

# Software for statistical analysis of surveillance data (ADS-B).

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**CNS Specialty**  
**DAN - IACC**

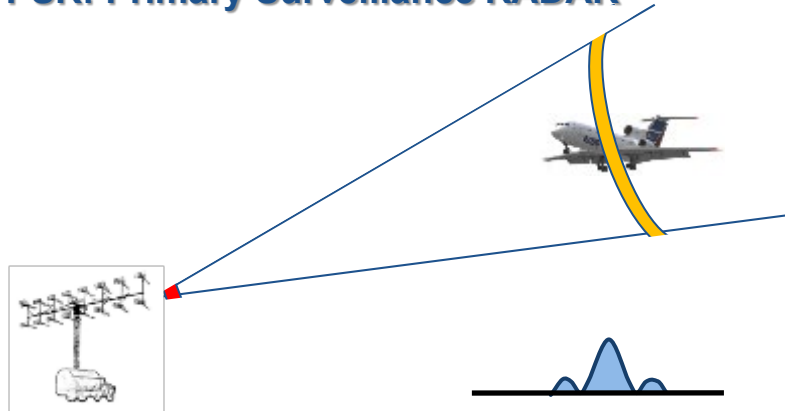
**Havana Cuba.**  
**August 2022**



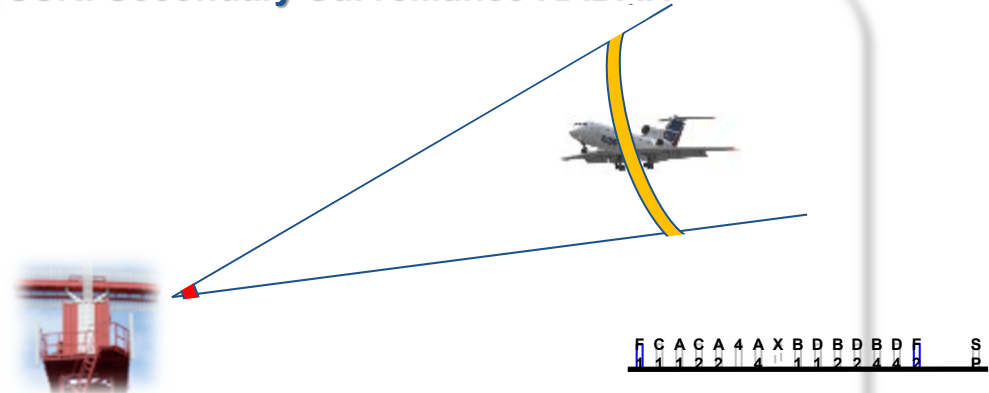


# Aeronautical Surveillance Systems ( Air-Ground )

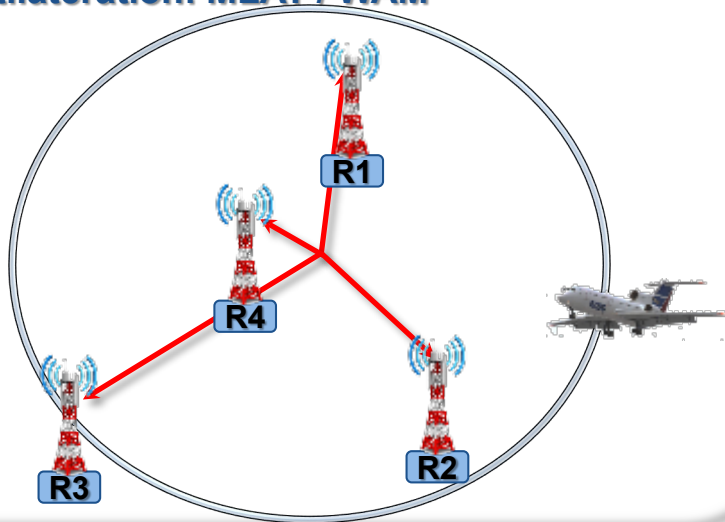
**PSR: Primary Surveillance RADAR**



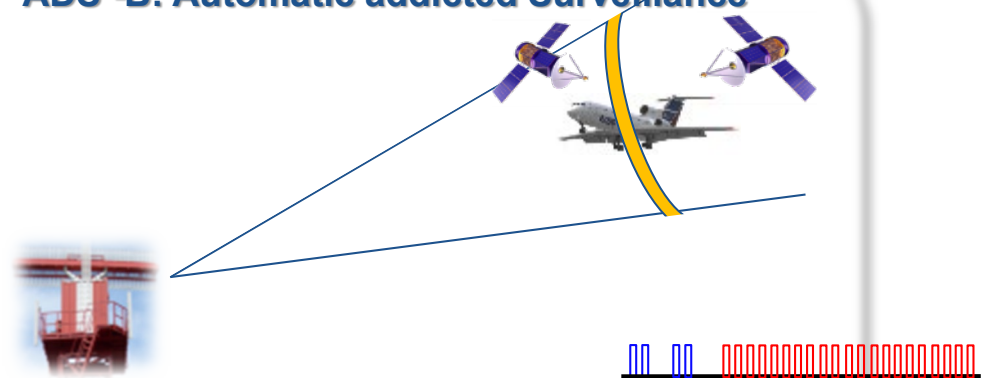
**SSR: Secondary Surveillance RADAR**



**Multilateration: MLAT / WAM**

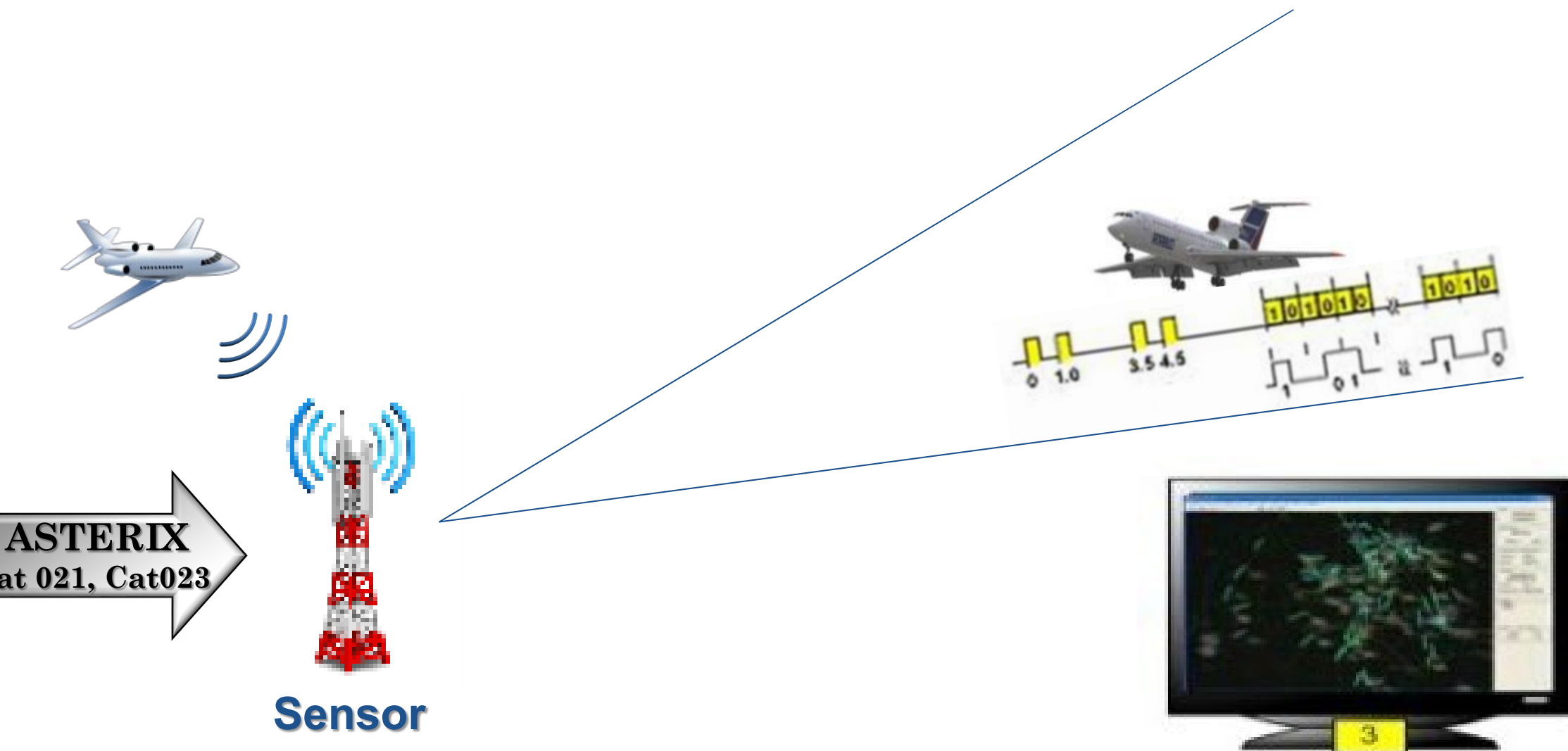


**ADS -B: Automatic broadcast Surveillance**





# General structure ADS-B





# Surveillance Data Exchange (ADS-B)

## **Asterix**

**All Purpose STructured Eurocontrol Radar  
Information EXchange**

**Cat 21: ADS-B Reports.**

**Cat 23: CNS/ATM Ground Station  
Service Messages.**





# ASTERIX Cat 21

## v0.26 and v1.80 versions

Edition : 0.26

Edition Date : 27 June 2005

FRN	Data Item	Information	Length
1	I021/010	Data Source Identification	2
2	I021/040	Target Report Descriptor	1+
3	I021/030	Time of Day	3
4	I021/130	Position in WGS-84 co-ordinates	6
5	I021/080	Target Address	3
6	I021/140	Geometric Altitude	2
7	I021/090	Figure of Merit	2
FX	-	Field extension indicator	-
8	I021/210	Link technology	1
9	I021/230	Roll Angle	2
10	I021/145	Flight Level	2
11	I021/150	Air Speed	2
12	I021/151	True Air Speed	2
13	I021/152	Magnetic Heading	2
14	I021/155	Barometric Vertical Rate	2
FX	-	Field extension indicator	-
15	I021/157	Geometric Vertical Rate	2
16	I021/160	Ground Vector	4
17	I021/165	Rate of Turn	1+
18	I021/170	Target Identification	6
19	I021/095	Velocity Accuracy	1
20	I021/032	Time of day accuracy	1
21	I021/200	Target Status	1
FX	-	Field extension indicator	-
22	I021/020	Emitter Category	1
23	I021/220	Met report	1+
24	I021/146	Intermediate State Selected Altitude	2
25	I021/148	Final State Selected Altitude	2
26	I021/110	Trajectory Intent	1+N*15
27	I021/070	Mode 3/A Code	2
28	I021/132	Signed Amplitude	1
FX	-	Field extension indicator	-
29	-	Spare bits set to zero	-
30	-	Spare bits set to zero	-
31	-	Spare bits set to zero	-
32	-	Spare bits set to zero	-
33	-	Spare bits set to zero	-
34	RE	Reserved Expansion Field	1+
35	SP	Special Purpose Field	1+
FX	-	Field extension indicator	-

Edition : 1.8 Edition Date : January 2011

FRN	Data Item	Information	Length
1	I021/010	Data Source Identification	2
2	I021/040	Target Report Descriptor	2+
3	I021/161	Track Number	2
4	I021/015	Service Identification	1
5	I021/071	Time of Applicability for Position	3
6	I021/130	Position in WGS-84 co-ordinates	6
7	I021/131	Position in WGS-84 co-ordinates, high res.	8
FX	-	Field extension indicator	-
8	I021/072	Time of Applicability for Velocity	3
9	I021/150	Air Speed	2
10	I021/151	True Air Speed	2
11	I021/080	Target Address	3
12	I021/073	Time of Message Reception of Position	3
13	I021/074	Time of Message Reception of Position-High Precision	4
14	I021/075	Time of Message Reception of Velocity	3
FX	-	Field extension indicator	-
15	I021/076	Time of Message Reception of Velocity-High Precision	4
16	I021/140	Geometric Height	2
17	I021/090	Quality Indicators	1+
18	I021/210	MOPS Version	1
19	I021/070	Mode 3/A Code	2
20	I021/230	Roll Angle	2
21	I021/145	Flight Level	2
FX	-	Field extension indicator	-
22	I021/152	Magnetic Heading	2
23	I021/200	Target Status	1
24	I021/155	Barometric Vertical Rate	2
25	I021/157	Geometric Vertical Rate	2
26	I021/160	Ground Vector	4
27	I021/165	Track Angle Rate	2
28	I021/077	Time of Report Transmission	3
FX	-	Field extension indicator	-
29	I021/170	Target Identification	6
30	I021/020	Emitter Category	1
31	I021/220	Met Information	1+
32	I021/146	Intermediate State Selected Altitude	2
33	I021/148	Final State Selected Altitude	2
34	I021/110	Trajectory Intent	1+
35	I021/016	Service Management	1
FX	-	Field extension indicator	-
36	I021/008	Aircraft Operational Status	1
37	I021/271	Surface Capabilities and Characteristics	1+
38	I021/132	Message Amplitude	1
39	I021/250	Mode S MB Data	1+N*8
40	I021/260	ACAS Resolution Advisory Report	7
41	I021/400	Receiver ID	1
42	I021/295	Data Ages	1+
FX	-	Field extension indicator	-
43	-	Not Used	-
44	-	Not Used	-
45	-	Not Used	-
46	-	Not Used	-
47	-	Not Used	-
48	RE	Reserved Expansion Field	1+

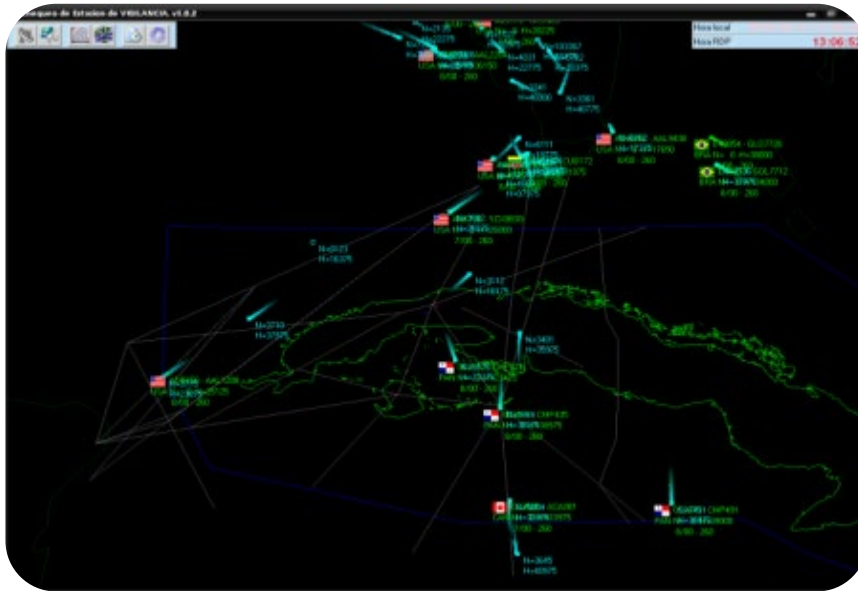


# Software for statistical analysis of aeronautical surveillance



# General structure.

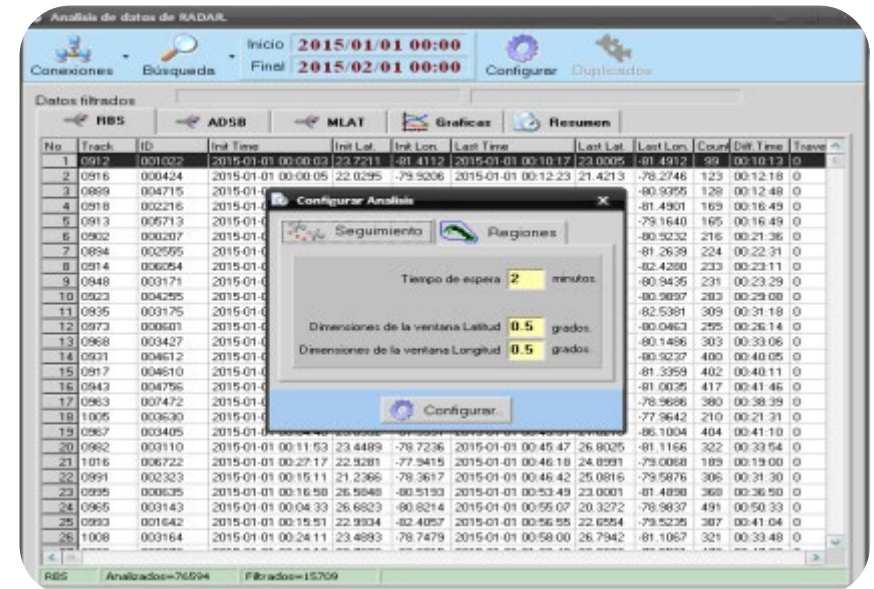
## SurvSENSOR



- Representation.
- Coverage H and V
- Processing.
- Storage.
- Transmission.



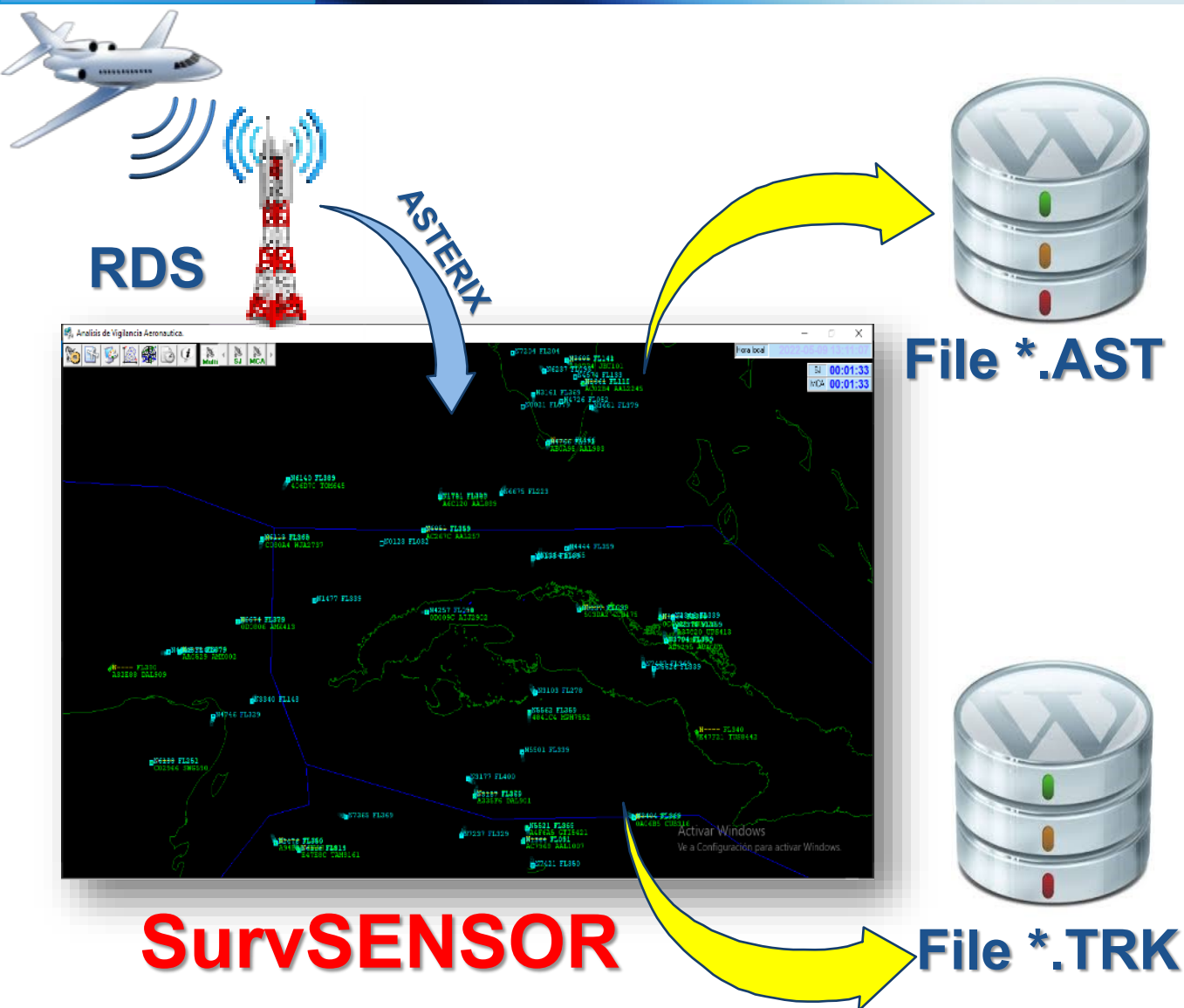
## Surv REPORT



- Processing.
- Statistical calculation.
- Storage.
- Report.
- Charts



# software structure



A monitoring station can generate monthly \*.AST files of the order of **8 GB**.

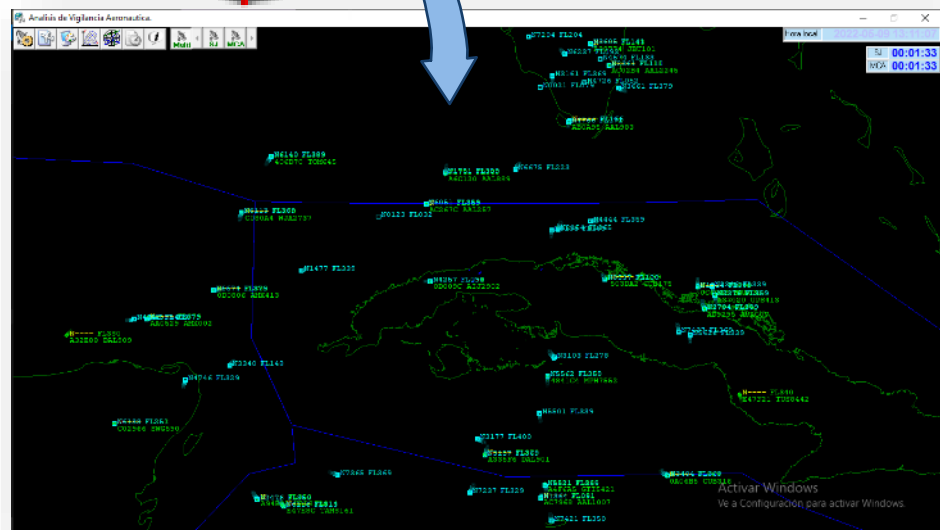
This same station, after pre-processing the data, generates \*.TRK files of the order of **200 Mb**.



SDP

ASTERIX

SurvSENSOR



\*.AST



\*.TRK

software structure



Aircraft



Airline



Countries

Reportes de Vigilancia Aeronáutica (v3.0)

Búsqueda

Inicio

2019-06-01 00:00

Final

2019-07-05 00:00

Configurar

Actualiza DB

DataBase

Info

Acción:

Progreso:

Listado de Aeronaves

RADAR

ADS-B

MLAT

Gráficas

Reportes

No	Adm	País	Matrícula	Tipo	M.A.	M.T	M.2	ID	Uso	Antena	Time	Int Lat	Int Lon	Last Time	Last Lat	Last Lon	H max	H max	Car	Diff Time	Out	Err	ETI	ICR	ICG	MAC	SIL	PC
1	AS0074	USA	N524TA	C-7	-	-	-	-	LRC518	LPC	2019-06-01 00:04:58 22:0778	-85.7645	2019-06-01 00:18:15	20.6088	-86.8002	55075	30025	438	00:13:16	0	11	2	87	8	9	3	0	
2	AC7910	USA	N3021H	C-7	-	-	-	-	AAL323	AAL	2019-06-01 00:04:58 21:8276	-78.7683	2019-06-01 00:18:41	20.0360	-78.2975	34975	35025	195	00:13:43	0	11	2	87	8	9	3	0	
3	CA1751	CAN	CFVIA	B747	-	-	-	-	ROU1544	ROU	2019-06-01 00:04:58 21:8085	-78.7214	2019-06-01 00:18:15	15.9519	-78.2895	33975	37000	276	00:14:20	0	11	2	87	8	9	3	0	
4	ABSC37	USA	N525NK	C-7	-	-	-	-	NKS1141	NKS	2019-06-01 00:04:58 21:3495	-79.0795	2019-06-01 00:21:18	19.1884	-79.1881	36950	37050	286	00:16:19	0	11	2	87	8	9	3	0	
5	AD782J	USA	N386WV	A320	-	-	-	-	AVI007	AVI	2019-06-01 00:06:00 22:0588	-78.8712	2019-06-01 00:21:38	19.9334	-78.2573	33975	35025	365	00:16:38	0	11	2	87	8	9	3	0	
6	A38232	USA	N307UP	B747	5504.0	-	-	-	UPS385	UPS	2019-06-01 00:04:58 23:7993	-81.2424	2019-06-01 00:22:27	25.6227	-80.9547	9900	34000	538	00:17:28	0	11	2	87	8	9	3	0	
7	394A12	FRA	F-GSDS	C-7	7253.0	-	-	-	AFR946	AFR	2019-06-01 00:04:58 23:2893	-82.2519	2019-06-01 00:24:31	22.9963	-82.4063	125	28275	730	00:19:32	0	11	2	87	8	9	3	0	
8	A7032E	USA	N803JB	C-7	-	-	-	-	JBU285	JBU	2019-06-01 00:04:58 22:5925	-78.3447	2019-06-01 00:30:48	19.0346	-79.3370	34975	35050	746	00:20:50	0	11	2	87	8	9	3	0	
9	A08371	USA	N6766Q	B737	2020.0	-	-	-	DAL673	DAL	2019-06-01 00:04:58 22:0962	-81.2449	2019-06-01 00:22:07	19.4651	-80.9192	29000	37025	857	00:22:08	0	11	2	87	8	9	3	0	
10	AD1443	USA	N342AN	B737	-	-	-	-	AAL269	AAL	2019-06-01 00:04:58 24:2599	-82.5995	2019-06-01 00:32:22	22.9964	-82.4077	175	26000	949	00:22:24	0	11	2	87	8	9	3	0	
11	040060	ETH	ET-APS	C-7	-	-	-	-	ETH5919	ETH	2019-06-01 00:04:58 23:9347	-83.3743	2019-06-01 00:32:58	23.0866	-87.2468	59975	36000	858	00:27:59	0	11	2	87	8	9	3	0	
12	340077	ESP	EC-MIT	A320	-	-	-	-	IBE5214	IBE	2019-06-01 00:04:58 20:6407	-80.2163	2019-06-01 00:32:49	23.7109	-78.0030	34000	34000	740	00:28:49	0	11	2	87	8	9	3	0	
13	AC7256	USA	N3006	C-7	-	-	-	-	AAL2616	AAL	2019-06-01 00:18:48 23:4084	-78.9637	2019-06-01 00:35:43	25.2440	-79.6272	15025	26025	226	00:16:53	0	11	2	87	8	9	3	0	
14	3444CA	ESP	EC-LZU	A320	7228.0	-	-	-	IBE6621	IBE	2019-06-01 00:04:58 23:7400	-80.6127	2019-06-01 00:36:02	22.9961	-82.4067	175	36000	1066	00:31:04	0	11	2	87	8	9	3	0	
15	A4380A	USA	N371FL	C-7	-	-	-	-	TSU1719	TSU	2019-06-01 00:04:58 23:4194	-83.2191	2019-06-01 00:38:48	25.5734	-80.8895	7675	23025	1075	00:34:50	0	11	2	87	8	9	3	0	
16	CO949F	MEX	XA-UJM	SWA6	-	-	-	-	VTM659	VTM	2019-06-01 00:04:58 23:4647	-83.2453	2019-06-01 00:41:05	25.3889	-81.1132	10000	21025	1191	00:36:05	0	11	2	87	8	9	3	0	
17	A394F4	USA	N331QT	A320	-	-	-	-	TPA4003	TPA	2019-06-01 00:04:58 24:6796	-79.7682	2019-06-01 00:42:52	19.7335	-79.2322	17700	41000	906	00:37:53	0	11	2	87	8	9	3	0	
18	A4414A	USA	N3730B	B737	-	-	-	-	DAL393	DAL	2019-06-01 00:04:58 24:3536	-79.2727	2019-06-01 00:44:04	24.3536	-79.1888	34975	37025	1084	00:39:04	0	11	2	87	8	9	3	0	
19	30489H	ITA	I-BPAU	C-7	1644.0	-	-	-	CUB986	CUB	2019-06-01 00:04:58 23:0094	-82.3786	2019-06-01 00:44:50	20.9495	-79.2861	225	39025	1134	00:39:51	0	11	2	87	8	9	3	0	
20	CO99FC	MEX	XA-AJB	C-7	4207.0	-	-	-	AU2902	AU	2019-06-01 00:04:58 22:4080	-86.4201	2019-06-01 00:45:58	22.9302	-82.4042	200	35025	1250	00:41:00	0	11	2	87	8	9	3	0	
21	AS6830	USA	N483UP	B737	4000.0	-	-	-	UPS391	UPS	2019-06-01 00:04:58 20:6690	-82.2419	2019-06-01 00:46:25	25.5002	-80.9172	10725	36025	1300	00:41:26	0	11	2	87	8	9	3	0	
22	ABA70C	USA	N528NK	C-7	4624.0	-	-	-	NKS1338	NKS	2019-06-01 00:04:58 19:9662	-82.4506	2019-06-01 00:54:40	25.6104	-80.9562	9650	38050	1540	00:49:45	0	11	2	87	8	9	3	0	
23	AC734E	USA	N577NK	C-7	-	-	-	-	NKS401	NKS	2019-06-01 00:01:06 26:0708	-80.0021	2019-06-01 00:54:27	19.9124	-78.2560	4000	37025	915	00:53:18	0	11	2	87	8	9	3	0	
24	CO5010	CAN	CF-7	C-7	-	-	-	-	TSC986	TSC	2019-06-01 00:29:58 25:8897	-79.2188	2019-06-01 00:56:24	22.8626	-77.8192	34950	35025	646	00:56:24	0	11	2	87	8	9	3	0	
25	A7A59F	USA	N52018	C-7	-	-	-	-	JBU1716	JBU	2019-06-01 00:09:58 22:4464	-86.6944	2019-06-01 00:57:24	25.6241	-80.8539	9700	33025	1259	00:47:25	0	11	2	87	8	9	3	0	
26	A3A225	USA	N339WV	C-7	-	-	-	-	DAL513	DAL	2019-06-01 00:19:58 25:0820	-80.5425	2019-06-01 01:00:01	22.9954	-82.4082	150	26025	1232	00:40:02	0	11	2	87	8	9	3	0	
27	A06256	USA	N6762	B737	7106.0	-	-	-	DAL325	DAL	2019-06-01 00:04:58 25:5889	-81.4539	2019-06-01 01:01:43	18.9332	-82.9495	37000	37025	1712	00:56:45	0	11	2	87	8	9	3	0	
28	CO2966	CAN	CF-FRP	B737	6341.0	-	-	-	Sw5423	SwG	2019-06-01 00:19:02 27:4454	-80.8157	2019-06-01 01:02:02	23.0106	-81.4729	700	38000	1083	00:40:00	0	11	2	87	8	9	3	0	
29	ACRE37	USA	N302AN	B737	1342.0	-	-	-	AAL2492	AAL	2019-06-01 00:14:50 25:1043	-80.8380	2019-06-01 01:03:21	21.7323	-86.1989	15975	36025	1398	00:49:22	0	11	2	87	8	9	3	0	
30	CO10KX	CAN	CF-GE2D	A320	0723.0	-	-	-	TSC242	TSC	2019-06-01 00:24:38 26:9130	-80.6132	2019-06-01 01:06:38	23.0179	-81.4613	475	34025	1167	00:42:36	0	11	2	87	8	9	3	0	
31	AD448C	USA	N364AN	B737	-	-	-	-	AAL1482	AAL	2019-06-01 00:48:18 23:1188	-79.0895	2019-06-01 01:07:15	24.9916	-79.3394	21950	36000	280	00:17:56	0	11	2	87	8	9	3	0	
32	AD360E	USA	N360AN	B737	-	-	-	-	AAL1082	AAL	2019-06-01 00:29:43 25:5076	-80.1437	2019-06-01 01:11:11	20.5720	-77.9651	10675	35000	768	00:41:28	0	11	2	87	8	9	3	0	

ES

9:14

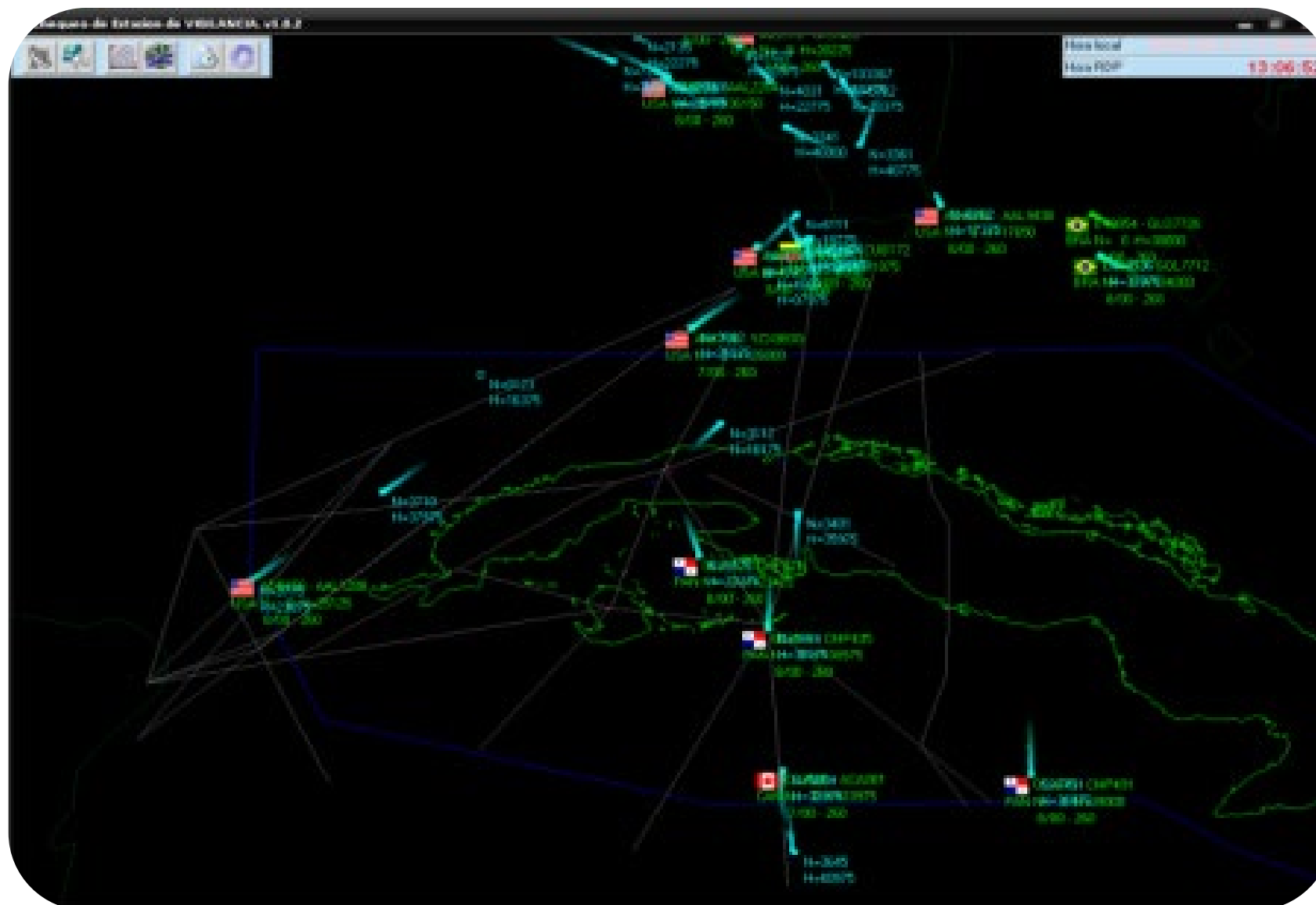
9/9/2022

SURV Report





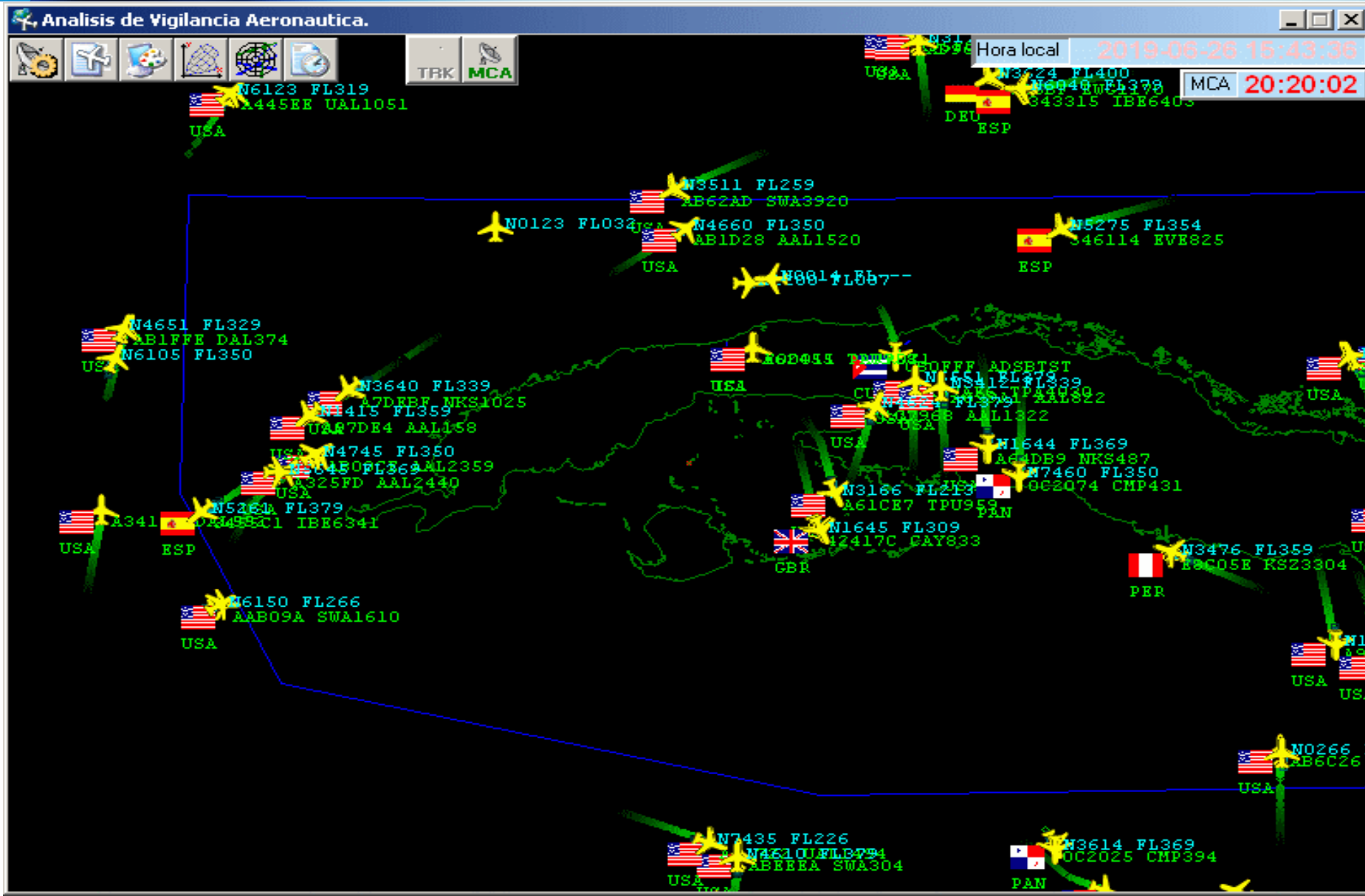
# Software SurvSENSOR







# RADAR – ADS-B Representation





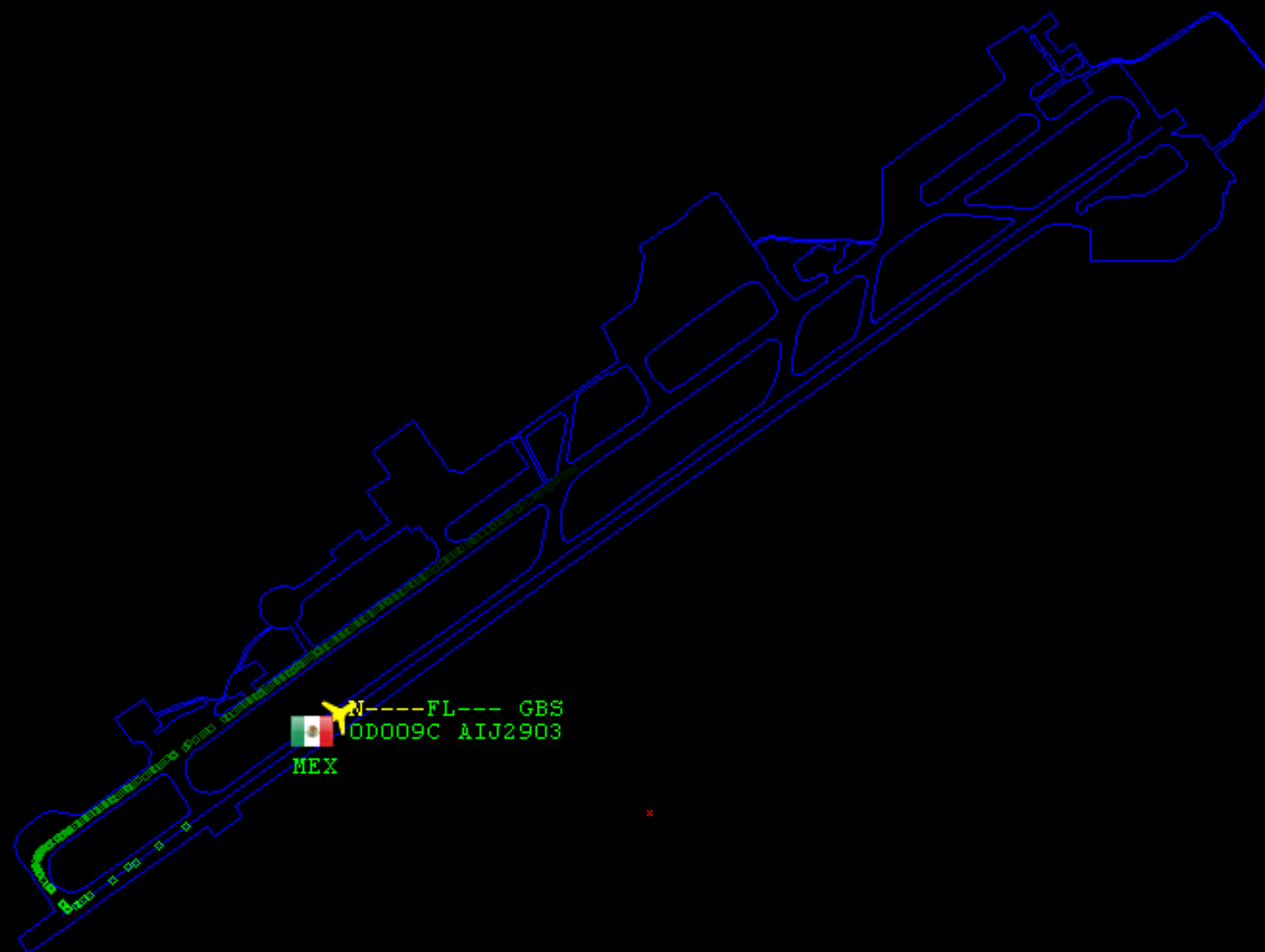


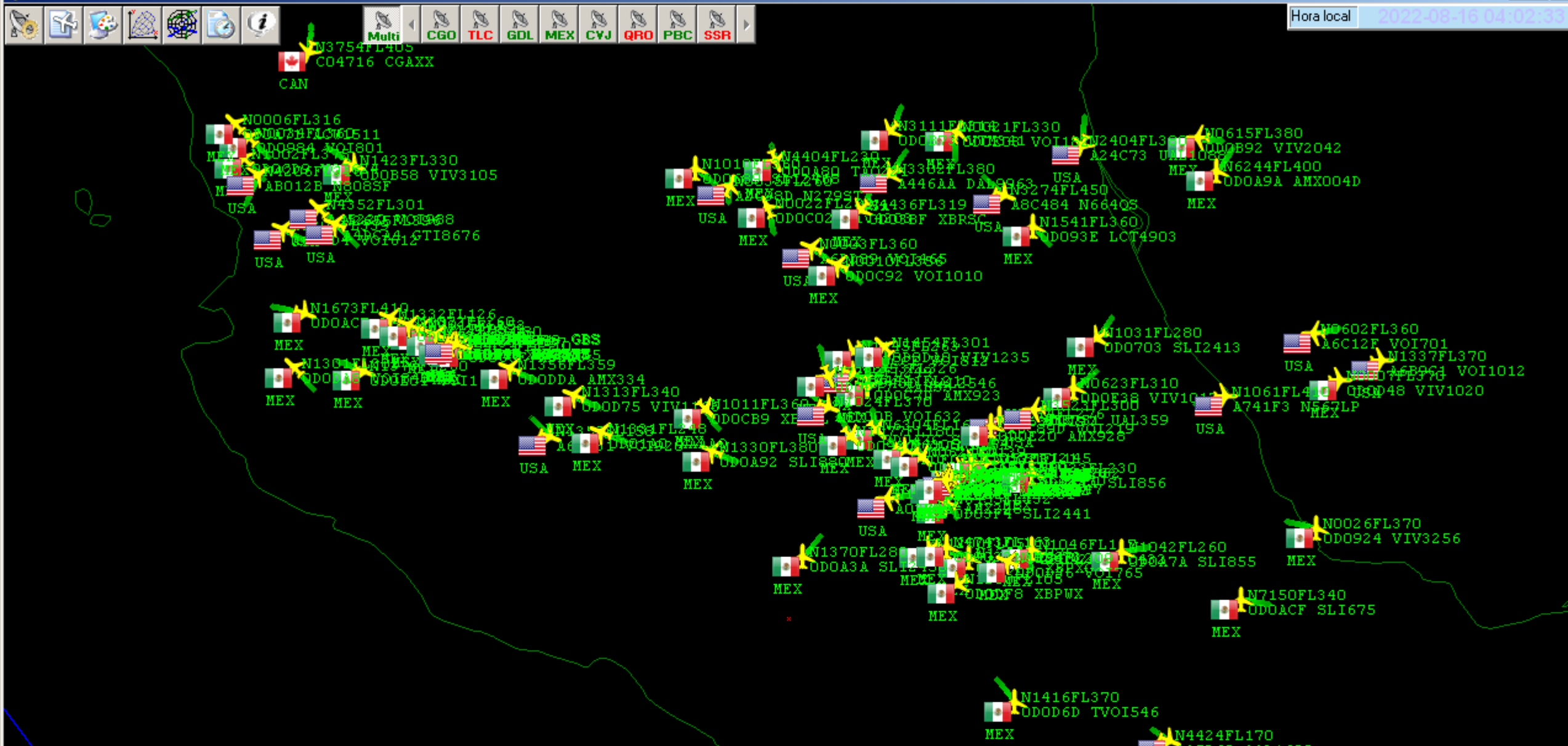
## Main Screen (Aerodrome)

Análisis de Sensores de Vigilancia Aeronáutica. (v3.0)



Hora local 2022-08-16 01:11:03





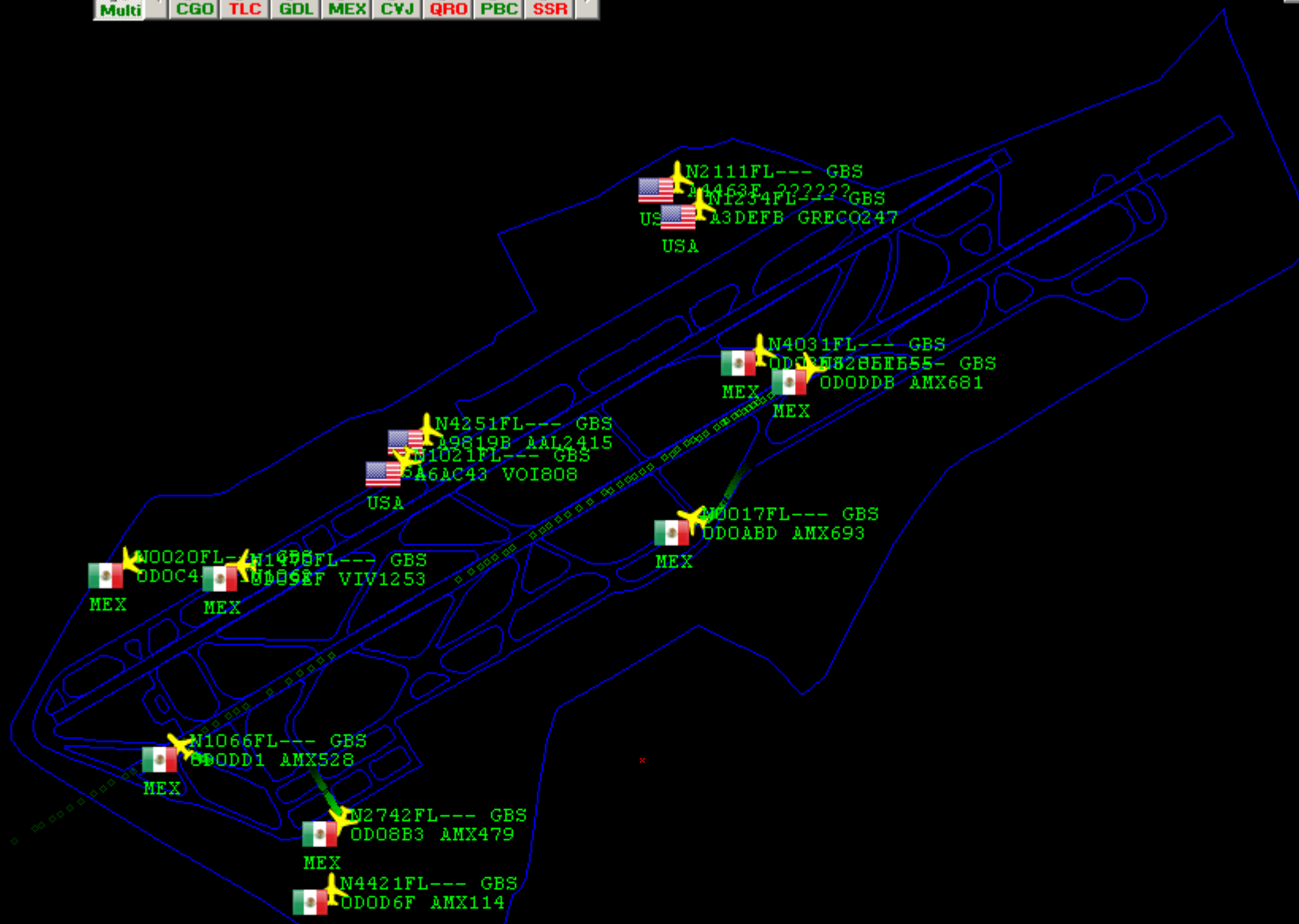


## Main Screen (Aerodrome)

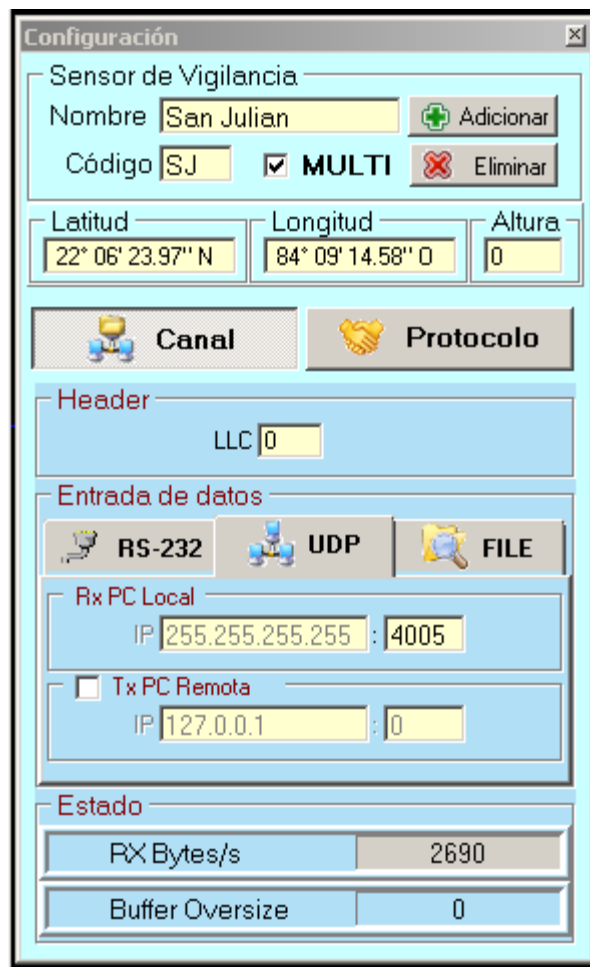
Análisis de Sensores de Vigilancia Aeronáutica. (v3.0)



Hora local 2022-08-16 04:03:4



Configuration of the **channels** surveillance data input.

The screenshot shows a software window titled 'Configuración'. It contains several sections: 'Sensor de Vigilancia' with fields for 'Nombre' (San Julian), 'Código' (SJ), and a 'MULTI' checkbox; 'Latitud' (22° 06' 23.97" N), 'Longitud' (84° 09' 14.58" O), and 'Altura' (0); 'Canal' and 'Protocolo' tabs; 'Header' with an 'LLC' field; 'Entrada de datos' with 'RS-232', 'UDP', and 'FILE' options; 'Rx PC Local' with IP and port fields; 'Tx PC Remota' with IP and port fields; and 'Estado' with 'RX Bytes/s' and 'Buffer Oversize' fields.

**Configuración**

Sensor de Vigilancia

Nombre

Código  ☒ MULTI

Latitud  Longitud  Altura

☒ Canal ☐ Protocolo

Header

LLC

Entrada de datos

☒ RS-232 ☐ UDP ☐ FILE

Rx PC Local

IP  :

☐ Tx PC Remota

IP  :

Estado

RX Bytes/s

Buffer Oversize

## Channel:

- **UDP**  
( Unicast , Multicast )
- **RS-232**
- **Files**





Protocol configuration surveillance data input.

The screenshot shows a software window titled 'Configuración'. It contains several sections for configuring surveillance data input. The 'Sensor de Vigilancia' section includes fields for 'Nombre' (ADS-B Mexico), 'Código' (MEX), and a checked 'MULTI' option. Below this are fields for 'Latitud' (19° 25' 50.85" N), 'Longitud' (99° 04' 12.40" O), and 'Altura' (0). A tabbed interface shows 'Canal' and 'Protocolo' tabs. The 'Datos' section has checkboxes for 'Guardar datos' and input fields for 'DLE' (00), 'STX' (00), and 'ETX' (00). The 'Sistemas de Vigilancia' section has buttons for 'RADAR', 'ADS-B', and 'MLAT'. Below these is a 'Categoría' dropdown menu set to '021: ADS-B Targets Reports', a 'Sincronizar Hora' checkbox, and fields for 'Versión' (2.3), 'Pkt RX' (3473), and 'Pkt Error' (0). The 'Estado del sistemas' section at the bottom includes a 'GS Status' dropdown (Op), a 'GS Report Period (s)' field (3), and an 'Operational Range (NM)' field (255.00).

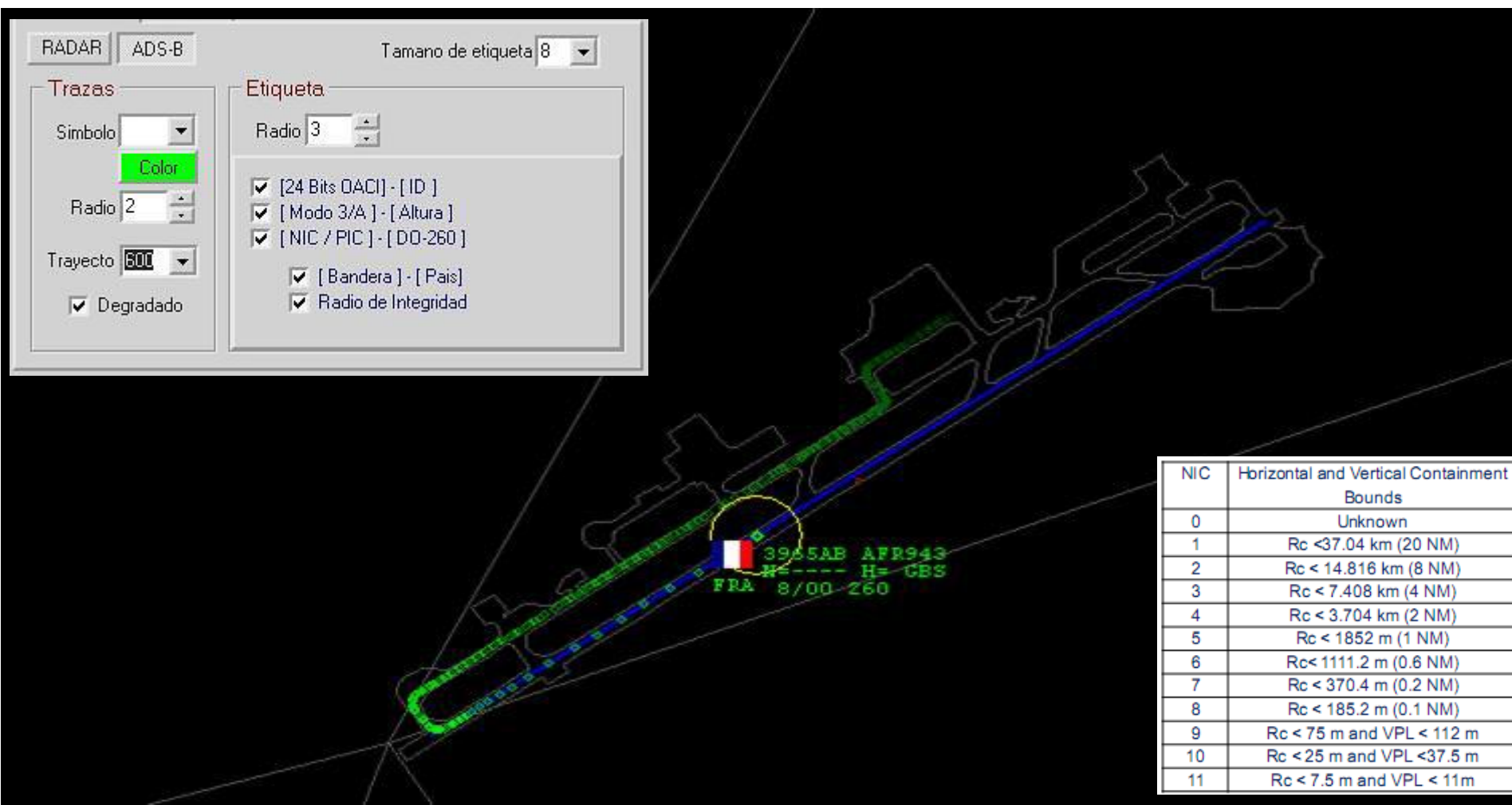
## ASTERIX protocol:

- **Cat 048** (RADAR Targets) (v1.14, v1.15, v1.17, v1.20, v1.21).
- **cat 034** (RADAR Status) (v1.26, v1.27, v1.30).
- **cat 021** (ADS-B Tgts ) (v0.23, v1.4, v1.8, v2.1, v2.6).
- **Cat 023** (ADS-B Status) (v0.11, v1.2).
- **cat 020** (MLAT Targets) (v1.5, v1.8).
- **cat 019** (MLAT Status) (v1.1, v1.2).



# Software facilities

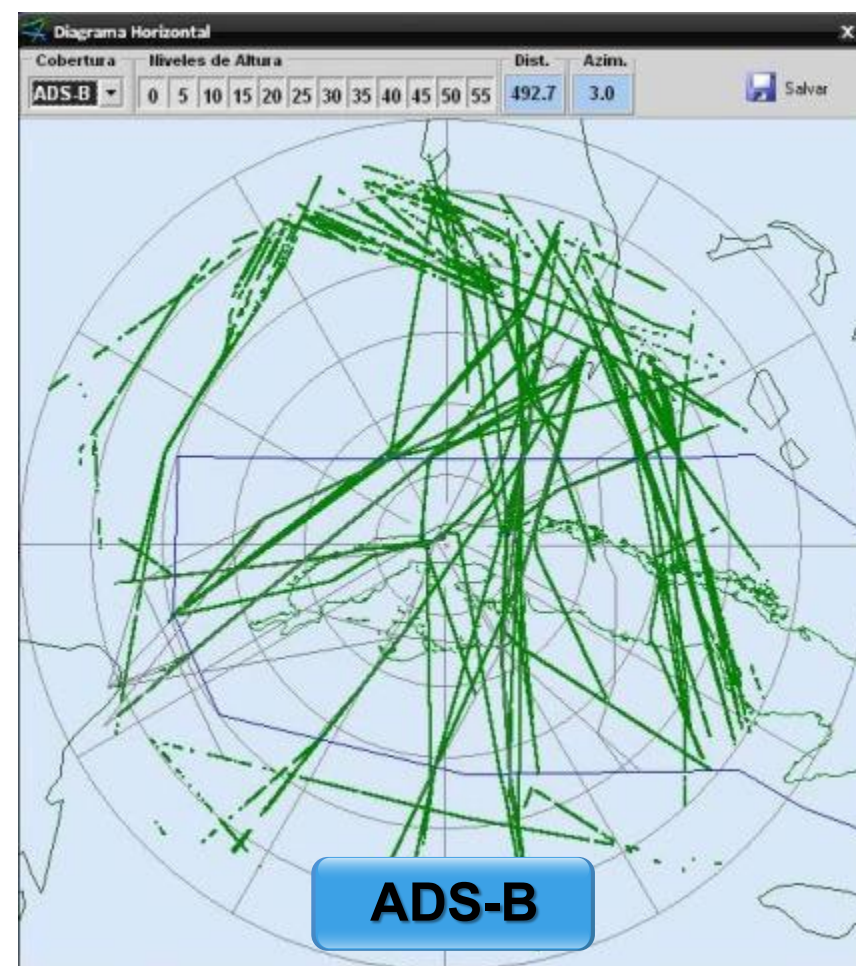
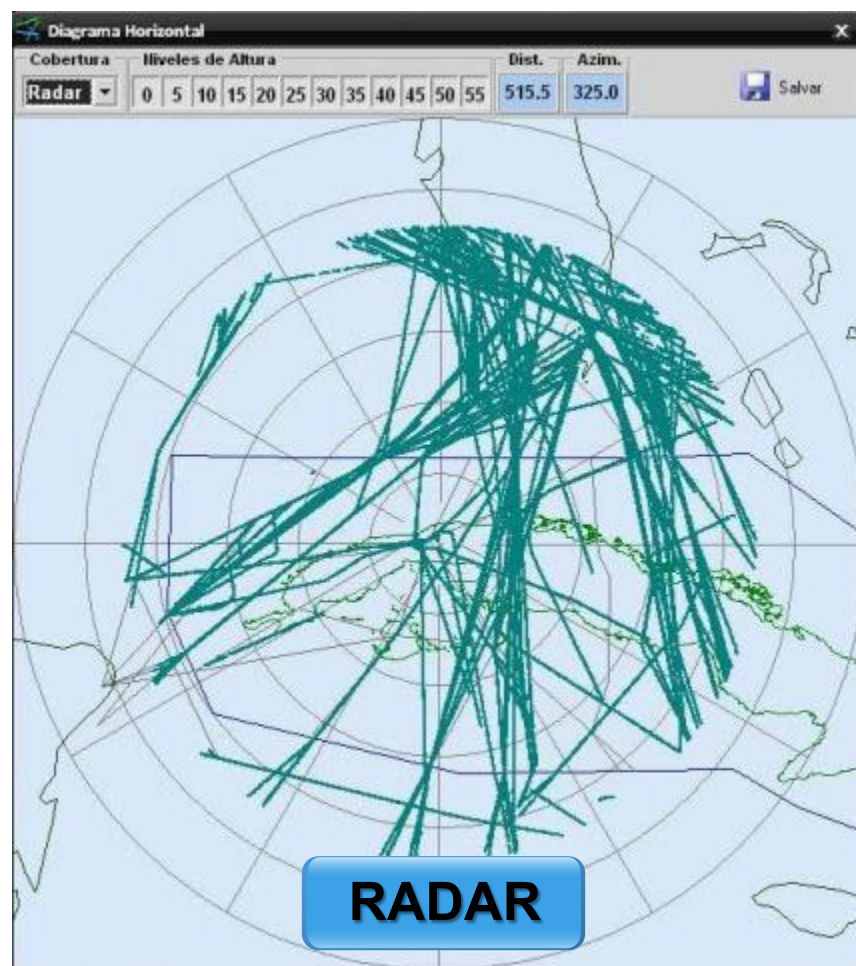
Personalized representation of the parameters transmitted by the aircraft.



NIC	Horizontal and Vertical Containment Bounds
0	Unknown
1	Rc < 37.04 km (20 NM)
2	Rc < 14.816 km (8 NM)
3	Rc < 7.408 km (4 NM)
4	Rc < 3.704 km (2 NM)
5	Rc < 1852 m (1 NM)
6	Rc < 1111.2 m (0.6 NM)
7	Rc < 370.4 m (0.2 NM)
8	Rc < 185.2 m (0.1 NM)
9	Rc < 75 m and VPL < 112 m
10	Rc < 25 m and VPL < 37.5 m
11	Rc < 7.5 m and VPL < 11m

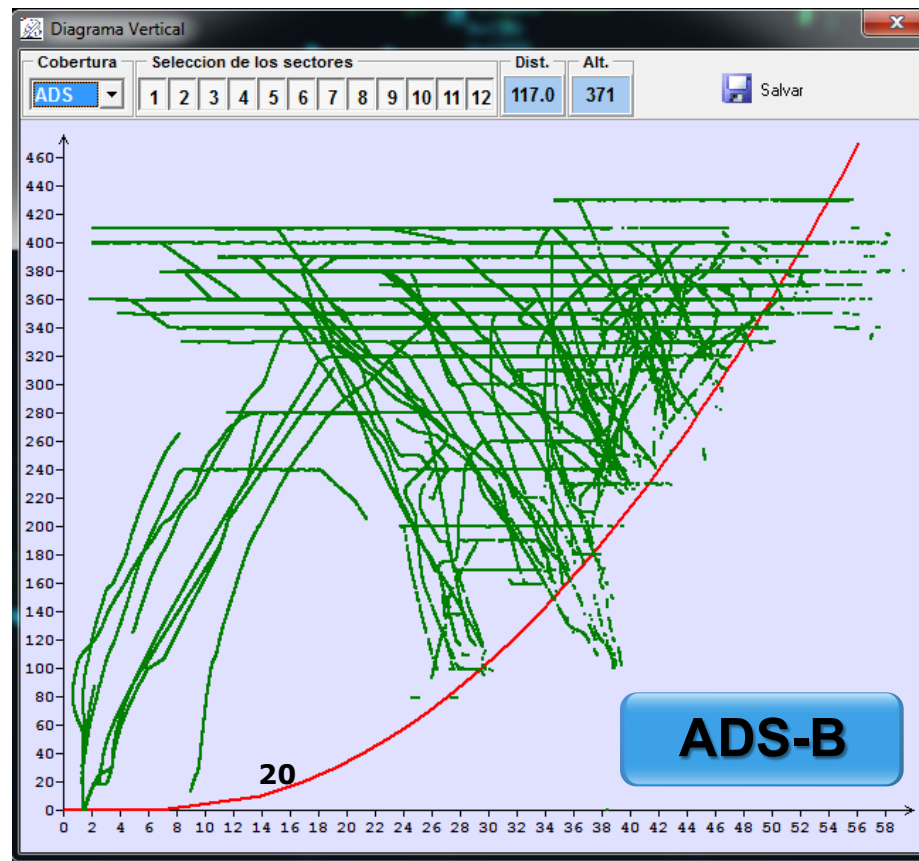
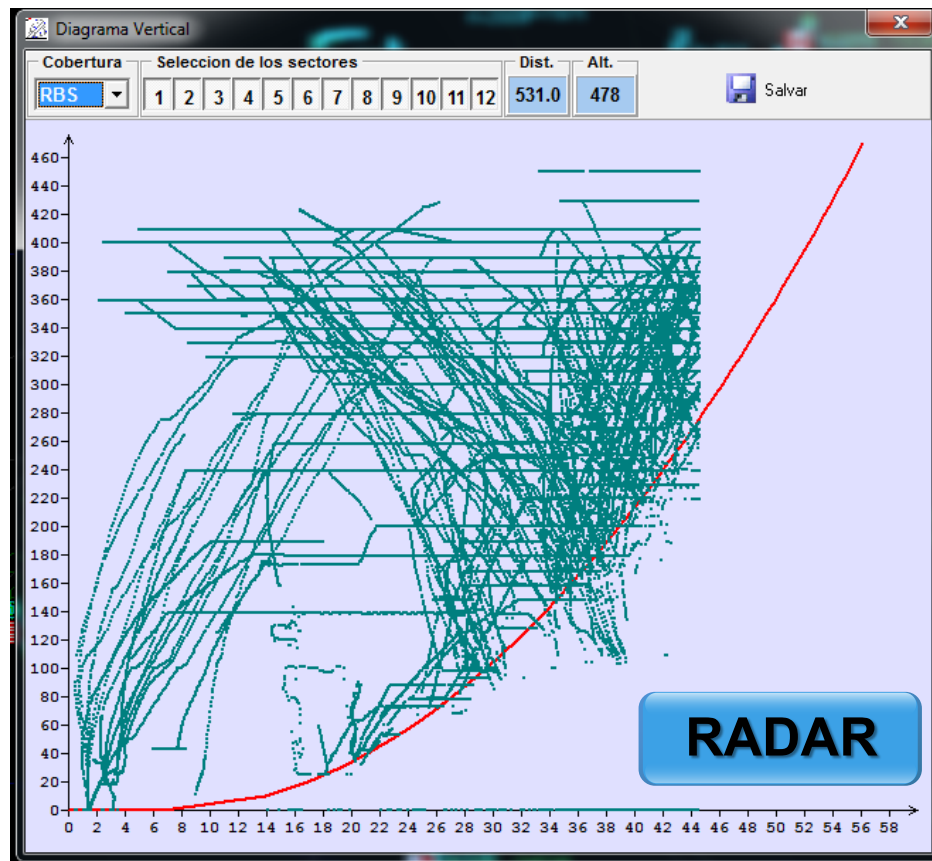
# Software facilities

Analysis of the coverage of the surveillance sensors in the **horizontal diagram** at different height levels.



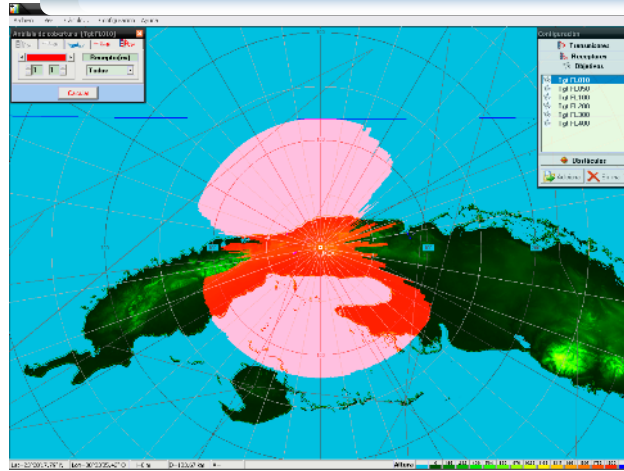


Analysis of the coverage of surveillance sensors in the **vertical diagram** to different sectors.

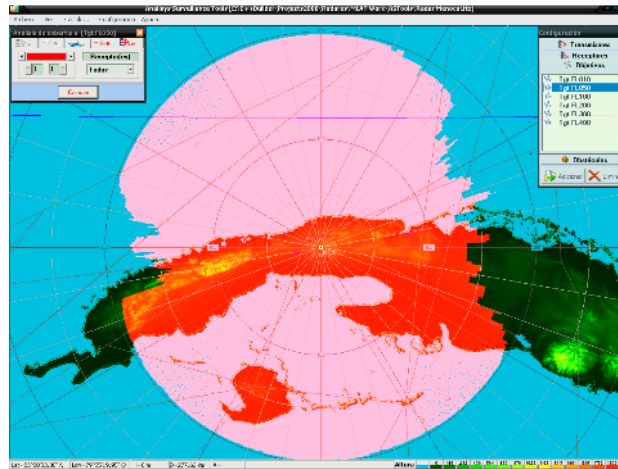


# Evaluation of theoretical coverage.

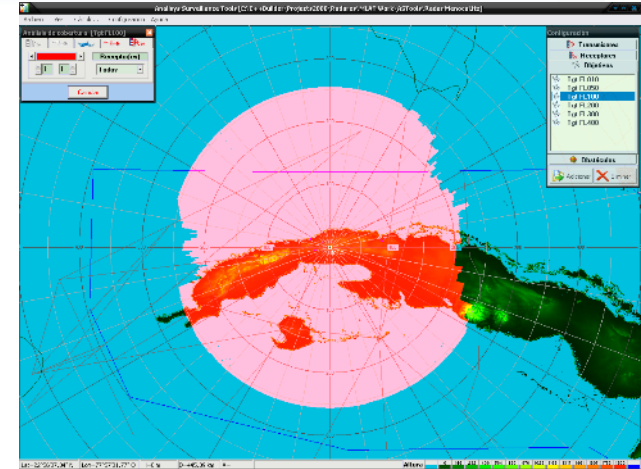
## ASTools



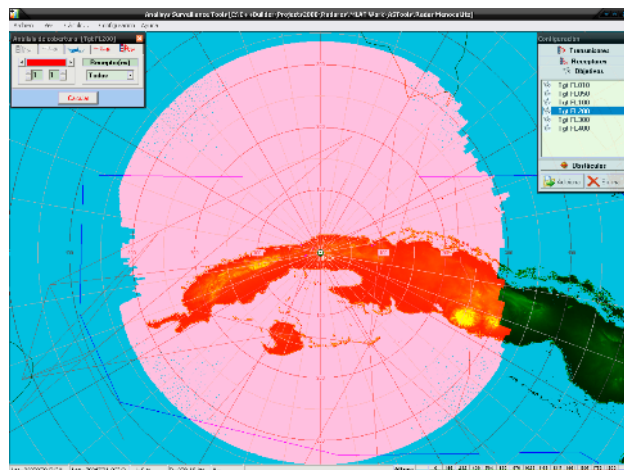
FL010



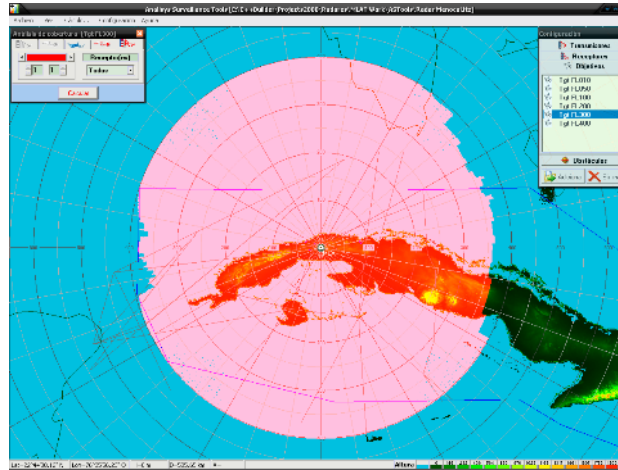
FL050



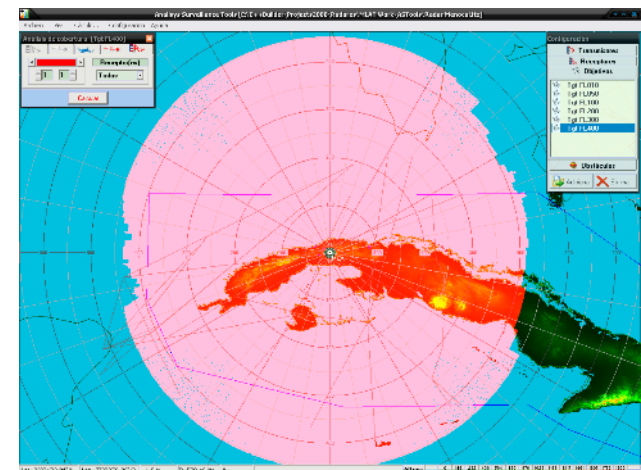
FL100



FL200



FL300



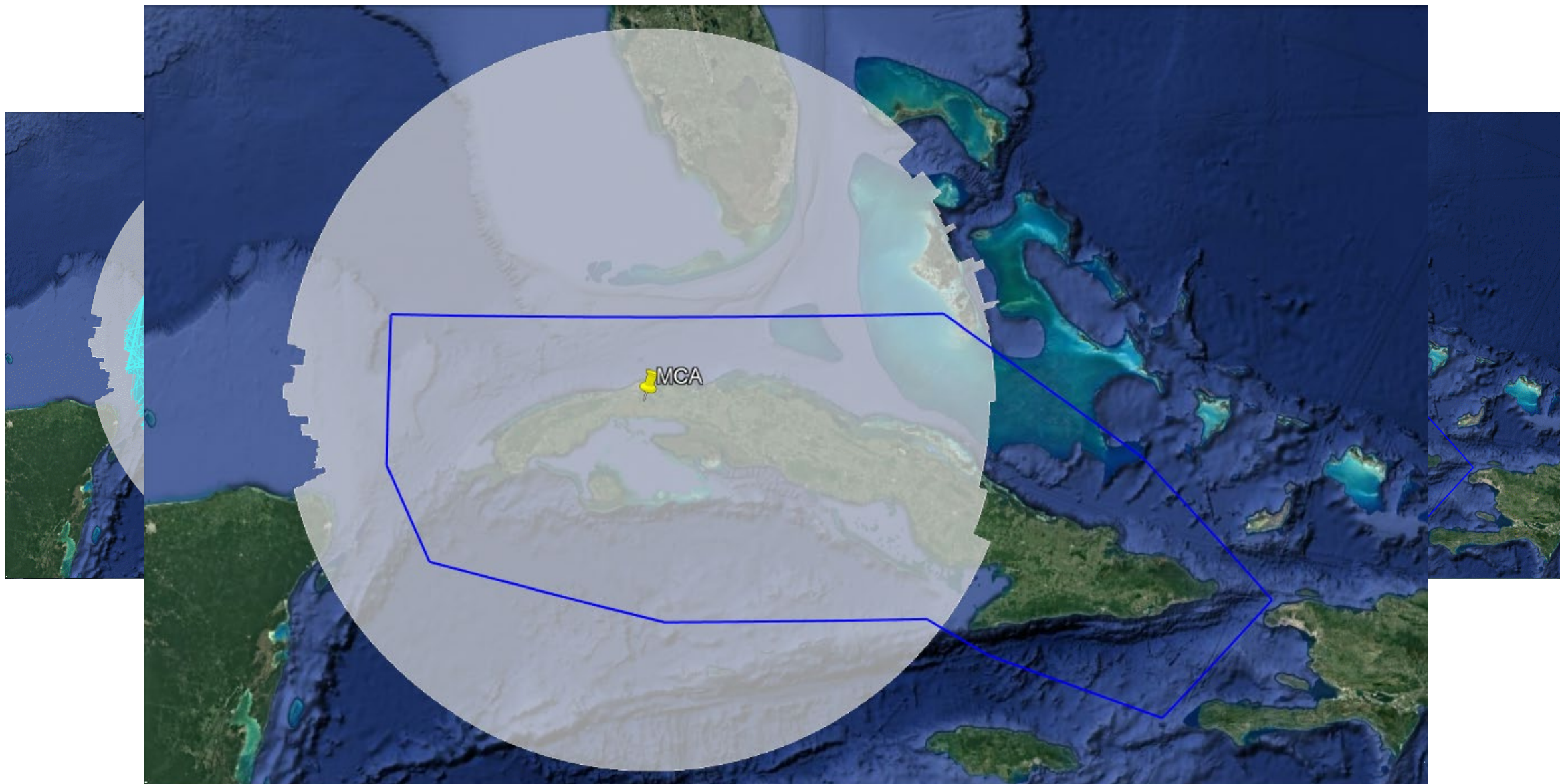
FL400





# RADAR- ADS-B analysis.

( Theoretical coverage vs real data)







# Software SurvREPORT

Análisis de datos de RADAR

Conexiones Búsqueda Inicio **2015/01/01 00:00** Final **2015/02/01 00:00** Configurar Duplicados

Datos filtrados

HBS ADSB MLAT Gráficas Resumen

No	Track	ID	Init Time	Init Lat	Init Lon	Last Time	Last Lat	Last Lon	Count	Diff Time	Travel
1	0912	001022	2015-01-01 00:00:03	23.7211	-81.4112	2015-01-01 00:10:17	23.0005	-81.4912	39	00:10:12	0
2	0916	000424	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-78.2746	123	00:12:18	0
3	0899	004715	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-80.9355	128	00:12:48	0
4	0918	002216	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-81.4901	169	00:16:49	0
5	0913	005713	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-79.1640	165	00:16:49	0
6	0902	000207	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-80.5232	216	00:21:36	0
7	0894	002555	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-81.2639	224	00:22:31	0
8	0914	006054	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-82.4280	233	00:23:11	0
9	0948	003171	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-80.9435	231	00:23:29	0
10	0923	004255	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-80.9897	283	00:29:08	0
11	0935	003175	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-82.5391	309	00:31:18	0
12	0973	000601	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-80.0462	255	00:26:14	0
13	0968	003427	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-80.1486	303	00:33:06	0
14	0931	004612	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-80.9237	400	00:40:05	0
15	0917	004610	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-81.3359	402	00:40:11	0
16	0943	004756	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-81.0035	417	00:41:46	0
17	0963	007472	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-78.9696	380	00:38:39	0
18	1005	003630	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-77.9642	210	00:21:31	0
19	0967	003405	2015-01-01 00:00:05	22.0295	-79.5206	2015-01-01 00:12:23	21.4213	-86.1004	404	00:41:10	0
20	0992	003110	2015-01-01 00:11:53	23.4489	-78.7236	2015-01-01 00:45:47	26.8025	-81.1166	322	00:33:54	0
21	1016	006722	2015-01-01 00:27:17	22.9281	-77.9415	2015-01-01 00:46:18	24.8591	-79.0068	189	00:19:00	0
22	0991	002323	2015-01-01 00:15:11	21.2366	-78.3617	2015-01-01 00:46:42	25.0816	-79.5876	306	00:31:30	0
23	0995	000635	2015-01-01 00:16:58	26.5848	-80.5193	2015-01-01 00:53:49	23.0001	-81.4858	368	00:36:50	0
24	0965	003143	2015-01-01 00:04:33	26.6823	-80.8214	2015-01-01 00:56:07	20.3272	-78.9837	491	00:50:33	0
25	0993	001642	2015-01-01 00:15:51	22.9934	-82.4057	2015-01-01 00:56:55	22.6554	-79.5235	387	00:41:04	0
26	1008	003164	2015-01-01 00:24:11	23.4893	-78.7479	2015-01-01 00:58:00	26.7942	-81.1067	321	00:33:48	0

Configurar Analisis

Seguimiento Regiones

Tiempo de espera **2** minutos

Dimensiones de la ventana Latitud **0.5** grados

Dimensiones de la ventana Longitud **0.5** grados

Configurar

RDS Analizados=76594 Filtrados=15709



# Main Screen ( SURVReport )

Reportes de Vigilancia Aeronáutica. (v3.0)

Búsqueda

**Inicio** 2019-06-01 00:00  
**Final** 2019-07-05 00:00

Configurar
 Actualiza DB
 DataBase
 Info

**Accion:**  
**Progreso:**

**Listado de Aeronaves**

**RADAR**

**ADS-B**

**MLAT**

**Gráficas**

**Reportes**

No	Addr.	Pais	Matricula	Tipo	M.A	M.1	M.2	ID Vuelo	Airline	Init Time	Init Lat.	Init Lon.	Last Time	Last Lat.	Last Lon.	H min	H max	Cant.	Diff.Time	Dist.	FIR	LTT	v26C	NIC	NAC	SIL	PIC
1	A69974	USA	N524TA	¿?	-	-	-	LRC618	LRC	2019-06-01 00:04:59	22.0788	-85.7845	2019-06-01 00:18:15	20.6686	-86.8082	35975	36025	438	00:13:16	0	11	2	B?	8	9	3	0
2	AC791D	USA	N9021H	¿?	-	-	-	AAL923	AAL	2019-06-01 00:04:58	21.8276	-78.7669	2019-06-01 00:18:41	20.0360	-78.2975	34975	35025	195	00:13:43	0	11	2	B?	8	9	3	0
3	C01791	CAN	C-FIYA	B764	-	-	-	ROU1944	ROU	2019-06-01 00:04:58	21.9085	-78.7214	2019-06-01 00:19:19	19.9518	-78.2858	36975	37000	276	00:14:20	0	11	2		8	0	0	0
4	A69CB7	USA	N525NK	¿?	-	-	-	NKS1141	NKS	2019-06-01 00:04:59	21.3495	-79.0755	2019-06-01 00:21:18	19.1884	-79.1861	36950	37050	286	00:16:19	0	11	2	B?	8	9	3	0
5	AD79F2	USA	N968AV	A333	-	-	-	AVA007	AVA	2019-06-01 00:05:00	22.0588	-78.8312	2019-06-01 00:21:38	19.8334	-78.2573	38975	39025	365	00:16:38	0	11	2		8	0	0	0
6	A33B23	USA	N307UP	B764	5504 0	-	-	UPS385	UPS	2019-06-01 00:04:58	23.7993	-81.2424	2019-06-01 00:22:27	25.6227	-80.8547	9900	34000	538	00:17:28	0	11	2	B?	8	9	3	0
7	394A12	FRA	F-GSQS	¿?	7253 0	-	-	AFR946	AFR	2019-06-01 00:04:59	23.2853	-82.2519	2019-06-01 00:24:31	22.9963	-82.4063	125	28275	730	00:19:32	0	11	2	B?	8	9	3	0
8	A7D32E	USA	N603JB	¿?	-	-	-	JBU2851	JBU	2019-06-01 00:04:58	22.5926	-79.3447	2019-06-01 00:30:48	19.0346	-79.3370	34975	35050	746	00:25:50	0	11	2	B?	8	10	3	0
9	A8DEF1	USA	N6706Q	B753	2020 0	-	-	DAL673	DAL	2019-06-01 00:04:59	22.0982	-81.2449	2019-06-01 00:32:07	18.4651	-80.9192	35000	37025	857	00:27:08	0	11	2	B?	8	9	3	0
10	AD14A3	USA	N942AN	B739	-	-	-	AAL2699	AAL	2019-06-01 00:04:58	24.2599	-82.5595	2019-06-01 00:32:22	22.9964	-82.4073	175	26000	949	00:27:24	0	11	2	B?	8	9	3	0
11	040060	ETH	ET-APS	¿?	-	-	-	ETH3519	ETH	2019-06-01 00:04:59	23.9347	-83.3743	2019-06-01 00:32:59	23.0866	-87.2468	35975	36000	858	00:27:59	0	11	2		8	0	0	0
12	3450D7	ESP	EC-MJT	A333	-	-	-	IBE6314	IBE	2019-06-01 00:04:59	20.6487	-80.2183	2019-06-01 00:33:49	23.7109	-78.0828	34000	34000	740	00:28:49	0	11	2		8	0	0	0
13	AC7256	USA	N9006	¿?	-	-	-	AAL2816	AAL	2019-06-01 00:18:49	23.4084	-78.5637	2019-06-01 00:35:43	25.2440	-79.6272	15025	26025	226	00:16:53	0	11	2		8	0	0	0
14	3444C4	ESP	EC-LZJ	A337	7236 0	-	-	IBE6621	IBE	2019-06-01 00:04:58	23.7400	-80.6127	2019-06-01 00:36:02	22.9961	-82.4067	175	36000	1066	00:31:04	0	11	2		8	0	0	0
15	A4380A	USA	N371FL	CX5	-	-	-	TSU7135	TSU	2019-06-01 00:04:58	23.4194	-83.2191	2019-06-01 00:39:48	25.5794	-80.8905	7675	23025	1075	00:34:50	0	11	2	B?	8	10	3	0
16	0DQAFB	MEX	XA-UUM	SWAK	-	-	-	VTM659	VTM	2019-06-01 00:04:59	23.4647	-83.2433	2019-06-01 00:41:05	25.3886	-81.1132	10000	21025	1191	00:36:05	0	11	2	B?	9	10	3	0
17	A39AF6	USA	N331QT	A333	-	-	-	TPA4003	TPA	2019-06-01 00:04:59	24.6796	-79.7682	2019-06-01 00:42:52	19.7335	-78.2322	17700	41000	906	00:37:53	0	11	2	B?	8	9	3	0
18	A4414A	USA	N3730B	B739	-	-	-	DAL393	DAL	2019-06-01 00:04:59	24.3536	-79.2727	2019-06-01 00:44:04	19.1875	-79.1868	34975	37025	1084	00:39:04	0	11	2	B?	8	10	3	0
19	300498	ITA	I-BPAG	¿?	1644 0	-	-	CUB986	CUB	2019-06-01 00:04:58	23.0094	-82.3766	2019-06-01 00:44:50	20.9456	-78.2061	225	35025	1134	00:39:51	0	11	2	B?	8	10	3	0
20	0D09FC	MEX	XA-AJB	¿?	4207 0	-	-	AJ2902	AJ2	2019-06-01 00:04:58	22.4080	-86.4291	2019-06-01 00:45:58	22.9932	-82.4042	200	35025	1250	00:41:00	0	11	2	B?	8	9	3	0
21	A5A690	USA	N463UP	B753	4606 0	-	-	UPS391	UPS	2019-06-01 00:04:59	20.6690	-82.2419	2019-06-01 00:46:25	25.5002	-80.9172	10725	36025	1300	00:41:26	0	11	2	B?	8	11	3	0
22	A6A7DC	USA	N528NK	¿?	4624 0	-	-	NKS1338	NKS	2019-06-01 00:04:54	19.9662	-82.4506	2019-06-01 00:54:40	25.6104	-80.8582	9650	38050	1540	00:49:45	0	11	2	B?	8	9	3	0
23	A67CA6	USA	N517NK	¿?	-	-	-	NKS401	NKS	2019-06-01 00:01:08	26.0708	-80.0021	2019-06-01 00:54:27	19.9124	-78.2560	4000	37025	915	00:53:18	0	11	2		8	0	0	0
24	C051D1	CAN	¿?	¿?	-	-	-	TSC898	TSC	2019-06-01 00:29:59	25.8687	-79.2188	2019-06-01 00:56:24	22.6626	-77.8192	34950	35025	646	00:26:24	0	11	2		8	0	0	0
25	A7A59F	USA	N592JB	¿?	-	-	-	JBU1718	JBU	2019-06-01 00:09:58	22.4464	-86.6944	2019-06-01 00:57:24	25.6241	-80.8539	9700	33025	1259	00:47:25	0	11	2	B?	8	9	3	0
26	A3A235	USA	N333NW	¿?	-	-	-	DAL513	DAL	2019-06-01 00:19:58	25.0820	-80.5425	2019-06-01 01:00:01	22.9954	-82.4082	150	26025	1232	00:40:02	0	11	2	B?	8	9	3	0
27	A8DE56	USA	N6702	B753	7106 0	-	-	DAL325	DAL	2019-06-01 00:04:58	25.5869	-81.4579	2019-06-01 01:01:43	18.2032	-82.8405	37000	37025	1712	00:56:45	0	11	2	B?	8	9	3	0
28	C02966	CAN	C-FPRP	B739	6341 0	-	-	SWG623	SWG	2019-06-01 00:19:02	27.4454	-80.8157	2019-06-01 01:02:03	23.0106	-81.4729	700	38000	1083	00:43:00	0	11	2		8	0	0	0
29	ACBE37	USA	N920AN	B739	1342 0	-	-	AAL2492	AAL	2019-06-01 00:14:58	25.1043	-80.8380	2019-06-01 01:03:21	21.7323	-86.1989	15875	36025	1398	00:48:22	0	11	2	B?	8	9	3	0
30	C051C6	CAN	C-GEZD	A33	0723 0	-	-	TSC242	TSC	2019-06-01 00:24:32	26.9130	-80.6132	2019-06-01 01:06:39	23.0179	-81.4613	475	36025	1167	00:42:06	0	11	2		8	0	0	0
31	AD44BC	USA	N954NN	B739	-	-	-	AAL1482	AAL	2019-06-01 00:49:18	23.1188	-78.0655	2019-06-01 01:07:15	24.8916	-79.3904	21850	32000	280	00:17:56	0	11	2	B?	9	9	3	0
32	AD35E0	USA	N950NN	B739	-	-	-	AAL1082	AAL	2019-06-01 00:29:43	25.5076	-80.1437	2019-06-01 01:11:11	20.5720	-77.9651	10675	35000	768	00:41:28	0	11	2	B?	8	9	3	0



# Search filter

Análisis de Reportes de Vigilancia Aeronáutica. (v3.0)

Búsqueda

Inicio **2022-07-01 00:00**

Final **2022-07-25 00:00**

Configurar Actualiza DB DataBase Info

Accion:

Progreso:

Listado de Aeronaves

RADAR ADS-B MLAT

Gráficas Reportes

No	Addr.	Pais	Matricula	Tipo	M.3/A	ID Vuelo	Airline	Init Time	Init Lat.	Init Lon.	Last Time	Last Lat.	Last Lon.	H min	H max	Cant.	Diff.Time	FIR	LTT	v26C	NICp	PIC	NAC	NAC	SIL
1	0D0D36	MEX	¿?	¿?	1334 0	VOI765	¿E?	2022-07-06 21:19:59	19.2655	-99.1300	2022-07-06 21:30:05	19.4323	-99.0858	6975	16700	2542	00:10:05	11	2	B	8	11	9	1	3
2	0D0E20	MEX	¿?	¿?	1363 0	AMX928	¿E?	2022-07-06 21:19:59	20.8321	-99.0530	2022-07-06 21:30:04	23.3590	-98.9274	26325	33025	1596	00:10:05	11	2	B	8	11	10	2	3
3	A6D00B	USA	¿?	¿?	1024 0																				
4	A6C89D	USA	¿?	¿?	0614 0																				
5	0D0A2C	MEX	¿?	¿?	6304 0																				
6	0D0CCE	MEX	¿?	¿?	1445 0																				
7	A0E751	USA	¿?	¿?	3523 0																				
8	0D0DD1	MEX	¿?	¿?	1066 0																				
9	A3C4C8	USA	¿?	¿?	1344 0																				
10	0D0BC3	MEX	¿?	¿?	1375 0																				
11	A8C484	USA	¿?	¿?	3274 0																				
12	0D09A5	MEX	¿?	¿?	1335 0																				
13	A6AC43	USA	¿?	¿?	1021 0																				
14	0D0E21	MEX	¿?	¿?	1057 0																				
15	0D0B92	MEX	¿?	¿?	0615 0																				
16	0D0A77	MEX	¿?	¿?	0634 0																				
17	0D0DA0	MEX	¿?	¿?	1454 0																				
18	0D0A7A	MEX	¿?	¿?	1042 0																				
19	A6C12F	USA	¿?	¿?	0602 0																				
20	0D0C44	MEX	¿?	¿?	0020 0																				
21	0D0A80	MEX	¿?	¿?	4404 0																				
22	0D05E4	MEX	¿?	¿?	1303 0																				
23	0D0AC7	MEX	¿?	¿?	1673 0																				
24	0D0A46	MEX	¿?	¿?	0024 0																				
25	0D0ACF	MEX	¿?	¿?	7150 0																				
26	A24C73	USA	¿?	¿?	2404 0																				
27	0D0DE1	MEX	¿?	¿?	0036 0																				

Parametros del filtro.

Formato de archivos...

Tracks (TRK)

Intervalo de Tiempo

Definido

Desde

2022-07-01 00:00

Hasta

2022-07-25 00:00

Periodo

24 dias

SubIntervalo

Periodo

Opciones de filtrado

Tiempo de vuelo ...

Mayor de: 00:10:00

Menor de: 23:59:59

Región ...

Area: FIR HAV

Nivel de vuelo :

Surface

Airborne 10000 55000 pies.

Cobertura ...

Radar: MCA

ADS: MCA

MLAT: ---

ID:

Modo 1/2/3/A

0000 7777

24 bits OACI

000000 FFFFFFFF

Target ID

Calidad:

ver DO-260

0 3

NICp

6 11

NACp

0 15

NACv

0 7

SIL

0 3

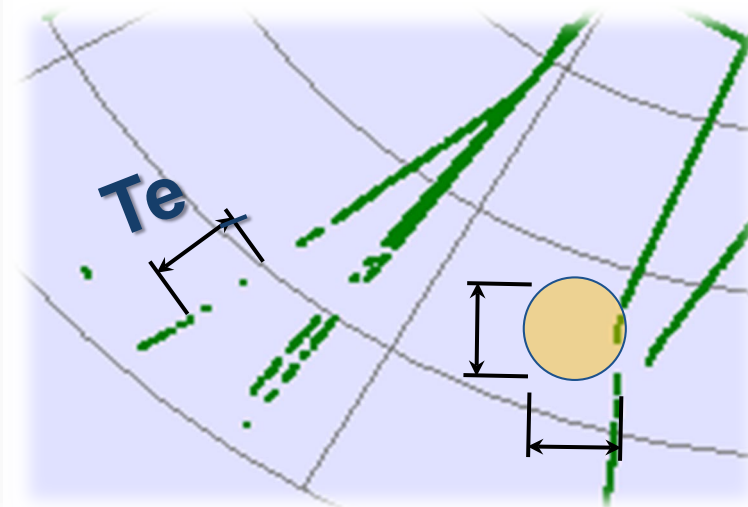
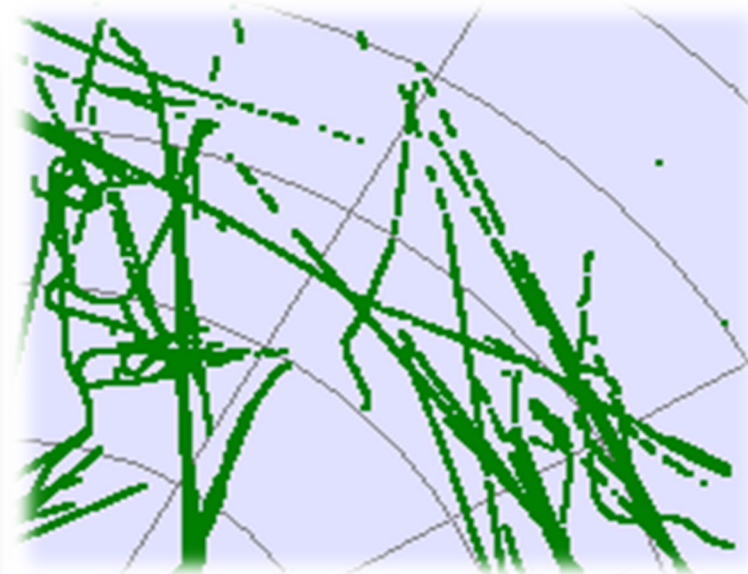
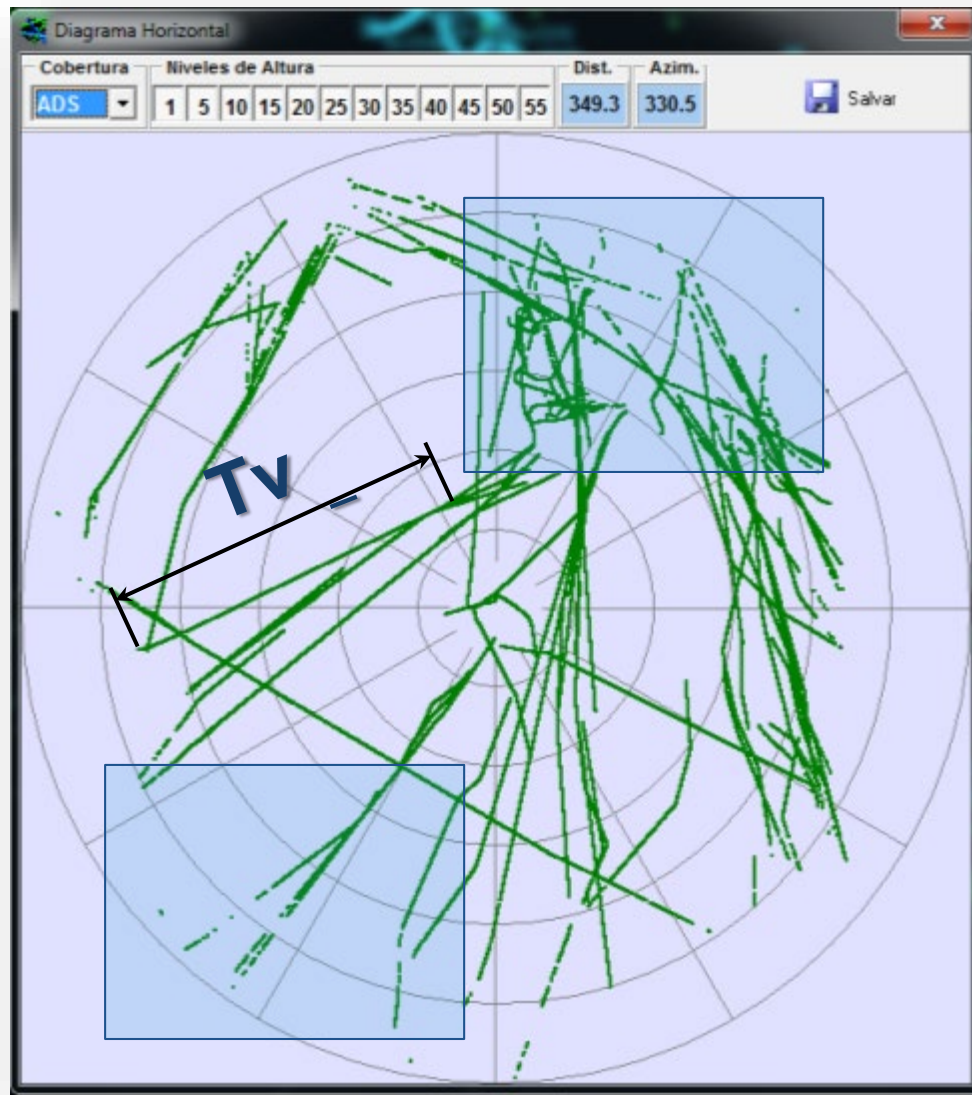
PIC

0 11

Buscar...



# Surveillance data







# Relationship of the databases.

## SURV Report

Reportes de Vigilancia Aeronáutica. (v3.0)

Inicio

2019-06-01 00:00

Final

2019-07-05 00:00

Configurar

Actualiza DB

DataBase

Info

Accion:

Progreso:

Listado de Aeronaves

RADAR

ADS-B

MLAT

Gráficas

Reportes

No	Addr	País	Matricula	Tipo	MA	M.1	M.2	ID Vuelo	Airline	Init Time	Init Lat	Init Lon	Last Time	Last Lat	Last Lon	H min	H max	Cent	Dif Time	Dut	FIR	LTT	vSE	NIC	NAC	SIL	PIC
1	A69974	USA	N524TA	¿?	-	-	-	LRC510	LRC	2019-06-01 00:04:59	22.0788	-85.7845	2019-06-01 00:18:15	20.6686	-86.8082	35975	36025	438	00:13:16	0	11	2	8	9	3	0	
2	AC791D	USA	N3021H	¿?	-	-	-	AAL923	AAL	2019-06-01 00:04:59	21.8276	-78.7669	2019-06-01 00:18:41	20.0360	-78.2975	34975	35025	195	00:13:43	0	11	2	8	9	3	0	
3	C01791	CAN	C-FVYA	B764	-	-	-	RDU1944	RDU	2019-06-01 00:04:59	21.9055	-78.7214	2019-06-01 00:19:19	19.9518	-78.2858	36975	37000	276	00:14:20	0	11	2	8	0	0	0	
4	A69C87	USA	N525NK	¿?	-	-	-	NKS1141	NKS	2019-06-01 00:04:59	21.3495	-79.0755	2019-06-01 00:21:18	19.1884	-79.1861	36950	37050	286	00:16:19	0	11	2	8	9	3	0	
5	AD79F2	USA	N968AY	A333	-	-	-	AVA007	AVA	2019-06-01 00:05:00	22.0588	-78.8312	2019-06-01 00:21:38	19.8334	-78.2573	36975	39025	365	00:16:38	0	11	2	8	0	0	0	
6	A33823	USA	N307UP	B764	5904	0	-	UPS385	UPS	2019-06-01 00:04:59	23.7993	-81.2424	2019-06-01 00:22:27	25.6227	-80.8547	8900	34000	538	00:17:28	0	11	2	8	9	3	0	
7	39A412	FRA	F-GSQS	¿?	7253	0	-	AFR946	AFR	2019-06-01 00:04:59	23.2853	-82.2519	2019-06-01 00:24:31	22.9963	-82.4063	125	28275	730	00:19:32	0	11	2	8	9	3	0	
8	A7D32E	USA	N603JB	¿?	-	-	-	JBW2851	JBW	2019-06-01 00:04:59	22.5926	-79.3447	2019-06-01 00:30:48	19.0346	-79.3370	34975	35050	746	00:25:50	0	11	2	8	9	10	3	
9	ABDEF1	USA	N6706Q	B753	2020	0	-	DAL673	DAL	2019-06-01 00:04:59	22.0982	-81.2449	2019-06-01 00:32:07	18.4651	-80.9192	35000	37025	857	00:27:08	0	11	2	8	9	3	0	
10	AD14A3	USA	N942AN	B739	-	-	-	AAL2699	AAL	2019-06-01 00:04:59	24.2599	-82.5595	2019-06-01 00:32:22	22.9964	-82.4073	175	26000	949	00:27:24	0	11	2	8	9	3	0	
11	040060	ETH	ET-APS	¿?	-	-	-	ETH3519	ETH	2019-06-01 00:04:59	23.9347	-83.3743	2019-06-01 00:32:59	23.0866	-87.2468	35975	36000	858	00:27:59	0	11	2	8	0	0	0	
12	345007	ESP	EC-MUT	A333	-	-	-	IBE6314	IBE	2019-06-01 00:04:59	20.6487	-80.2183	2019-06-01 00:33:49	23.7109	-78.0828	34000	34000	740	00:28:49	0	11	2	8	0	0	0	
13	AC7256	USA	N9006	¿?	-	-	-	AAL2816	AAL	2019-06-01 00:18:49	23.4084	-78.5637	2019-06-01 00:35:43	25.2440	-79.6272	15025	26025	226	00:16:53	0	11	2	8	0	0	0	
14	3444C4	ESP	EC-LZJ	A337	7236	0	-	IBE6621	IBE	2019-06-01 00:04:59	23.7400	-80.6127	2019-06-01 00:36:02	22.9961	-82.4067	175	36000	1066	00:31:04	0	11	2	8	0	0	0	
15	A4388A	USA	N371FL	Q45	-	-	-	TSU7135	TSU	2019-06-01 00:04:59	23.4194	-83.2191	2019-06-01 00:39:48	25.5794	-80.8905	7675	23025	1075	00:34:50	0	11	2	8	9	10	3	
16	0004F9	MEX	XA-UJM	SWA	-	-	-	VTM659	VTM	2019-06-01 00:04:59	23.4647	-83.2433	2019-06-01 00:41:05	25.3886	-81.1132	10000	21025	1191	00:36:05	0	11	2	8	9	10	3	
17	A394F5	USA	N331QT	A333	-	-	-	TPH4003	TPH	2019-06-01 00:04:59	24.5786	-79.7882	2019-06-01 00:42:52	19.7335	-78.2322	17700	41000	908	00:37:53	0	11	2	8	9	3	0	
18	A4414A	USA	N3730B	B739	-	-	-	DAL393	DAL	2019-06-01 00:04:59	24.3536	-79.7277	2019-06-01 00:44:04	19.1875	-79.1868	34975	37025	1084	00:39:04	0	11	2	8	9	10	3	
19	300438	ITA	I-BPAG	¿?	16440	-	-	CUB986	CUB	2019-06-01 00:04:59	23.0094	-82.3766	2019-06-01 00:44:50	20.9456	-78.2061	225	35025	1134	00:39:51	0	11	2	8	9	10	3	
20	0009FC	MEX	XA-AJB	¿?	4207	0	-	AU2902	AU	2019-06-01 00:04:59	22.4080	-86.4291	2019-06-01 00:45:58	22.9932	-82.4042	200	35025	1250	00:41:00	0	11	2	8	9	3	0	
21	A5A690	USA	N463UP	B753	4606	0	-	UPS391	UPS	2019-06-01 00:04:59	20.6690	-82.2419	2019-06-01 00:46:25	25.5002	-80.9172	10725	36025	1300	00:41:26	0	11	2	8	9	11	3	
22	A6A70C	USA	N528NK	¿?	4624	0	-	NKS1338	NKS	2019-06-01 00:04:59	19.9662	-82.4506	2019-06-01 00:54:40	25.6104	-80.8582	9650	38050	1540	00:49:45	0	11	2	8	9	3	0	
23	A67C46	USA	N517NK	¿?	-	-	-	NKS401	NKS	2019-06-01 00:01:08	26.0708	-80.0021	2019-06-01 00:54:27	19.9124	-78.2560	4000	37025	915	00:53:18	0	11	2	8	0	0	0	
24	C051D1	CAN	¿?	¿?	-	-	-	TSC898	TSC	2019-06-01 00:29:59	25.8687	-79.2188	2019-06-01 00:56:24	22.6626	-77.8192	34950	35025	646	00:26:24	0	11	2	8	0	0	0	
25	A7A59F	USA	N592JB	¿?	-	-	-	JBW1718	JBW	2019-06-01 00:09:58	22.4464	-86.6944	2019-06-01 00:57:24	25.6241	-80.8539	9700	33025	1259	00:47:25	0	11	2	8	9	3	0	
26	A3A235	USA	N333NW	¿?	-	-	-	DAL513	DAL	2019-06-01 00:19:58	25.0820	-80.5425	2019-06-01 01:00:01	22.9954	-82.4082	150	26025	1232	00:40:02	0	11	2	8	9	3	0	
27	ABDE56	USA	N6702	B753	7106	0	-	DAL325	DAL	2019-06-01 00:04:59	25.5889	-81.4579	2019-06-01 01:01:43	18.2032	-82.8405	37000	37025	1712	00:56:45	0	11	2	8	9	3	0	
28	C02966	CAN	C-FPRP	B739	6341	0	-	SWG623	SWG	2019-06-01 00:19:02	27.4454	-80.8157	2019-06-01 01:02:03	23.0106	-81.4729	700	38000	1083	00:43:00	0	11	2	8	0	0	0	
29	ACBE37	USA	N320AN	B739	1342	0	-	AAL2482	AAL	2019-06-01 00:14:58	25.1043	-80.8380	2019-06-01 01:03:21	21.7323	-86.1989	15675	36025	1398	00:48:22	0	11	2	8	9	3	0	
30	C051C5	CAN	C-GEZD	A33	0723	0	-	TSC242	TSC	2019-06-01 00:24:32	26.9130	-80.6132	2019-06-01 01:06:39	23.0179	-81.4613	475	36025	1167	00:42:06	0	11	2	8	0	0	0	
31	AD448C	USA	N954NN	B739	-	-	-	AAL1482	AAL	2019-06-01 00:49:18	23.1188	-78.0655	2019-06-01 01:07:15	24.8916	-79.3904	21850	32000	280	00:17:56	0	11	2	8	9	3	0	
32	AD35E0	USA	N950NN	B739	-	-	-	AAL1082	AAL	2019-06-01 00:29:43	25.5076	-80.1437	2019-06-01 01:11:11	20.5720	-77.9651	10675	35000	768	00:41:28	0	11	2	8	9	19	3	

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Reportes de Vigilancia



countries

- Allocation of aircraft addresses to States. (Annex 10 vol3).



Aircraft

- Code 24 Bits mode S.
- Registration
- Type designator. (Doc8643)



Airline

- Code 24 Bits mode S.
- Flight ID.

- Airlines Code. ( Doc 8585)



Tabulated report of the statistics in a time interval with the application of several configured filters.

➤ **Percentage of aircraft between Radar / ADS-B / MLAT .**

➤ **Surveillance data list (RAD, ADS, MLT)**

- ID Mode A, Addr , Target ID
- Flight level.
- amount of data
- DO260, NIC, NAC, SIL, PIC.
- FIR.

➤ **Detailed report by:**

- countries.
- Airlines.
- Aircraft type designator .
- DO260 version, NIC, NAC, SIL.
- Compliance criteria.





# Statistical analysis reports

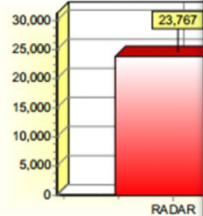
## Systems



### Reporte

Tiempo Inicial:  
Tiempo Final:  
Región:  
Cobertura:  
M3/A: 0  
DO260: 0 - 3

#### Análisis por Sistemas



Mensajes ASTERIX  
Mensajes TRACKs  
Objetivos analizados

Tiempo de Vuelo  
Área  
Nivel de vuelo  
Filtro de región

M3/A  
Target ID  
Codigo 24bit OACI  
DO260  
NIC  
NAC  
SIL

Filtro de Parámetro

Objetivos analizados  
Filtro de región  
Filtro de Parámetro

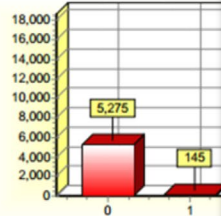
## DO-260



### Reporte

Tiempo Inicial:  
Tiempo Final:  
Región:  
Cobertura:  
M3/A: 0  
DO260: 0 - 3

#### Análisis por versión DO



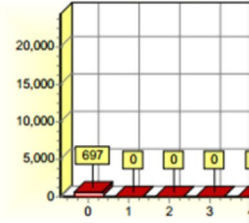
## NICp



### Reporte

Tiempo Inicial:  
Tiempo Final:  
Región:  
Cobertura:  
M3/A: 0  
DO260: 0 - 3

#### Análisis por NICp (Navegación)



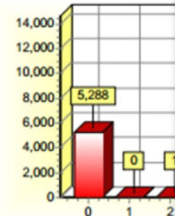
## CAPN



### Reporte

Tiempo Inicial:  
Tiempo Final:  
Región:  
Cobertura:  
M3/A: 0  
DO260: 0 - 3

#### Análisis por NACp



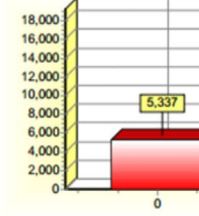
## LIS



### Reporte

Tiempo Inicial:  
Tiempo Final:  
Región:  
Cobertura:  
M3/A: 0  
DO260: 0 - 3

#### Análisis por SIL (Surveillance)



## Criterion



### Reporte de aeronaves en vigilancia

FIR

Tiempo Inicial: 2022-07-01 00:00 Tiempo Final: 2022-07-25 00:00  
Tiempo de vuelo: 00:10:00 - 23:59:59 Espera: 20.0 min.  
Región: --- Nivel de vuelo: 10000 - 55000  
Cobertura RADAR: --- ADS-B: --- MLAT: ---  
M3/A: 0000 - 7777 Addr: 000000 - FFFFFFFF ID:  
DO260: 0 - 3 NICp: 6 - 11 NACp: 0 - 15 NACv: 0 - 7 SIL: 0 - 3 (Ave)

#### Análisis por Aerolíneas.

#### Listado de vuelos por Aerolíneas. (¿?)

No	Address	Register	Flight ID	Code	Cnt	260	NICp	NACp	NACv	SIL	SDA	GVA	Cumple
1	0AC9DE	¿?	VVC478	¿E?	1	2	8	9	1	3	3	2	SI
2	0ACA28	¿?	VVC479	¿E?	1	2	8	9	1	3	3	2	SI
3	0C2056	¿?	JOS5218	¿E?	1	2	8	9	1	3	2	2	SI
4	0C2077	¿?	CMP121	¿E?	1	2	8	9	1	3	2	2	SI
5	0C20CE	¿?	CMP136	¿E?	1	2	8	9	1	3	2	2	SI
6	0D001E	¿?	AMX931	¿E?	1	2	8	9	1	3	2	2	SI
7	0D0339	¿?	XAKCM	¿E?	1	2	9	10	2	3	3	2	SI
8	0D0380	¿?	SLI2067	¿E?	2	2	8	10	2	3	2	2	SI
9	0D0381	¿?	SLI2099	¿E?	1	2	8	10	2	3	2	2	SI
10	0D03BF	¿?	XBRSC	¿E?	3	2	8	9	2	3	2	2	SI
11	0D03F4	¿?	SLI2520	¿E?	1	2	8	10	2	3	2	2	SI
12	0D04AF	¿?	SLI651	¿E?	1	2	8	10	2	3	2	2	SI
13	0D04DF	¿?	SLI2044	¿E?	1	2	8	10	2	3	2	2	SI
14	0D05E4	¿?	SLI306	¿E?	4	2	8	10	2	3	2	2	SI
15	0D0648	¿?	SLI629	¿E?	1	2	8	10	2	3	2	2	SI
16	0D06C1	¿?	SLI523	¿E?	1	2	8	10	2	3	2	2	SI
17	0D06D3	¿?	SLI2418	¿E?	1	2	8	10	2	3	2	2	SI
18	0D06DE	¿?	SLI2132	¿E?	1	2	8	10	2	3	2	2	SI
19	0D06FD	¿?	SLI395	¿E?	1	2	8	10	2	3	2	2	SI
20	0D0703	¿?	SLI2413	¿E?	4	2	8	10	2	3	2	2	SI
21	0D0707	¿?	AMX678	¿E?	1	2	8	9	1	3	2	2	SI
22	0D0731	¿?	¿EX	¿E?	2	2	8	9	2	3	2	2	SI
23	0D073D	¿?	XAGAT	¿E?	1	2	8	10	1	3	2	2	SI
24	0D075A	¿?	XAELX	¿E?	1	2	8	10	2	3	2	2	SI
25	0D0798	¿?	XAKAR	¿E?	1	2	8	10	2	3	2	2	SI
26	0D07B3	¿?	VOI111	¿E?	1	2	8	9	1	3	2	2	SI
27	0D07E2	¿?	XALCD	¿E?	1	2	8	10	1	3	2	2	SI
28	0D07FC	¿?	XAEMM	¿E?	1	2	8	10	2	3	2	2	SI
29	0D0805	¿?	AMX325	¿E?	1	2	8	9	1	3	2	2	SI
30	0D080E	¿?	SLI2697	¿E?	1	2	8	10	2	3	2	2	SI
31	0D0810	¿?	SLI305	¿E?	2	2	8	10	2	3	2	2	SI
32	0D083B	¿?	SLI634	¿E?	1	2	8	10	2	3	2	2	SI
33	0D08A5	¿?	AMX436	¿E?	1	2	8	9	1	3	2	2	SI
34	0D08A7	¿?	FAM5209	¿E?	1	2	8	10	1	3	2	2	SI
35	0D08B1	¿?	SLI134	¿E?	3	2	8	10	2	3	2	2	SI
36	0D08EB	¿?	VOI137	¿E?	3	2	8	9	1	3	2	2	SI
37	0D08EE	¿?	AMX423	¿E?	1	2	8	9	1	3	2	2	SI
38	0D08F4	¿?	VOI805	¿E?	1	2	8	9	1	3	3	2	SI
39	0D08FD	¿?	VOI981	¿E?	1	2	8	9	1	3	3	2	SI
40	0D0939	¿?	VIV2135	¿E?	1	2	8	9	1	3	2	2	SI
41	0D093E	¿?	LCT7033	¿E?	4	2	8	10	2	3	2	2	SI



# Identification analysis .

## Reporte de aeronaves en vigilancia

### *FIR HABANA*



Tiempo Inicio: 2019-06-01 00:00 Tiempo Final: 2019-07-01 00:00

Tiempo de vuelo: 00:10:00 - 23:59:59 Espera: 5.0 min.

Región: **FIR HAV** Nivel de vuelo: **10000 - 55000**

RADAR: **MCA** ADS-B: **MCA** MLAT: **—**

DO260: **0 - 2** NICp: **6 - 11**



### Listado de vuelos sin identificar Aerolineas.

No	ID	Flight ID	InitTime	LastTime	
1	A6881D	N52RS	2019-06-15 17:34:53	2019-06-15 18:36:56	2019-06-15 18:36:56
2	A3D0F5		2019-06-08 19:14:36	2019-06-08 20:16:35	2019-06-08 20:16:35
3	A88026	N650EH	2019-06-15 17:58:28	2019-06-15 18:59:54	2019-06-15 18:59:54
4	A00806	N15BY	2019-06-15 17:44:30	2019-06-15 18:55:44	2019-06-15 18:55:44
5	A90589	N729FS	2019-06-19 16:06:01	2019-06-19 17:15:28	2019-06-19 17:15:28
6	AC8A63	NK651	2019-06-04 15:18:04	2019-06-04 16:05:42	2019-06-04 16:05:42
7	AA6332	621	2019-06-25 18:29:33	2019-06-25 19:27:01	2019-06-25 19:27:01
8	A63841	N500PM	2019-06-12 14:38:49	2019-06-12 15:55:33	2019-06-12 15:55:33
9	AA63C9	584	2019-06-08 21:29:56	2019-06-08 22:03:15	2019-06-08 22:03:15
10	OC602F	BW476	2019-06-25 18:24:54	2019-06-25 19:18:20	2019-06-25 19:18:20
11	ACA91A	N915AM	2019-06-19 21:04:50	2019-06-19 22:02:40	2019-06-19 22:02:40
12	A65CC5	N509QS	2019-06-15 19:14:57	2019-06-15 20:18:01	2019-06-15 20:18:01



# **Example of Statistic analysis**

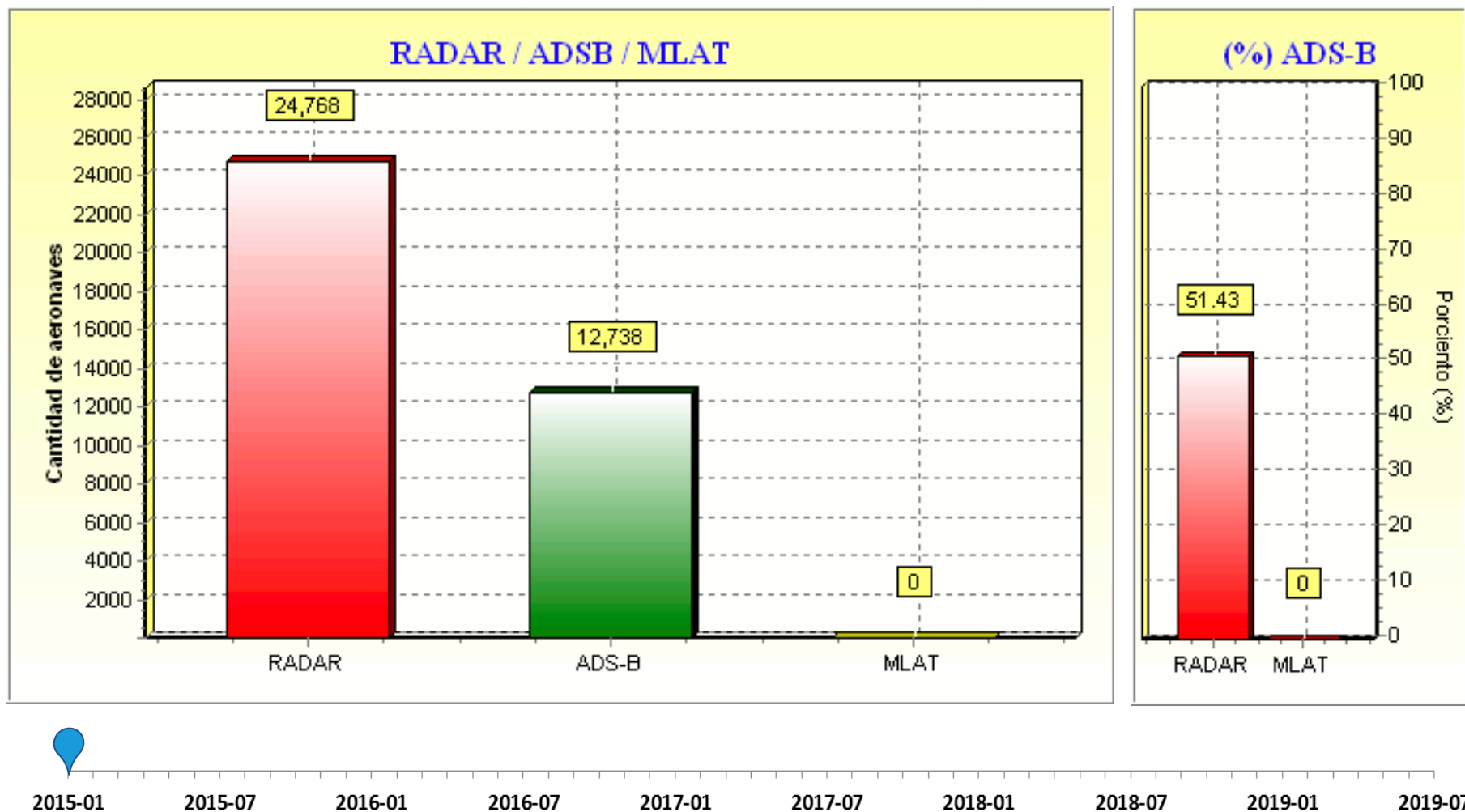
**Cuba  
(2015-2019).**



# Evolution of the ADS-B implementation ( 2015-2019)

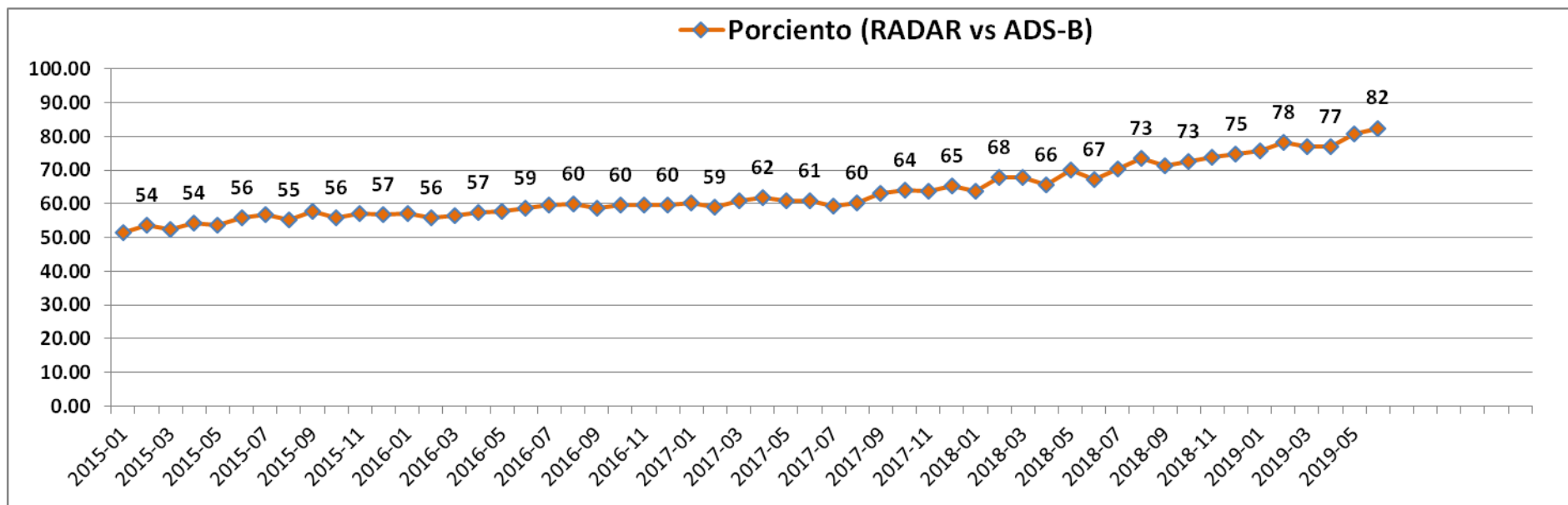
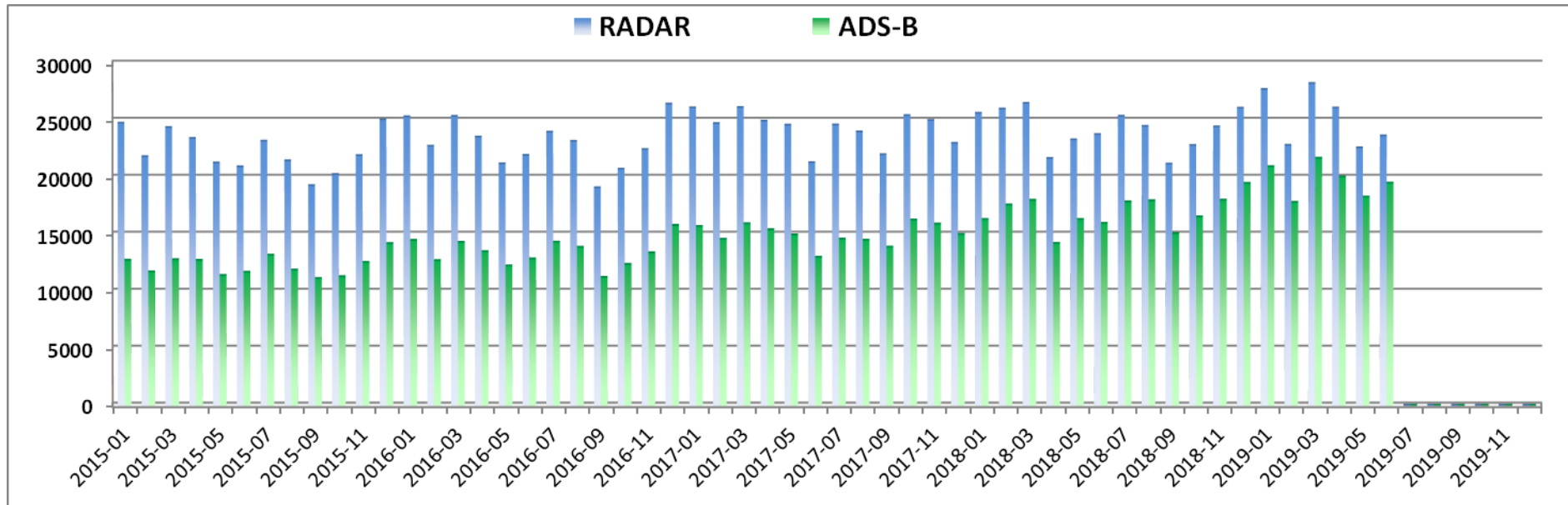
Graphs in a time interval of the parameters:

**(RADAR vs ADSB)**



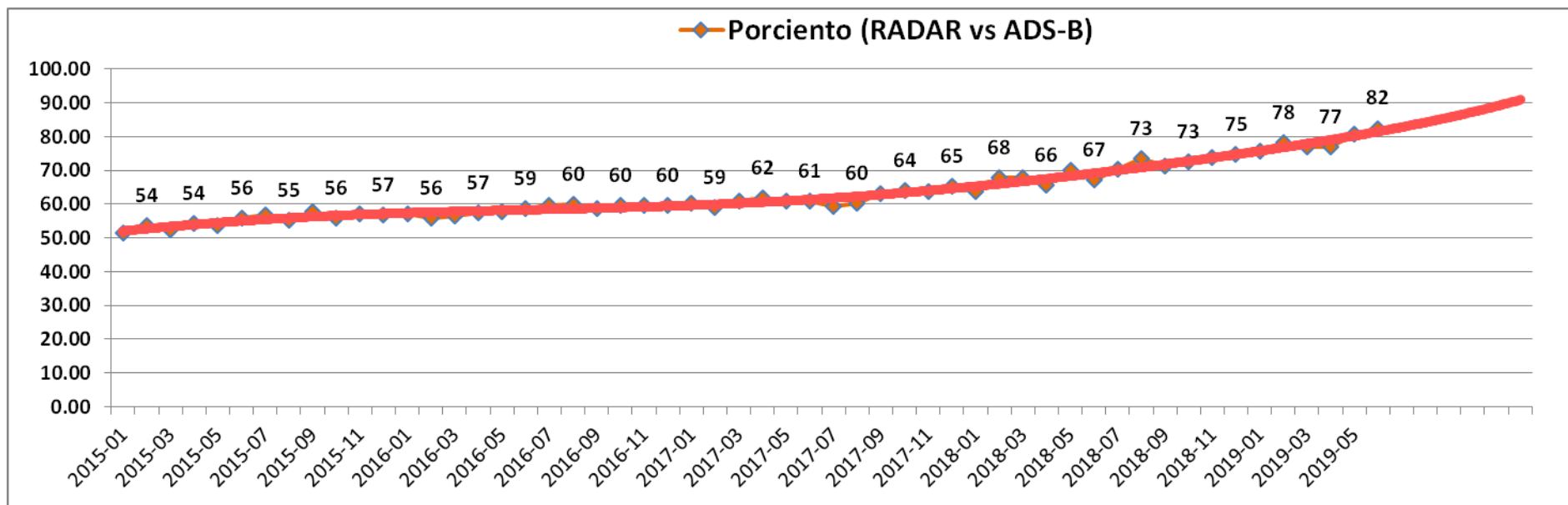
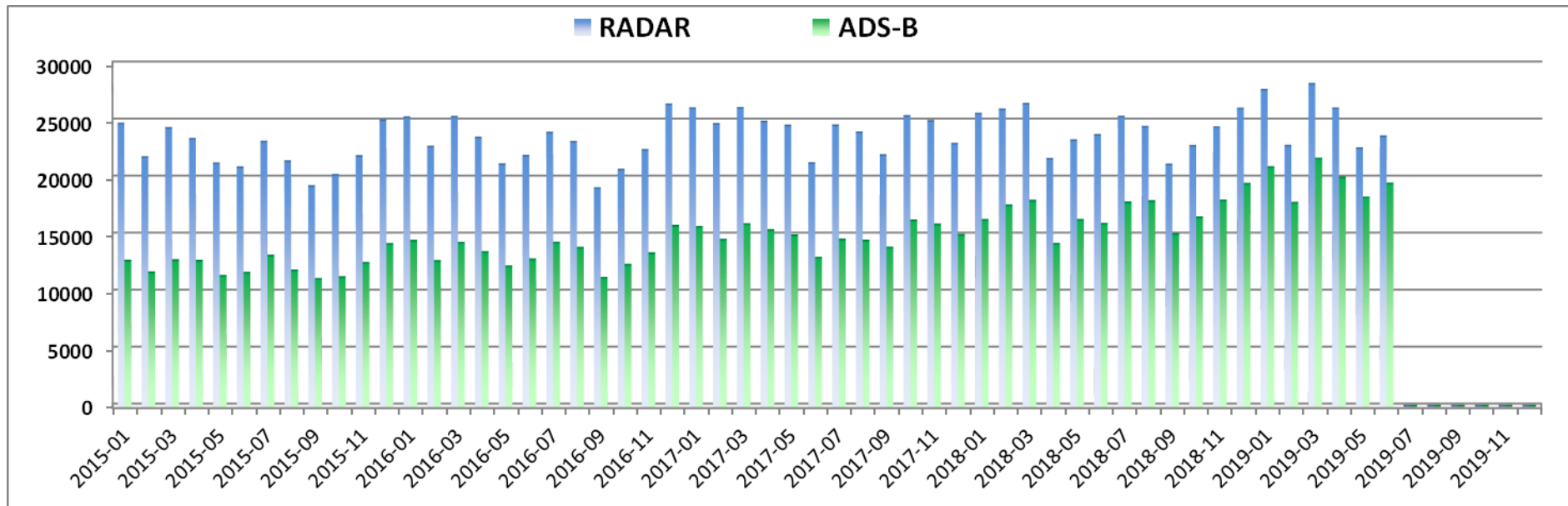


# RADAR vs. ADS-B data analysis .





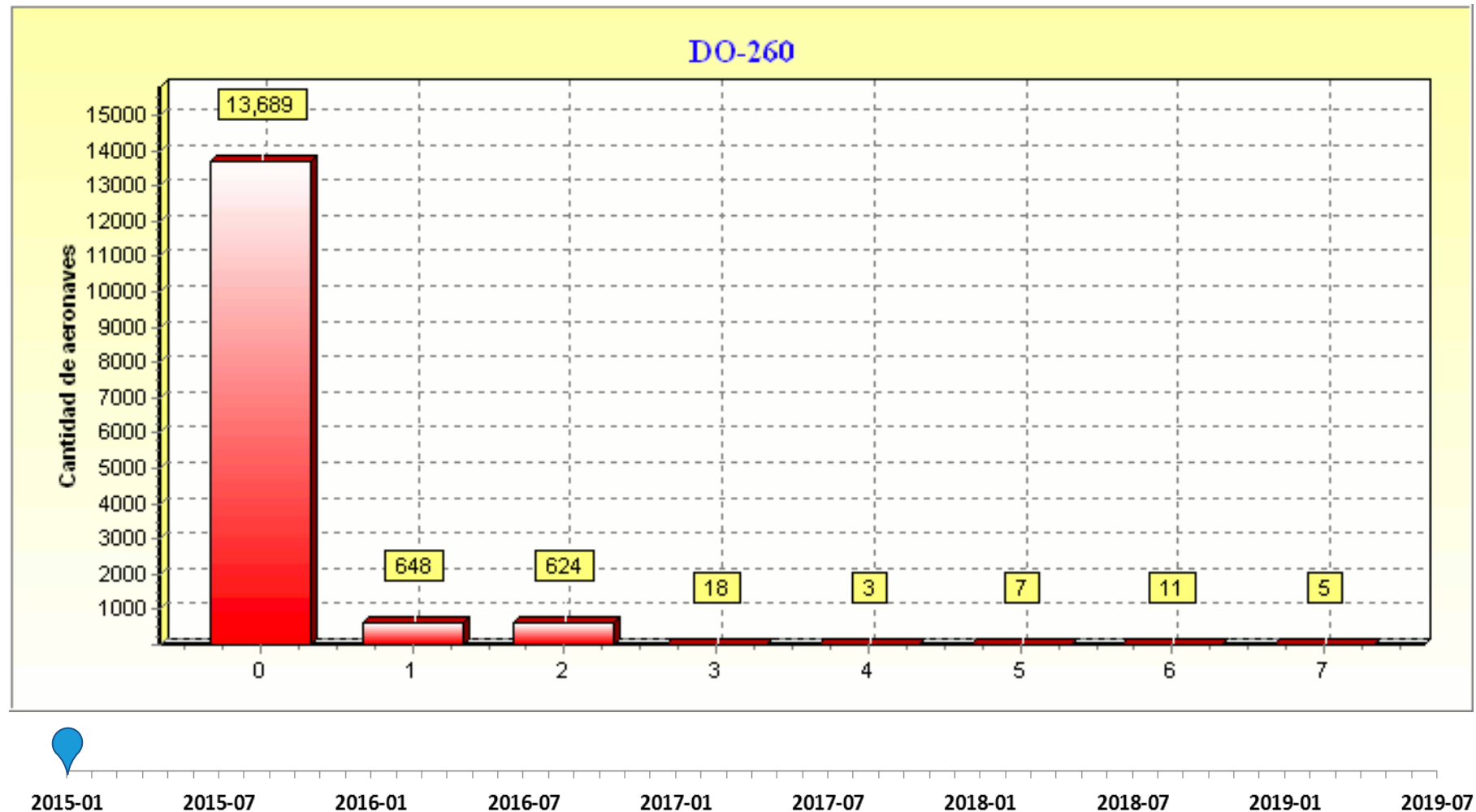
# RADAR vs. ADS-B data analysis .





# Evolution of the ADS-B implementation ( 2015-2019)

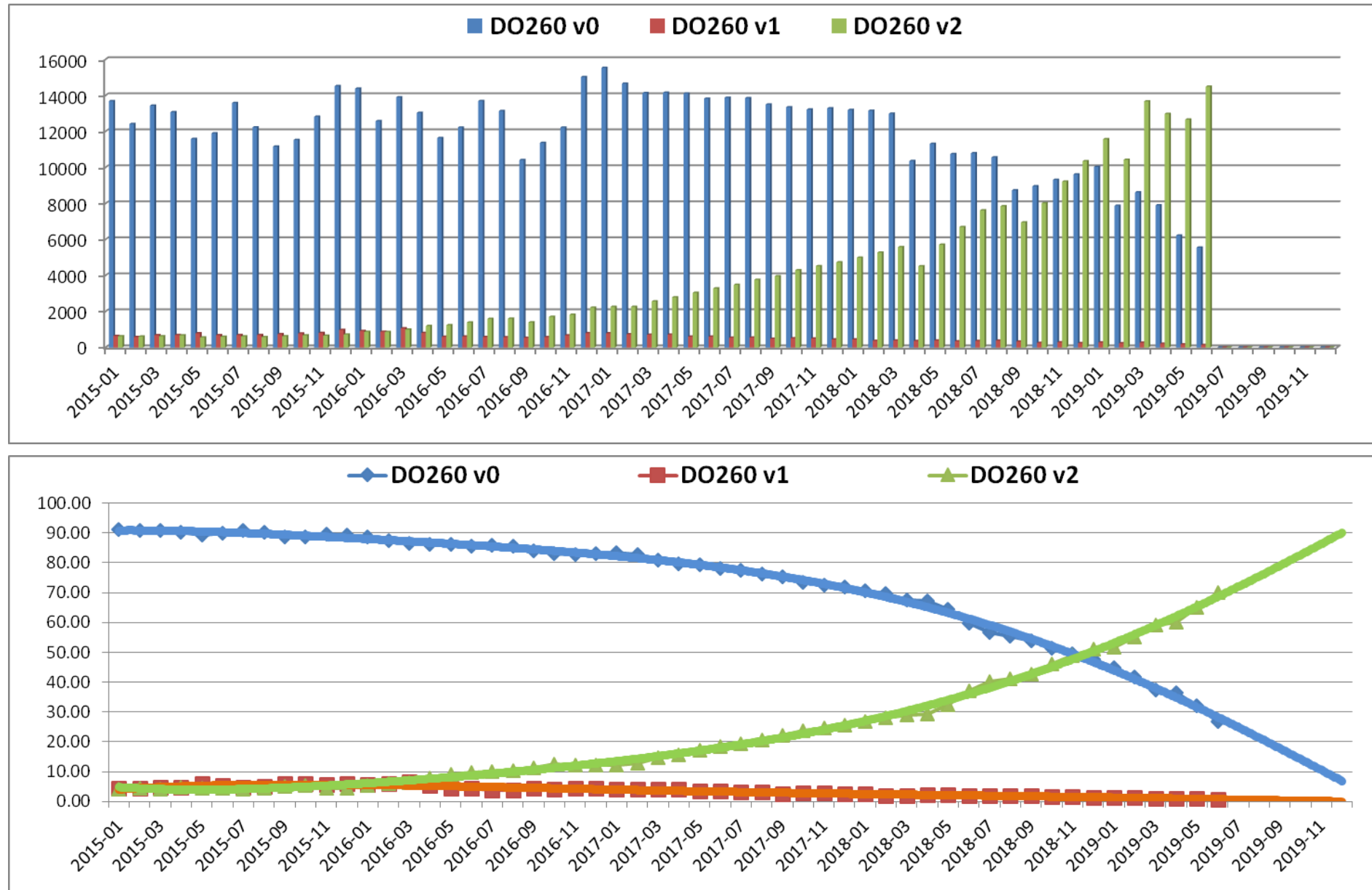
Graphs in a time interval of the parameters:  
**(DO-260 version)**





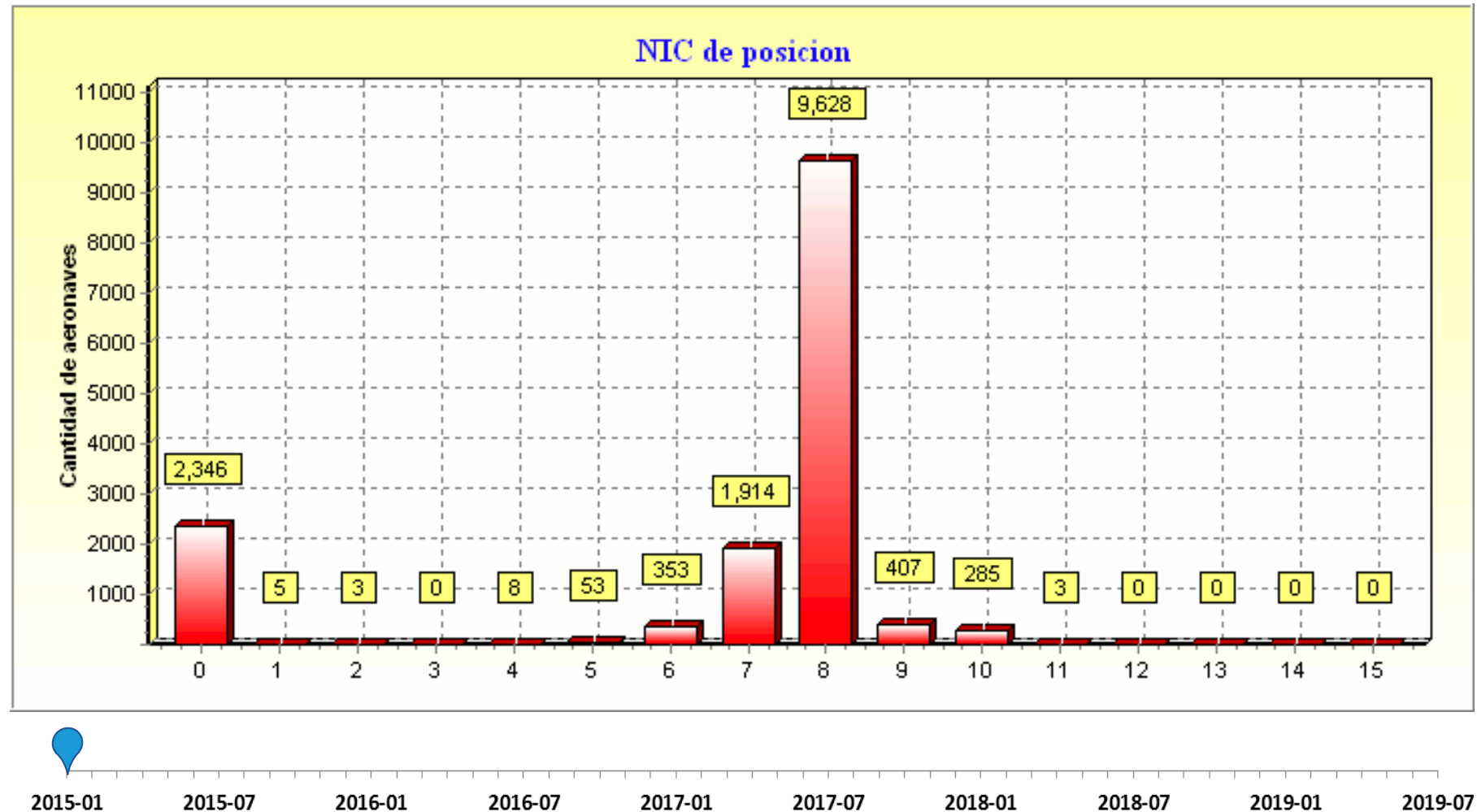


# Analysis of the DO-260 version



# Evolution of the ADS-B implementation ( 2015-2019)

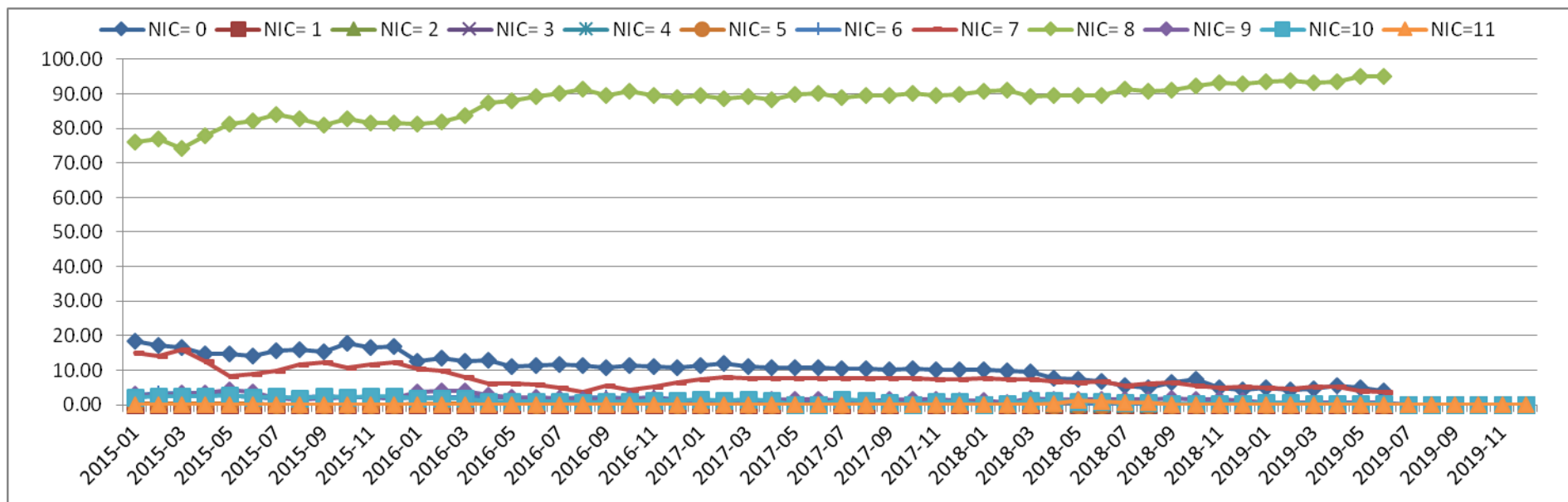
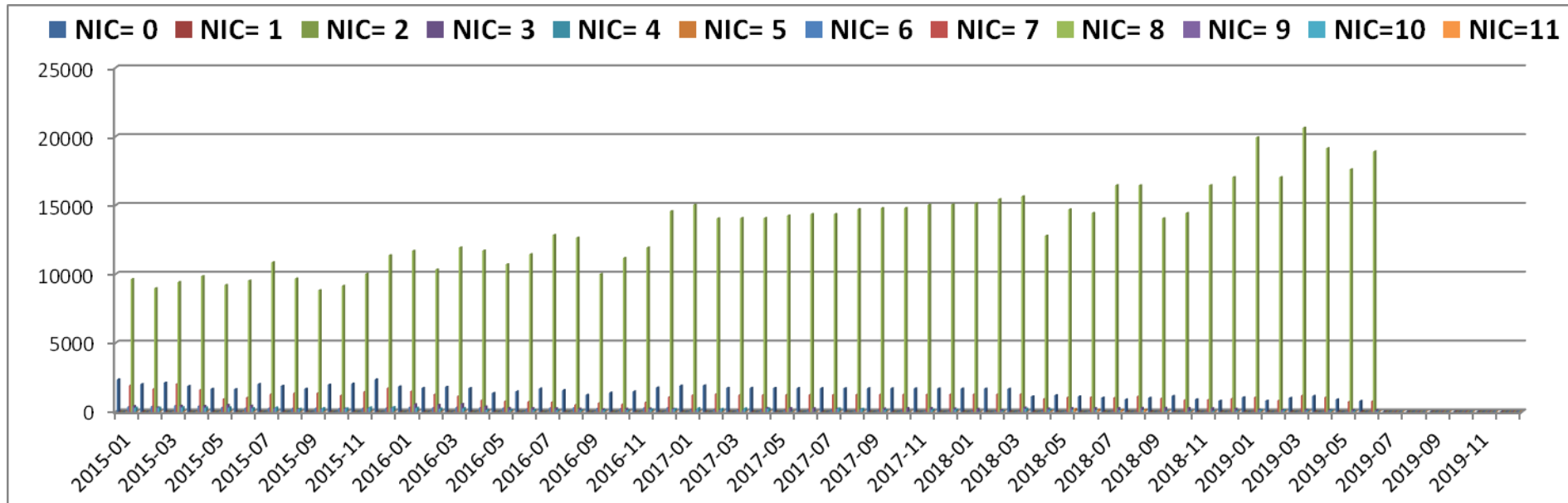
Graphs in a time interval of the parameters:  
**(position NIC)**



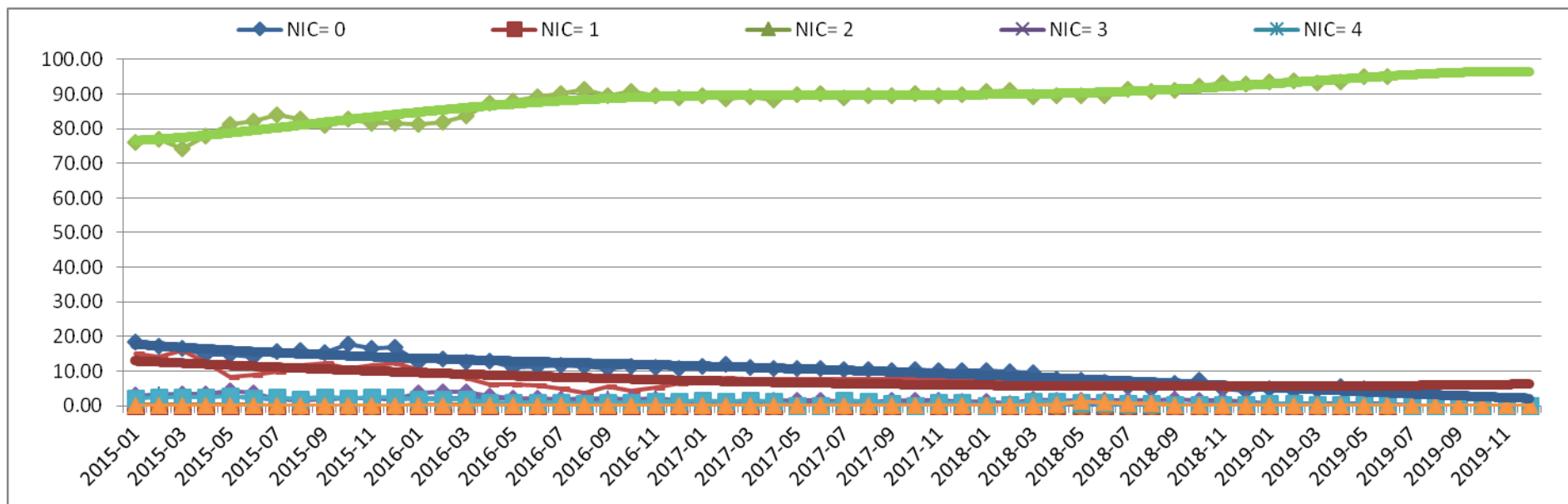
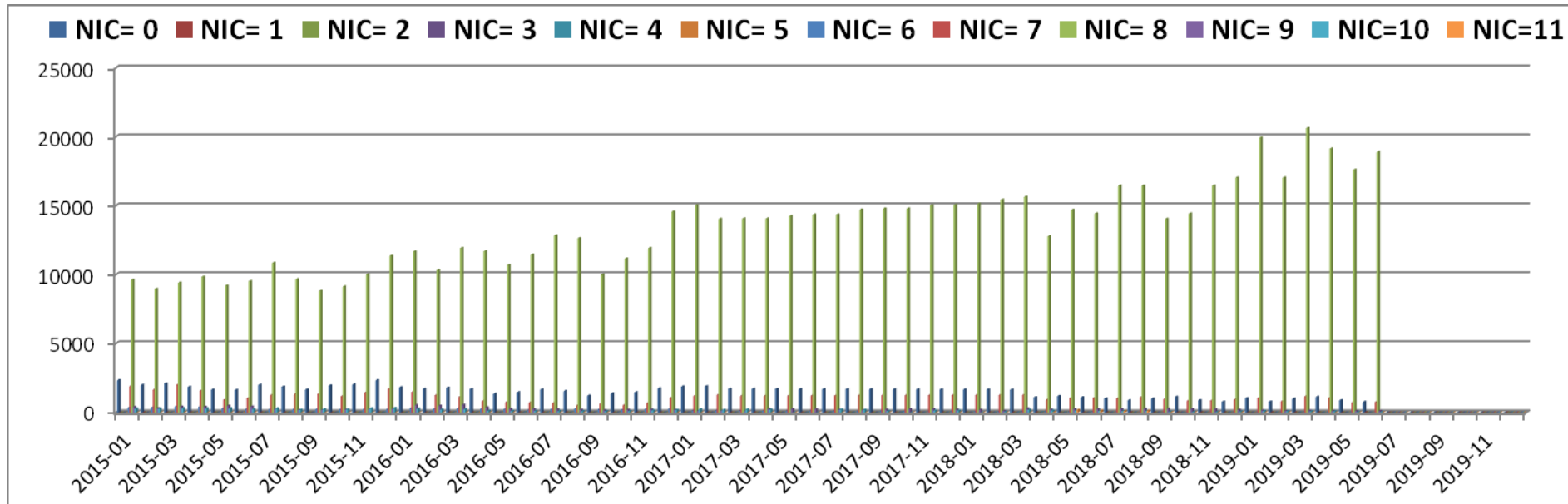




# Position NIC analysis .

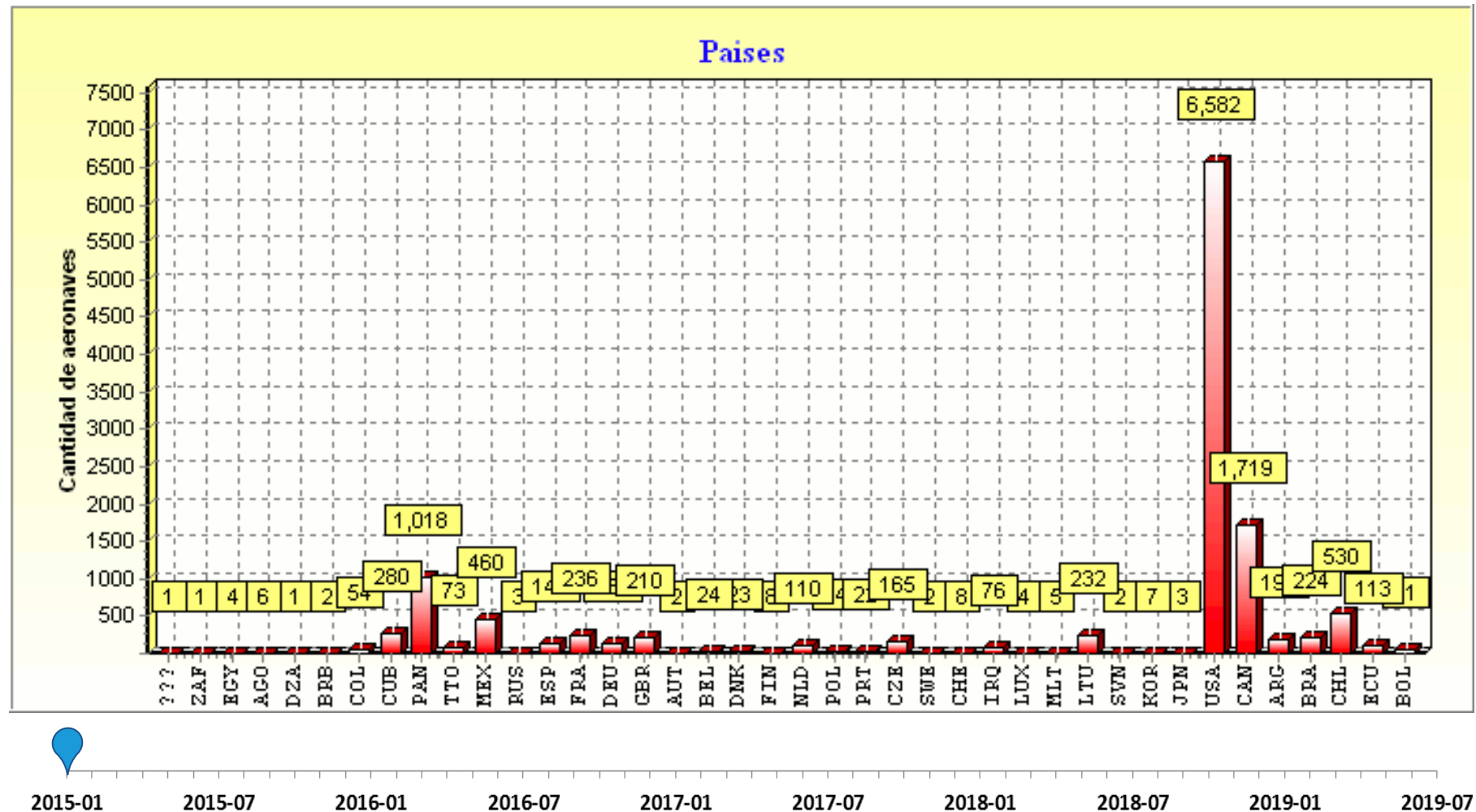


# Position NIC analysis .



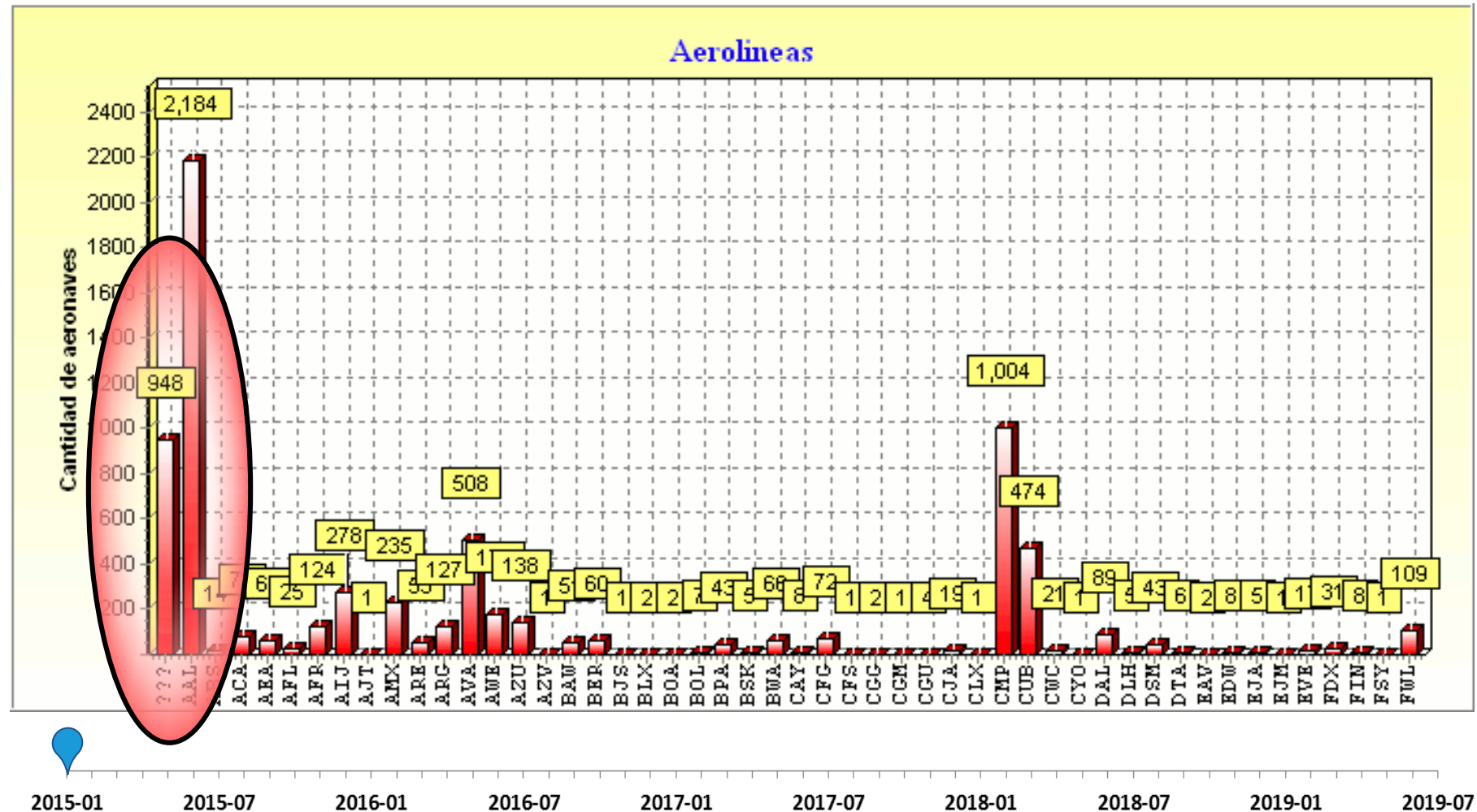
# Evolution of the ADS-B implementation ( 2015-2019 )

Graphs in a time interval of the parameters:  
( Address → Countries )



# Evolution of the ADS-B implementation ( 2015-2019 )

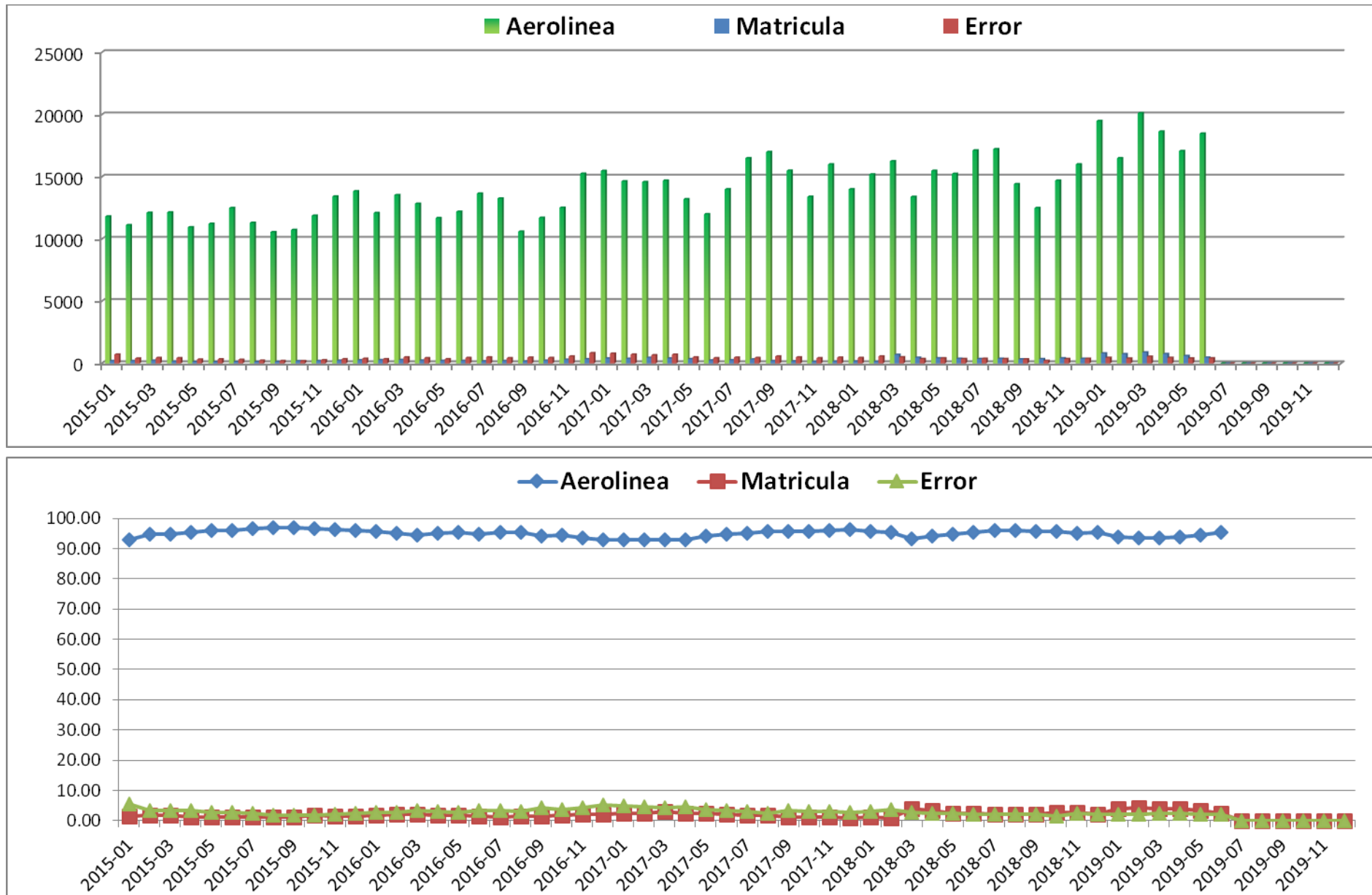
Graphs in a time interval of the parameters:  
( ID → Airlines )





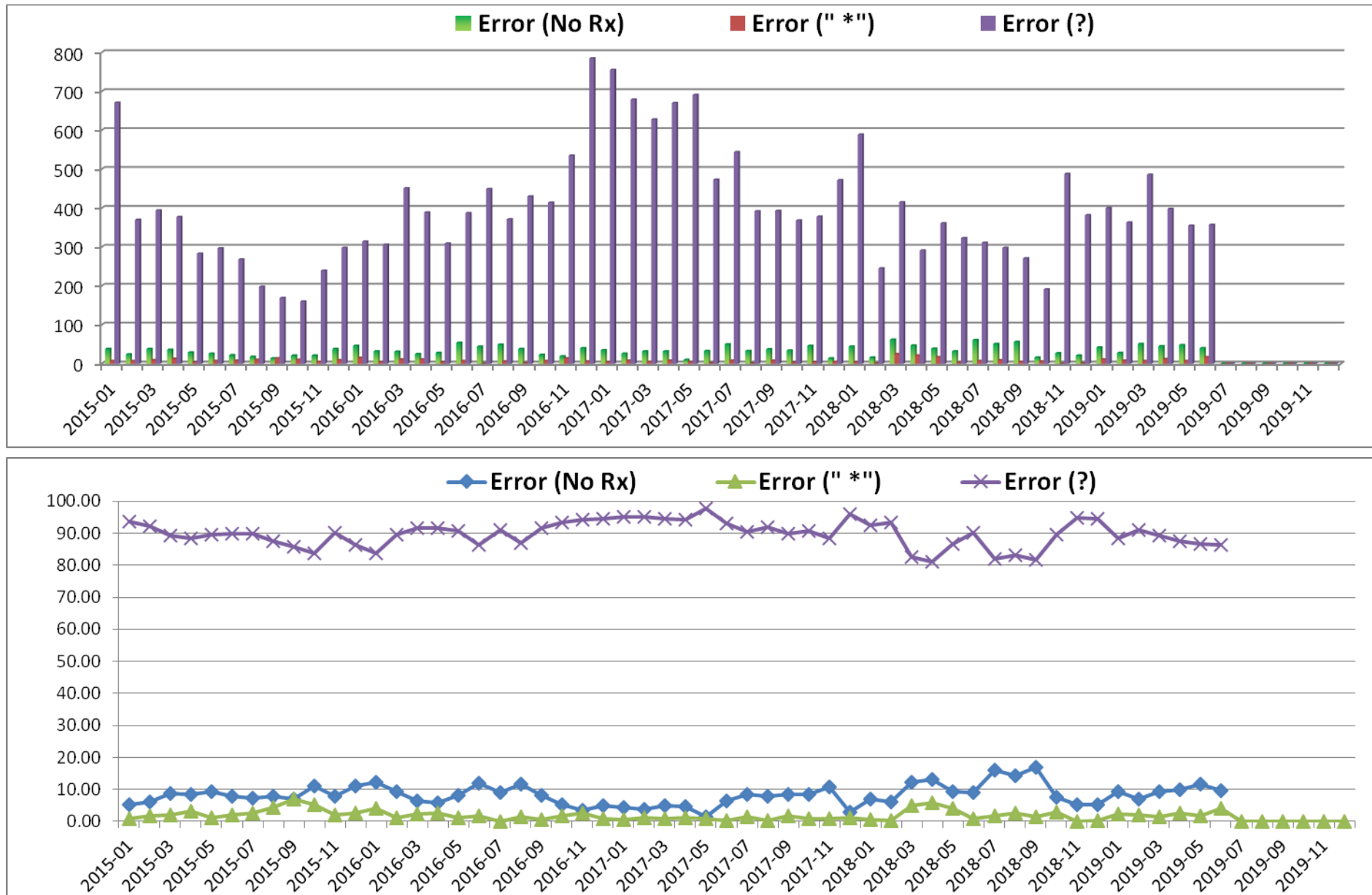


# Identification analysis .



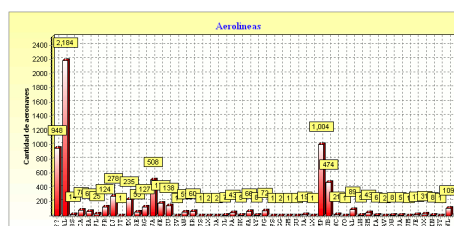
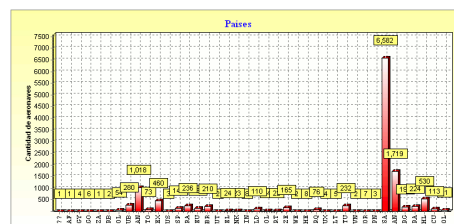
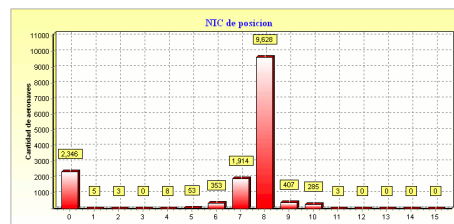
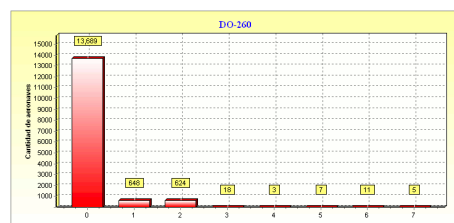
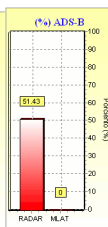
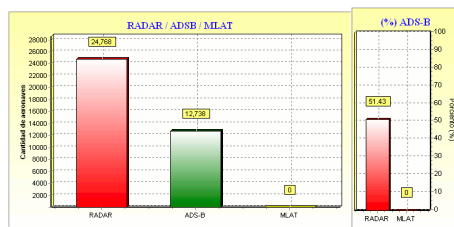


# Identification analysis .





# Summary of statistical analysis.



Statistical analysis of surveillance systems shows :

- A sustained growth of aircraft with ADS-B transmissions.
- The reduction of transponders with the DO-260 / DO-260A version and the increase of the DO-260B version.
- The predominant Navigation Integrity Category (NIC) is NICp =8.
- There are errors in the introduction of the ID identifier, so they cannot be correlated with the airline codes .
- There are transponder configuration errors with the 24-bit code assigned for each state.



# Conclusions

- These software allow a preliminary analysis of the behavior of the implementation of ADS-B surveillance systems, being able to analyze the status of aircraft operating in a given region .
- It is easy to configure the parameters and the time interval you want to obtain .
- network traffic for analysis is minimized .
- A scenario with a high volume of information has been tested , and its stability can be verified.
- It is a system in constant development, which continues to evolve with new possibilities .



The image features a vibrant blue background with flowing, wavy lines that create a sense of movement. The text 'Thank you!' is prominently displayed in the center in a bold, red, serif font. The letters have a slight shadow effect, making them stand out against the blue background.

Thank you!