Operations Guide for Icing Forecasting

Icing Analog Catalog

Chicago CWSU

Motivation

A provision for operational aviation forecasters

- Quantification of icing intensity pireps with associated Bufkit proximity analysis soundings.

- Aid in distinguishing between high and low impact icing events.

- Increase awareness of significant icing signatures in an effort to improve decision support.

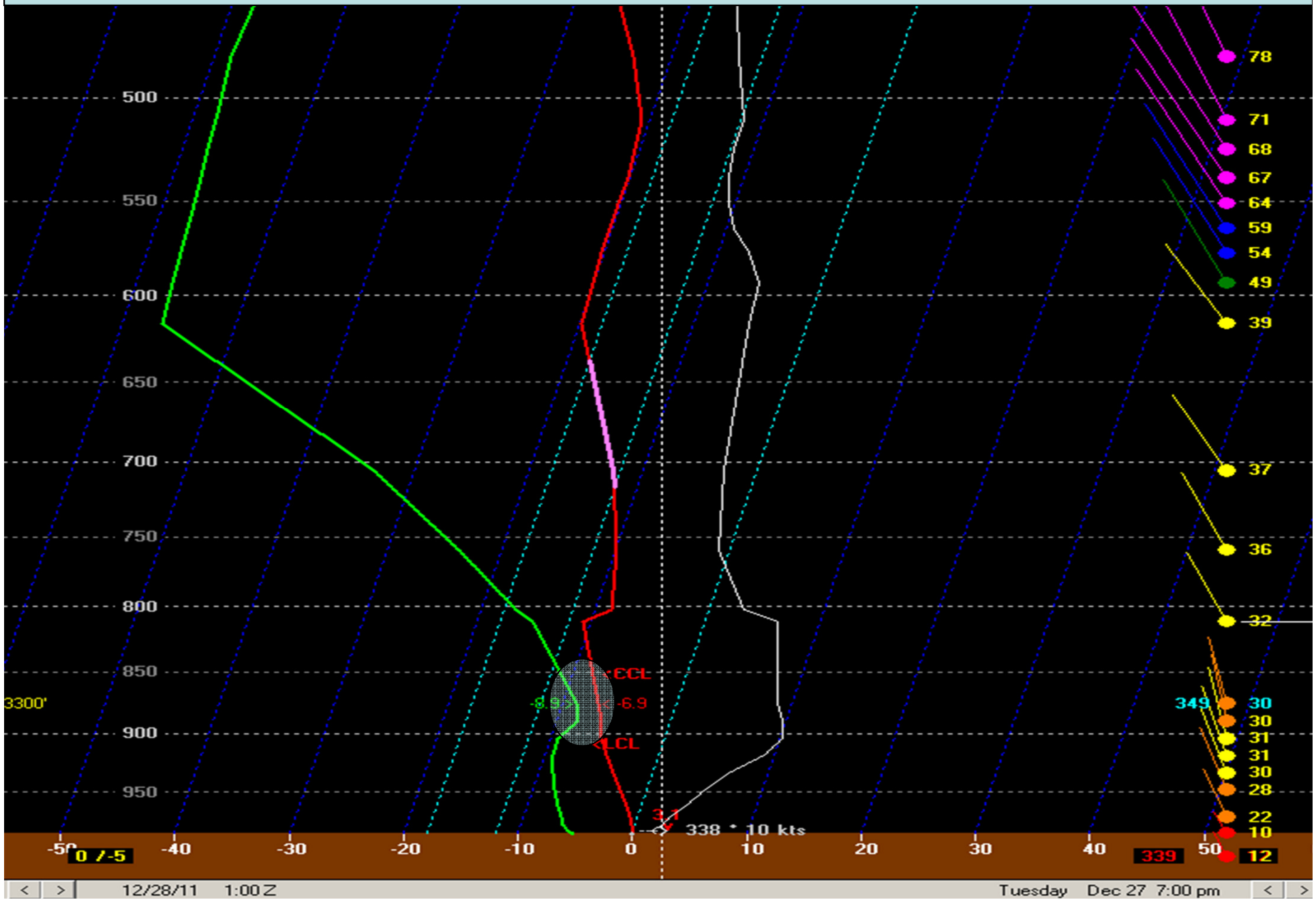
Additional considerations

- Pireps/Bufkit data do not indicate droplet size distribution or aircraft residence time within icing layer.

** At times corresponding Metar data has been included.

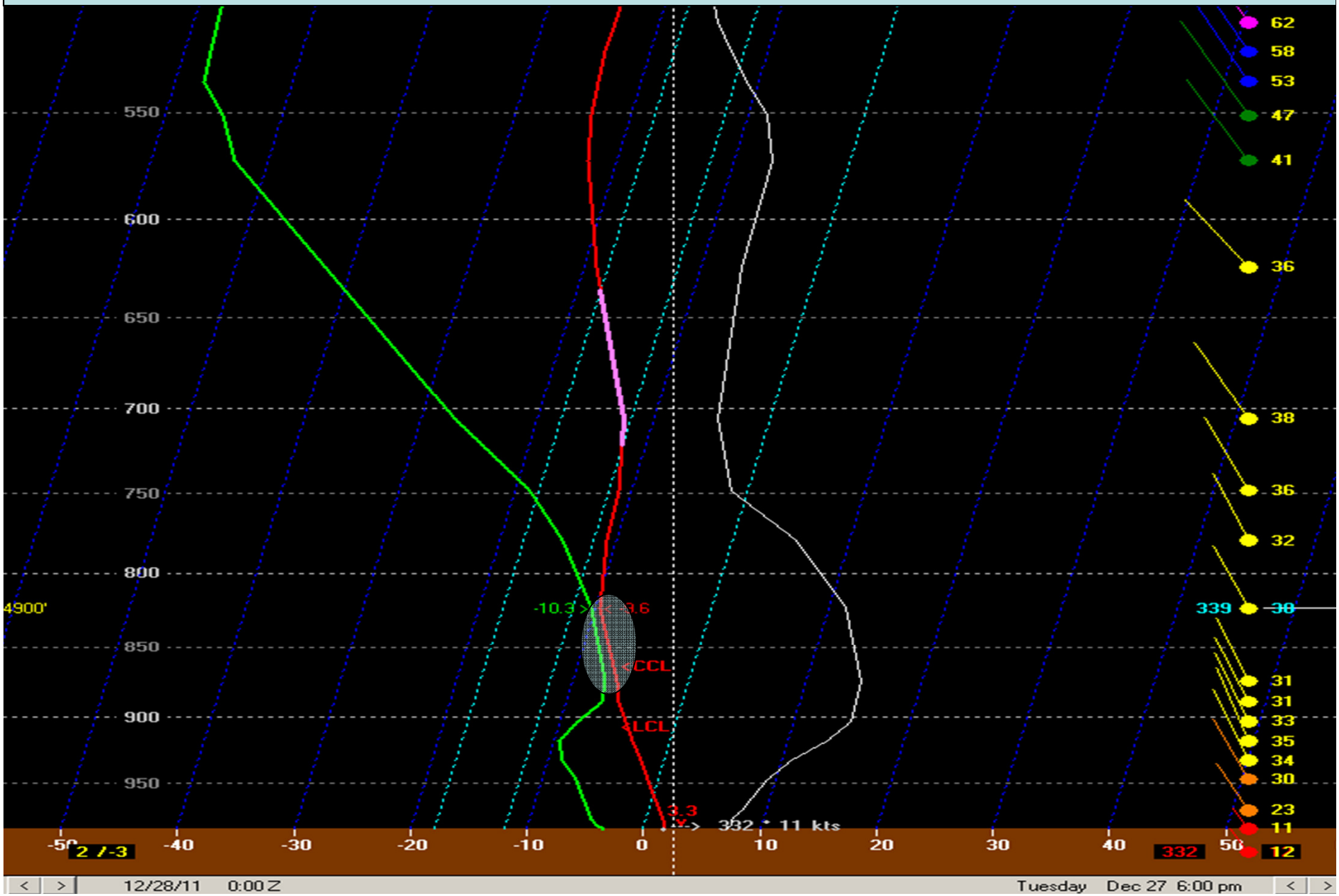
TRACE ICING

ORD UA /OV ORD135015 /TM 0010 /FL037-050 /TP CRJ7 /IC TRACE

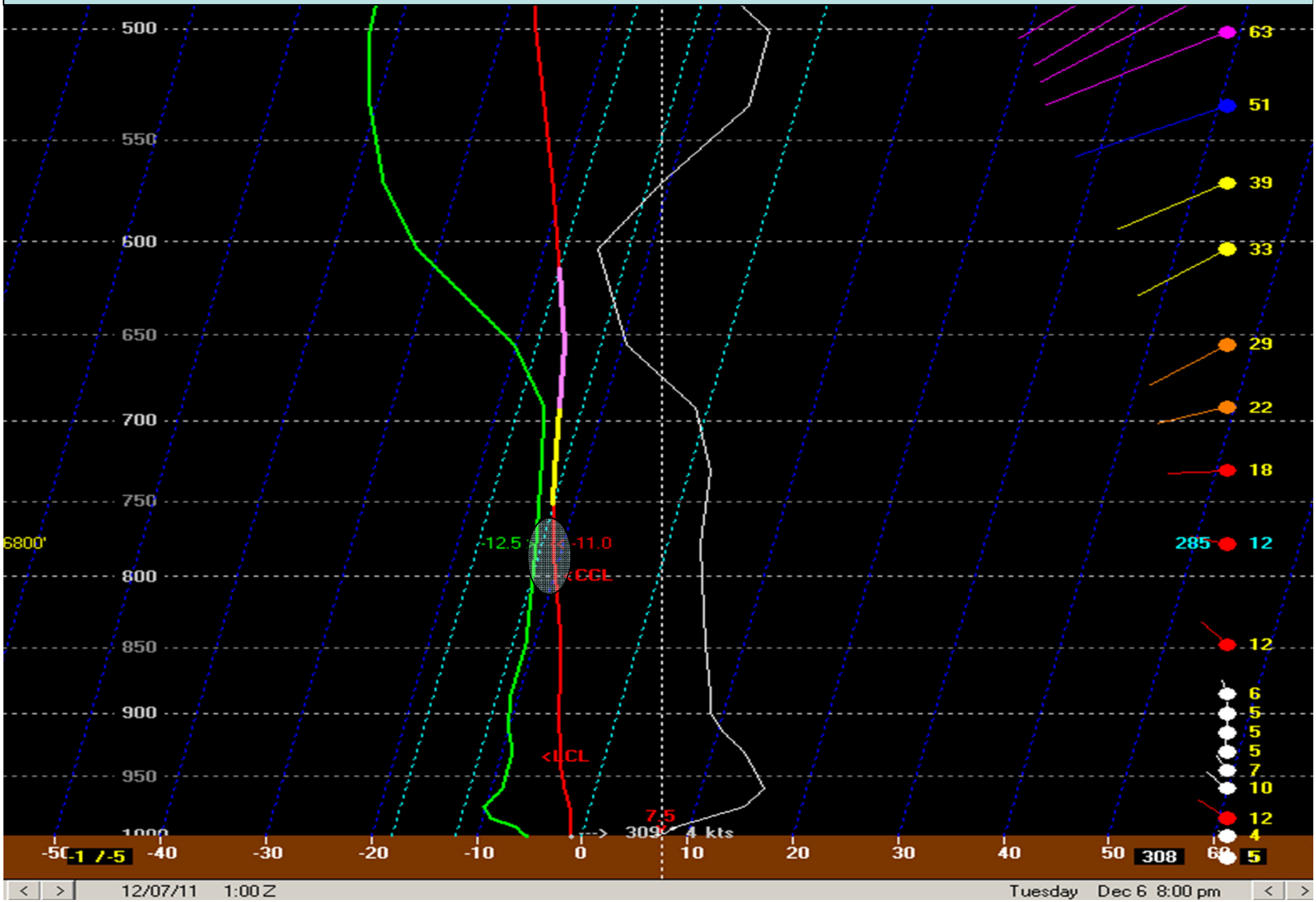


LIGHT ICING

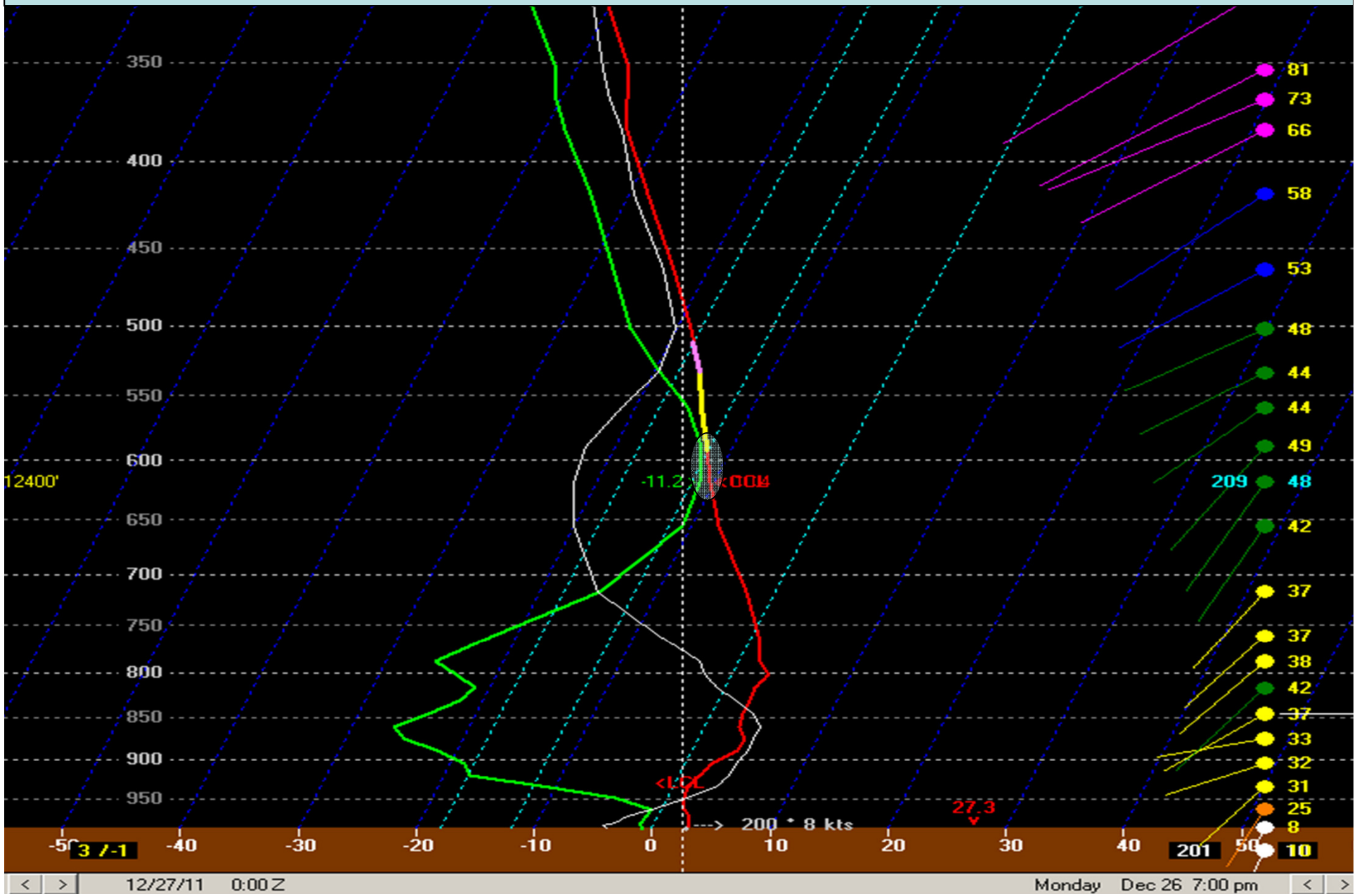
ORD UA /OV MDW045010 /TM 0015 /FL038-050 /TP 767 /IC LGT MIX



/OV MDW 135025 /TM 0105 /FL060 /TP 737 /IC LGT RIME, -10

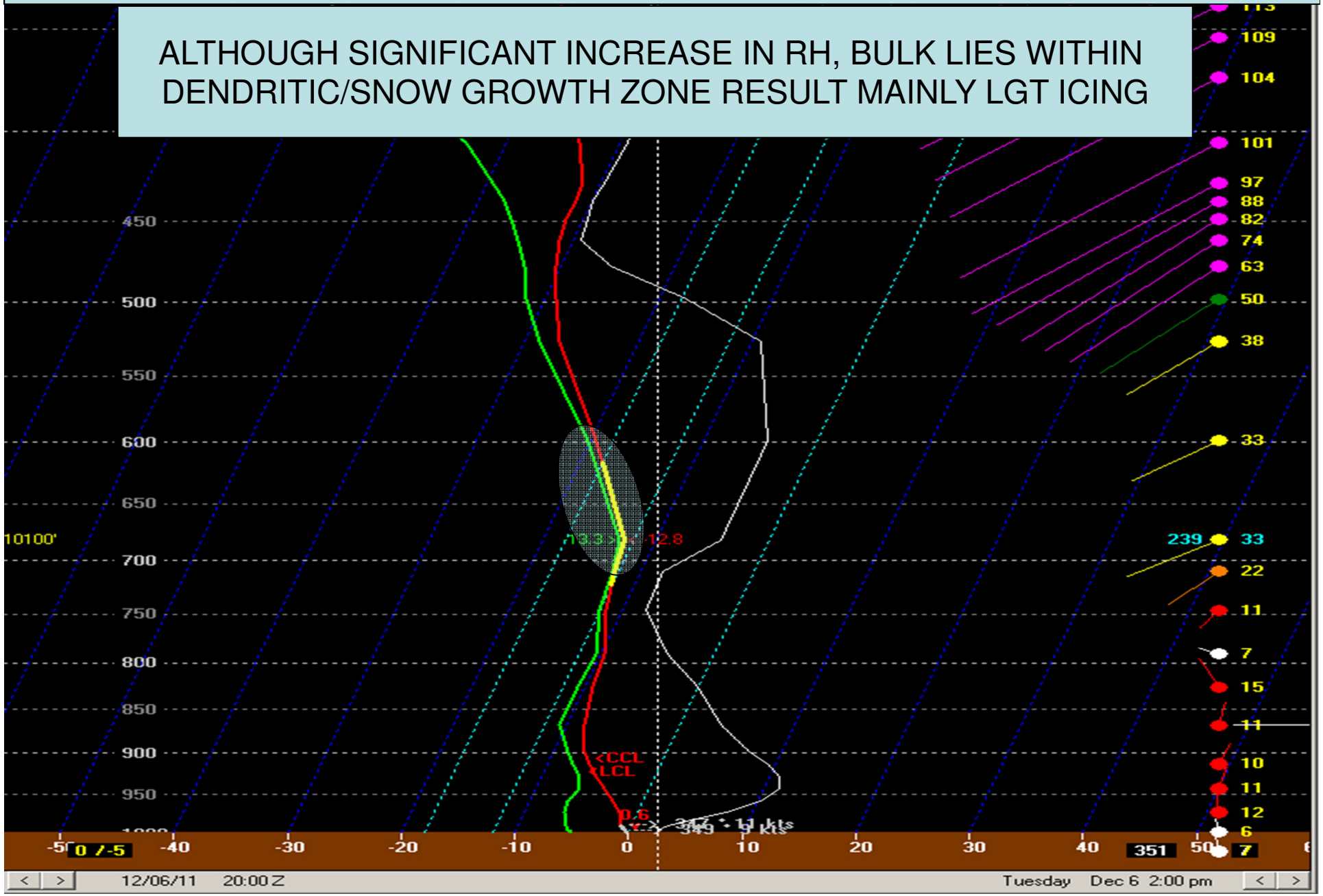


/OV JOT 290020 /TM 2358 /FL120 /TP E145 /IC LGT RIME, -10



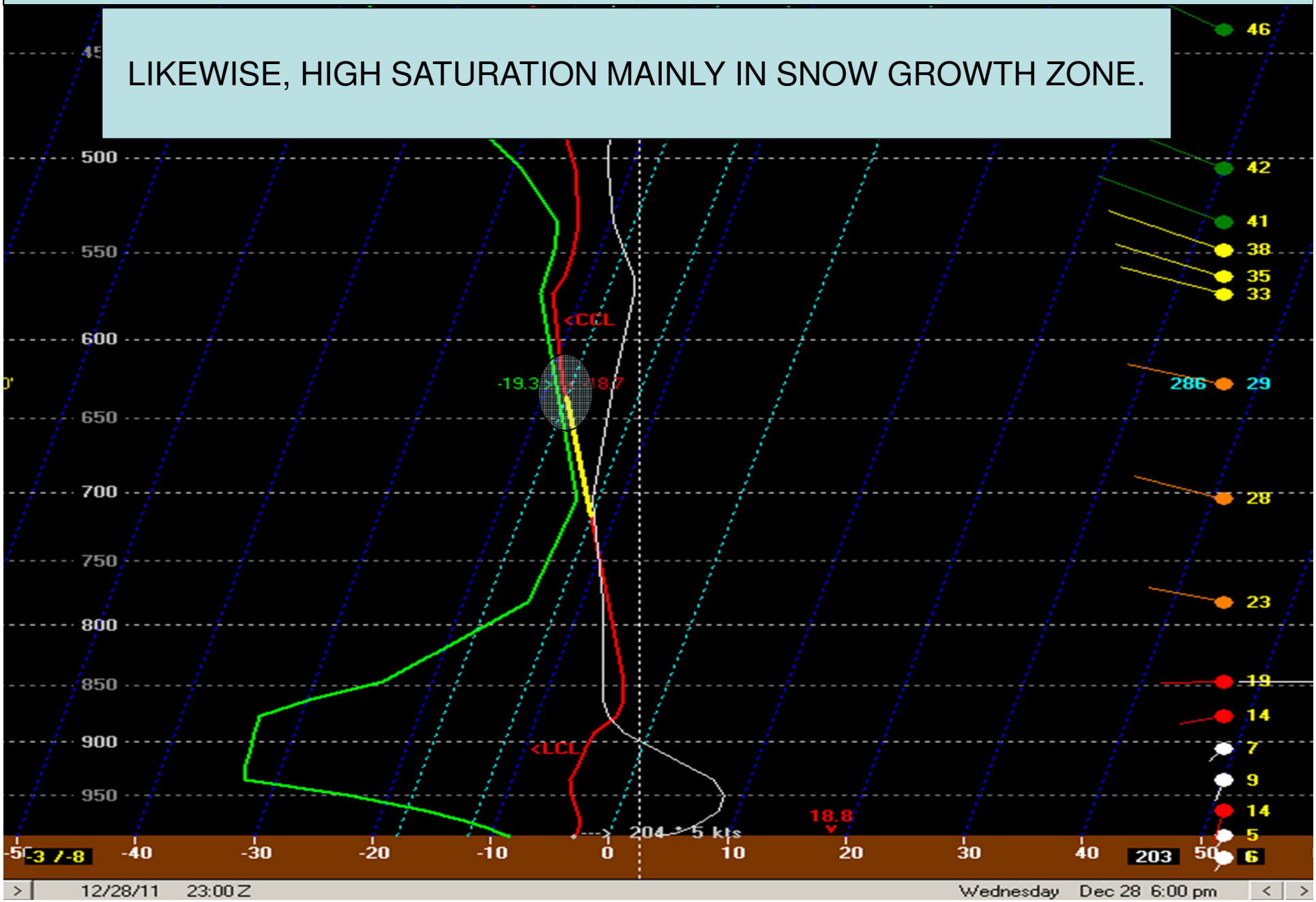
/OV ORD 04530-040 /TM 2230 /FL090-145 /TP E135 & E170 /<u>IC LGT RIME, -6</u>

ALTHOUGH SIGNIFICANT INCREASE IN RH, BULK LIES WITHIN DENDRITIC/SNOW GROWTH ZONE RESULT MAINLY LGT ICING



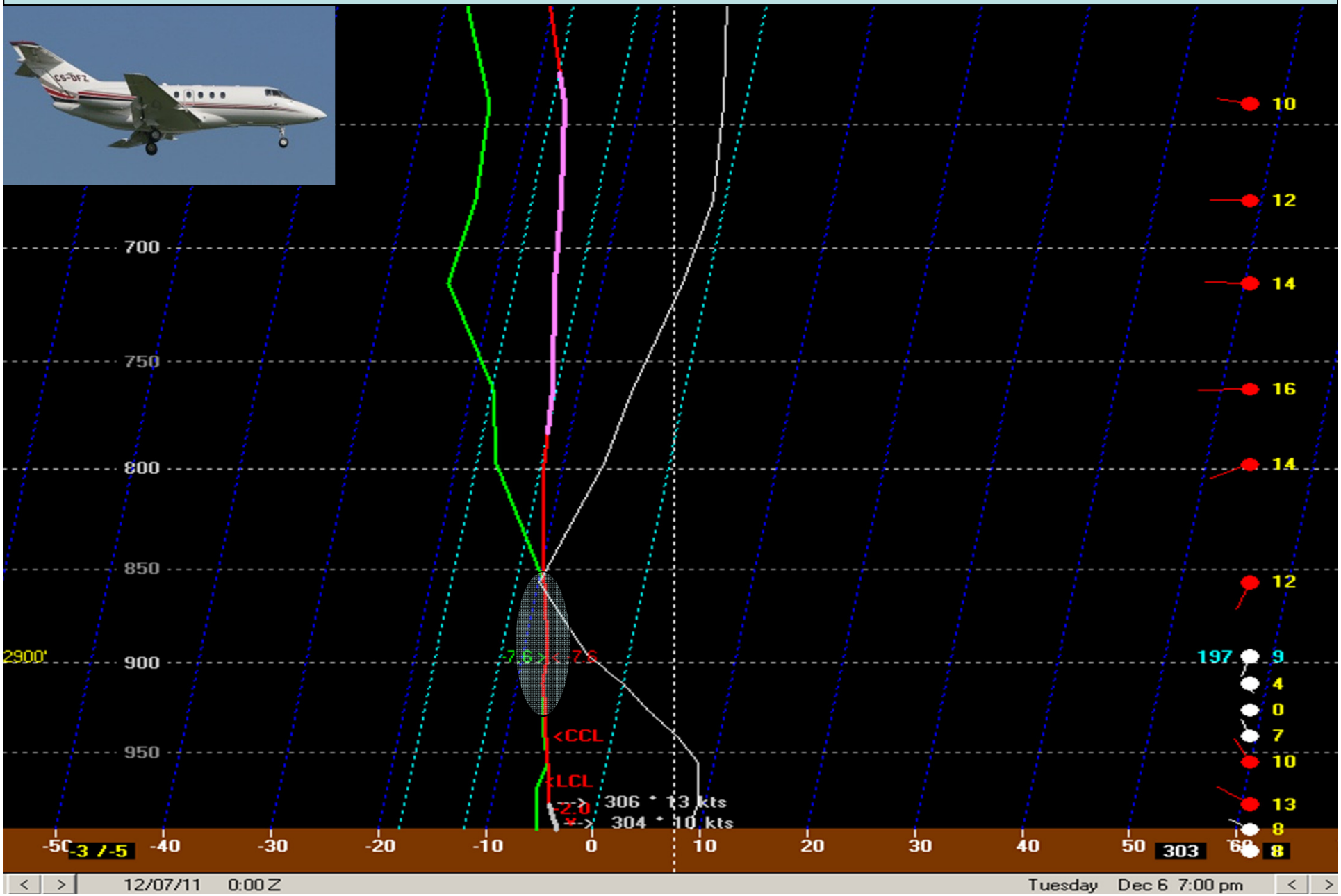
/OV MKE 180020 /TM 2248 /FL120 /TP E135 /<u>IC LGT RIME, -11</u>

LIKEWISE, HIGH SATURATION MAINLY IN SNOW GROWTH ZONE.

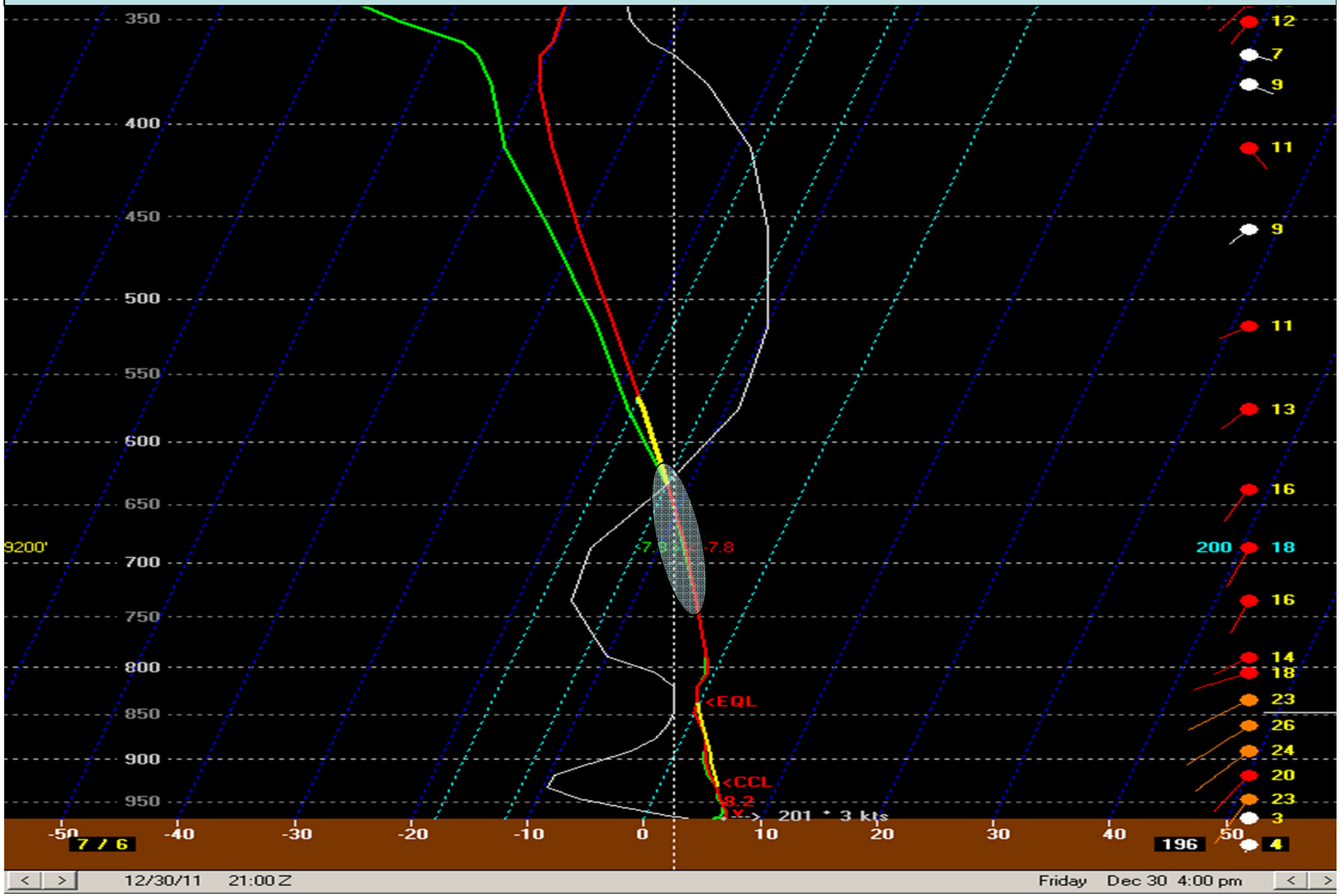


LIGHT TO MODERATE ICING

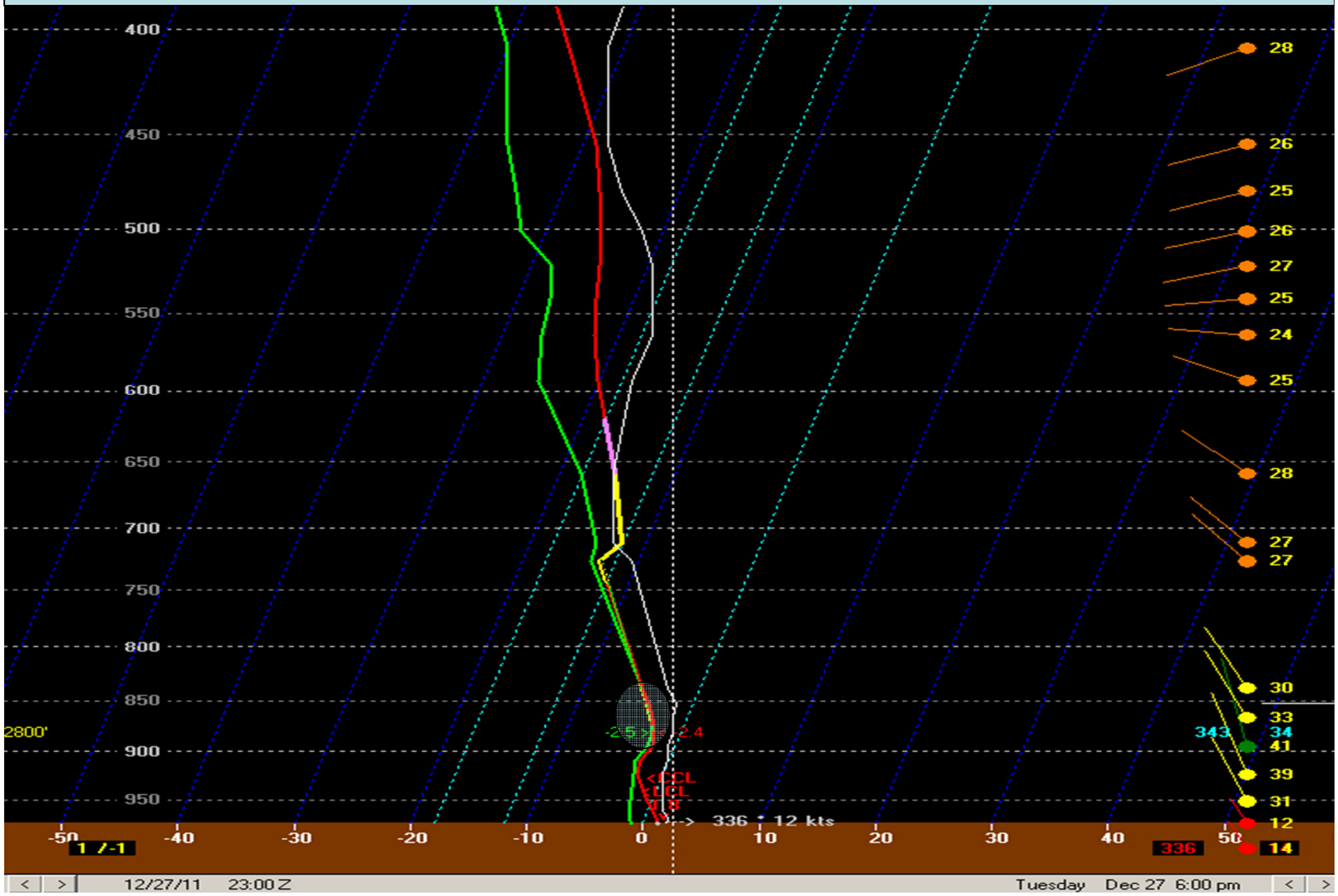
CID UA /OV CID/TM 2355 /FL021-045 /TP H25B /IC LGT-MOD RIME, -6



/OV OXI 180010/TM 2115/FL085-120 /TP 737 /IC LGT-MOD RIME, -9

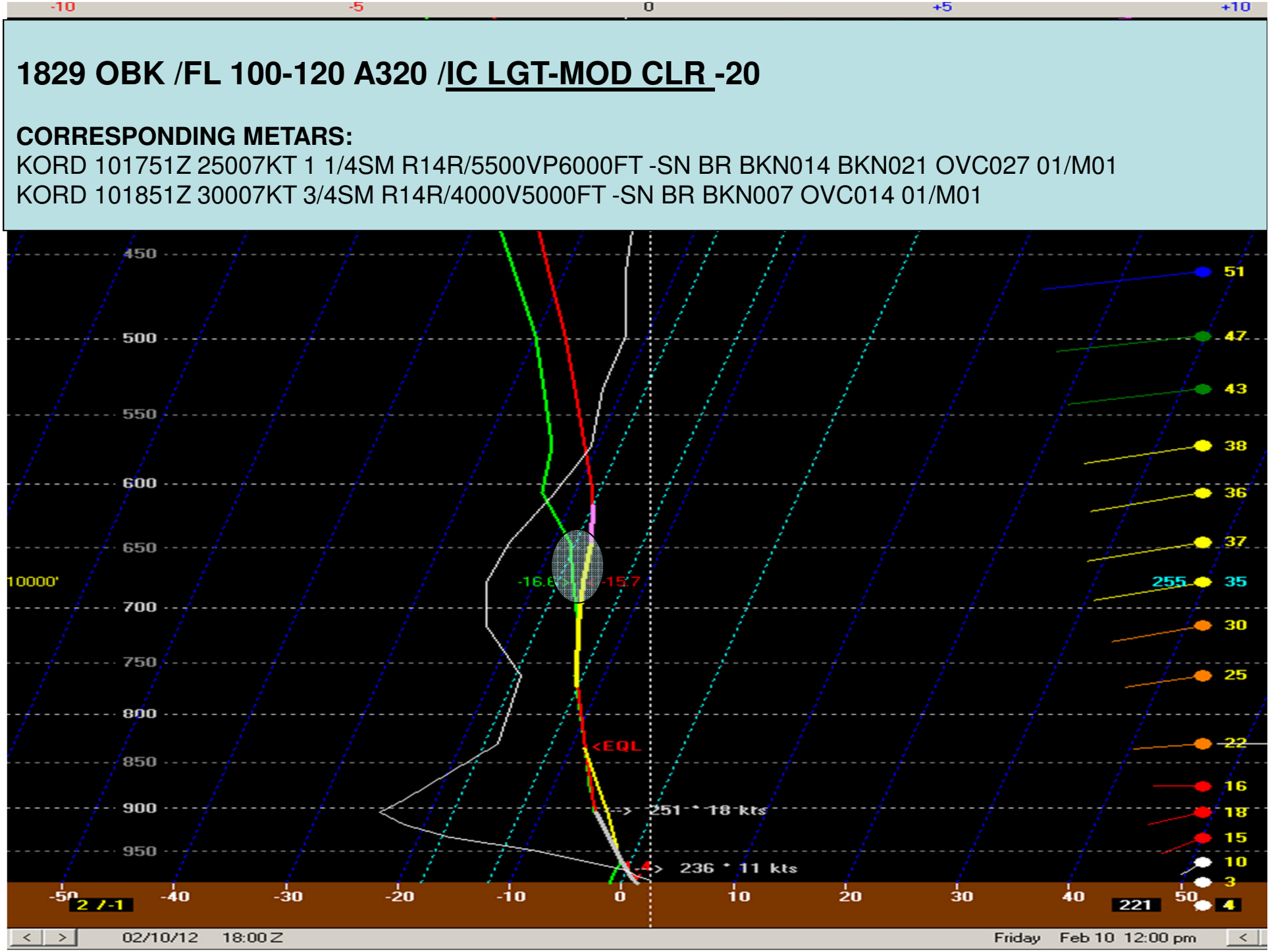


/OV GRR180007/TM 2319/FL030 /TP CRJ2 /IC LGT-MOD MIX, -8



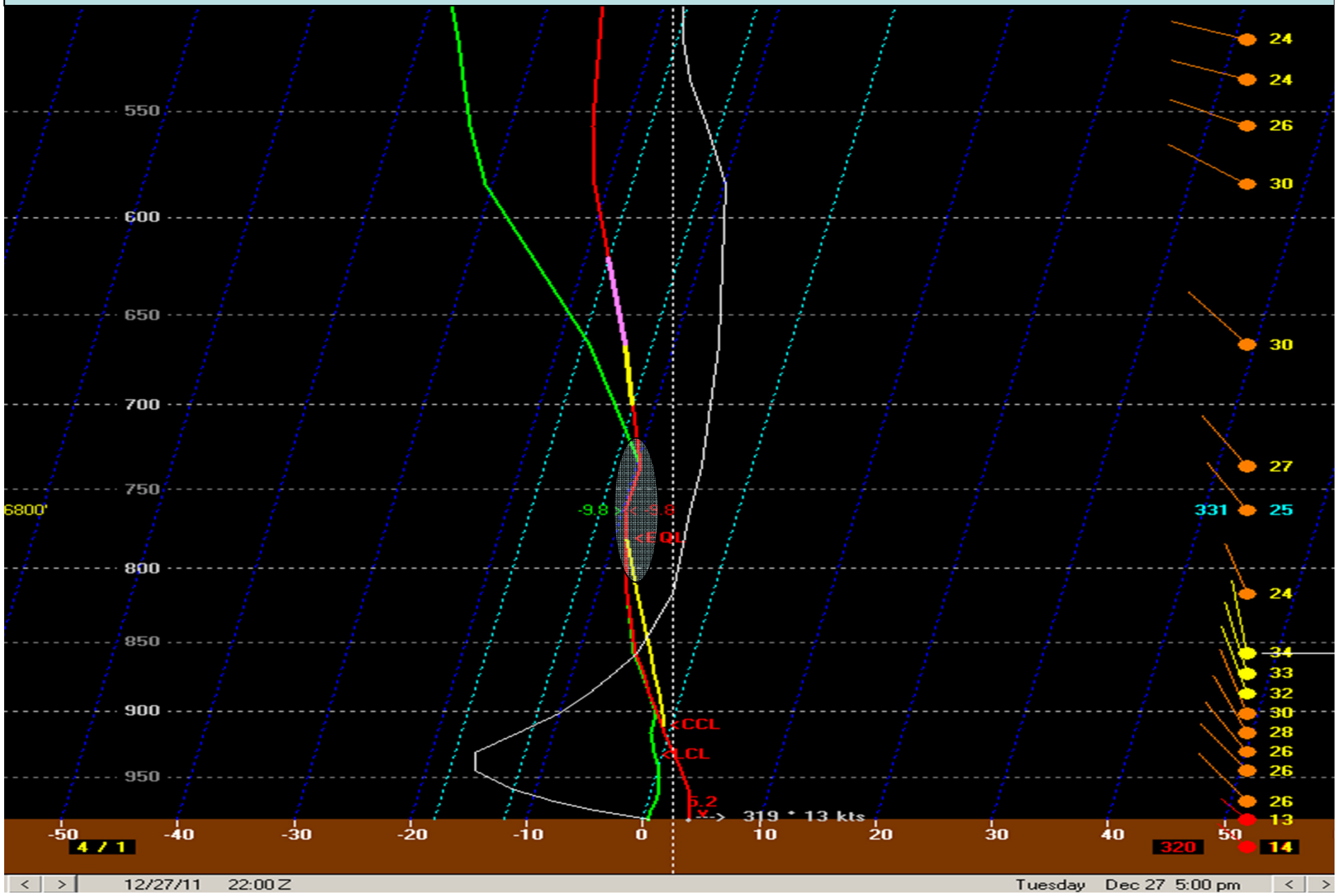
1829 OBK /FL 100-120 A320 /<u>IC LGT-MOD CLR</u> -20

CORRESPONDING METARS:
KORD 101751Z 25007KT 1 1/4SM R14R/5500VP6000FT -SN BR BKN014 BKN021 OVC027 01/M01
KORD 101851Z 30007KT 3/4SM R14R/4000V5000FT -SN BR BKN007 OVC014 01/M01

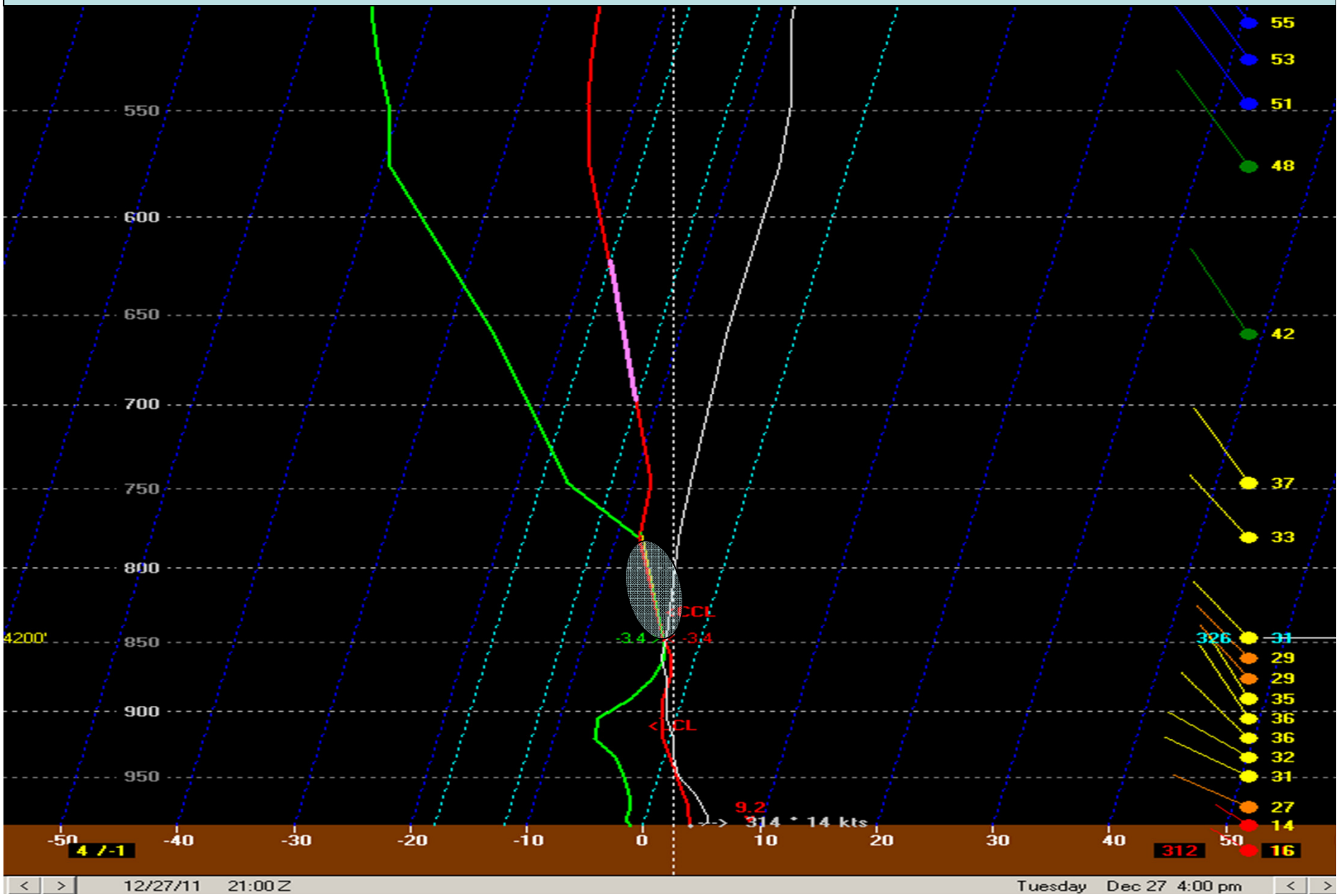


MODERATE ICING

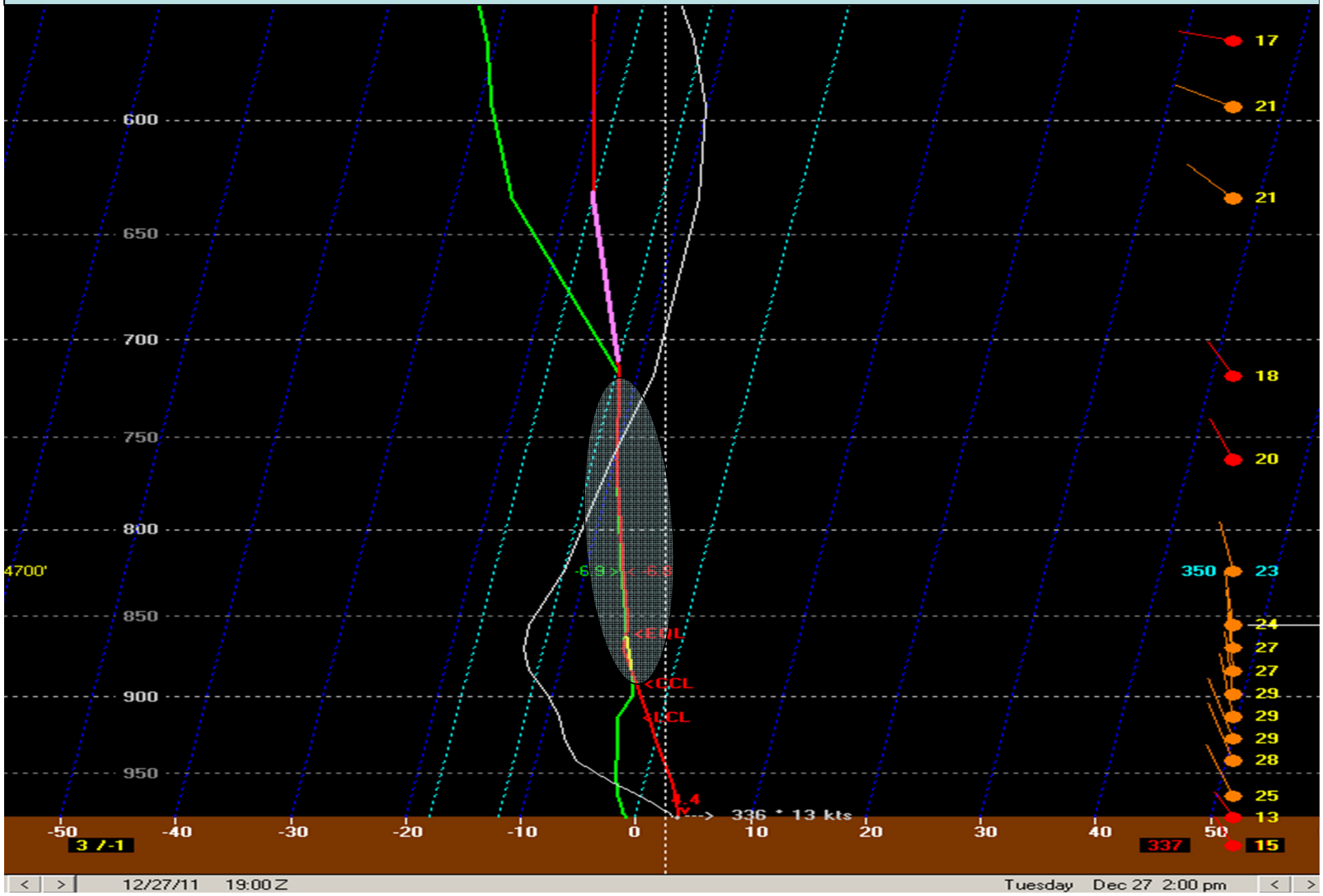
/TM 2134 /OV VPZ /FL060-088 /TP 737 /IC MOD MIX -14



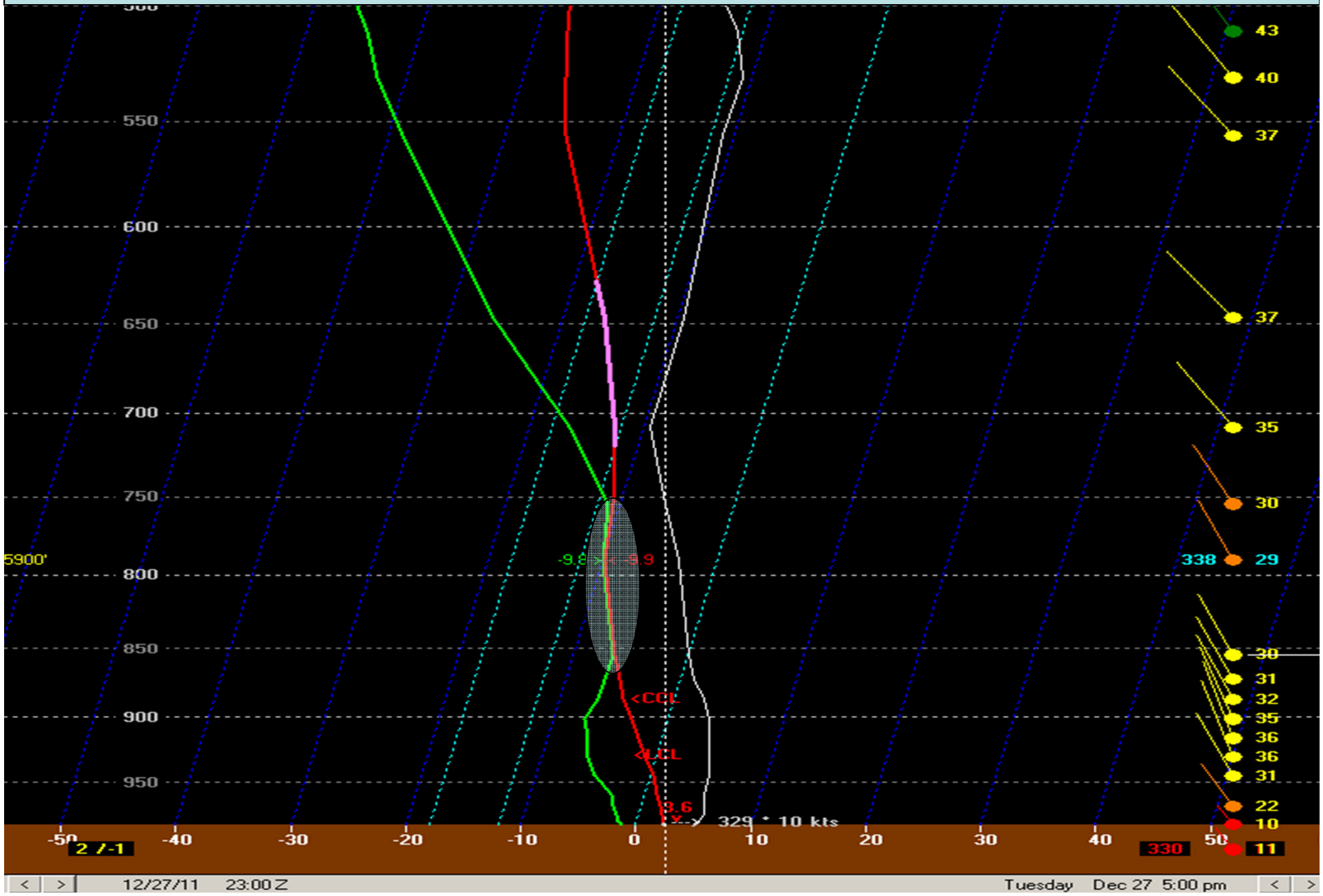
/TM 2054 /OV PIA045015 /FL045-060 /TP CRJ7 /IC MOD RIME -6



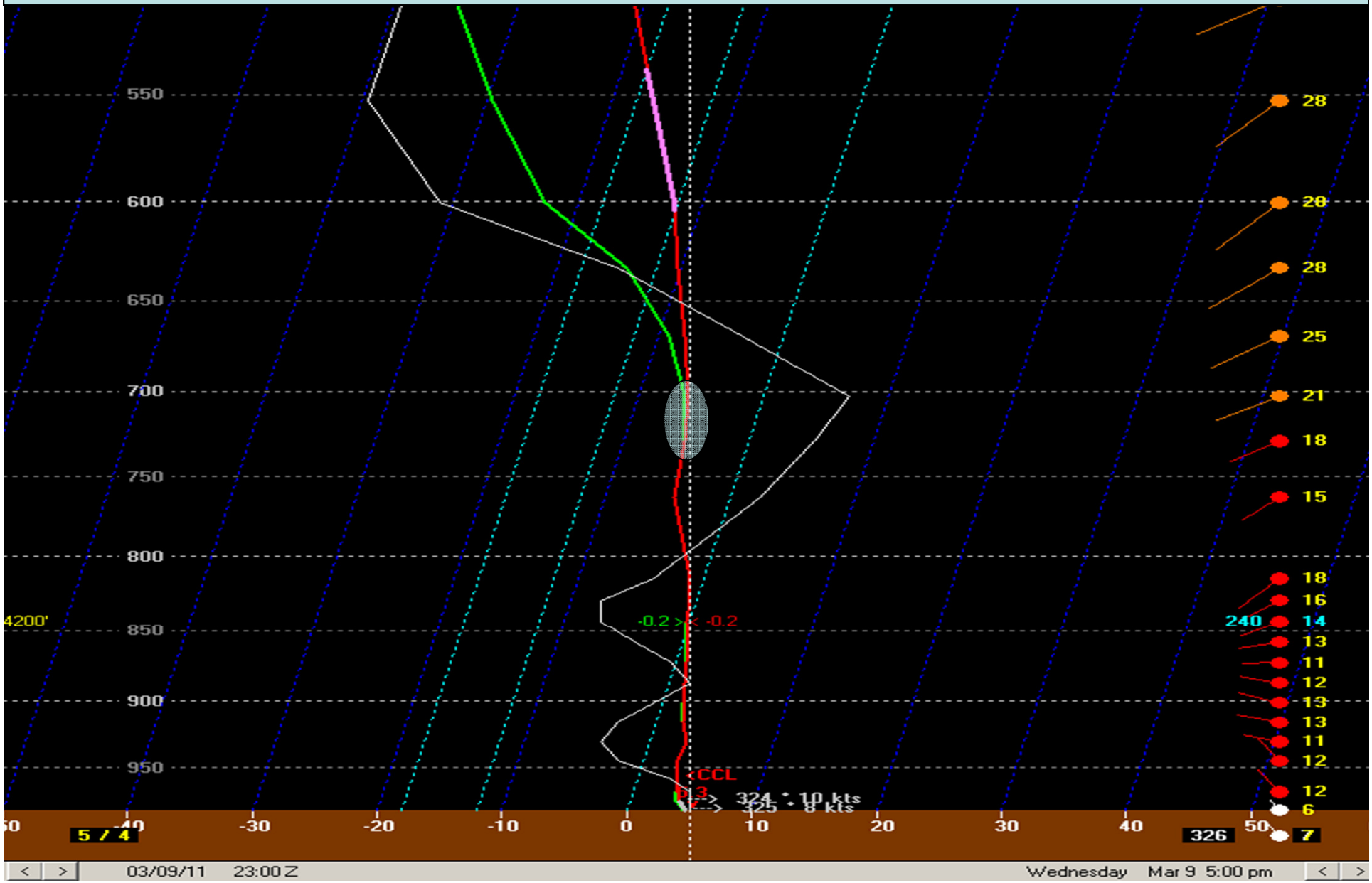
/TM 1925 /OV MKE /FL025-093 /TP C421 /IC MOD RIME, -9



/TM 2245 /OV ORD 090020 /FL040-070 /TP NUMEROUS /IC MOD RIME -3

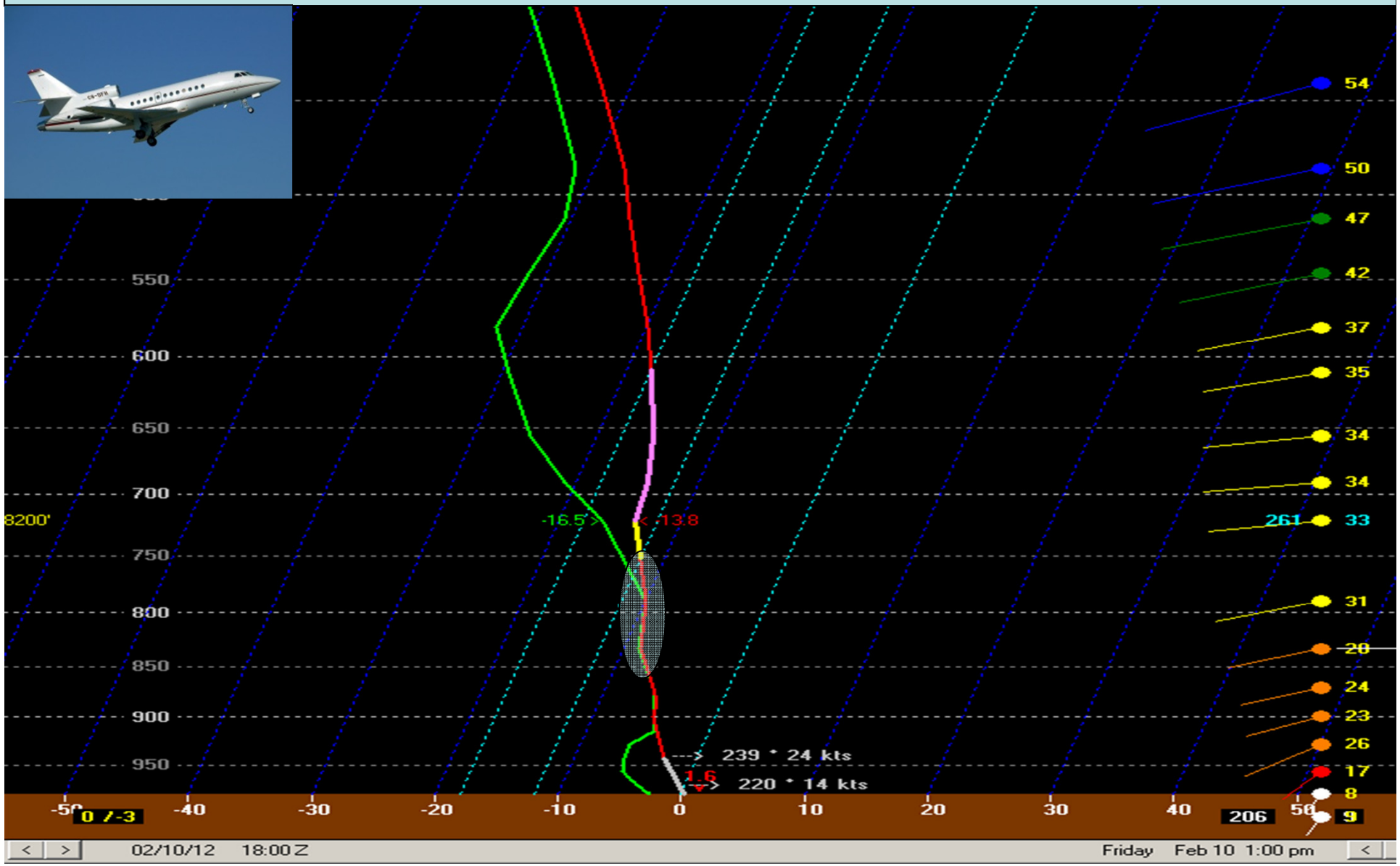


/TM 2325 /OV ORD 315025 /FL100 /TP CRJ7 /<u>IC MOD RIME</u>, -11



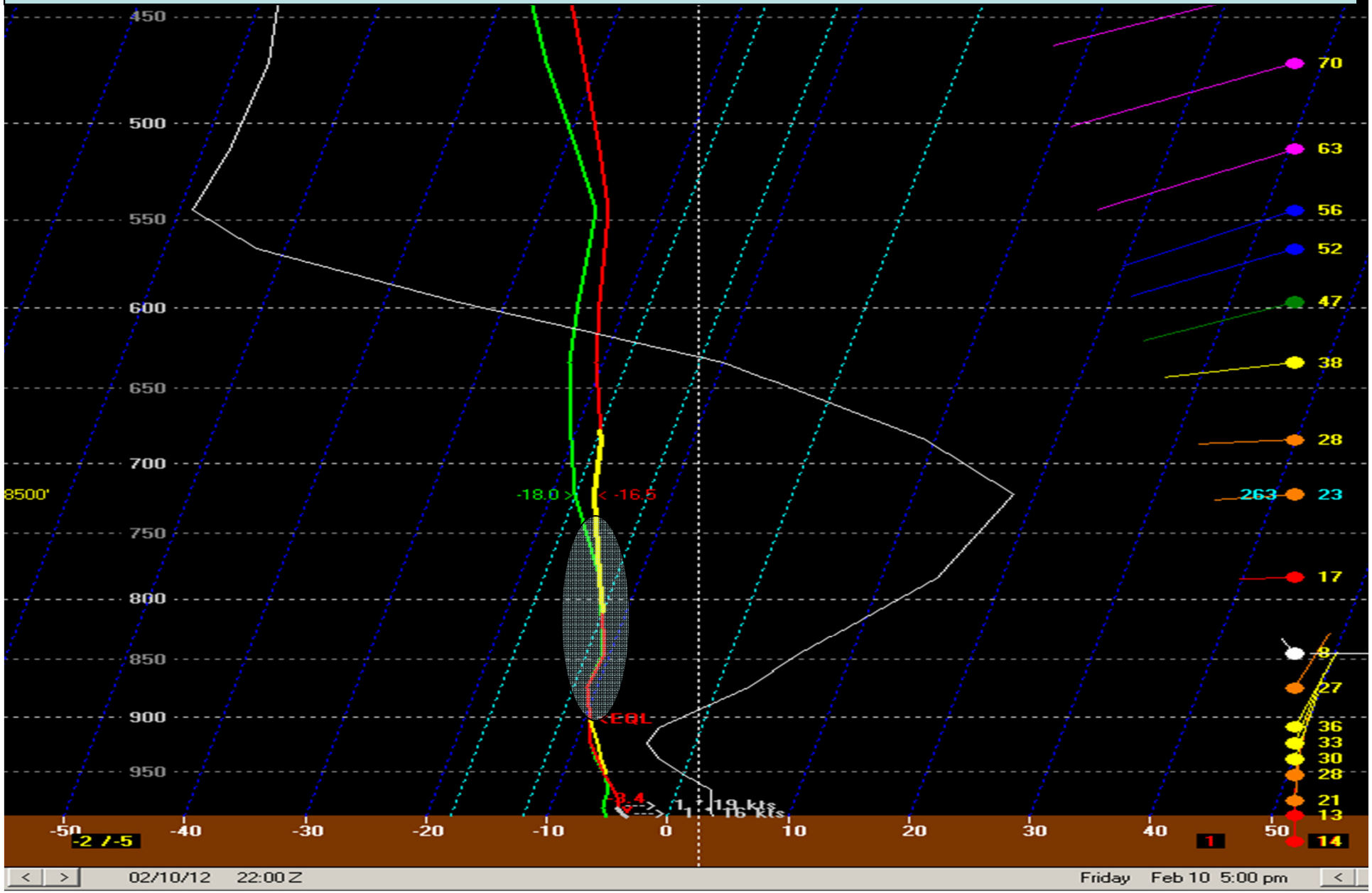
1806Z AZO 360005 /FL 045-072 F900 /<u>IC MOD RIME</u>, -7

CORRESPONDING METAR: KAZO 101753Z 22011KT 4SM -SN OVC020 01/M03 A2989

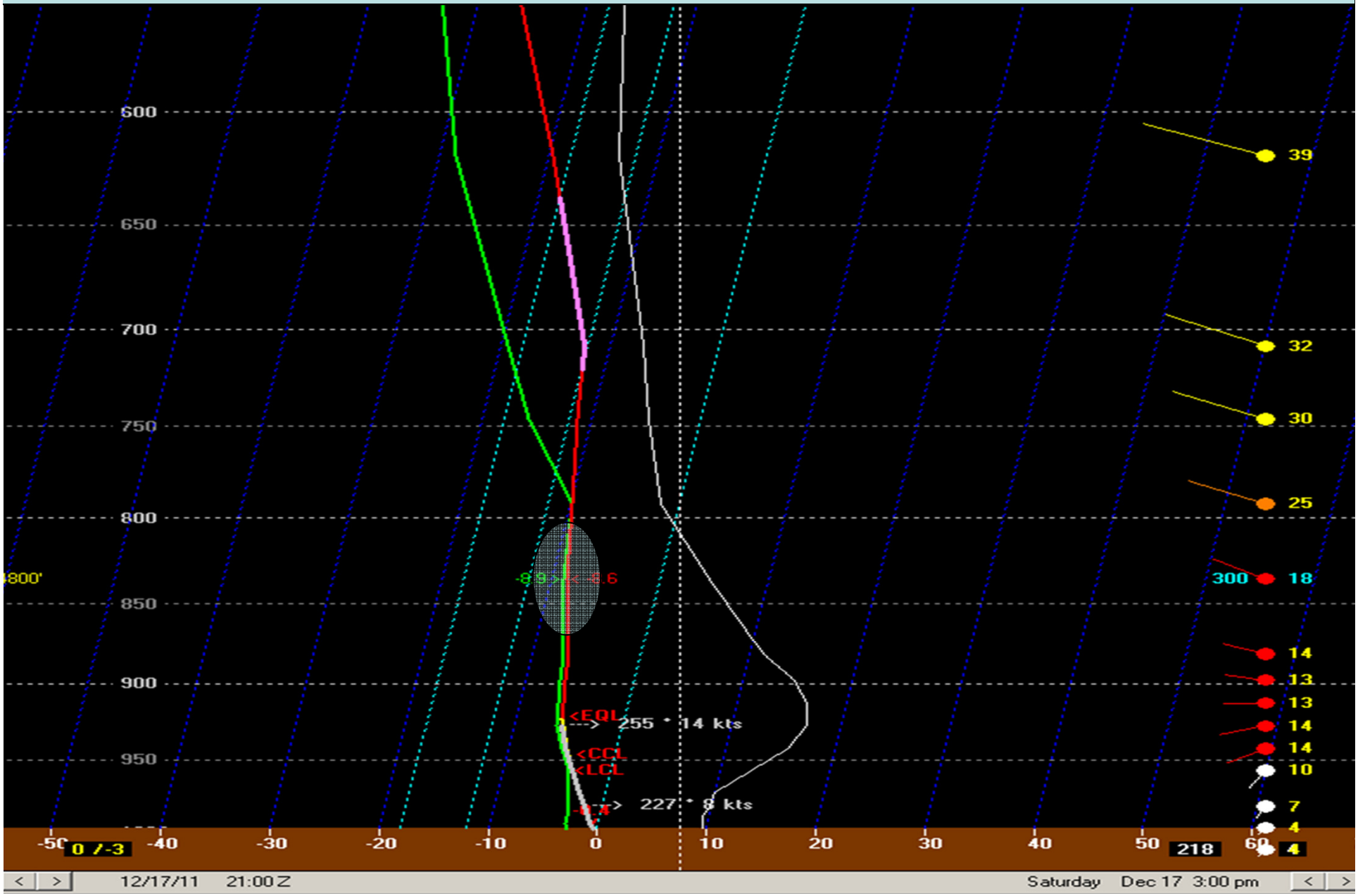


2219Z MDW 040015 /FL 030-080 737 /<u>IC MOD RIME</u>

CORRESPONDING METAR: KMDW 102151Z 35019G26KT 5SM -SN BR BKN018 OVC022 M03/M06

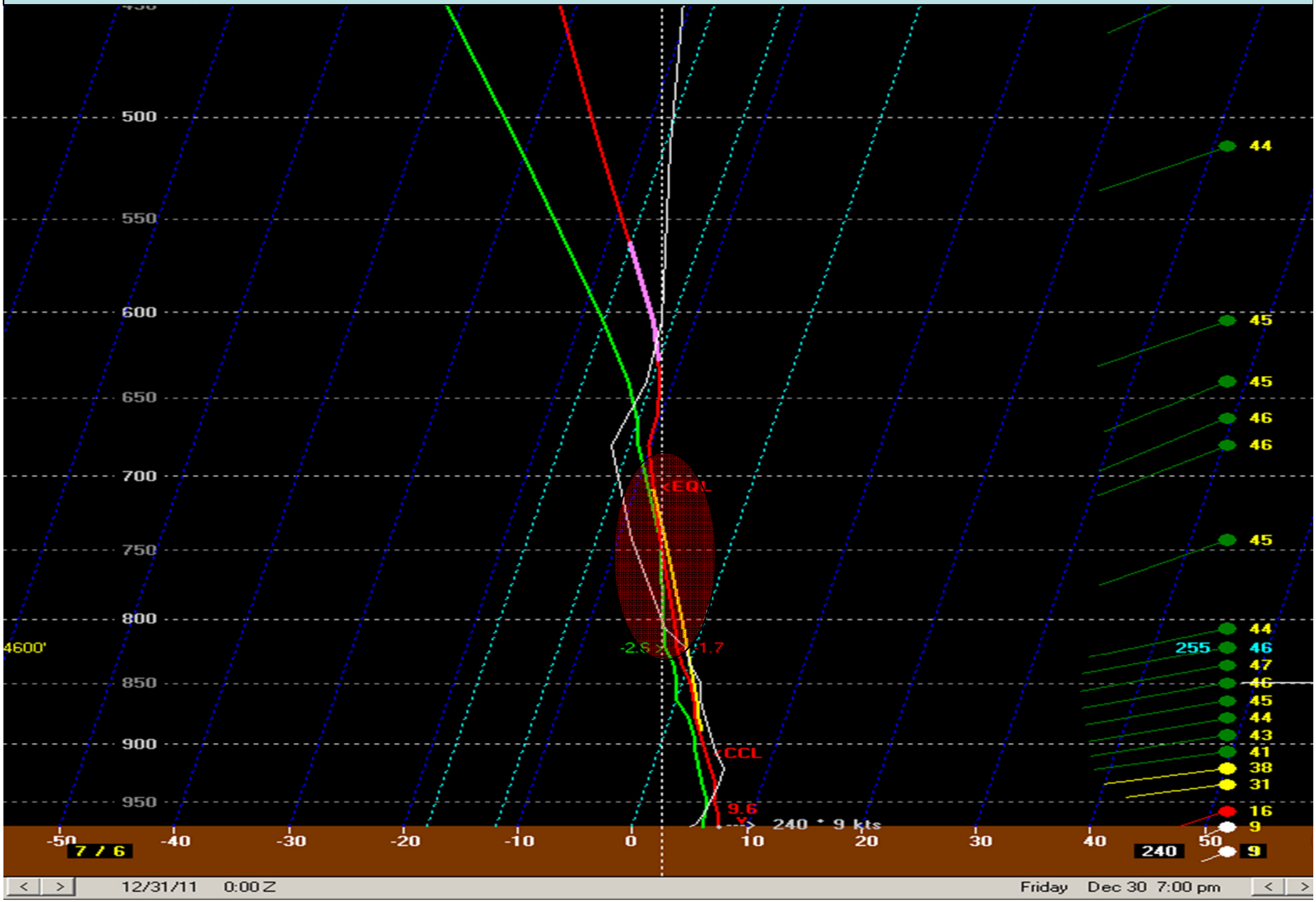


2115Z ORD 090010 /FL 040-060 NUMEROUS AC /IC MOD RIME, MOD MIX, -10

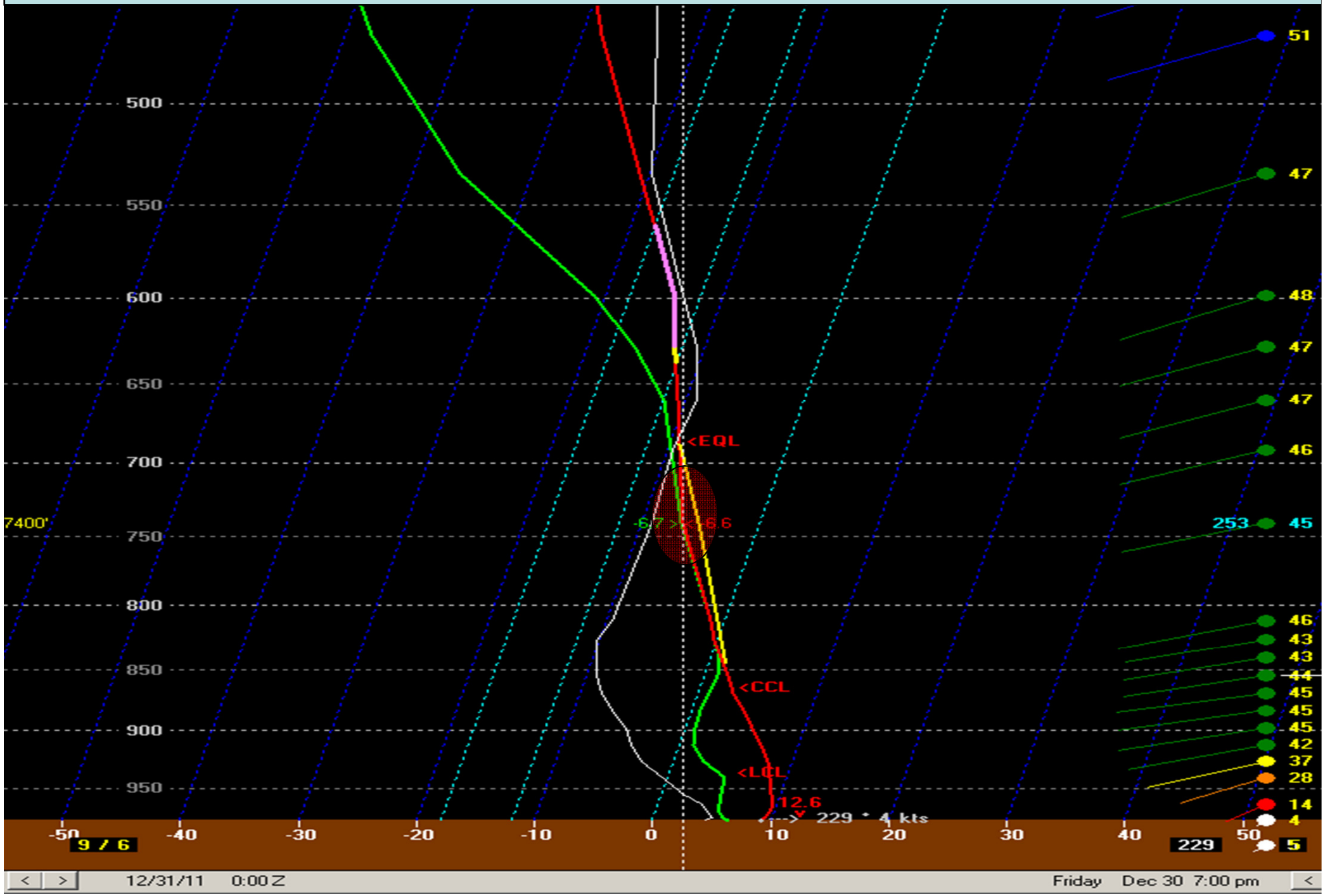


MODERATE-SEVERE ICING

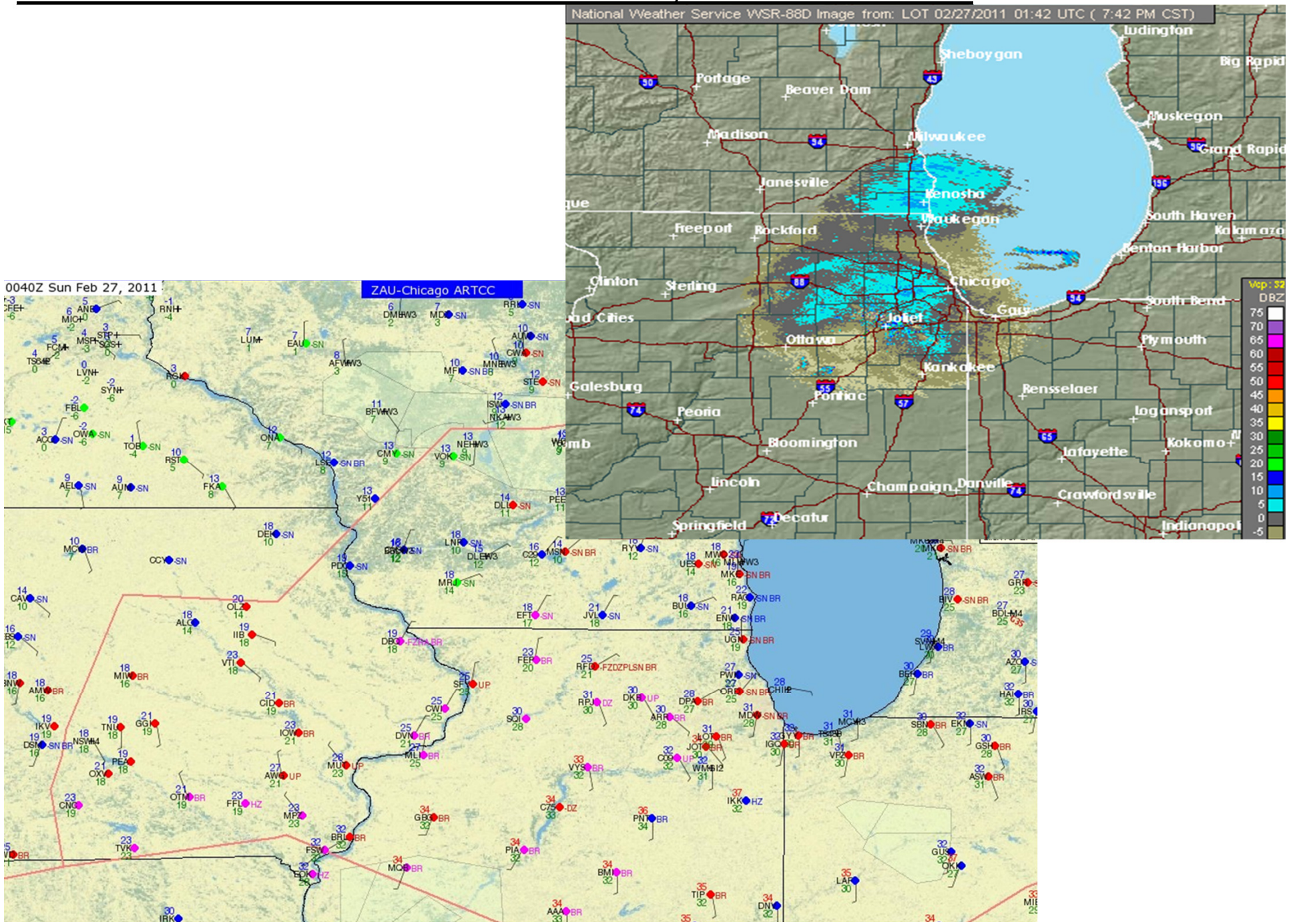
/OV ROD /TM 2335 /FL055-100 /TP CRJ1 /IC MOD-SEV RIME -9



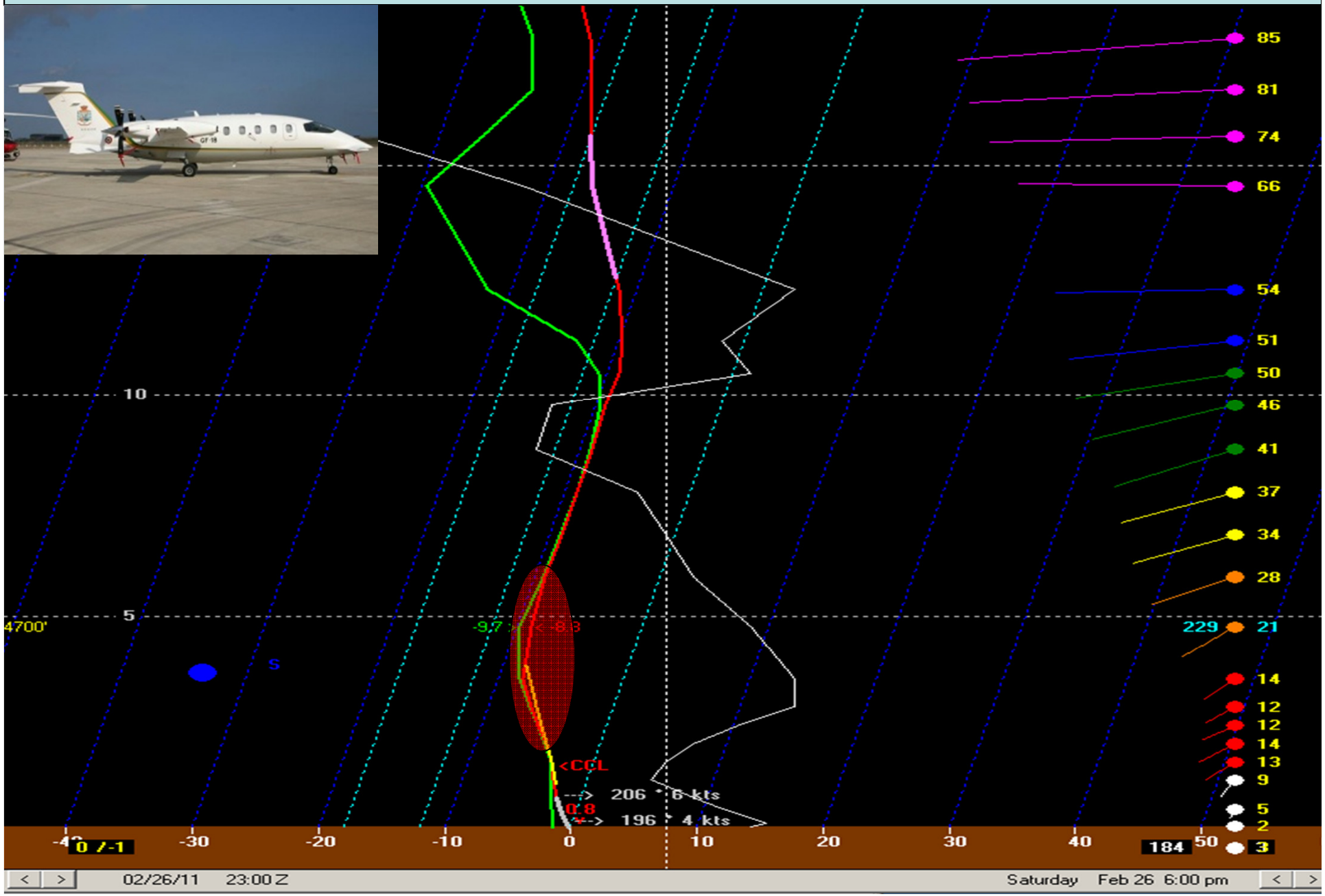
/OV CVG 225010 /TM 2320 /FL 070-080 /TP 727 /IC SEV RIME DSCNT -9



MODERATE-SEVERE ICING CASE: FEB 26, 2011 LOCAL AREA



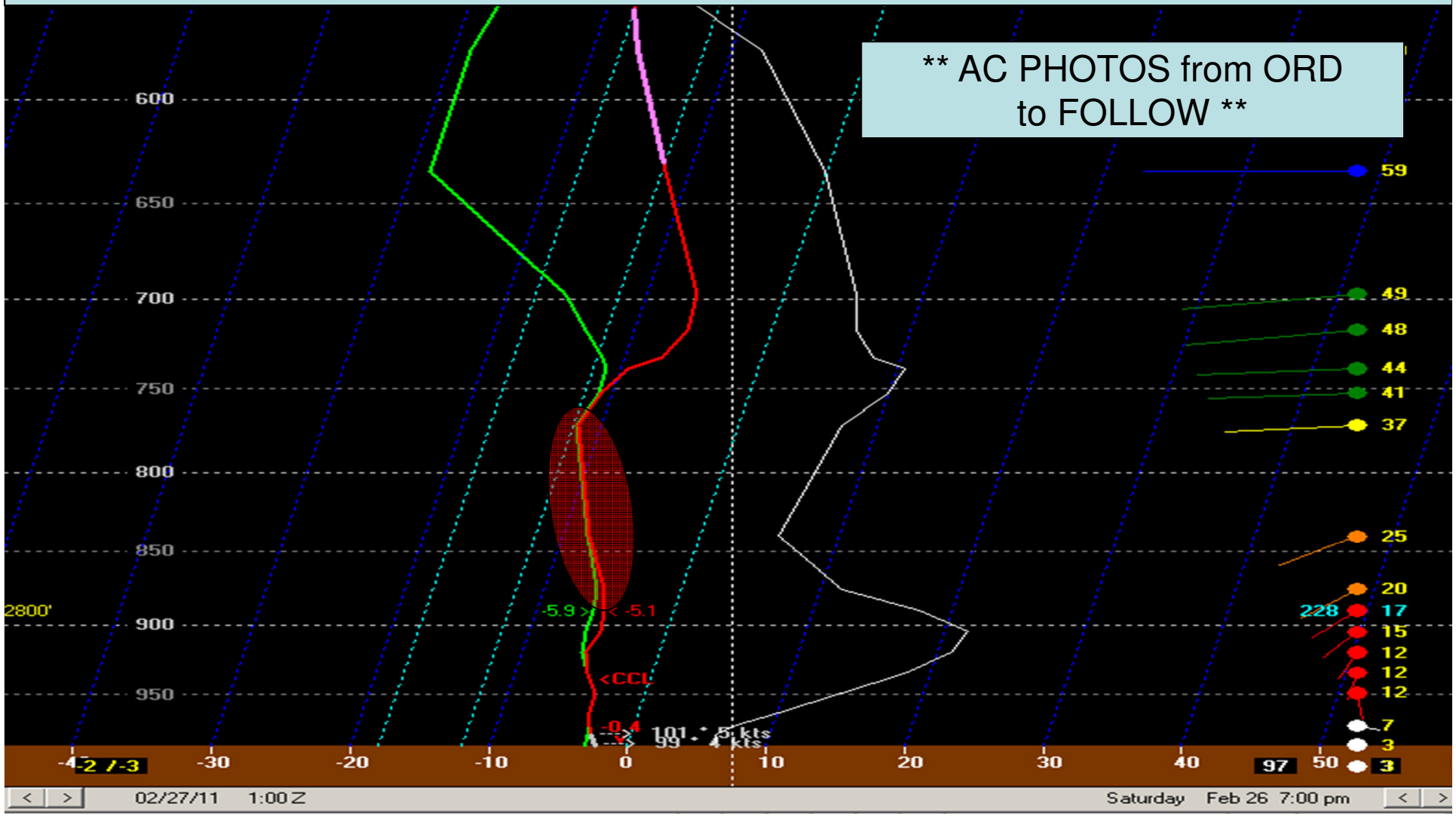
/OV GYY145010/TM 2241 /FL025-060 /TP P180/TA M08 /IC SEV RIME

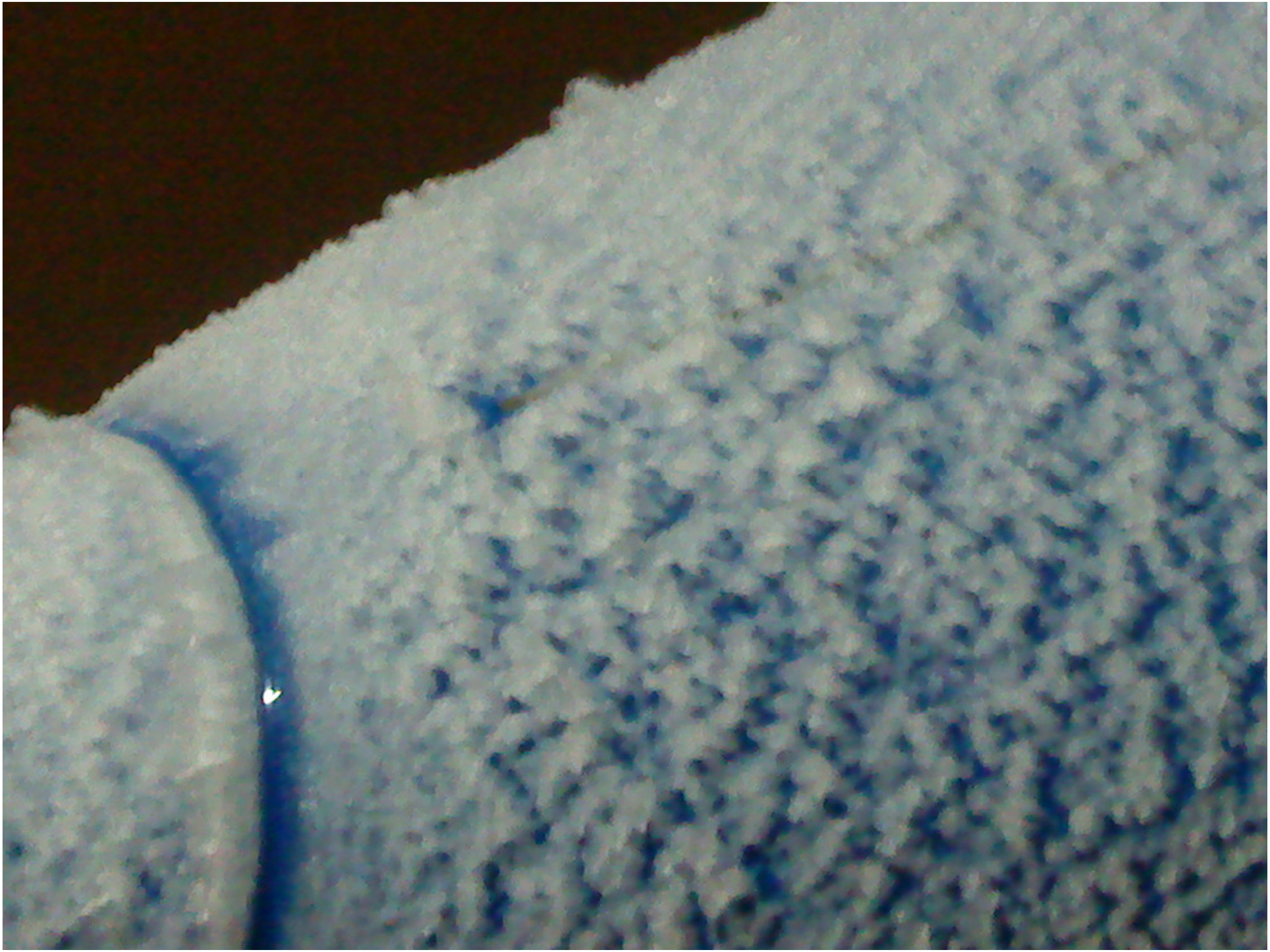


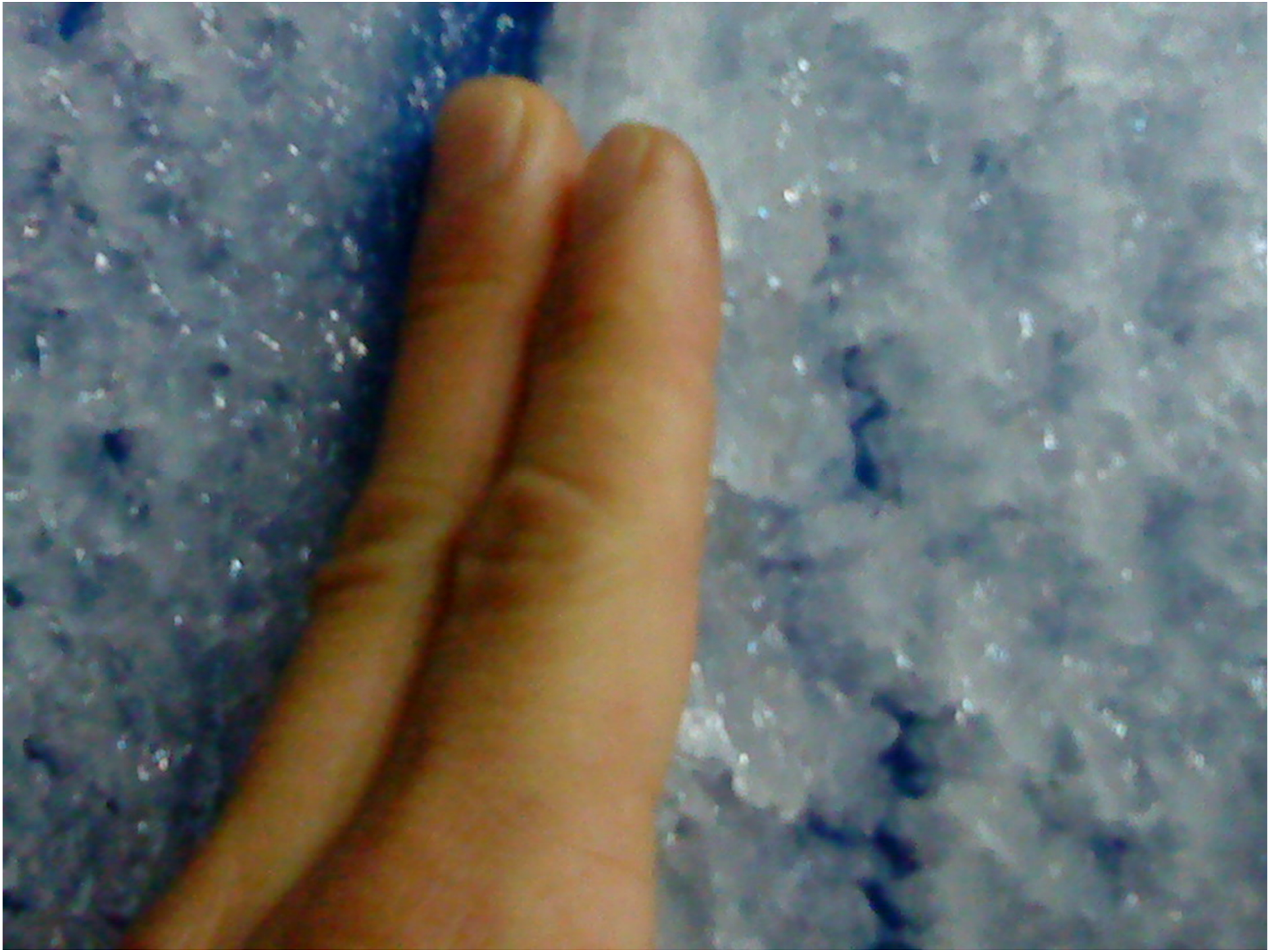
0043Z OBK AOB 085 MOD RIME -9

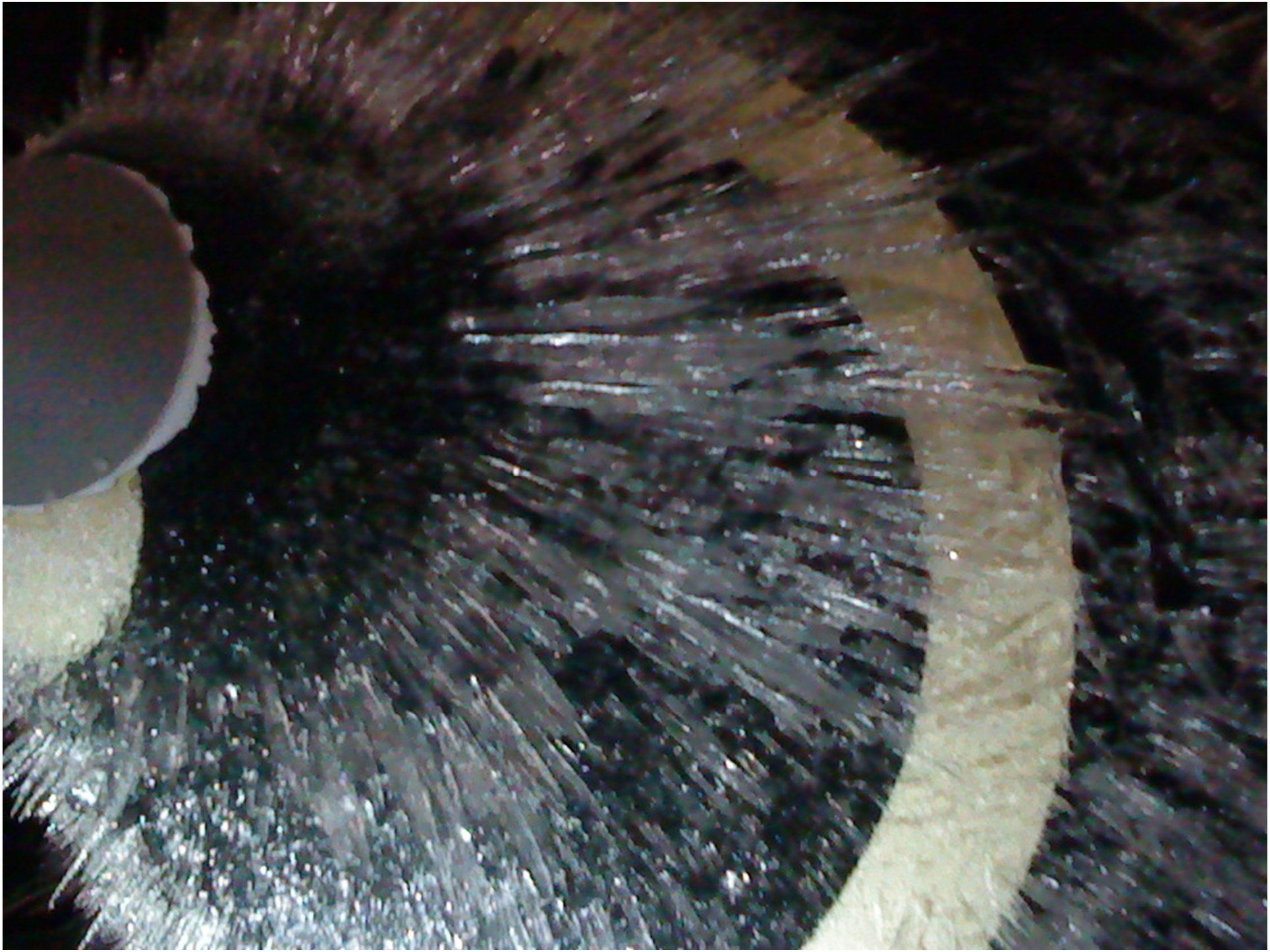
/OV 15E ORD /TM 0120 FL030 /TP A319 /<u>IC SEVERE</u>

ORD GROUND STOP 0120Z – 0215Z DUE SEVERE ICING IN TRACON
<u>0120Z 15E ORD A319 SEVERE ICING ON RUNWAY 28 LOCALIZER FROM A319 @ 030</u>.





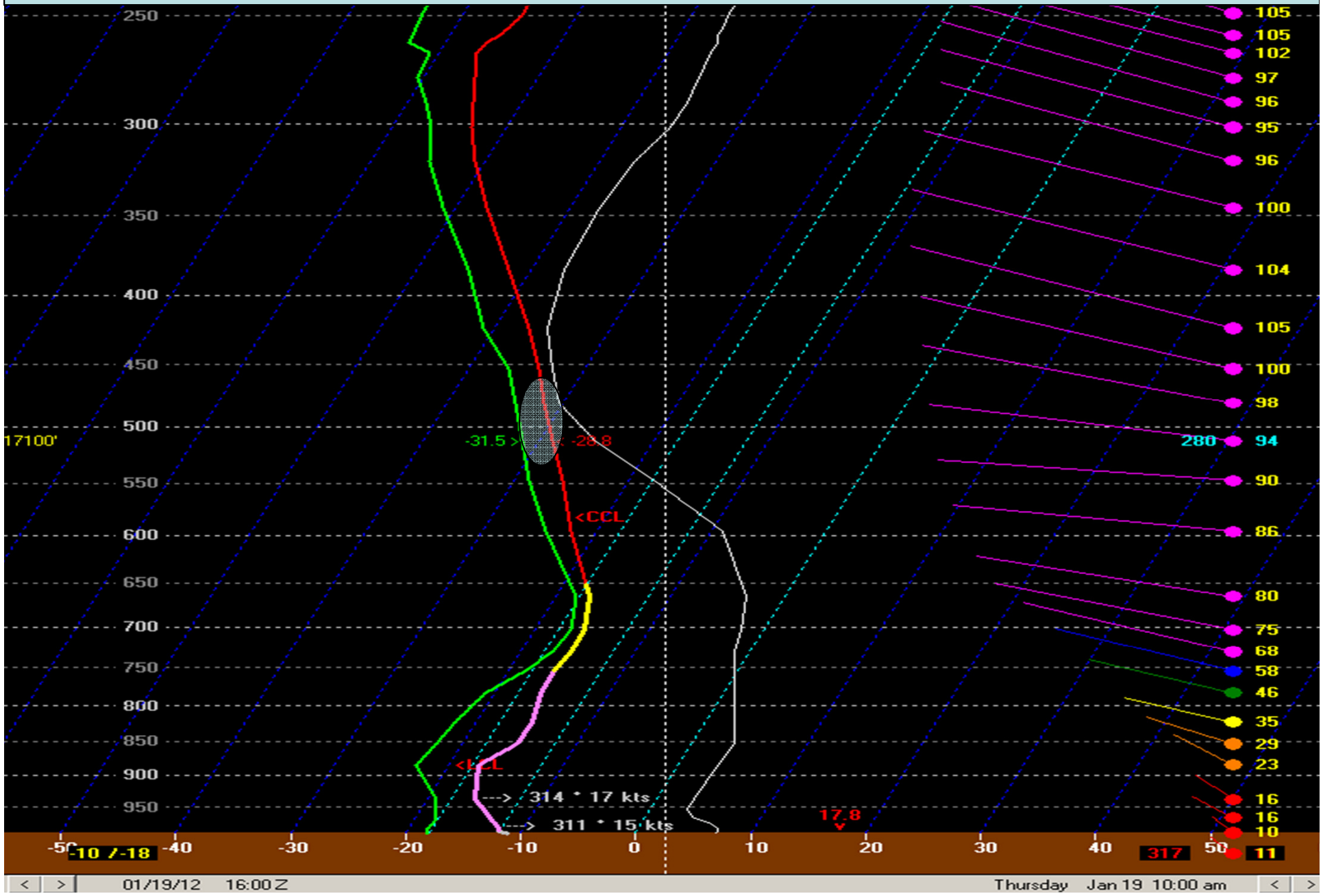




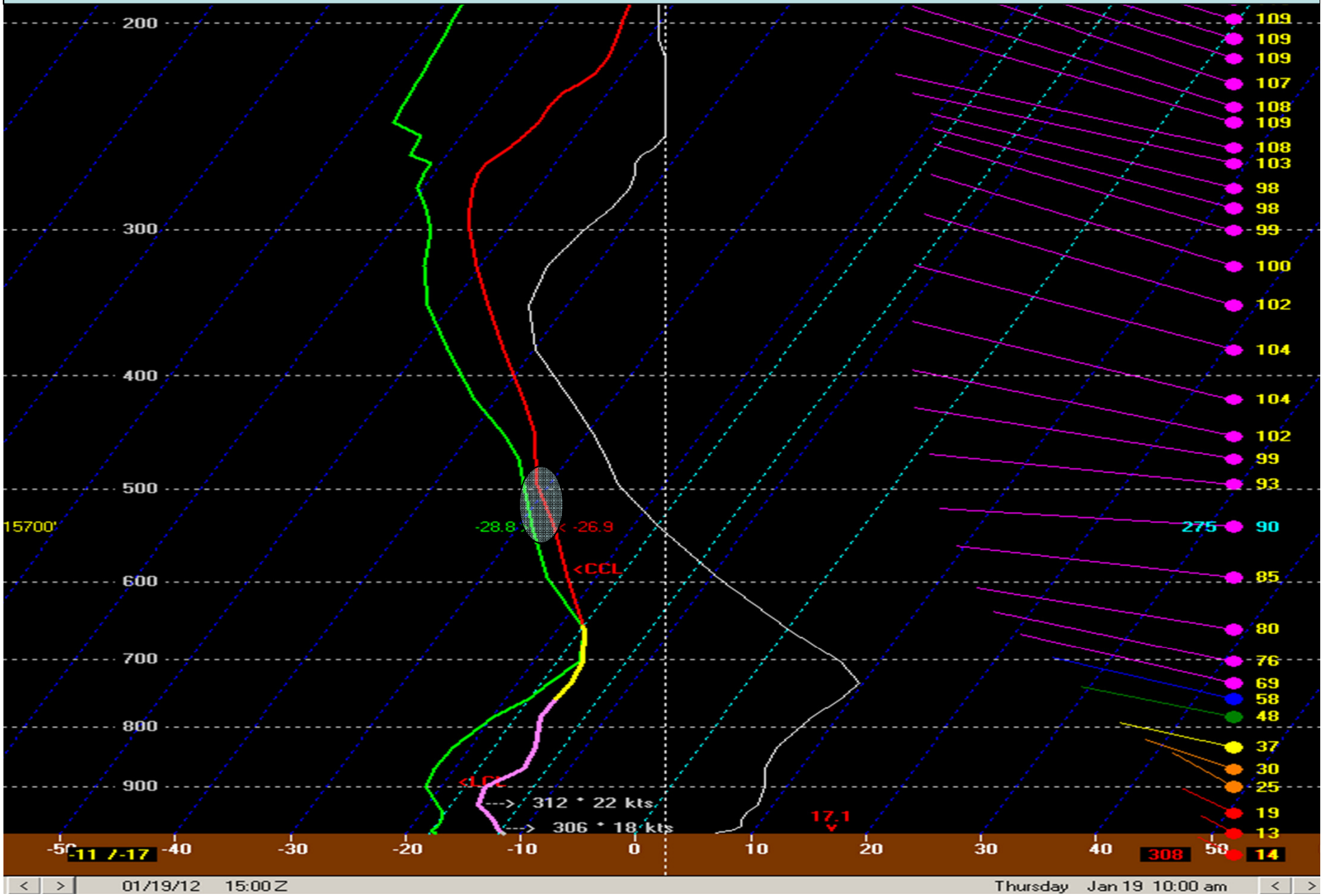
OTHER ICING SCENARIOS

ICING ABOVE THE DENDRITIC ZONE

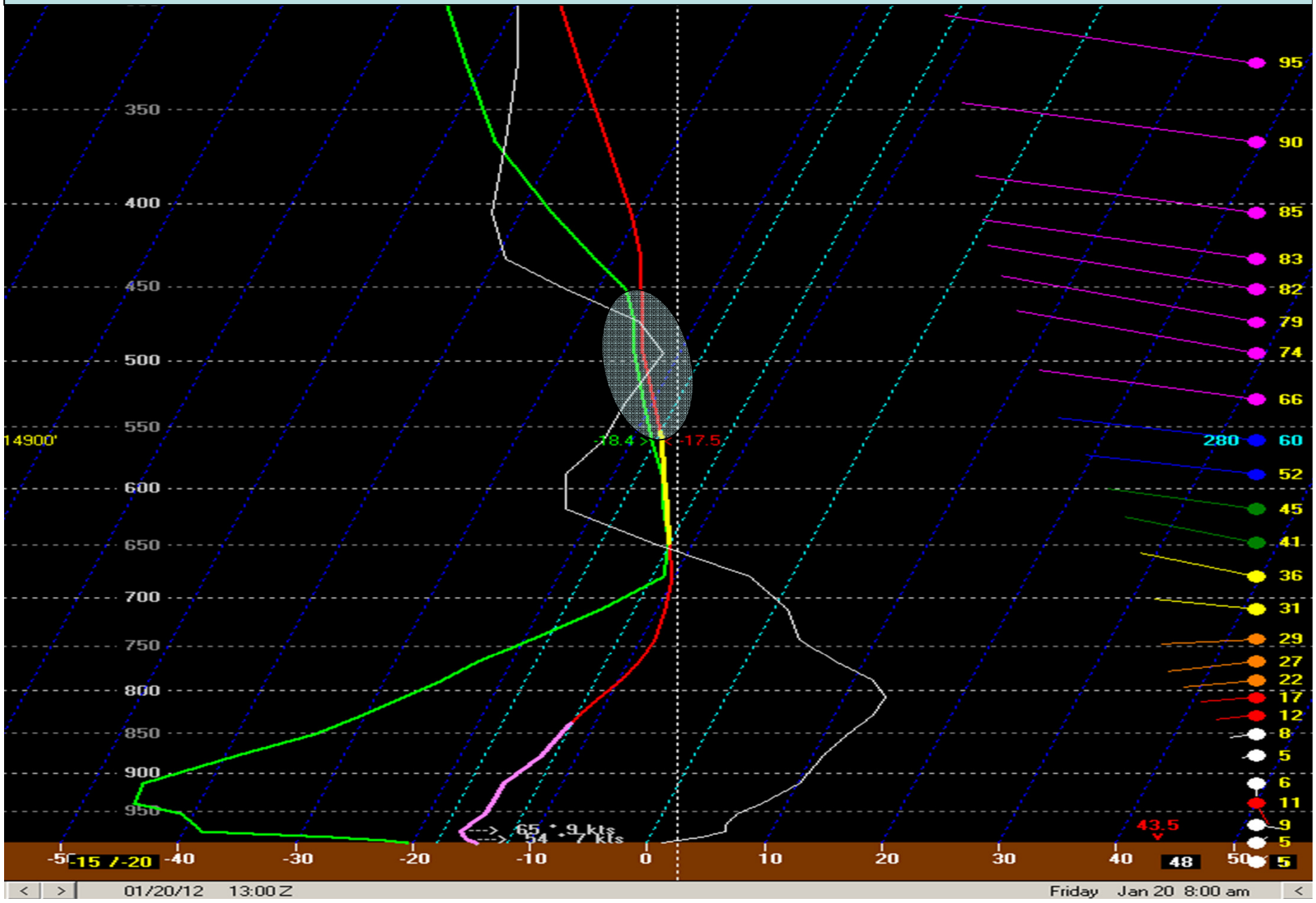
/TM 1614Z /OV 40E ORD /FL170-190 /TP E135 /IC MOD RIME



/TM 1500 /OV10W OBK /FL160-180 /TP DC9 /<u>IC LGT RIME</u>, -19



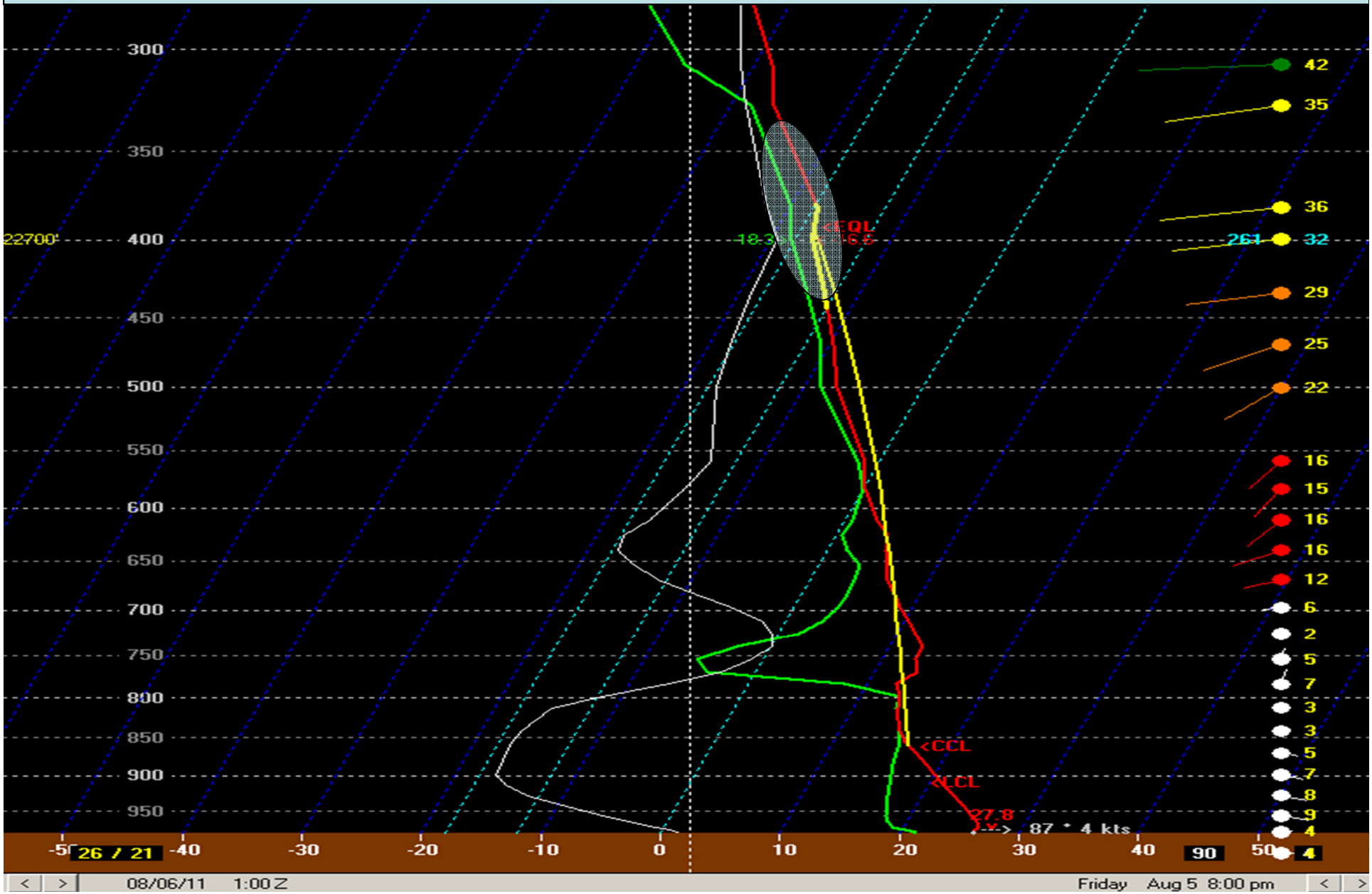
/OV DKB /TM 306 /FL 155-205 /TP 737 /IC LGT RIME, -1



WITHIN A ZONE OF HIGH LEVEL MOIST - UPGLIDE

LGT TO MOD RIME.

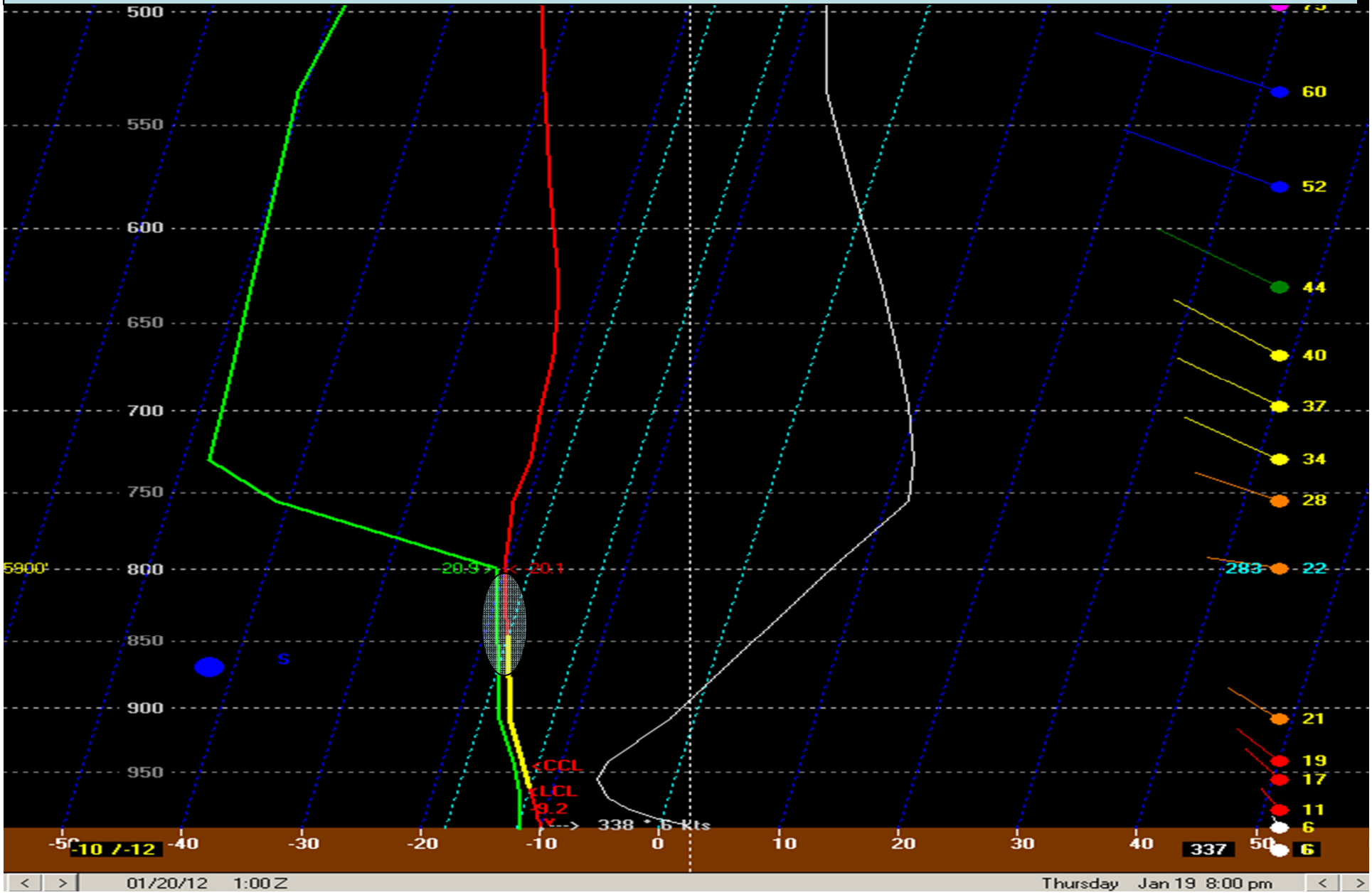
/TM 0100 /OV MSN-JVL /FL 200-255 /TP MULTI AC /<u>IC LGT AND MOD RIME</u>



WITHIN MODEST LAKE EFFECT SNOW - W/SATURATION
ALL COLDER THAN -10C/ WITHIN DENDRITIC ZONE.

LGT RIME

/OV MKG /TM0145 /FL 035-055 /TP CRJ2 /IC LGT RIME -20



LGT ICING WITHIN LGT TO MOD SNOW REPORTED ALOFT

OSH UA /OV OSH/TM 0048/FL060/TP PA34/TA UNKN /IC LGT RIME /RM LGT-MOD SNOW

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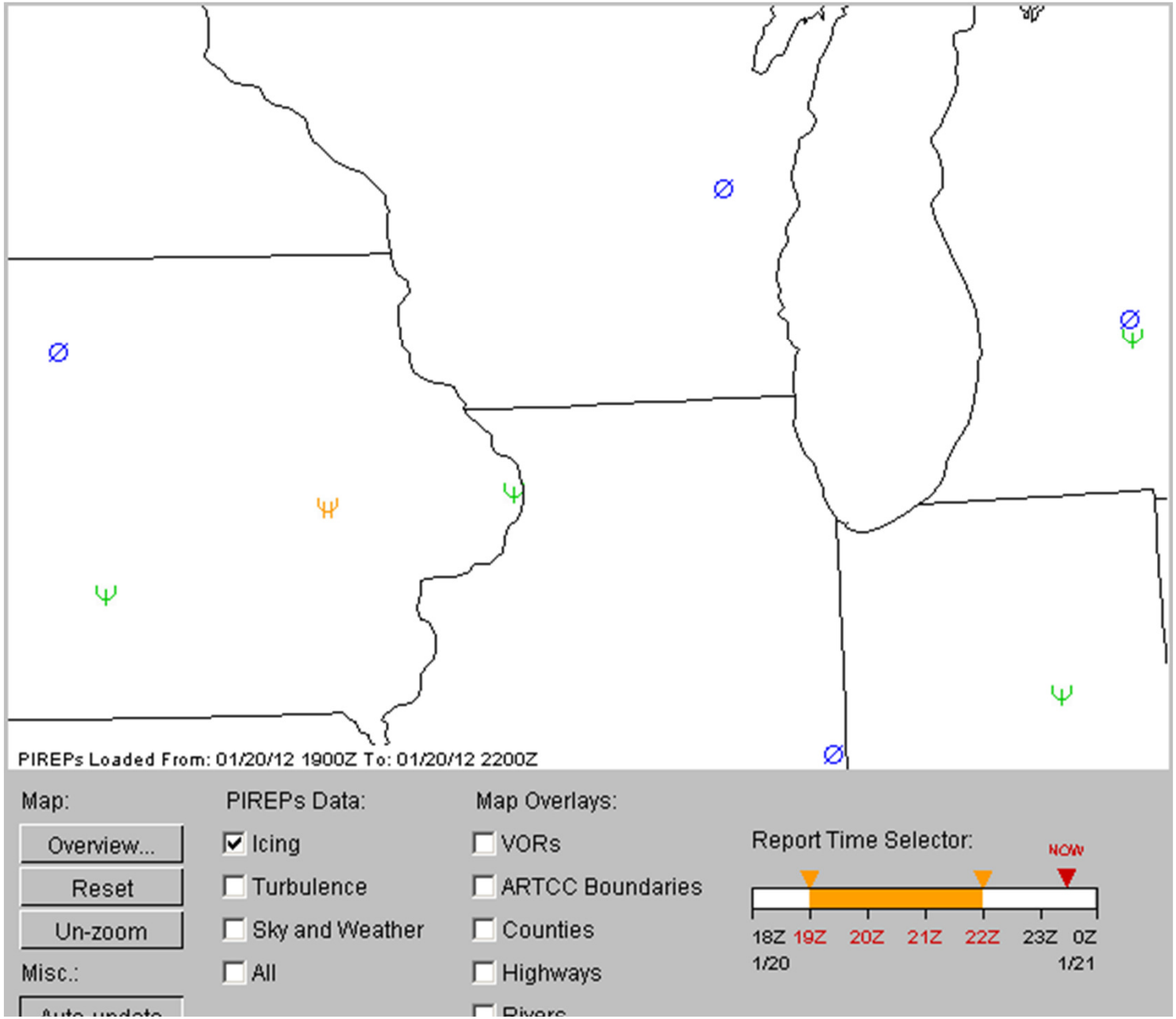
-50 6 / 3 -40 -30 -20 -10 0 10 20 30 40 50 122 60
10/29/11 1:00 Z
Friday Oct 28 8:00 pm

MOD-HEAVY SNOW EVENT ORD 20JAN2012 – LTL SIGNIFICANT ICING

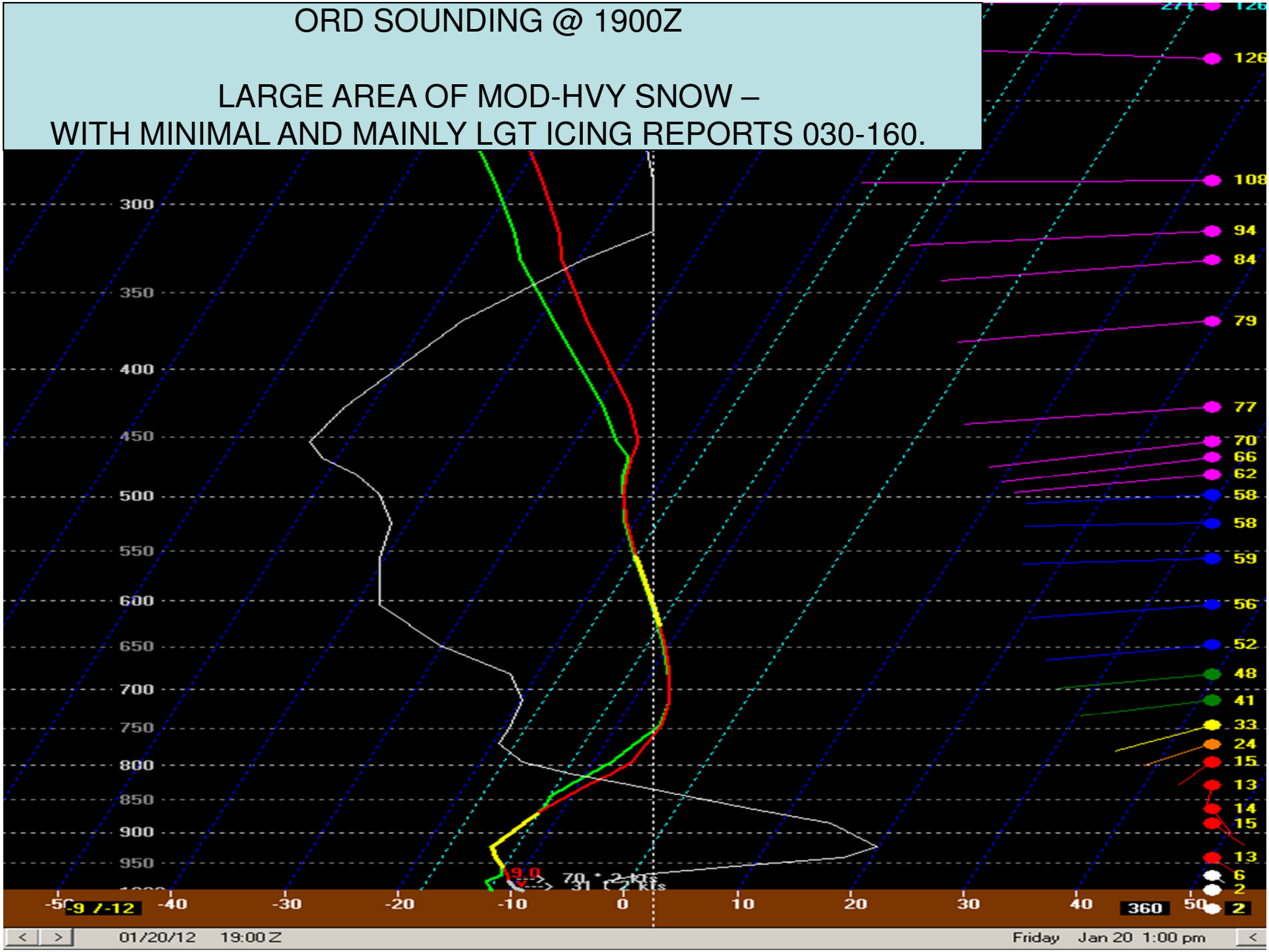
HEAVY OMEGA WITHIN MOIST DENDTRITIC ZONE SCRUBBING SUPERCOOLED BELOW.

MOD-HEAVY SNOW EVENT ORD 20JAN2012 – LITTLE SIG ICING….



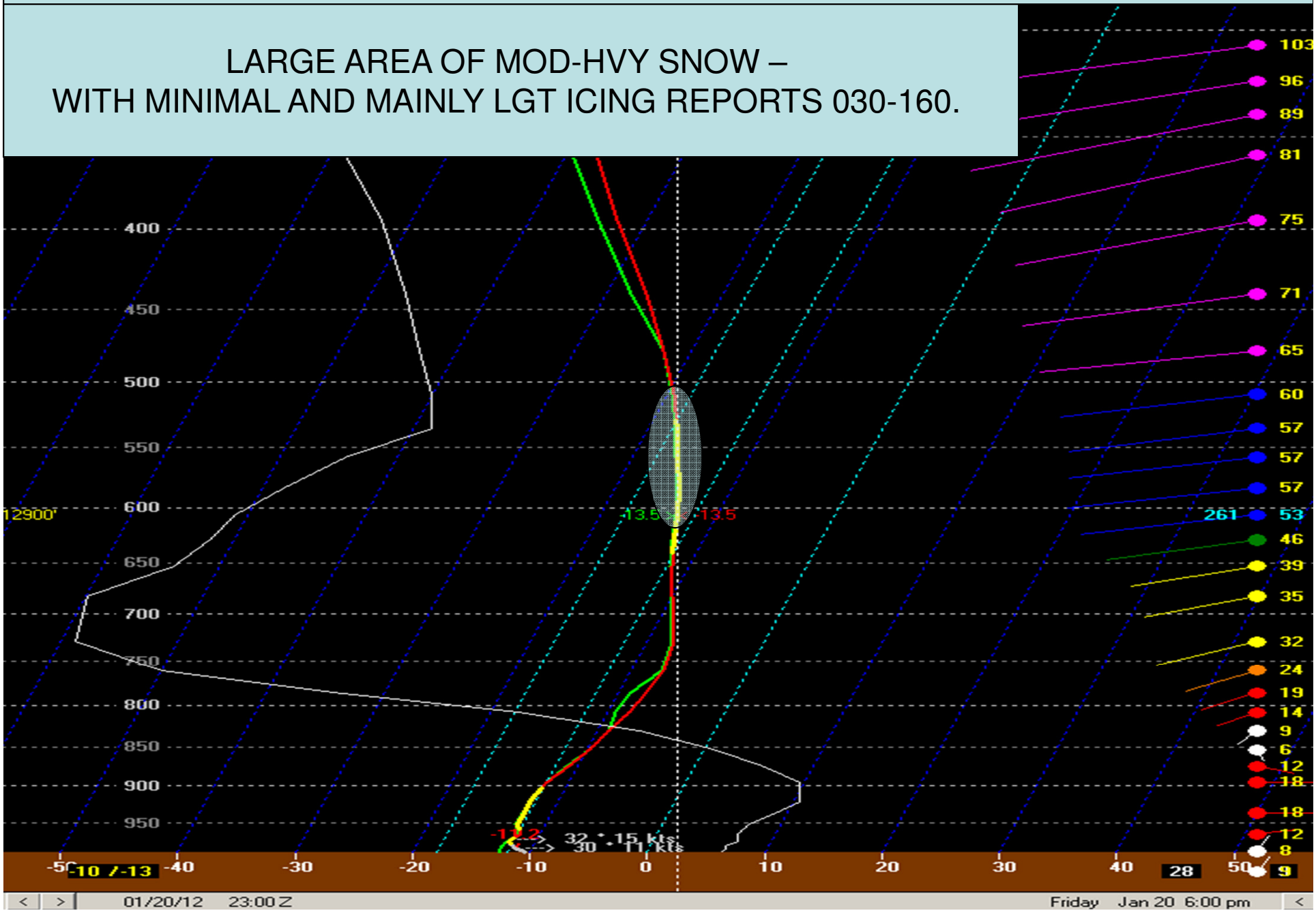
ORD SOUNDING @ 1900Z

LARGE AREA OF MOD-HVY SNOW –
WITH MINIMAL AND MAINLY LGT ICING REPORTS 030-160.



/OV DPA 270010 /TM 2331 /FL 120-170 /TP C425 /IC LGT RIME, -12

LARGE AREA OF MOD-HVY SNOW –
WITH MINIMAL AND MAINLY LGT ICING REPORTS 030-160.

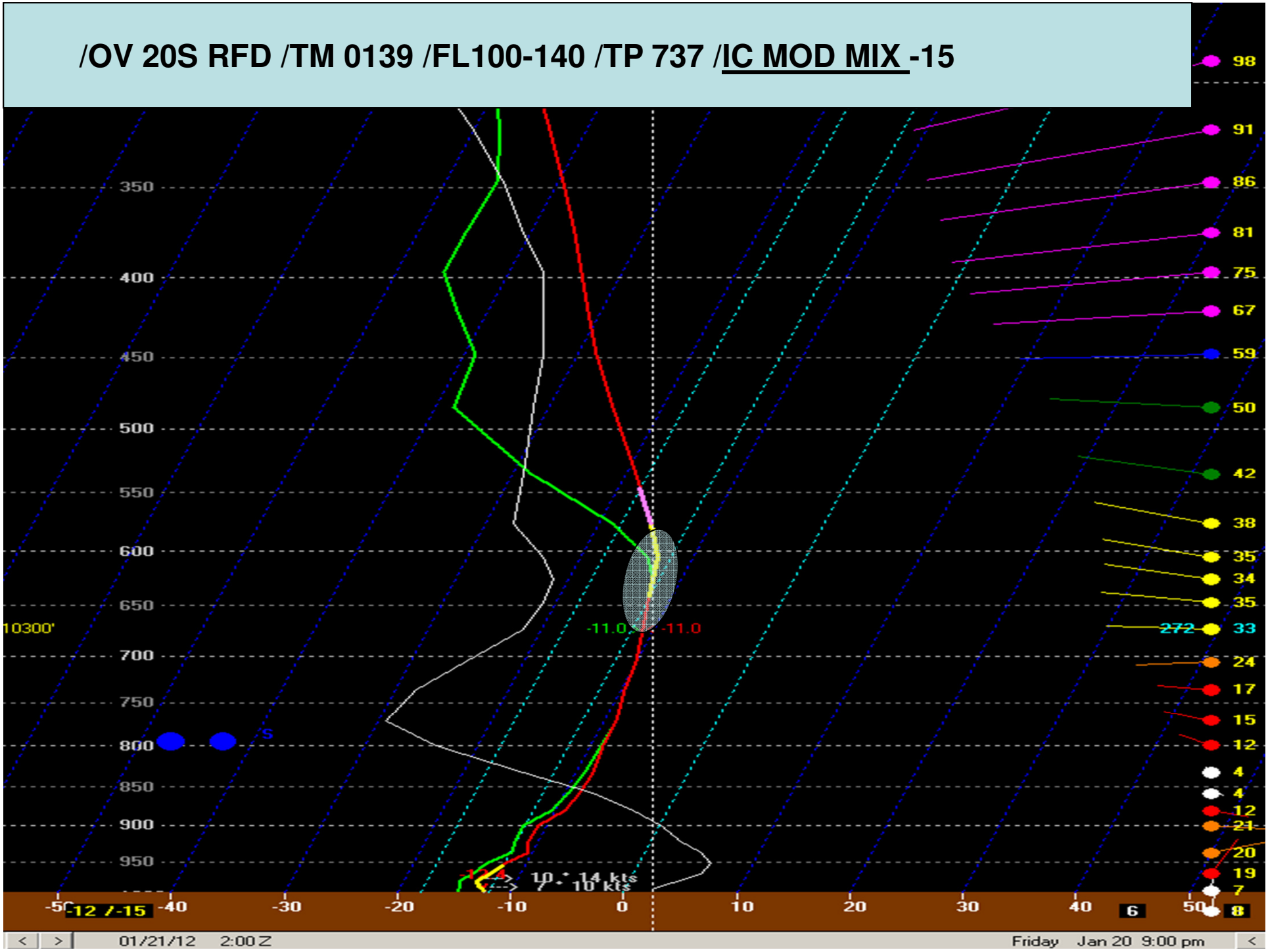


SAME MOD-HVY SNOW EVENT 20JAN2012

AS LAYER MOISTURE AND OMEGA DECREASES WITHIN DENDRITIC ZONE

ICING INCREASES TO MODERATE

/OV 20S RFD /TM 0139 /FL100-140 /TP 737 /IC MOD MIX -15



LAST EVENT:

MODERATE ICING DECREASE TO LIGHT ICING to NONE

@ ORD 1700Z-0200Z

1) SATURATION BELOW DENDRITIC/SNOW GROWTH ZONE RESULTED IN MOD ICING

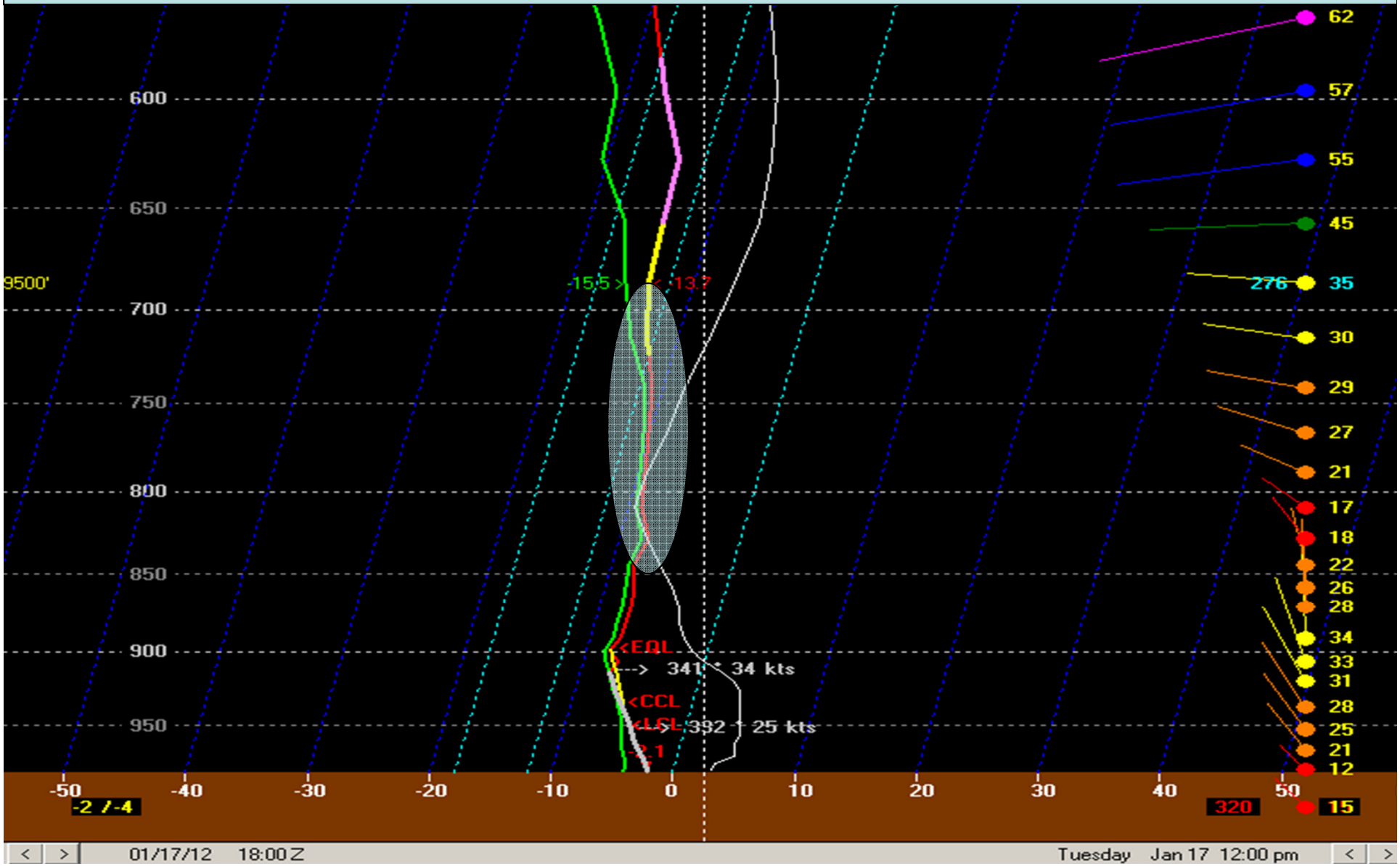
2) INCREASED SATURATION WITHIN DENDRITIC ZONE RESULTED IN DECREASE OF ICING INTENSITY.

3) & 4) RAPID DECREASE OF ENTIRE COLUMN MOISTURE = ICING RISK GONE.

1)

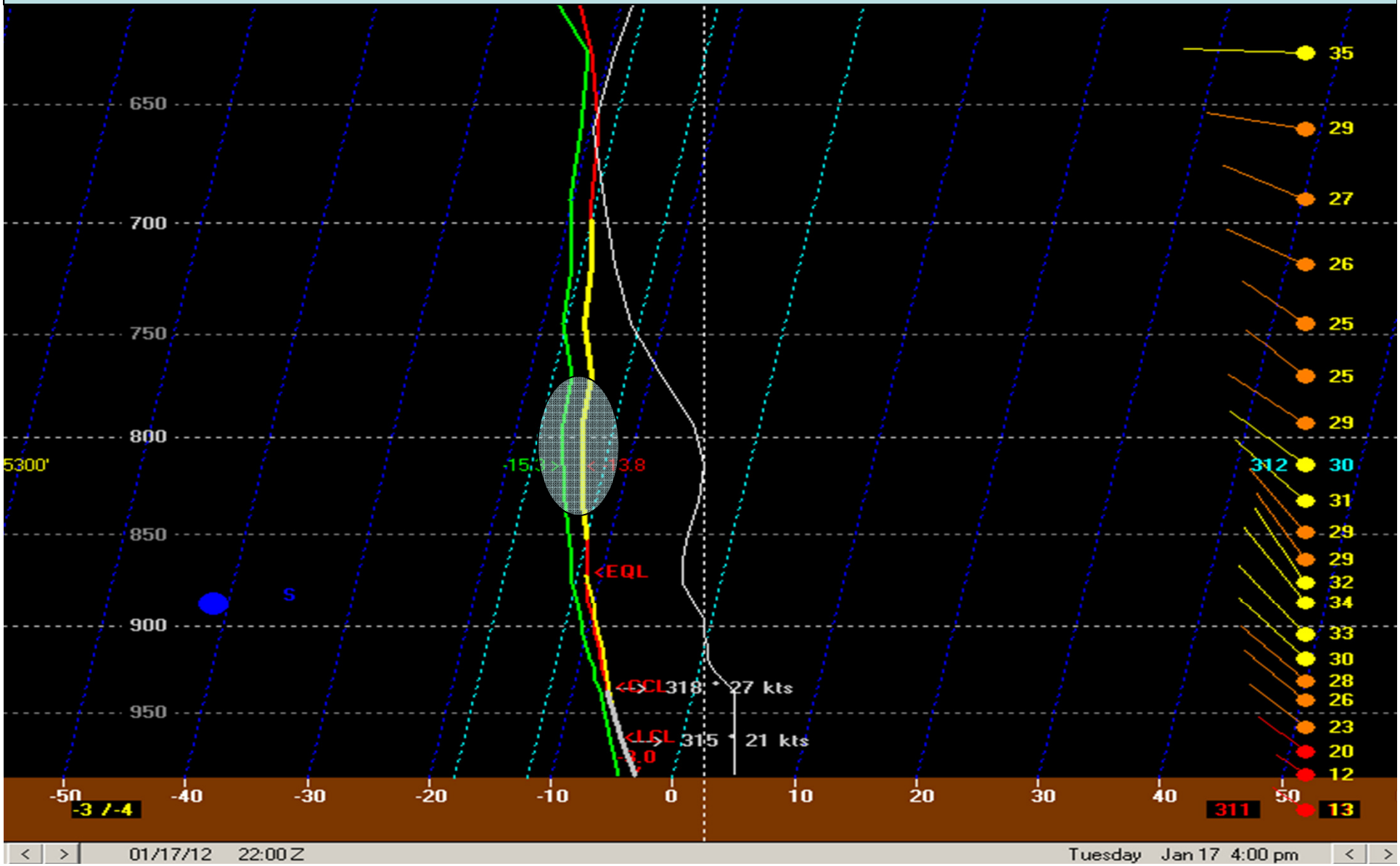
ORD UA /OV ORD270010 /TM 1703 /FL050 /TP 757 /<u>IC MOD RIME, -12</u>

ORD UA /OV ORD 090025 /TM 1748 /FL055-100 /TP E135 <u>/IC MOD MIX, -6</u>

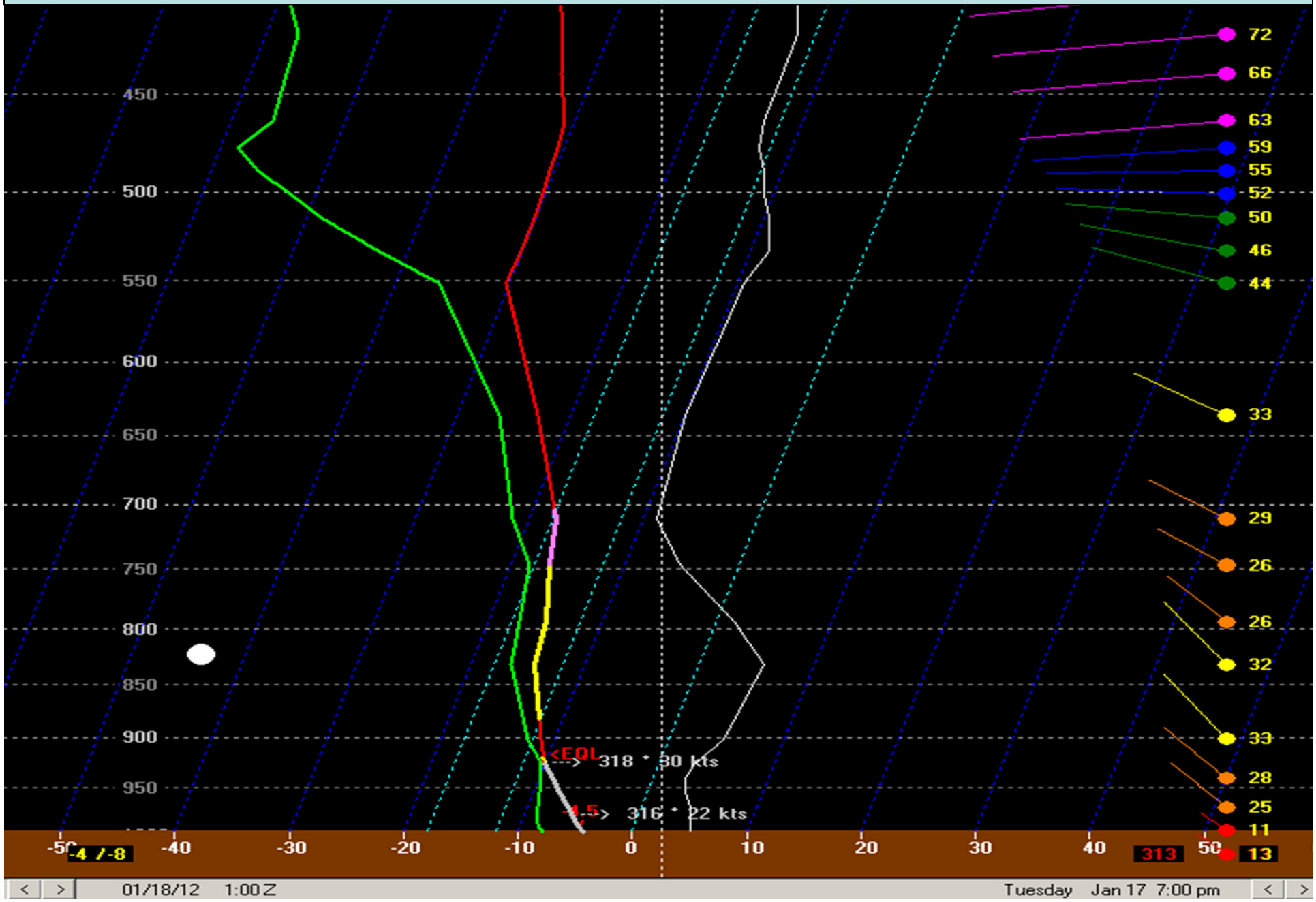


2)

ORD UA /OV ORD /TM 2151/FL050 /TP A320 /IC LGT RIME, -10
ORD UA /OV ORD 090015 /TM 2155 /FL055 /TP A319 /IC LGT RIME, -5



3) **NONE**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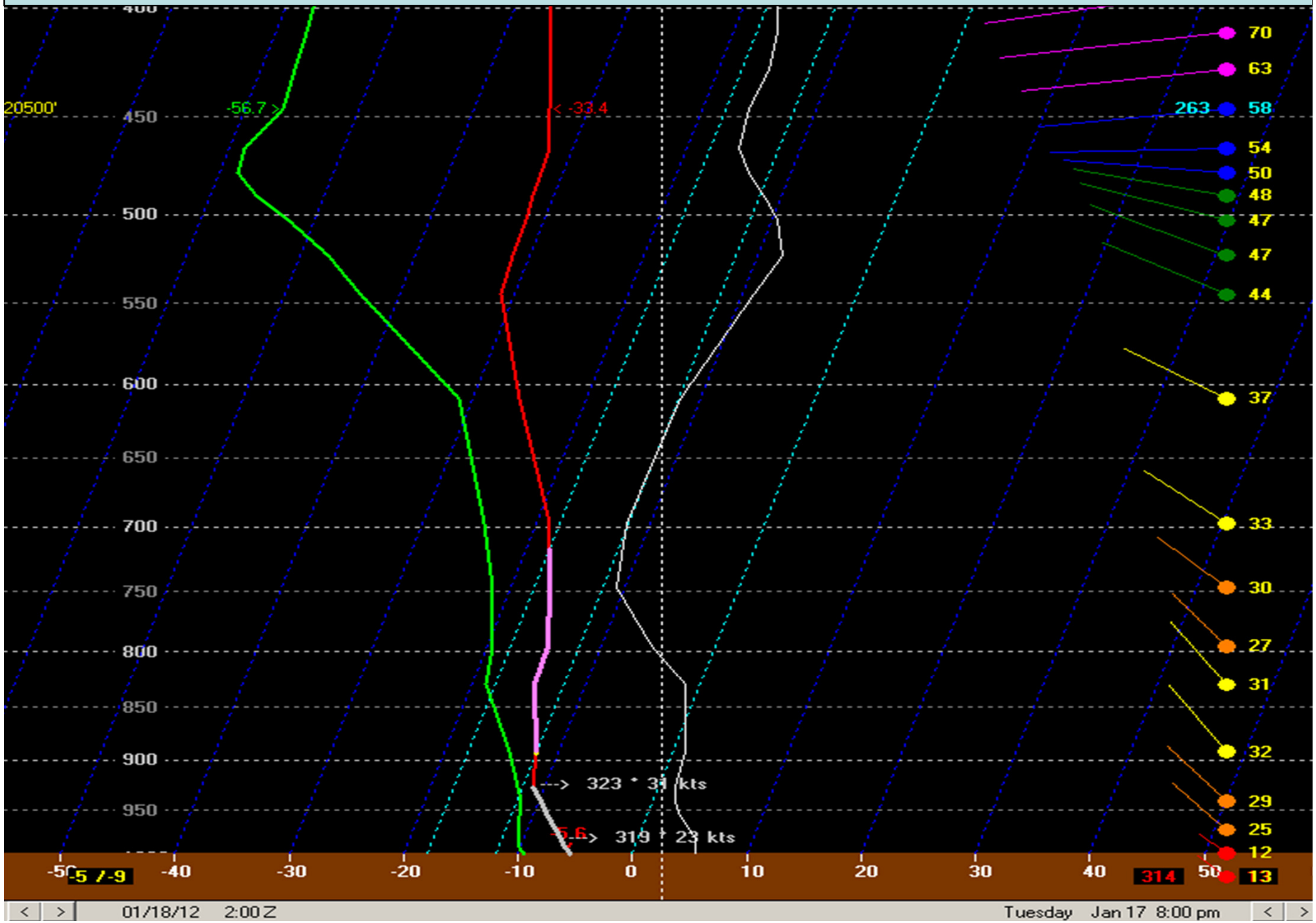
40
50
-4 / -8
313
<EQL
318 ° 30 kts
316 ° 22 kts
01/18/12 1:00 Z
Tuesday Jan 17 7:00 pm

4) **NONE**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314
---> 323 ° 31 kts
-5.6
> 319 ° 23 kts
-5 / -9
01/18/12 2:00 Z
Tuesday Jan 17 8:00 pm