# SMOG-P and ATL-1 display automatic spectrum files and telemetry with gndapp

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#### 1 Foreword

This document describes the display of automatic spectrum files for SMOG-P, ATL-1, and SMOG-1 satellites with gndapp.

#### 2 Description

Gndapp automatically plots the received auto spectrum images during reception. It is possible to load saved packages into the program. The source can be gndapp packets log files (logs folder smogp\_packets.txt, atl1\_packets.txt or smog1\_packets.txt), but may be packets received by other programs. In both cases, the same steps must be performed, except that the gndapp packets files must be simply copied, while for packages from other sources, the hexadecimal content of the package must be copied with a line feed between the packages. The "manual packet input" window should be opened according to figure 1. This can be done by pressing "load packets" in the "Options" drop-down menu in the upper left corner or by pressing ctrl + o. The contents of gndapp smogp\_packets.txt or atl1\_packets.txt or smog1\_packets.txt should be copied to the popup window. If the package is from another source, the package must be inserted in hexadecimal format, separated by an enter. This content is in pkts or json files, depending on the program.

gs Packets Status	on-board computer (OBC) 1969-12-31T23:00:00 UTC	
U voltage	on-board computer (OBC) 1969-12-31T23:00:00 UTC	
U voltage	on-board computer (OBC) 1969-12-31T23:00:00 UTC	
U voltage	1969-12-31T23:00:00 UTC	· · · · · · · · · · · · · · · · · · ·
U voltage	1969-12-31T23:00:00 UTC	
U voltage	1969-12-51125:00:00 01C	
o voltage	0 mV	
°C temperature	0 °C	
52-A T1	0 °C	
52-A T2	0 °C	
M TX current (avg)	0 mA	
M RX current (avg)	0 mA	
M TX data rate	0	
M1 limiter	SW=0; OC=0; OVR=0	
M2 limiter	SW=0; OC=0; OVR=0	
U gyroscope	x=0; y=0; z=0	
U magnetometer	x=0; y=0; z=0	
U accelerometer	x=0; y=0; z=0	
U temperature	0 °C	
ive OBC/COM	OBC1   COM1	
sh status	NO	
CC status	NO	
U status	NO	
id packets	0	
ong sized packets	0	
kets w/ failed Golay	0	
kets w/ wrong signature	0	
kets w/ invalid serial	0	
C-COM UART errors	0	
acon contents		
ssage		
U1 bus telemetry		
lestamp	2020-03-05T18:42:54 UTC	
C1 consumption	0 mA (OC=0)	
C2 consumption	9 mA (OC=0)	
U2 bus telemetry		
lestamp	2020-03-05T18:42:54 UTC	
C1 consumption	0 mA (OC=0)	
C2 consumption	10 mA (OC=0)	
	12-A T1 12-A T2 AT Z current (avg) M TX current (avg) M TX data rate M1 Ilmiter M2 limiter J gyroscope J magnetometer J accelerometer J temperature Ve OBC/COM sh status C status J temperature Ve OBC/COM sh status C status J di packets M failed Golay kets w/ worg signature kets w/ invalid serial C-OM UART errors stage DJ bus telemetry uestamp 11 consumption 22 consumption 21 consumption 21 consumption 21 consumption 21 consumption	2-A T1     0 °C       2-A T2     0 °C       M TX current (avg)     0 mA       M TX current (avg)     0 mA       M TX dat rate     0       0     0       M1 limiter     SW=0; CC=0; OVR=0       M2 limiter     SW=0; CC=0; OVR=0       M2 limiter     SW=0; CC=0; OVR=0       J aragnetometer     x=0; y=0; z=0       J accelerometer     x=0; y=0; z=0       Satus     NO       Satus     NO       Satus     NO       J status     NO       Satus     NO       J backets     0       Costus     0       Costus     0       Costus     0       Satus     0       Costus     0       Sat

Figure 1: Load Packages window

The figure 2 shows when packets come from an external source (contents of the gndsw packets folder). Each row is longer, just the rest of the rows can't fit in the window.

	Latest data about the	e on-board computer (OBC)	
OBC	OBC - On-board compute	r	· Cased.
	Timestamp	1969-12-31T23:00:00 UTC	SMOG-
COM	MCU voltage	0 mV	
	RTCC temperature	0 °C	
PCU	EPS2-A T1	0 °C	
TID	EPS2-A T2	0 °C	
IIU	COM TX current (avg)	0 mA	
Solar	COM RX current (avg)		
	COM TX data rate	0	
	COM1 limiter	SW=0; OC=0; OVR=0	
	COM2 limiter	SW=0: OC=0: OVR=0	
	MPU gyroscope	Manual packet input	
	MPU magnetometer	Please provide the packet(c) to be decoded in uppercase hexadecimal string format	
	MPU accelerometer	Please provide the packet(s) to be decoded in appercase nexadecimal string format	
	MPU temperature	610101010101016131310101310101013101010131013	
	Active OBC/COM	0101010101010101010101010191A1F1D171610101010101010101610101C2114210AA9D78ADEF74881	
	Flash status		
	RTCC status		
	MPU status		
	Valid packets		
	Wrong sized packets		
	Packets w/ failed Golay		
	Packets w/ wrong signature		
	Packets w/ invalid serial		
	OBC-COM UART errors		
	Beacon contents		
	Message		
	PCU1 bus telemetry		
	Timestamp	Mégse Megnyitás	
	OBC1 consumption	0 mA (OC=0)	
	OBC2 consumption	9 mA (OC=0)	
	OBC2 consumption	9 mA (OC=0)	
	OBC2 consumption PCU2 bus telemetry Timestamp	9 mA (OC=0)	
	OBC2 consumption PCU2 bus telemetry Timestamp OBC1 consumption	9 mA (OC=0) 2020-03-05T18:42:54 UTC 0 mA (OC=0)	

Figure 2: Hexadecimal content of packages

If we did everything right and the loaded packets contain automatic spectrum packets, a graph similar to 3 will be displayed. In parallel, the spectrum data is saved in the downloads folder with png and csv extensions.



Figure 3: Display of spectrum

### 3 SMOGCLI2 pkts source

Open the pkts file with excel or libreOffice calc with parameters refer to 4. Then copy the data field content to gndapp manual packet input as shown in figure 5.

Text Impo	ort - [SMOG	-P_14742.29	0627464_HA	5MRC.pkt	s.uploaded	] - 🛛 😣					
Import											
Ch <u>a</u> racter set:	Western I	•									
<u>L</u> anguage:	Default - I	-Hungarian 🔻									
From ro <u>w</u> :	1	- +									
Separator Optio	ns										
Fixed width Separated by											
🗌 <u>T</u> ab	🖌 <u>C</u> omma	S <u>e</u> mic	olon	S <u>p</u> ace	✔ Othe <u>r</u>	:					
Merge <u>d</u> e	limiters	🗌 Tr <u>i</u> m s	spaces	S	tring delim	iter: " 💌					
Other Options											
Format que	oted field as	text	De	etect specia	al <u>n</u> umbers						
Fields											
Column t <u>y</u> pe:		•									
Standard	Standard	Standard	Standard	Standard	Standard	Standard					
1 pos	1428592	time	28.572	freq	366.211	rate					
2 pos	1750104	time	35.002	freq	366.211	rate					
3 pos	2300248	time	46.005	freq	366.211	rate					
4 pos	6363767	time	127.275	freq	390.625	rate					
5 pos	6311568	time	126.231	freq	366.211	rate					
6 pos	6493543	time	129.871	freq	390.625	rate					
7 pos	6580085	time	131.602	freq	390.625	rate					
8 pos	6632680	time	132.654	Treq	366.211	rate					
<u>H</u> elp					<u>о</u> к	<u>C</u> ancel					

Figure 4: libreOffice load pkts file

							ѕмос	G-P_147	42.29627	7464_HA	SMRC.	pkts.up	ploade	d - Lib	reOf	fice Cal	c					-	o 😣
File	Edit V	'iew In	sert Fo	rmat	Style	s Sheet	Data	Tools	Windo	ow Hel	p												×
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V37:	V53	-	f <sub>x</sub> Σ	• =	0737	FAB85E1	5001900	0050043	30015313	230AF5	E53534	15F303	530300	000029	2E3B	2D332A	2C3234	3530283	8634362C2	2E2F34	34342D3	312C2F2	2F3 🔻
	Q	R	S	Т	U																		-
34	data snr	12.878	data ber	0.000	data	0737FAB8	35E1200	1900050	04300153	13230AF	5E53534	15F3035	303000	00332F	2B352	D36343A	30322F	322E2F35	2A332E302	282C303	8302B34	2C29382	72D2A2
35	data snr	13.772	data ber	0.000	data	0737FAB8	35E1300	1900050	04300153	13230AF	5E53534	15F3035	303000	002D37	302C3	3342E2C	332C35	32373334	3036303720	C323620	C302F333	2312F2E	2E3232
36	data snr	14.470	data ber	0.000	data	0737FAB8	35E1400	1900050	04300153	13230AF	5E53534	15F3035	303000	002F2C	2E2F2	2D313434	2A3130	33292F2F	2B302D313	352F332	F352732	30312C3	135322F
37	data_snr	14.937	data ber	0.000	data	0737FAB8	SE1500	1900050	04300153	13230AF	5E53534	15F3035	303000	00292E	3B2D3	C202020	2343530	28363436	202E2F343	34342D3	312C2F2F	352D2F2	D2C2D
20	data enr	15.049	data ber	0.000	data	07275400	DE1000	1000050	04300133	12220AF	5E52524	15E2025	202000	003733	342M21	C293030	2/2220	0203424	22202232930	DZE2020	J3032373 021212/3	1212020	22222215
40	data snr	16.079	data ber	0.000	data	0737EAB	SE1800	1900050	04300153	13230AF	5E53534	15E3035	303000	002120	31202	2353E34	373238	B32373B	323021 3221	230303	03732373	V3V383B	333536
41	data snr	15.170	data ber	0.000	data	0737FAB8	35E0000	1900058	04300153	1D854AF	5E53534	15F3035	5303100	000000E	36B1B0	00703839	007701	0090105	CE54AF5EI	D854AF	5E581400	0000000	0000000
42	data snr	15.877	data ber	0.000	data	0737FAB8	35E0100	1900058	04300153	1D854AF	5E53534	115F3035	5303100	000514F	4C4F5	150484D	50574C	5A525B5	9505659574	D4B554	F4A5458	5751565	8545B5
43	data snr	15.878	data ber	0.000	data	0737FAB8	35E0200	1900058	04300153	1D854AF	5E53534	15F3035	5303100	0003734	35363	2313F424	4045414	03F3B383	3E463C3B4	0422E3	F3533332	F323233	333532
44	data_snr	15.951	data ber	0.000	data	0737FAB8	35E0300	1900058	04300153	1D854AF	5E53534	15F3035	5303100	0004740	40453	E404443	3F36403	83B373E	3234453C3	5313E30	C353A423	BD3A3D4	33D3D4
45	data_snr	17.141	data ber	0.000	data	0737FAB8	35E0400	1900058	04300153	1D854AF	5E53534	15F3035	5303100	002E2E	E32363	32C3033	352C26	2D332C3	5313034343	6322F3	0332C343	332F292I	3343525
46	data snr	17.235	data ber	0.000	data	0737FAB8	35E0500	1900058	04300153	1D854AF	5E53534	115F3035	5303100	005250	50545	34C5152	5252544	9524B4C	544E4B4E4	753565	24D51465	51534248	4E4946
47	data snr	16.942	data ber	0.000	data	0737FAB8	35E0600	1900058	04300153	1D854AF	5E53534	15F3035	5303100	000494E	4C4C4	49424648	474540	464D4645	43474B474	E444D4	174D4C4E	3414A45	444E3D
48	data snr	17.019	data ber	0.000	data	0737FAB8	35E0700	1900058	04300153	1D854AF	5E53534	115F3035	5303100	00484A	43484	7484B49	4D4A4D	494A494	34C4A45454	4047494	184448494	484C494	9494B4
49	data snr	15.881	data ber	0.000	data	0737FAB8	35E0800	1900058	04300153	1D854AF	5E53534	115F3035	5303100	003E40	03E3A3	3E38434	33D3D3I	423D3F3	B3E34373	D42413E	D3F43364	03D3E3	E3B383
50	data snr	16.330	data ber	0.000	data	0737FAB8	35E0900	1900058	04300153	1D854AF	5E53534	115F3035	5303100	000403E	039454	1344043	373D3E	3D423E3E	340423A404	14403B4	10453D3D	443C384	03D3E
51	data snr	16.695	data ber	0.000	data	0737FAB8	35E0A00	1900058	04300153	1D854AF	-5E53534	415F303	5303100	0003A3	63A3E	3638373	9353C36	353A3A3	034343B3D	393B37	34313837	3434392	E35373
52	data_snr	16.969	data ber	0.000	data	0737FAB8	35E0B00	1900058	04300153	1D854AF	-5E53534	415F303	5303100	J003A3	73A353	3B3B3B3	A3A363	D38363A	3A3D3C3D3	37363D4	103F4547	3E36373	A3B3A3
55	data shr	16.050	data ber	0.000	data	07275400		1000058	04300153	1D054AF	-DE03034	415F303	5303100	00303	73A3E	403A393	F40303	303E3B3	83840383C	3940303	72022200	3B413D	3B3C3E
55	data snr	17 986	data ber	0.000	data	0737EAB	SE0000	1900058	04300153	1D854AF	-DE03034 -SE5353/	415F303	5303100	1003220 1002E33	220303	25020	202020	3332352F	2F2A302F3	2B32342	28263331	2E37322	234333U B2E2A3
56	data snr	18.074	data ber	0.000	data	0737EAB	35E0E00	1900058	04300153	1D854AF	5E53534	415E303	5303100	003431	2E312	C303138	322E33	2E353526	32342D303	0313430	02D31362	82B3330	2E3230
57	data snr	15.057	data ber	0.000	data	0737FAB8	35E1000	1900058	04300153	1D854AF	5E53534	115F3035	5303100	004748	47514	A484C47	46444B	2423E42	4A484F4B4	B4D454	184B474E	4543484	7454A4
58	data snr	16.905	data ber	0.000	data	0737FAB8	35E1100	1900058	04300153	1D854AF	5E53534	115F3035	5303100	002B30	035302	E343132	3937333	03036333	3322C2C3	5322F31	332D323	12D2C2	0303034
59	data snr	16.556	data ber	0.000	data	0737FAB8	35E1200	1900058	04300153	1D854AF	5E53534	15F3035	5303100	003031	2F312	C2A2A31	1322C20	302C2C3	22E2D3532	2A2D32	2D31323	62E2E29	35282E
60	data_snr	17.412	data ber	0.000	data	0737FAB8	35E1300	1900058	04300153	1D854AF	5E53534	115F3035	5303100	00332E	2E302	B323231	2D2C36	2E31332	E2F3134373	302C2E	2C2D313	22F372F	322D2B
61	data snr	17.204	data ber	0.000	data	0737FAB8	35E1400	1900058	04300153	1D854AF	5E53534	15F3035	5303100	003035	302C2	C2C3333	323732	32382E34	302D39283	32F362F	F2F38353	42B3231	L2F2A32
62	data snr	17.252	data ber	0.000	data	0737FAB8	35E1500	1900058	04300153	1D854AF	5E53534	115F3035	5303100	0004742	44454	24143424	164D444	23E41464	1543454946	3C4443	45434B45	54240434	463B3A4
63	data snr	16.176	data ber	0.000	data	0737FAB8	35E1600	1900058	04300153	1D854AF	5E53534	115F3035	5303100	000372E	32F2F3	822F332C	293332	2C313230	352E34323	3312834	42D322C2	2F2D2F2	F2F373
64	data snr	16.139	data ber	0.000	data	0737FAB8	35E1700	1900058	04300153	1D854AF	5E53534	115F3035	5303100	003231	.302D2	A2E332E	32D2C3	3031343	435372C2F2	2C302E	323A2035	3033343	237343
65	data snr	17.330	data ber	0.000	data	0737FAB8	35E1800	1900058	04300153	1D854AF	5E53534	115F3035	5303100	000312E	35313	4323326	3430302	C2C352F	2B2E292A3	35282A2	D363332	3430333	4333636
66	gata snr	17.066	data ber	0.000	data	0737FAB8	35E0000	1900050	04400153	1C856AF	5E53534	15F3035	0303200	U00000E	36B1B(	JU703839	007701	0090205	U556AF5EC	2856AF	5E581400		000000
60	data snr	18.752	data ber	0.000	data	0737FAB8	SEU100	1000050	04400153	1C856AF	DE53534	+T2E3032	5303200	100312F	-383B3	0222220	39413C4	13F4447	3F4A484D4	1212420	04B454F4	+C49544	-004A5
60	data err	10 572	data ber	0.000	data	0720EAD		1000050	04400153	1C0564F	0003334	+10F3035	5202200	100352L	122213	932332C	3431332	E2U382L	122001112	131343	54140404	0343133	302B2E
70	data enr	19.052	data ber	0.000	data	0720EAD	SE0300	1900050	04400153	1C056AE	SE52524	115E2025	5202200	004041	26242	1202041	272520	12262227	4330444413	244404	1646462	7565505	SESE42
70	data snr	18.030	data ber	0.000	data	0738EAB	SE0500	1900050	04400153	1C856AE	SE53534	115E303F	5303200	005E51	544R4	105B3A3	3751 55	303E3C3	C3E3E303/30	42303	32D3734	36353C3	8353936
72	data spr	18.181	data ber	0.000	data	0737FAB	35E0600	1900050	04400153	1C856AF	5E53534	115F3035	5303200	002F30	363F3	A433C3F	384130	3E393C3	4332C3A30	363A32	332D333	7343936	3B36353
73	data snr	17.677	data ber	0.000	data	0737FAB8	35E0700	1900050	04400153	1C856AF	5E53534	115F3035	5303200	004C49	9484A5	04E474E	4A4C4	0484D444	C4B4D4850	04A4B4	A49444B	4C474C4	54F4A4
74	data snr	14.752	data ber	0.000	data	0737FAB8	35E0800	1900050	04400153	1C856AF	5E53534	15F3035	5303200	003436	37363	B383031	3138383	53F323D	383E383338	3383F35	3936373	33C373E	3D3E3E
75	data snr	14.080	data ber	0.000	data	0737EAB8	35E0900	1900050	04400153	1C856AE	5E53534	415E3035	5303200	0003132	363A3	53E3C32	3D3336	35333730	372731353	62B372	B3034333	22E3434	4323631
K	A      A  A     A	+	SMOG-P	14742.2	962746	54 HA5MRC	.pkts																-
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Shee	t1of1		Selected	: 17 row	s, 1 colu	JMN	C	Default			Hungar	rian			I_ B	\$	1	verage: ; :	Sum: 0				100%

Figure 5: pkts data column