermal updraft region and expect puffy clouds, -ve = above the thermal updraft region and expect no puffy clouds) However, read Dr. Jack’s summary to understand all of the subtleties involved.

11) **maxRH** - This is a Relative Humidity measure that Dr. Jack uses for calculating cloud potential. Larger values indicate greater cloud probability. Again, read Dr. Jack to understand the subtleties.

12) **ODpotentia**l - We will skip forward to **blCL** then come back to this line.

13) **blCL** – This is the predicted overdevelopment cloudbase height. If this height is below the **BL Top** (TI=0) height. overdevelopment is likely. If above it is less likely.

14) **ODpotentia**l – Overdevelopment potential. The number here is the difference between **blCL** and **BL Top** (see point 13 above). The more positive this number the greater the likelihood of overdevelopment, the more negative the less likely overdevelopment will occur (+ve = within the thermal updraft region, expect overdevelopment, -ve = above the thermal updraft region and expect no overdevelopment).

So, in a nutshell, what are we looking for. Here is my current (subject to revision) checklist:

1. **Hcrit** – Over 3000
2. **BL Top** – Over 5000
3. **Hgt. Variab**. – 1000 to 3000
4. **W*** - Over 500
5. **B/S** – Over 6
6. **CLOUDpotent** – Hopefully no more than +500
7. **ODpotential** – Less than zero (firmly –ve)

For reference, the predicted conditions for 18Z (2.00 P.M.) on super

Wednesday were as follows:

1. **Hcrit** – 4978
2. **BL Top** – 6866
3. **Hgt. Variab**. – 3092
4. **W*** - 539
5. **B/S** – 6
6. **CLOUDpotent** - -ve 1991
7. **ODpotential** - -ve 5573

As you can see from this forecast Dr. Jack was spot on in nearly all respects. The predicted thermal strength and B/S ratio were a little low but he predicted the heights and the blue sky conditions quite accurately. My guess is the surface temperature exceeded forecast by a couple of degrees which boosted the thermal strength and B/S ratio and led to an extra 1000 ft or so on the Hcrit and BL Top heights (approx 30-50% of the Hgt. Variab)