

Chapter 9 -- Data Products and Data Archiving
Revision 16 as of December 11, 2003

9.0 Data Products and Data Archiving	Ch. 9 Pg. 1
9.1 WMO Coded Message.....	Ch. 9 Pg. 1
9.2 RADAT Message	Ch. 9 Pg. 1
9.3 Local Archive	Ch. 9 Pg. 1
9.4 NCDC Archive	Ch. 9 Pg. 1
9.4.1 Administrative Data.....	Ch. 9 Pg. 2
9.4.2 Time stamped raw PTU data	Ch. 9 Pg. 3
9.4.3 Time stamped raw GPS “unsmoothed radiosonde” data	Ch. 9 Pg. 4
9.4.4 Time stamped raw GPS “smoothed wind” data.....	Ch. 9 Pg. 4
9.4.5 Time stamped processed pressure, temperature, and humidity (PTU) data.....	Ch. 9 Pg. 5
9.4.6 Time stamped processed u & v winds and position data	Ch. 9 Pg. 5
9.4.7 Time stamped Levels data	Ch. 9 Pg. 6
9.5 NCEP Distributed Data Set (DDS) Archive	Ch. 9 Pg. 6
9.6 Specific Data Archiving Requirements	Ch. 9 Pg. 6
9.7 Tables	Ch. 9 Pg. 7

9.0 Data Products and Data Archiving

The software will create a series of data products and archives. These data products reflect the information in a flight and are disseminated for storage, analysis, and forecasting. The archives include both the raw base data entering at each interface and the refined data after NWS processing has been applied. The following data products and archives are created:

- WMO Coded Message
- RADAT Message
- Local Data Archive
- NCDC Archive (including the current MicroART archive format)
- NCEP Distributed Data Set (DDS) Archive

Some of these products such as the WMO Coded Message are broadcast to the AWIPS network for all to use, some are maintained locally on the software, and others such as the NCDC and NCEP archives are sent to specific destinations. Some of these products created will optionally be storable on hard media for delivery via the postal service or other similar delivery service rather than electronic transmission. All electronic transmission of data products will occur through a modem connection or a LAN connection.

9.1 WMO Coded Message

The WMO coded message which contains the coded flight information will be transmitted automatically to AWIPS twice during each flight: once at 70 hPa (configurable), and then again at termination. The message transmitted at 70 hPa (configurable) will contain all information up to the 100 hPa level, while the message transmitted at termination will contain information for the entire flight. Additionally, the observer may generate the coded message any time during an observation by selecting the code option. The reason that automatic coding of the first message is not started until 70 hPa (configurable) is because there is a certain lag to the data, and all data necessary to code the 100 hPa level may not be available until the 70 hPa level has been reached.

9.2 RADAT Message

The RADAT message contains all zero crossings or freezing levels in a flight. The software will construct the RADAT message by selecting all zero crossing levels specified in the levels data table. The RADAT message is generated automatically and transmitted at the 400 hPa level. The observer can manually generate the RADAT message at any level above 400 hPa by manually selecting the RADAT option. Attempting to generate the RADAT message below 400 hPa will result in an error message. The RADAT message will be encoded as specified in Appendix E, Table 0421 of FMH 3, FCM-H3-1997.

9.3 Local Archive

The software will permit creating a local data archive from the data acquired during an observation. The local archive will consist of several data sets, including Raw, Corrected, Smoothed, and Derived data. This archive data will be the requisite data necessary for "reworking" and will include information such as surface observation, raw and corrected PTU, and winds data. The software will be able to store these local data sets either on the PC hard drive or optionally on a Zip drive. The software will not distribute all of the intermediate data sets --- as they can be reconstructed (if the user desires) by using the raw data and applying a correction suite (that will be provided).

9.4 NCDC Archive

The NCDC Archive consists of two separate products. The first product is the current low-resolution "MicroART format" upper air data being archived at NCDC, containing Levels and some administrative data, in a text format (FMH 3, Appendix F). The second product is a new, high-resolution archive product, containing multiple datasets, in the **B**inary **U**niversal **F**orm for the **R**epresentation of meteorological data format (BUFR).

Radiosonde Replacement System Requirements

This enhanced NCDC product will contain all parameters listed in the individual datasets below. In Build 1, the software will generate the data product as a file and optionally archive the data product to hard media; the data product file will also be sent manually via FTP to the NWSTG, and thence to NCDC and NCEP. In a later build, the product file may be sent automatically, in segments as multiple AWIPS messages, to the NWSTG. The handling of the NCDC archive will be dependent on the station configuration (e.g., Internet bandwidth). The exact transmission interval (e.g., daily or monthly) for the NCDC archive product is not currently defined.

The following seven sections describe the seven datasets of the enhanced NCDC product. Each section describes the constituent data variables and includes their BUFR mnemonics (and any code-table prefix or suffix modifiers) in small caps, e.g. **ICLX**, for cross-reference.

9.4.1 Administrative Data (NC002019)

The following administrative data (or “meta” data) will be included in the enhanced NCDC product.

RRS-site call letters:	DATSIG ICLX	4-letter ICAO symbol, capitalized
WMO block number:	WMOB	1 - 99
WMO station number:	WMOS	1 - 999
WBAN number:	WBAN	5-digit number
CCCC call letters of “Responsible WFO”:		(either the RRS-site or its parent site)
	DATSIG ICLX	4-letter ICAO symbol, capitalized, part of AWIPS Identifier
XXX (FAA) call letters:	SSTN	3-character symbol, capitalized, part of AWIPS Identifier
Observer initials:	OBSVR	4-character string, space-fill
Version number of workstation software:	SOFTV	“###.##.##.###” (12-character string, space-fill)
Number of archive recomputes:	ARRE	0 - 99
Ascension number:	RASCN	1 - 999 (allow for 9999 extension)
Release number:	RRLSE	1 - 3
Release date:	DATSIG TIMEST	mm/dd/yyyy (UTC)
Release time:	TIMEST	hh:mm:ss.xx (UTC) [.01 seconds]
Release point latitude:	CLATH	0E to 90E N/S [0.00001E]
Release point longitude:	CLONH	0E to 180E E/W [0.00001E]
Release point elevation:	HEIT	-100 to 3000 meters, above MSL [Integer]
Barometer elevation:	HBMSL	-100 to 3000 meters, above MSL [Integer, or 0.1 m if avail.]
Radiosonde type:	RATP	Code Table 9-1
Radiosonde serial number:	RSERL	20-character string, space-fill
Radiosonde sensors used:	PSENS	Code Table 9-2
	TSENS	Code Table 9-3
	RHSENS	Code Table 9-4
Operating radio frequency:	RFREQ	403 MHz or 1680 MHz [0.1 MHz]
Ground receiving system:	RGRSY	Code Table 9-5
Tracking technique:	TTSS	Code Table 9-6
Surface weather observation:	DATSIG	
Pressure:	PRES	700.0 to 1070.0 hPa [0.1 hPa = 10 Pa]
Temperature:	TMDB	-100.0 to 50.0EC [0.1EC]
Relative Humidity:	REHU	0.0 % to 100.0 % [0.1 %]
Wet-bulb Temp:	TMWB	-100.0 to 50.0EC [0.1EC]
Dewpoint Temp:	TMDP	-100.0 to 50.0EC [0.1EC]
Temp 12hrs ago:	TPHR TMDB	-100.0 to 50.0EC [0.1EC] (or 99.9 if missing)

Radiosonde Replacement System Requirements

Wind direction:	WDIR	1E to 360E (integer)
Wind speed:	WSPD	[0.1 m/s]
Clouds/WX:		N _h C _L hC _M C _H WWWW (converted to Code tables, q.v.)
	PRWE	BUFR 0-20-003 (2 entries),
	CLAM	BUFR 0-20-011,
	CLTP	BUFR 0-20-012 (3 entries),
	HOCS	BUFR 0-20-013
Surface obs. equipment used:	SFEQP	5 entries (P, T, U, DP, W) from Code Table 9-7
Surface obs. equipment:	DATSIG	
horizontal distance:	DIST	0 to 500 meters [Integer]
vertical distance:	HINC	-250 to +250 meters [Integer]
bearing:	BEARAZ	0E to 359E [0.01E]
from release point		
Release point pressure correction:	RRPPC	-50.00 to +50.00 hPa [.01 hPa = 1 Pa]
Orientation correction, azimuth:	ORCRAZ	-10.00 to +10.00E [0.01E]
Orientation correction, elevation:	ORCREL	-10.00 to +10.00E [0.01E]
Balloon shelter type:	BSHEL	Code Table 9-8
Balloon manufacturer:	BMFGR	Code Table 9-9
Balloon type:	BTYPE	Code Table 9-10a
Balloon weight:	BWHGT	300-2500 gm
Balloon lot number:	BLOTN	12 characters
Balloon manufacture date:	DATSIG Y,M,D	mm/dd/yyyy (Must be 1980 - present)
Gas type used:	BGTYP	Hydrogen, Helium, or Natural Gas (Code Table 9-10b)
Gas amount (nozzle lift, gm):	BGAMT	300 to 5000 gm (BILS ft ³ will be converted to gm)
Flight train length:	BFTLN	20.0 to 80.0 meters (Preflight 70 to 260 ft, converted to m)
Train regulator (y/n):	RCONF	Y or N (Flag Table 9-10c)
Light unit (y/n):	RCONF	Y or N (Flag Table 9-10c)
Parachute (y/n):	RCONF	Y or N (Flag Table 9-10c)
Rooftop release (y/n):	RCONF	Y or N (Flag Table 9-10c)
Data Corrections applied, if any:		
Pressure:	FLPC	Code Table 9-11
Height:		Code Table 9-12 (unused)
Temperature:	SIRC	Code Table 9-13
Relative Humidity:		Code Table 9-14 (unused)
Dewpoint:		Code Table 9-15 (unused)
Wind:		Code Table 9-16 (unused)
Flight termination:	DATSIG	
Duration:	TPMI, TPSC	hh:mm:ss
Date:	TIMEST	mm/dd/yyyy (UTC)
Time:	TIMEST	hh:mm:ss (UTC)
Latitude:	CLATH	0E to 90E N/S [0.00001E]
Longitude:	CLONH	0E to 180E E/W [0.00001E]
Geopotential Height:	GPH10	-50 to +45,000 std. geopot. meters, above MSL
Pressure:	FLPC PRLC	0.01 hPa to 1070.00 hPa [0.01 hPa = 1 Pa]
Temperature:	SIRC TMDB	-100.00EC to +50.00EC [0.01EC]
RH:	REHU	0.0 % to 100.0 % [0.1 %]
Reason for Wind Processing Term:	LEVSIG RTERM	Code Table 9-17

Radiosonde Replacement System Requirements

Reason for Flight Term: **LEVSIG RTERM** Code Table 9-17

9.4.2 Time stamped raw PTU data (NC002020)

This radiosonde data may represent an average of several values over a period sample (vendor specific), thus allowing for the removal of random and systematic instrument noise. This data is not interpolated or smoothed, and is reported every 1 to 2 seconds of the flight (vendor specific).

Time Stamp:	DATSIG	TIMEST	mm/dd/yyyy (UTC), hh:mm:ss.xx (UTC) [.01 seconds]
Pressure:	FLPC	PRLC	0.01 hPa to 1070.00 hPa [0.01 hPa = 1 Pa], but permit extended range for erroneous P (e.g., 0.00 to 1310.73 hPa)
Temperature:	SIRC	TMDB	-100.00EC to +50.00EC [0.01EC], but permit extended range for erroneous T (e.g., -273.16E to 382.19E)
Relative Humidity:	RAWHU		0.0 % to 100.0 % [0.1 %], but permit extended range for erroneous RH values (e.g., -100.0 % to +309.5 %)
P Quality Indicator:	PCCF		Integer (0 to 100, vendor-generated in the SPS)
T Quality Indicator:	PCCF		Integer (0 to 100, vendor-generated in the SPS)
U Quality Indicator:	PCCF		Integer (0 to 100, vendor-generated in the SPS)
P Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)
T Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)
U Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)

9.4.3 Time stamped raw GPS “unsmoothed radiosonde” data (NC002021)

This radiosonde data may represent an average of several values over a period sample (vendor specific), thus allowing for the removal of random and systematic instrument noise. This data is not smoothed, and is reported every 1 to 2 seconds of the flight (vendor specific).

Time Stamp:	DATSIG	TIMEST	mm/dd/yyyy (UTC), hh:mm:ss.xx (UTC) [.01 seconds]
GPS Latitude:	CLATH		0E to 90E N/S [0.00001E]
GPS Longitude:	CLONH		0E to 180E E/W [0.00001E]
GPS (geometric) height	HEIT		-50 m to +45,000 m, above MSL [Integer]
GPS u wind component	UWND		-200.0 to 200.0 m/s [0.1 m/s]
GPS v wind component	VWND		-200.0 to 200.0 m/s [0.1 m/s]
GPS velocity & position Quality Indicator	PCCF		Integer (0 to 100, vendor-generated in the SPS)
Lat Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)
Lon Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)
H _{geometric} Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)
u Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)
v Quality-Control Flag:	MAQC	QCCHEK	Integer (Code Table 9-19, 9-20)

9.4.4 Time stamped raw GPS “smoothed wind” data (NC002022)

This radiosonde data may represent an average of several values over a period sample (vendor specific), thus

Radiosonde Replacement System Requirements

allowing for the removal of random and systematic instrument noise. This data is smoothed in the SPS to remove the effects of erratic and pendular motion, and is reported every 1 to 2 seconds of the flight (vendor specific).

Time Stamp: **DATSIG TIMEST** mm/dd/yyyy (UTC), hh:mm:ss.xx (UTC) [.01 seconds]

GPS Latitude:	CLATH	0E to 90E N/S [0.00001E]
GPS Longitude:	CLONH	0E to 180E E/W [0.00001E]
GPS (geometric) height	HEIT	-50 m to +45,000 m, above MSL [Integer]
GPS u wind component	UWND	-200.0 to 200.0 m/s [0.1 m/s]
GPS v wind component	VWND	-200.0 to 200.0 m/s [0.1 m/s]

GPS velocity & position Quality Indicator **PCCF** Integer (0 to 100, vendor-generated in the SPS)

Lat Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
Lon Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
H _{geometric} Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
u Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
v Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)

9.4.5 Time stamped processed pressure, temperature, and humidity (PTU) data (NC002023)

This processed data is arrived at by applying normalization, correction, smoothing, outlier removal, and data plausibility checks to the raw PTU data provided by the radiosonde. This data is reported at the normalization interval --- once a second.

Time Stamp: **DATSIG TIMEST** mm/dd/yyyy (UTC), hh:mm:ss.xx (UTC) [.01 seconds]

Corrected Pressure:	FLPC	PRLC	0.01 hPa to 1070.00 hPa [0.01 hPa = 1 Pa]
Smoothed Pressure:	FLPC	PRLC	0.01 hPa to 1070.00 hPa [0.01 hPa = 1 Pa]
Uncorrected Temperature:	SIRC	TMDB	-100.00EC to +50.00EC [0.01EC] (for NCEP)
Corrected Temperature:	SIRC	TMDB	-100.00EC to +50.00EC [0.01EC]
Corrected Relative Humidity:		REHU	0.0 % to 100.0 % [0.1 %]
Derived Dewpoint Temperature:		TMDP	-135.00EC to +50.00EC [0.01EC]
Derived Geopotential Height:		GPH10	-50 m to +45,000 std. geopot. m, above MSL [Integer]

P _{corrected} Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
P _{smoothed} Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
T _{uncorrected} Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
T _{corrected} Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
RH Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
Dewpoint Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)
H _{geopotential} Quality-Control Flag:	MAQC	QCCHEK Integer (Code Table 9-19, 9-20)

9.4.6 Time stamped processed u & v winds and position data (NC002024)

This processed data is arrived at by applying normalization, correction, smoothing, outlier removal, and data plausibility checks to the raw GPS “smoothed wind” data provided by the radiosonde. This data is reported at the normalization interval --- once a second. Note that this GPS-derived wind and position data may drop out at times during the flight, but the pressure-derived geopotential height may still be available, and vice versa. In a later build, when and if using non-GPS radiosondes, this wind and position data may instead be calculated from the TRS

Radiosonde Replacement System Requirements

(azimuth and elevation) antenna tracking data.

Time Stamp: **DATSIG TIMEST** mm/dd/yyyy (UTC), hh:mm:ss.xx (UTC) [.01 seconds]

Latitude: **CLATH** 0E to 90E N/S [0.00001E]
Longitude: **CLONH** 0E to 180E E/W [0.00001E]
Geometric height: **HEIT** -50 m to +45,000 m, above MSL [Integer]
u wind component: **UWND** -200.0 to 200.0 m/s [0.1 m/s]
v wind component: **VWND** -200.0 to 200.0 m/s [0.1 m/s]

Lat Quality-Control Flag: **MAQC QCCHEK** Integer (Code Table 9-19, 9-20)
Lon Quality-Control Flag: **MAQC QCCHEK** Integer (Code Table 9-19, 9-20)
H_{geometric} Quality-Control Flag: **MAQC QCCHEK** Integer (Code Table 9-19, 9-20)
u Quality-Control Flag: **MAQC QCCHEK** Integer (Code Table 9-19, 9-20)
v Quality-Control Flag: **MAQC QCCHEK** Integer (Code Table 9-19, 9-20)

9.4.7 Time stamped Levels data (NC002025)

This data represents the Mandatory, Significant, and other special winds and PTU levels selected from the Processed Data Set (Processed PTU and Processed Winds data).

The following parameters will be included for each level:

Time Stamp: **DATSIG TIMEST** mm/dd/yyyy (UTC), hh:mm:ss.xx (UTC) [.01 seconds]

Pressure: **FLPC PRLC** 0.01 hPa to 1070.00 hPa [0.01 hPa = 1 Pa]
Temperature: **SIRC TMDB** -100.0 to 50.0EC [0.1EC]
Relative Humidity: **RENU** 0.0 % to 100.0 % [0.1 %]
Dewpoint Temperature: **TMDP** -135.0 to 50.0EC [0.1EC]
Geopotential Height: **GPH10** -50 m to +45,000 std. geopot. m, above MSL [Integer]
Geometric Height: **HGHT** -50 m to +45,000 m, above MSL [Integer]
Wind direction: **WDIR** 1E to 360E (integer)
Wind speed: **WSPD** 0.0 to 300.0 [0.1 m/s]

Vertical Sounding Flag: **LEVSIG** Code Table 9-18, indicating Met/Wind Level type/signif.

9.5 NCEP Distributed Data Set (DDS) Archive

The Distributed Data Set (DDS) is a new high-resolution data product that may be defined in subsequent builds, as a means to convey additional data (or subsets of the existing NCDC archive data) in near real-time to NCEP, twice per flight. The first generation or transmittal of this product will occur once the radiosonde reaches the 70 hPa (configurable) level and will contain all data up to the 100 hPa level. The second generation or transmittal will occur when the flight terminates and will contain all data acquired from 100 hPa to termination.

When and if the content is defined, the software will create, format, and send the DDS in the **Binary Universal Form** for the **Representation** of meteorological data format (BUFR) as AWIPS messages over the AWIPS network.

9.6 Specific Data Archiving Requirements

- The software will provide for management of the local data archive through the local data base.

Radiosonde Replacement System Requirements

- X The software will be capable of retrieving from the local data base, a local data archive and “reworking” the sounding from the data.
- X The software will maintain the local archive data on the PC hard drive for a specified number of days at which time the data will be automatically deleted. The amount of time data is stored on the PC is a configuration item. The default time is 31 days.

9.7 Tables

Table 9-1: Radiosonde type (existing 0-02-011, C-2, RATP)

Code	Meaning
0-50	Defined or Reserved
51	VIZ-B2 (USA)
52	Vaisala RS80-57H
53-86	Defined or Reserved
87	Sippican Mark IIA with chip thermistor, pressure
88-254	Defined or Reserved
255	Missing value

Table 9-2: Type of pressure sensor (new 0-02-095, PSENS)

Code	Meaning
0	Capacitance aneroid
1	Derived from GPS
2	Resistive strain gauge
3-29	Reserved
30	Other
31	Missing value

Table 9-3: Type of temperature sensor (new 0-02-096, TSENS)

Code	Meaning
0	Rod thermistor
1	Bead thermistor
2	Capacitance bead
3-29	Reserved
30	Other
31	Missing value

Radiosonde Replacement System Requirements

Table 9-4: Type of humidity sensor (new 0-02-097, RHSENS)

Code	Meaning
0	VIZ Mark II Carbon Hygristor
1	VIZ B2 Hygristor
2	Vaisala A-Humicap
3	Vaisala H-Humicap
4	Capacitance sensor
5	Vaisala RS90
6	Sippican Mark IIA Carbon Hygristor
7-29	Reserved
30	Other
31	Missing value

Table 9-5: Radiosonde ground receiving system (new 0-02-066, RGRSY)

Code	Meaning
0	TRS-2000
1	IMS-1500C
2-61	Reserved
62	Other
63	Missing value

Table 9-6: Tracking technique (existing 0-02-014, C-7, TTSS)

Code	Meaning
0	No windfinding
1	Automatic with auxiliary optical direction finding
2	Automatic with auxiliary radio direction finding
3	Automatic with auxiliary ranging
4	Not used
5	Automatic with multiple VLF-Omega signals
6	Automatic with cross chain Loran-C
7	Automatic with auxiliary wind profiler
8	Automatic satellite navigation (GPS)

Radiosonde Replacement System Requirements

9-18	Reserved
19	Tracking technique not specified
20-126	ASAP technique/status entries
127	Missing value

Table 9-7: Type of surface observing equipment (new 0-02-115, SFEQP)

Code	Meaning
0	PDB
1	RSOIS
2	ASOS
3	Psychrometer
4	F420
5-29	Reserved
30	Other
31	Missing value

Table 9-8: Type of balloon shelter (new 0-02-083, BSHEL)

Code	Meaning
0	High bay
1	Low bay
2	BILS
3	Roof-top BILS
4-13	Reserved
14	Other
15	Missing value

Table 9-9: Balloon manufacturer (new 0-02-080, BMFGR)

Code	Meaning
0	Kaysam
1	Totex
2	KKS
3-61	Reserved

Radiosonde Replacement System Requirements

62	Other
63	Missing value

Table 9-10a: Type of balloon (new 0-02-081, BTYPE)

Code	Meaning
0	GP26
1	GP28
2	GP30
3	HM26
4	HM28
5	HM30
6	SV16
7-29	Reserved
30	Other
31	Missing value

Table 9-10b: Type of gas used in balloon (new 0-02-084, BGTYP)

Code	Meaning
0	Hydrogen
1	Helium
2	Natural Gas
3-14	Reserved
15	Missing value

Table 9-10c: Radiosonde configuration (new 0-02-016, RCONF)

Bit	Meaning
1	Train regulator
2	Light unit
3	Parachute
4	Rooftop release
All 5	Missing value

Radiosonde Replacement System Requirements

Table 9-11: Pressure Corrections (new 0-25-069, FLPC)

Bit	Meaning
1	Smoothed
2	Baseline adjusted
3	Normalized time interval
4	Outlier checked
5	Plausibility checked
6	Consistency checked
7	Interpolated
All 8	Missing value

Table 9-12: Height Corrections (unused, undefined)

Code	Meaning
TBD	TBD

Table 9-13: Temperature Corrections (existing 0-02-013, SIRC)

Code	Meaning
0	No correction
1-3	CIMO
4	Solar and infrared corrected by radiosonde system
5	Solar corrected by radiosonde system
6-7	corrected as specified by country
8-14	Reserved
15	Missing value

Table 9-14: Relative Humidity Corrections (unused, undefined)

Code	Meaning
TBD	TBD

Radiosonde Replacement System Requirements

Table 9-15: Dewpoint Corrections (unused, undefined)

Code	Meaning
TBD	TBD

Table 9-16: Wind Corrections (unused, undefined)

Code	Meaning
TBD	TBD

Table 9-17: Reason for termination (new 0-35-035, RTERM)

Code	Meaning
0	Reserved
1	Balloon burst
2	Balloon forced down by icing
3	Leaking or floating balloon
4	Weak or fading signal
5	Battery failure
6	Ground equipment failure
7	Signal interference
8	Radiosonde failure
9	Excessive missing data frames
10	Reserved
11	Excessive missing temperature
12	Excessive missing pressure
13	User terminated
14-29	Reserved
30	Other
31	Missing value

Table 9-18: RRS flight level significance (new 0-08-040, LEVSIG)

Code	Meaning
0	High resolution data sample

Radiosonde Replacement System Requirements

1	Within 20 hPa of surface
2	Pressure less than 10 hPa (i.e., 9, 8, 7, etc.) when no other reason applies
3	Base pressure level for stability index
4	Begin doubtful temperature, height data
5	Begin missing data (all elements)
6	Begin missing RH data
7	Begin missing temperature data
8	Highest level reached before balloon descent because of icing or turbulence
9	End doubtful temperature, height data
10	End missing data (all elements)
11	End missing RH data
12	End missing temperature data
13	Zero degrees C crossing(s) for RADAT
14	Standard pressure level
15	Operator added level
16	Operator deleted level
17	Balloon re-ascended beyond previous highest ascent level
18	Significant RH level (per WMO criteria)
19	RH level selection terminated
20	Surface level
21	Significant temperature level (per WMO criteria)
22	Mandatory temperature level
23	Flight termination level
24	Tropopause(s)
25	Aircraft report
26	Interpolated (generated) level
27	Mandatory wind level
28	Significant wind level
29	Maximum wind level
30	Incremental wind level (fixed regional)
31	Incremental height level (generated)
32	Wind termination level
33	Pressure 100 to 110 hPa, when no other reason applies

Radiosonde Replacement System Requirements

34-39	Reserved
40	Significant thermodynamic level (inversion)
41	Significant RH level (per NCDC criteria)
42	Significant temperature level (per NCDC)
43	Begin missing wind data
44	End missing wind data
45-61	Reserved
62	Other
63	Missing value

Table 9-19: RRS Data Quality-Check Mark, maps to Manual/Automatic Quality Control (existing 0-33-035, MAQC)

Code	Meaning	RRS
0	Automatic QC passed; not manually checked	0
1	Automatic QC passed; manual QC passed	
2	Automatic QC passed; manual QC deleted	4
3	Automatic QC failed; not manually checked	2
4	Automatic QC failed; manual QC deleted	6
5	Automatic QC failed; manual QC re-inserted	
6	Automatic QC questionable; not manually checked	1
7	Automatic QC questionable; manual QC deleted	5
8	Manual QC failed	
9-14	Reserved	
15	Missing value	3,7

Table 9-20: RRS Data Quality-Check Indicator (new 0-33-015, QCCHK)

Code	Meaning
0	Passed all checks
1	Missing-data check
2	Descending/reascending balloon check
3	Data plausibility check (above limits)
4	Data plausibility check (below limits)
5	Superadiabatic lapse rate check
6	Limiting angles check

Radiosonde Replacement System Requirements

7	Ascension rate check
8	Excessive change from previous flight
9	Balloon overhead check
10	Wind speed check
11	Wind direction check
12	Dependency check
13	Data valid but modified
14	Data outlier check
15-62	Reserved
63	Missing value

Supplemental Table used

Table 9-21: RRS data significance (new 0-08-041, DATSIG)

Code	Meaning
0	parent site
1	observation site
2	Balloon manufacture date
3	Balloon launch point
4	Surface observation
5	Surface observation displacement from launch point
6	Flight level observation
7	Flight level termination point
8-30	Reserved
31	Missing value