SUPPLEMENTARY VORTEX DATA MESSAGE

The supplemental vortex data gives a cross-section of weather data from one side
of the storm to the other side, normally out to 105 nautical miles from the center.
This information can be used to find the extent of damaging winds in the four
quadrants of the storm (northeast, southeast, southwest, and northwest).

The generic format of this type of report for the north Atlantic
is as follows:

```
URNT14 KNHC DDTTTT
AA ### MMXX NAME
SUPPLEMENTARY VORTEX DATA MESSAGE

01LaLaLa 1LoLoLoLo 1jHHH 1TTTdTd ddfff
02LaLaLa 2LoLoLoLo 2jHHH 2TTTdTd ddfff
03LaLaLa 3LoLoLoLo 3jHHH 3TTTdTd ddfff
04LaLaLa 4LoLoLoLo 4jHHH 4TTTdTd ddfff
05LaLaLa 5LoLoLoLo 5jHHH 5TTTdTd ddfff
etc...etc...etc

MFLaLaLa MLoLoLoLo MFfff
OBS 01 AT HHMMZ
OBS XX AT HHMMZ
OBS 01 SFC WND ddfff
```

Some comments about the above code:

Generally, the data in each line are:
Latitude / Longitude / Height of Standard Surface / Temp & Dewpoint / Winds

The format for decoding these reports is quite similar to the
traditional RAOB decode. Height, temperature, dewpoint, wind
direction and speed are decoded almost identically.

Data are collected every 15 nautical miles both approaching and departing
the storm. When approaching, data normally starts at 105 nm from
the center and at 15 nm intervals thereafter. When departing the storm,
data normally starts 15 nm from the center and at 15 nm intervals there-
after. The first half of the SUPVOR message contains the inbound data,
the second half is the outbound leg. Each line contains all the important
weather data from a different point.

Usually two supplementary vortex messages are sent on every flight,
so that data covers all four quadrants of the storm.

The indicator numbers at the beginning of each group are simply used
to distinguish one group from another. For example, the first line of
data is labeled 01, and each block of data on that line starts with "1"
except the last block (surface winds). The next line (15 nm later) is
labeled 02/2, etc.

The line by line decode breaks down as follows:

UR 14 is the name of this report. Atlantic reports are coded URNT14
KNHC is the location of the recipient of the message (Nat'l Hurricane Center)
DDTTTT is the day and time of the report in Greenwich Mean Time
AA is the Agency providing the report. AF is Air Force, NOAA is NOAA
is the aircraft number flying the mission
MM is the number of the mission for this storm
XX is the depression number, or simply XX if not a depression or greater
NAME is the name of the storm, if any, or words CYCLONE or INVEST

LaLaLa is the latitude of the report in degrees/tenths

LoLoLoLo is the longitude of the report in degrees/tenths

jHHH is the pressure height data in the following format:
j=0 means sea level data follows with HHH in whole millibars
j=2 means 850 mb data follows with HHH in geopotential meters
j=3 means 700 mb data follows with HHH in geopotential meters
j=8 D - Value in geopotential decameters; if neg, 500 is added to HHH
j=9 means 925 mb data follows with HHH in geopotential meters

TTTdTd is the temperature/dewpoint in degrees Celcius. If the temperature or
dewpoint is greater than 50, it means it is negative. Subtract 50 from the number
and add a negative sign to decode. Example: TdTd=58 decodes to -8 Celcius.

ddfff is the true direction of flight level wind in tens of degrees, and fff is
the speed of wind in knots (multiply by 1.15 to convert to miles per hour).
/ means data unknown or unobtainable

MF means that maximum flight level wind data follows, in the following format:
MFLaLaLa MLoLoLoLo MF fff. The first two blocks are the latitude and
longitude of the max wind, in degrees and tenths. The last block is the windspeed
in knots.

```
  The following is an actual message with a partial decode following:

  URNT14 KNHC 020031
  AF985 1605A EDOUARD OB 16 KNHC
  SUPPLEMENTARY VORTEX DATA MESSAGE
  01401 10721 13086 10303 04044
  02400 20719 23068 20505 06048
  03398 30716 33052 30606 07045
  04396 40714 43038 40606 06036
  05394 50711 53020 50706 06048
  06391 60709 63986 60707 05050
  07388 70706 73949 70907 04051
  08386 80704 83914 80908 04048
  09385 80702 93872 91010 04047
  10384 00699 03813 01311 04041
  MF398 M0717 MF058
  OBS 01 AT 2122Z
  OBS 10 AT 2205Z
  OBS 01 SFC WND 03040
  01381 10694 13753 11411 23044
  02379 20692 23823 21310 23067
  03377 30690 33887 31109 22075
  04375 40687 43942 41105 22074
  05374 50685 53980 51203 22068
  06372 60683 63011 60905 22062
  MF378 M0691 MF082
  OBS 01 AT 2213Z
  OBS 10 AT 2239Z
  OBS 06 SFC WND /////
  REMARKS;
```

  The first three lines identify the report in detail...

  URNT14 is the report header
  KNHC signifies the report was sent to the Nat'l Hurricane Center
  012245 means the report was sent on the 1st day of the month, 2245Z
       (2245 Greenwich Mean Time = 1745 CDT = 5:45 p.m. CDT)
  AF means this mission was flown by the Air Force Reserve
  966 is the aircraft number (tail number 50966)
  1605A means this was the sixteenth mission for this tropical system, and
       this was the 5th tropical cyclone of the season in the Atlantic/Gulf/Carib
  EDOUARD was the name of the storm
  OB 11 means this was the 11th observation from this mission

  The first data line decodes as follows:
  01401 10721 13086 10303 04044

  01401...latitude is 40.1 degrees North
  10721...longitude is 72.1 degrees West
  13086...700 millibar height is 3086 meters
  10303...temperature is 3 Celsius / dewpoint is 3 Celsius (100% humidity)
  36027...wind is 040 degrees (out of the northeast) at 44 knots (51 mph)

  The seventh line of data decodes as follows:
  07388 70706 73949 70907 04051
  Position: 38.8N 70.6W. 700 mb height is 2949 meters. Temperature is 9 Celsius,
  Dewpoint is 7 Celsius. Flight level winds are from 040 degrees at 51 kts (59 mph).

  At the end of the inbound leg, there are data for the maximum winds:
  MF398 M0717 MF058
  mean the maximum wind on this leg was 58 knots at 39.8N 71.7W

  OBS 01 AT 2122Z...first line of data taken at 2122Z (2122 GMT or 1622 CDT)
  OBS 10 AT 2205Z...last line of data taken at 2205Z (2205 GMT or 5:05 p.m. CDT)
  OBS 01 SFC WIND 03040..surface wind at the beginning of the inbound track
       was 030 degrees at 40 knots (46 mph)

  The second half of the message (outbound leg) decodes the same way.