This document describes the changes made to the format of the NEUBrew UV Scan Product files available on our FTP server ftp://ftp.srrb.noaa.gov/pub/data/neubrew/data/products/uv_scans/. All Header information lines start with '#'. Header content will (for the most part) remain consistent between product levels. The exception being, QC Flag information contained in the header will grow as new QC flags are defined in higher data levels (201,211,212…). End of Header information will always be denoted by the following string "#### END OF METADATA ####".

The remainders of the file's content are repeating sections of Scan Header Data and 154 rows of Spectral Scan Data. The number of scans in a file is dependant on the length of the solar day and Brewer Operation Schedules.

Old File Fields	New File Fields	Field Description
Scan Heading Fields	**Scan Heading Fields**	
Scan#	Scan#	Number of Scan During a Solar Day
DarkCount	DarkCount	Dark Count of Scan
SumLE325	SumLE325	Sum of Signal for Wavelengths >= 325nm
SubGT325	SubGT325	Sum of Signal for Wavelengths > 325nm
MinsSinceLastHG	MinsSinceLastHG	Minutes Since Last HG Scan
BrewerTemperature	BrewerTemperature	Internal Temperature of the Brewer
TimeAdvcmntFailures	TimeAdvcmntFailures	Marks Timestamp Advancement Failures in file
	RefDBScanUID *	UID reference to an external Database Record
Data Fields	**Data Fields**	
WvLenAct	WvLenAct	Actual Wavelength (1/100 nm)
Signal	Signal	Signal Measurement Value
Noise	Noise	Possion Noise
DOY	DOY	Day Of Year
DecHour	DecHour	Decimal Hour of Day (GMT)
AirMass	AirMass	Air Mass Value
SolZnAng	SolZnAng	Solar Zenith Angle
SolAzAng	SolAzAng	Solar Azimuth Angle
WvLenNom	WvLenNom	Nominal Wavelength (1/10 nm)
CosineCor	RespLamp **	Lamp Responsivity

Old File Fields	New File Fields	Field Description
RespvCor	SignalCor **	Signal Correction Multiplier
StrayLightCor	CosineCor **	Cosine Correction Multiplier
	RespCor **	Responsivity Correction Multiplier
DrkCnt	DrkCnt	Spike Corrected Dark Count
Cyc	Cyc	Number of Cycles
MicStep	MicStep	Micrometer Step Value
YYYY	YYYY	Calendar Year
MM	MM	Month
DD	DD	Day of Month
HH	HH	Hour of Day 0-23 UTC
mm	mm	Minute of Day
ss	ss	Second of Day
	Ancillary1 *	External Instrument Reference Value
	Ancillary2 *	External Instrument Reference Value
	Ancillary3 *	External Instrument Reference Value
	RefDBRecUID *	UID reference to an external Database Record
Flags	Flags	QC Flag Digits

*** = New Fields**
**** = Modified Fields**

New File Format Example:

```
#,"2008123tmtfco134ux.101"                                                    ,"[ File Name: yyyyDDDssssssBBBux.SCR ]"
#,"NOAA-EPA Brewer UV and Ozone Network - NEUBREW                             ,"[ Data Provider ]"
#,"Daily UV Extended Scans (UX), level 100 + CUCF lamp responsivity correction" ,"[ File Content Description ]"
#,"2008 May 14 08:16:34 GMT"                                                  ,"[ File Date of Creation ]"
#,"2008-05-02"                                                                ,"[ Date of Data Acquisition ]"
#,123                                                                         ,"[ Data Acquisition Day-of-Year (DOY): DDD ]"
#,"Table Mountain Test Facility"                                              ,"[ Station Name ]"
#,"tmtfco"                                                                    ,"[ Station Code: ssssss ]"
```

```
#,40.126                                                                    ,"[ Station Latitude (- for South) ]"
#,105.238                                                                   ,"[ Station Longitude (- for East) ]"
#,1689.0                                                                    ,"[ Station Elevation MASL ]"
#,"2008 May 02 12:03:32 GMT"                                                ,"[ Station Sunrise GMT ]"
#,"2008 May 02 18:57:51 GMT"                                                ,"[ Station Solar Noon GMT ]"
#,"2008 May 03 01:52:48 GMT"                                                ,"[ Station Sunset GMT ]"
#,134                                                                       ,"[ Brewer Instrument Serial #: BBB ]"
#,"7.9; 11.7; 15.2; 2.3"                                                    ,"[ Brewer Temperatures: Min; Avg; Max; Std-Dev ]"
#,"0.000; 0.082; 0.150; 0.039"                                              ,"[ UX Dark Counts: Min; Avg; Max; Std-Dev ]"
#,2.8e-008                                                                  ,"[ Brewer Dead Time in Seconds ]"
#,101                                                                       ,"[ Processing Levels: SCR=Signal Cosine Responsivity]"
#,46                                                                        ,"[ Total Number of Scans in file ]"
#
#," Scan Header Descriptions"
#,"                Scan# - number/count of scan during the day"
#,"            DarkCount - PMT Dark Count in Count-Per-Cycle [cpc]"
#,"             SumLE325 - Sum of Signal (Total Horizontal Irradiance) values from 286.5nm thru 325.0nm in [mW/m2/nm]"
#,"             SumGT325 - Sum of Signal (Total Horizontal Irradiance) values from 325.5nm thru 363.0nm in [mW/m2/nm]]"
#,"       MinsSinceLastHG - Number of minutes elapsed since the last HG (Mercury Lamp) scan"
#,"     BrewerTemperature - The internal Brewer temperature measurement in Degrees Celsius"
#,"   TimeAdvcmntFailures - Indicates the Brewer recorded timestamp incorrectly, either failing to advance"
#,"                         or regressing in time; the DecHour, AirMass, SolZnAng, SolAzAng will be affected"
#,"          RefDbScanUID - Reference UID of this scan's data in a relational database. Used for internal purposes only"
#," Scan Data Header Descriptions"
#,"             WvLenAct - Actual wavelength in nanometers [nm]"
#,"               Signal - Signal (Total Horizontal Irradiance) in [mW/m^2/nm]"
#,"                        Signal=(Counts/RespLamp)*SignalCor*CosineCor*RespCor is a general relationship for all files"
#,"                        Counts is Signal from level 100 file"
#,"                Noise - Relative (DeltaSignal/Signal) Poisson Noise"
#,"                  DOY - Day-of-Year 001-365 (366 in leap-years and DOY=1 for Jan 1)"
#,"              DecHour - Decimal Hour of Day since 00:00:00 UTC"
#,"              AirMass - Airmass = 1.0/(cos(SZA_in_Radians)+0.50572*(6.07995+90-SZA_in_Degrees)^-1.6364)"
#,"                        AirMass SZA corrected for atmospheric refaction"
#,"             SolZnAng - Solar Zenith Angle in degrees, uncorrected for refraction"
#,"             SolAzAng - Solar Azimuth Angle in degrees, 180=south"
#,"             WvLenNom - Nominal Wavelength in nanometers [nm] reported by the instrument"
#,"             RespLamp - CUCF lamp based responisvity; RespLamp is in [pps/(mW/m^2/nm)]"
#,"            SignalCor - Signal correction for spikes and/or stray light and/or other effects; SignalCor=1 in this file"
#,"            CosineCor - Cosine correction. CosineCor=1 in this file"
#,"              RespCor - Responsivity correction for temperature and/or drift and/or other effects; RespCor=1 in this file"
#,"               DrkCnt - Dark Count in Counts-Per-Cycle [cpc]. If less than Header DarkCount, Dark Count Spike repaired via Median Filter."
#,"                  Cyc - Number of Brewer Slitmask Cycles"
#,"              MicStep - Brewer Micrometer Step Value"
#,"                 YYYY - 4-digit year"
#,"                   MM - 2-digit month 01-12"
#,"                   DD - 2-digit day of month 01-31"
#,"                   HH - 2-digit hour of day 00-23 UTC"
#,"                   mm - 2-digit minutes 00-59"
```

```
#,"                   ss - 2-digit seconds 00-59"
#,"            Ancillary1 - not defined in this file"
#,"            Ancillary2 - not defined in this file"
#,"            Ancillary3 - not defined in this file"
#,"           RefDBRecUID - Reference UID of this scan-wavelength in a relational database. Used for internal purposes only"
#,"                 Flags - 1000=ZCBA where in this file:"
#,"                         A,B,C flags are inherited from level 100 file"
#,"                         Z = 1  Always 1"
#,"                         A = 0  Signal Dead Time Solution Found"
#,"                         A = 1  if Signal Count has no Dead Time Correction Solution, then uncorrected value is passed"
#,"                         B = 0  Signal and Noise Normal"
#,"                         B = 1  if (Signal < 0) then set Noise = -2.0"
#,"                         B = 2  if (Signal == 0 or Noise > 2) then set Noise = 2.0"
#,"                         C = 0  No Time advancements flagged"
#,"                         C = 1  Failed Monotonic Time advancement"
#### END OF METADATA ####
Scan#, DarkCount,     SumLE325,     SumGT325, MinsSinceLastHG, BrewerTemperature, TimeAdvcmntFailures,  RefDBScanUID
    1,      0.05,         65.6,       1096.9,              34,               7.9,                   0,        216288
WvLenAct,      Signal,   Noise, DOY, DecHour, AirMass, SolZnAng, SolAzAng, WvLenNom,    RespLamp,   SignalCor,   CosineCor,     RespCor,   DrkCnt, Cyc,
MicStep, YYYY, MM, DD, HH, mm, ss, Ancillary1, Ancillary2, Ancillary3,   RefDBRecUID, Flags
 286.50, 1.3913E-03, 0.6374, 123, 12.5303,    9.834,    84.866,    73.923,     286.5,   2.5065E03,   1.0000E00,   1.0000E00,   1.0000E00,     0.05, 4.0,
286.0, 2008, 05, 02, 12, 31, 49,  0.0000E00,  0.0000E00,  0.0000E00,      33307949, 1000
  287.00, 2.9784E-03, 0.3967, 123, 12.5310,    9.824,    84.860,    73.928,     287.0,   2.6345E03,   1.0000E00,   1.0000E00,   1.0000E00,     0.05, 4.0,
352.0, 2008, 05, 02, 12, 31, 51,  0.0000E00,  0.0000E00,  0.0000E00,      33307950, 1000
  287.50, 4.4893E-03, 0.3113, 123, 12.5317,    9.815,    84.854,    73.934,     287.5,   2.7189E03,   1.0000E00,   1.0000E00,   1.0000E00,     0.05, 4.0,
418.0, 2008, 05, 02, 12, 31, 53,  0.0000E00,  0.0000E00,  0.0000E00,      33307951, 1000
```

Old File Format Example:

```
#,"2008108tmtfco134ux.101"                                                                                ,"[ File Name: yyyyDDDssssssBBBux.SCR ]"
#,"NOAA-EPA Brewer UV and Ozone Network - NEUBREW"                                                         ,"[ Data Provider ]"
#,"Daily UV Extended Scans (UX), corrected for Dark Count,Dead Time, and Responsivity "                    ,"[ File Content Description ]"
#,"Mon Apr 21 08:12:36 GMT 2008"                                                                          ,"[ File Date of Creation ]"
#,"2008-04-17"                                                                                            ,"[ Date of Data Acquisition ]"
#,108                                                                                                      ,"[ Data Acquisition Day-of-Year (DOY): DDD ]"
#,"Table Mountain Test Facility"                                                                           ,"[ Station Name ]"
#,"tmtfco"                                                                                                 ,"[ Station Code: ssssss ]"
#,40.126                                                                                                   ,"[ Station Latitude (- for South) ]"
#,105.238                                                                                                  ,"[ Station Longitude (- for East) ]"
#,1689                                                                                                     ,"[ Station Elevation MASL ]"
#,"Thu Apr 17 12:23:43 GMT 2008"                                                                           ,"[ Station Sunrise GMT ]"
#,"Thu Apr 17 19:00:22 GMT 2008"                                                                           ,"[ Station Solar Noon GMT ]"
#,"Fri Apr 18 01:37:41 GMT 2008"                                                                           ,"[ Station Sunset GMT ]"
#,134                                                                                                      ,"[ Brewer Instrument Serial #: BBB ]"
#,4.6;13.8;18.5;4.7                                                                                        ,"[ Brewer Temperatures: Min; Avg; Max; Std-Dev ]"
#,00.000;00.125;00.250;00.063                                                                              ,"[ UX Dark Counts: Min; Avg; Max; Std-Dev ]"
```

```
#,2.8e-08                                                                    ,"[ Brewer Dead Time in Seconds ]"
#,101                                                                        ,"[ Processing Levels: SCR=Signal/Cosine/Responsivity]"
#,44                                                                         ,"[ Total Number of Scans in file ]"
#
#,"Scan Header Descriptions"
#,                  Scan#," - number/count of scan during the day"
#,              DarkCount," - PMT Dark Count in Count-Per-Cycle [CPC]"
#,               SumLE325," - Sum of Signal values from 286.5nm thru 325.0nm in Pulses-Per-Second [PPS]"
#,               SumGT325," - Sum of Signal values from 325.5nm thru 363.0nm in Pulses-Per-Second [PPS]"
#,       MinsSinceLastHG," - Number of minutes elapsed since the last HG (Mercury Lamp) scan"
#,     BrewerTemperature," - The internal Brewer temperature measurement in Degrees Celsius"
#,   TimeAdvcmntFailures," - Indicates the Brewer recorded timestamp incorrectly, either failing to advance"
#,                      ,"   or regressing in time. The DecHour, AirMass, SolZnAng, SolAzAng will be affected"
#,"Scan Data Header Descriptions"
#,               WvLenAct," - Actual Wavelength in nanometers [nm]. For level 101 data, actual WvLenAct = WvLenNom"
#,                 Signal," - Signal in mW/m^2/nm.  Corrected for Dark Counts and PMT Dead Time and Responsivity"
#,                  Noise," - Relative (DeltaSignal/Signal) Poisson Noise"
#,                    DOY," - Day-of-Year 001-365 (366 in leap-years and DOY=1 for Jan 1)"
#,                DecHour," - Decimal Hour of Day since 00:00:00 UTC"
#,                AirMass," - Airmass = 1.0/(cos(SZA_in_Radians) + 0.50572* (6.07995 + 90 – SZA_in_Degrees)^ -1.6364)"
#,                      ,"   AirMass SZA corrected for atmospheric refaction"
#,               SolZnAng," - Solar Zenith Angle in degrees, uncorrected for Refraction"
#,               SolAzAng," - Solar Azimuth Angle in degrees, 180=south"
#,               WvLenNom," - Nominal Wavelength in nanometers [nm] reported by the instrument"
#,              CosineCor," - Cosine Correction value. For Level 101 data, CosineCor = 1.0"
#,               RespvCor," - Responsivity Correction value.  [pps/(mW/m^2/nm)]"
#,          StrayLightCor," - Stray Light Correction value. For Level 101 data, StrayLightCor = 1.0"
#,                 DrkCnt," - Dark Count in Counts-Per-Cycle [CPC]"
#,                    Cyc," - Number of Brewer Slitmask Cycles"
#,                 MicStep," - Brewer Micrometer Step Value"
#,                    YYYY," - 4-digit year"
#,                      MM," - 2-digit month 01-12"
#,                      DD," - 2-digit day of month 01-31"
#,                      HH," - 2-digit hour of day 00-23 UTC"
#,                      mm," - 2-digit minutes 00-59"
#,                      ss," - 2-digit seconds 00-59"
#,                   Flags," - 1000=ABCD where:"
#,                        ,"    A = 1  Always 1"
#,                        ,"    B = 0  No Time advancements Flagged "
#,                        ,"    B = 1  Failed Monotonic Time advancement"
#,                        ,"    C = 0  Signal and Noise Normal"
#,                        ,"    C = 1  if (Signal < 0) then set Noise = -2.0"
#,                        ,"    C = 2  if (Signal == 0 or Noise > 2) then set Noise = 2.0"
#,                        ,"    D = 0  Signal Dead Time Solution Found"
#,                        ,"    D = 1  if Signal Count has no Dead Time Correction Solution, then uncorrected value is passed."
#### END OF METADATA ####
Scan#, DarkCount,     SumLE325,     SumGT325, MinsSinceLastHG, BrewerTemperature, TimeAdvcmntFailures
    1,      0.05,        152.7,       2501.5,              31,               4.6,                   0
```

```
WvLenAct,     Signal,  Noise, DOY, DecHour, AirMass, SolZnAng, SolAzAng, WvLenNom,  CosineCor,   RespvCor, StrayLightCor, DrkCnt, Cyc, MicStep, YYYY,
MM, DD, HH, mm, ss,    Flags
  286.50, 4.8696E-03, 0.3113, 108, 12.8593,   9.722,   84.791,   80.362,    286.5,  1.0000E00,  2.5065E03,     1.0000E00,   0.05, 4.0,   286.0, 2008,
04, 17, 12, 51, 33,     1000
  287.00, 6.2877E-03, 0.2645, 108, 12.8600,   9.708,   84.782,   80.370,    287.0,  1.0000E00,  2.6345E03,     1.0000E00,   0.05, 4.0,   352.0, 2008,
04, 17, 12, 51, 36,     1000
  287.50, 7.6959E-03, 0.2339, 108, 12.8607,   9.699,   84.776,   80.376,    287.5,  1.0000E00,  2.7189E03,     1.0000E00,   0.05, 4.0,   418.0, 2008,
04, 17, 12, 51, 38,     1000
```