Q:\Ver10Gen\ Aaadocs\ Software\ File_Formats\ Spectrum.doc

EDAX Spectrum File (*.SPC) File Format Vers 0.70 February 10, 2015

(>) = Parameters replaced at End of File (-) Parameter Obsoleted

New variables added in this file version are in bold. See Edit Log at the end of the file for a description.

NAME	POSITION	TYPE	DESCRIPTION
fVersion	0	float	File format Version **(V 0.69)**
aVersion	4	float	Application Version
(>) fileName	8	chars(8)	File name w/o '.spc' extension
collectDate	16	*struct date	Date the spectrum was collected
collectTime	20	*struct time	Time the spectrum collection was started
fileSize	24	long int	Size of spectrum file in bytes
dataStart	28	long int	Start of spectrum data in bytes offset from 0 of file
numPts	32	short int	Number of spectrum pts
IntersectingDist	34		short int Intersecting distance * 100 (mm)
WorkingDist	36	short int	Working distance * 100
ScaleSetting	38	short int	Scale setting distance * 100
<< Filler>>	24 Bytes		
spectrumLabel	64	char(256)	256 byte label for spectrum, 0-39=material type, 40-255=sample type
(>) imageFilename	320	char (8)	Parent Image filename
spotX, spotY	328, 330	short int	Spot X,Y, in parent image file
imageADC	332	short int	Image ADC value 0-4095
discrValues[5]	**334**	**long int**	**Analyzer discriminator values**
discrEnabled[5]	**354**	**unsigned char**	**Discriminator flags (0=disabled,1=enabled)**
pileupProcessed (0=no PU,1=static PU, 2=Dynamic PU,…)	**359**		**unsigned char Pileup Processed flag**
fpgaVersion	**360**	**long int**	**Firmware version.**
pileupProcVersion	**364**	**long int**	**Pileup processing software version**
NB5000CFG	**368**	**long int**	**Defines Hitachi NB5000 dual Stage CFG 0=None, 10=Eucentric CrossX, 11= Eucentric Surface 12= Side Entry - Side 13 = Side Entry - Top**

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NAME	POSITION	TYPE	DESCRIPTION
<< Filler2 >>	12 Bytes		
evPerChan	384	long int	EV/channel
(>) ADCTimeConstant	388	short int	ADC Time constant
analysisType	390	short int	Preset mode 1=clock, 2=count, 3=none, 4=live, 5=resume
preset	392	float	Analysis Time Preset value
maxp	396	long int	Maximum counts of the spectrum
maxPeakCh	400	long int	Max peak channel number
xRayTubeZ	404	short int	XRF
filterZ	406	short int	XRF
current	408	float	XRF
sampleCond	412	short int	XRF Air= 0, Vacuum= 1, Helium= 2
sampleType	414	char	Bulk or thin
X-ray Collimator	416	short int	0=None, 1=Installed
X-ray CapilaryType	418	short int	0=Mono, 1=Poly
X-ray CapilarySize	420	short int	Range : 20 – 5000 Microns
X-ray FilterThickness	422	short int	Range : 0 – 10000 Microns
SpectrumSmoothed	**424**	**short int**	**1= Spectrum Smoothed, else 0**
SiLi_Detector_Size	**426**	**short int**	**Eagle Detector 0=30mm, 1=80mm**
SpectrumReCalib	**428**	**short int**	**1= Peaks Recalibrated, else 0**
EagleSystem	**430**	**short int**	**0=None, 2=Eagle2, 3=Eagle3, 4-Xscope**
sumPeakRemoved	**432**	**short int**	**1= Sum Peaks Removed, else 0**
EdaxSoftwareType	**434**	**short int**	**1= TEAM Spectrum, else 0**
<< Filler3 >>	6 Bytes		
escapePeakRemoved	442		short 1=escape peak was removed, else 0
analyzerType	444	long	Hardware type 1=EDI1, 2=EDI2, 3=DPP2 **31=DPP-FR, 32=DPP-FR2, 4=DPP3** **5= Apollo XLT/XLS/DPP-4 (eDPP)**
startEnergy	448	float	Starting energy of spectrum
endEnergy	452	float	Ending energy of spectrum
liveTime	456	float	LiveTime
tilt	460	float	Tilt angle

NAME	POSITION	TYPE	DESCRIPTION
takeoff	464	float	Take off angle
beamCurFact	468	float	Beam current factor
detReso	472	float	Detector resolution

NAME	POSITION	TYPE	DESCRIPTION
detectType	476	long int	**Detector type:** 1=Std-BE, 2=UTW 3=Super UTW, 4=ECON 3/4 Open 5=ECON 3/4 Closed, 6=ECON 5/6 Open 7=ECON 5/6 Closed, 8=TEMECON **Add + 10 for Sapphire SiLi Detectors,** **(11-18), which started shipping in 1996.** **30 = Apollo 10 SDD, 31=Apollo XV,** **32 = Apollo 10+, 40 = Apollo 40 SDD** **50 = Apollo-X, 51=Apollo-XP** **52 = Apollo-XL, 53 = Apollo XL-XRF** **60 =Apollo-XLT-LS, 61 =Apollo-XLT-NW** **62 =Apollo-XLT-SUTW**
parThick	480	float	Parlodion light shield thickness
alThick	484	float	Aluminum light shield thickness
beWinThick	488	float	Be window thickness
auThick	492	float	Gold light shield thickness
siDead	496	float	Si dead layer thickness
siLive	500	float	Si live layer thickness
xray-inc	504	float	X-ray incidence angle
azimuth	508	float	Azimuth angle of detector
elevation	512	float	Elevation angle of detector
b-coeff	516	float	K-line B coefficient
c-coeff	520	float	K-line C coefficient
tail-max	524	float	Tail function maximum channel
tail-height	528	float	Tail height adjustment percentage
kV	532	float	Acc voltage
apThick	536	float	Ap window thickness
xTilt	540	float	x tilt angle for mDX
yTilt	544	float	y tilt angle for mDX
YAG Status	**548**	**long int**	**0 = N/A, 1 = Yag Out, 2 = Yag In**
<< Filler4 >>	24 Bytes		

NAME	POSITION	TYPE	DESCRIPTION
rawDataType	576	short int	TEM or SEM data
totalBkgdCount	578	float	Accumulated background counts
totalSpectralCount	582	long int	Accumulated spectrum counts
avginputCount	586	float	Average spectral counts
stdDevInputCount	590	float	Standard deviation of spectral counts
peakToBack	594	short int	Peak to background setting. 0 = off, 1 = low, 2 = medium, 3 = high, 4 = user selected
peakToBackValue	596	float	Peak to back value
<< Filler5 >>	38 Bytes		
numElem	638	short int	Number of peak id elements 0-48
at(1)-(48)	640	short int	atomic numbers for peak id elems
line(1)-(48)	736	short int	line numbers for peak id elems
energy (1)-(48)	832	float	energy of identified peaks
height (1)-(48)	1024	unsigned long int	height in counts of id' ed peaks
spkht (1)-(48)	1216	short int	sorted peak height of id' ed peaks
numRois	1342	short int	Number of ROI's defined 0-48
st(1)-(48)	1344	short int	Start channel # for each ROI
end(1)-(48)	1440	short int	End channel # for each ROI
roiEnable(1)-(48)	1536	short int	ROI enable/disable flags
roiNames(1)-(48)	1632	char [8]	8 char name for eah ROI
UserID	1825	char[80)	User ID (Vision S/W) - Overlapping
sroi (1)-(48)	2016	short int	sorted ROI heights
scaNum(1)-(48)	2112	short int	SCA number assigned for each ROI
<< Filler6 >>	12 Bytes		
backgrdWidth	2220	short int	Background width
manBkgrdPerc	2222	float	Percentage to move manual background down
numBkgrdPts	2226	short int	Number of background points (2-64)
backMethod	2228	unsigned long int	Background method 1=auto, 2=manual
backStEng	2232	float	Starting energy of background
backEndEng	2236	float	Ending energy of background
bg(1)-(64)	2240	short int	Channel # of background point
bgType	2368	unsigned long int	Background type. 1 = curve, 2 = linear.

NAME	POSITION	TYPE	DESCRIPTION
concenKev1	2372	float	First concentration background point
concenKev2	2376	float	Second concentration background point
concenMethod	2380	char	0 = Off, 1 = On
JobFilename	**2382**	**char[32]**	**Vision Job Filename**
<< Filler7 >>	16 Bytes		
numLabels	2430	short int	Number of displayed labels
label (1)-(10)	2432	char [32]	32 character labels on the spectrum
labelx (1)-(10)	2752	short int	x position of label in terms of channel #
labely (1)-(10)	2772	long int	y position of label in terms of counts
zListFlag	2812	long int	Flag to indicate if Z List was written
bgPercents(64)	2816	float	Percentage to move backgrount point up and down.
IswGBg	3072	short int	= 1 if new backgrd pts exist
BgPoints(5)	3074	float	Background points
IswGConc	3094	short int	= 1 if given concentrations exist
numConcen	3096	short int	Number of elements (up to 24)
ZList(24)	3098	short int	Element list for which given concentrations exist
GivenConc(24)	3146	float	Given concentrations for each element in Zlist
<< Filler8 >>	598 Bytes		
s(1)-s(4096)	3840	long int	counts for each channel
fileName	20224	char[256]	Long filename for 32 bit version
imageFileName	20480	char[256]	Associated long image file name
ADCTimeConstant	20736	float	Time constant: 2.5… 100 **or** 1.6… 102.4 us
<< Filler9 >>	60 Bytes		
numZElements	20800	short int	number of Z List elements for quant
zAtoms	20802	short int[48]	Z List Atomic numbers
zShells	20898	short int[48]	Z List Shell numbers

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NAME	POSITION	TYPE	DESCRIPTION

struct date {
int da_year;
char da_day;
char da_mon;
}

struct time {
unsigned char ti_min;
unsigned char ti_hour;
unsigned char ti_hund;
unsigned char ti_sec:

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NAME	POSITION	TYPE	DESCRIPTION

Edit Log

Variable	Position	Date added	Purpose
zListFlag	*2812*	*Jan 2002*	*=1 if Z List was written to the spc file*
numZElements	*20800*	*Jan 2002*	*Number of Z list elements*
zAtoms	*20802*	*Jan 2002*	*Z List atoms*
zShells	*20898*	*Jan 2002*	*Z List Shells*
X-ray Collimator	*416*	*Jan 2002*	*Eagle Vision Support*
X-ray CapilaryType	*418*	*Jan 2002*	*Eagle Vision Support*
X-ray CapilarySize	*420*	*Jan 2002*	*Eagle Vision Support*
X-ray FilterThickness	*422*	*May 2003*	*Eagle Vision Support*
SpectrumSmoothed	*424*	*Feb 2007*	*Eagle Vision Support*
SiLi_Detector_Size	*426*	*June 2004*	*Eagle Detector Size*
SpectrumReCalib	*428*	*Feb 2007*	*Spectrum Peaks has been Recalibrated*
Yag Status		*Jan 12, 2007*	*Indicator if SEM YAG Detector Out/ In*
detectType		*Feb 26, 2007*	*Added SDD Defintions to Detector Type (30 & 40)*
EagleSystem	*430*	*March 2007*	*Type of Eagle System used to collect spectra*
sumPeakRemoved	*432*	*March 2007*	*Flag - Spectrum Sum Peaks were subracted*
JobFilename	*2382*	*Feb 2007*	*Vision Job Filename*
AnalyzerType	*444*	*April 2008*	*Added (4) DPP3*
Discrim. Values	*334*	*April 2008*	*Added) for Pileup Correction* ***V0.66***
Discrim. Flags	*354*	*April 2008*	*Added) for Pileup Correction*
PileUp Corr flag	*359*	*April 2008*	*Added for Pileup Correction*
FPGA Version	*360*	*April 2008*	*Added for Pileup Correction*
PileUp Corr Version	*364*	*April 2008*	*Added for Pileup Correction*
Detector Type	*476*	*Jan 2009*	*Added 31=Apollo XV, 32=Apollo 10+*
Detector Type	*476*	*Aug 2009*	*Additional 3 Apollo X Detector Types*
NB5000CFG	*368*	*Oct 2009*	*Support for Hitachi NB5000 Dual Stage Configurations*
EdaxSoftwareType	*434*	*Feb 2009*	*Parameter to define TEAM Spectrum File* ***V0.68***
AnalyzerType	*444*	*Jan 11,2011*	*Added AnalyzerType* **5= Apollo XLT/XLS** ***V0.69***
detectType	476	*Jan 11,2011*	*Added 60=Apollo XLT-LS (Light Shield)*
detectType	476	*Jan 11, 2011*	*Added 61=Apollo XLT-WL (Windowless)*
detectType	476	*Jan 17, 2012*	*Added 62=Apollo XLT-SUTW (SuperUltraThin)*
IntersectingDist	34	*Feb 10,205*	
WorkingDist	36	*Feb 10, 2015*	
ScaleSetting	38	*Feb 10, 2015*	