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To: VSRT Group
From: Alan E.E. Rogers
Subject: Ozone spectrometer data file format

The ozone spectrometers under construction for the CCLI project will use “compressed” file format to reduce the volume of data which will be sent to Haystack day. For easy exchange between machines of different endian an ASCII format is preferred but the Spectra will be encoded using 2-bytes for each spectral point. These 2-bytes use the 6-bit email attachment ASCII codes:

0→25	A→Z
26→51	a→z
52→61	0→9
62	+
63	/

The format is space delimited as follows:

yyyy:ddd:hh:mm:ss decimal_hours fstart
fstep fcal fcalamp total_pwr_db staname
spect_vsrt_number peak s 256_point_spectrum

where

yyyy year i.e. 2009
ddd day of year i.e. 1-365 or 1-366 in leap yr
hh hour Universal time
mm minute
ss second

decimal_hours hours in 9.5f (redundant may be assigned to something else in future)

fstart frequency of first spectral point MHz 9.4f

fstep frequency spacing MHz 9.7f

fcal frequency of calibration signal MHz 9.4f

fcalamp amplitude of calibration signal 9.5f

total_pwr_db total power in dB 9.5f

staname station name in up to 12 characters spect*03d

peak peak magnitude of spectrum in K (used to normalize 12-bit values $9.5 f$)
s fixed ASCII lower case s (used as marker)

256_point_spectrum 512 characters

Each pair of characters represents a spectral point which can be reconstructed by

$$((64a + b) - 2000) \times peak / 2000 K$$

where a is the 6-bit code of the 1st character

and b is the 6-bit code for the 2nd character

example

```
2009:018:14:25:59 14.43306 1322.1420 0.0024414
1320.5347 0.7357 23.54290 bridgewater
spect002 1.09244 s YHTB.....
```

files are named

yydddhh.sn

where yy yr i.e. 2009=09

ddd day of year

hh UT hour

s fixed character

n spectrometer number 03d

A single “record” with the encoder spectrum is written every 90 seconds as a line with 627 characters and a new file is started each day. The data transferred from 6 spectrometers will be about 3.6 MB per day.