

**SURVEILLANCE AND CONFLICT RESOLUTION SYSTEMS PANEL  
(SCRSP)**

**SURVEILLANCE SYSTEMS WORKING GROUP-B**

**Montreal, 26<sup>th</sup> to 30<sup>th</sup> April, 2004**

**Agenda Item 5.5 : Implementation monitoring**

**Analytical Results of Unauthorized Aircraft Address  
Measured by Aircraft Address Monitoring System**

**INFORMATION PAPER**

(Presented by Fumiki Horikoshi)  
(Prepared by Naoki Fujii, ENRI and Toshio Nakamura, NEC)

**SUMMARY**

This paper describes the analytical result to detect the unauthorized aircraft address by Aircraft Address Monitoring System installed at the New Tokyo and Kansai international airports.

## **1. Introduction**

The Aircraft Address Monitoring System (AAMS), which is the detection system for unauthorized aircraft addresses, has been operating since July 17<sup>th</sup>, 1996 at New Tokyo International Airport and since June 1<sup>st</sup>, 1997 at Kansai International Airport. It was already introduced by several WPs at WG1 (SICASP), WGB (SCRSP) and SICASP/7. And the latest WP is WPB6-32-I at Honolulu in November 2003.

This paper updates the list of the unauthorized address aircraft, considering the recent analytical results.

## **2. Analytical Result and Conclusion**

The analytical results measured by the AAMS are listed in Table-1, and the transition of unauthorized address aircraft is shown in Fig-1. Most of unauthorized address aircraft are estimated by the differences between the nationality of their registration numbers and the nationality of their aircraft addresses. Some unauthorized address aircraft are estimated by their aircraft addresses having only their nationality codes. The number of unauthorized address aircraft has been decreasing since AAMS started to operate in the second half of 1997, and as the result of this analysis, we can see the tendency to decrease the number of unauthorized address aircraft. On the other hand, we can see the tendency to increase some private aircraft with unauthorized address since the 2<sup>nd</sup> half of 2001.

Believing that this activity is very effective to reduce the unauthorized address aircraft, we will continue this activity even after implementation of SSR mode S sensors in Japan.

### **(Note)**

From September 2003 to December 2003, it was impossible to monitor unauthorized address aircrafts by the AAMS installed at Kansai International Airport, because Mikunisan SSR, the AAMS used Mikunisan SSR to receive replies synchronized to interrogation transmission, didn't operate due to its reinstallation work.

After reinstallation, Mikunisan SSR system has been changed to mode S system, resulting in decrease of mode A interrogation rate. Therefore, instead of Mikunisan SSR, we selected Mikawa SSR for receiving replies synchronized to interrogation transmission.

As a result, it is possible to monitor by the AAMS at Kansai International Airport above 10,000 ft, but we believe that the fact has little effect on monitoring unauthorized address aircrafts by the AAMS.

**Table-1 List of Unauthorized Mode S Aircraft**

Registration Country	Registration Number	Operation Airline	Operation Airline Country	Mode S Address	Mode S Assignment country	code*	2000 1st half	2000 2nd half	2001 1st half	2001 2nd half	2002 1st half	2002 2nd half	2003 1st half	2003 2nd half	Total	Remarks
Aruba?	P4GJC	OPR/PV	-	48412E	Netherlands	1					2	2			4	
Australia	VNA764	Vietnam Airlines	Vietnam	000000	No assignment	3			12						12	
No assignment	70400	OPR/DOD	-	AE010D	United States	1						2			2	U.S. governmental?
Germany	DABVT	Deutsche Lufthansa, A.G.	Germany	BC4AD4	No assignment	1			6	5		6			17	3C4AD4? bit 1 error
Italy	IDEIC	Alitalia-Linee Aeree Italiane, S.P.A.	Italy	340089	Spain	1				2					2	300089?
Japan	JA8498	Japan Air System CO.LTD.	Japan	02DDCA	Tunisia	1					2				2	86DDCA, upper 6 bits error
Japan	JA8930	Japan Transocean Air	Japan	3C618D	Germany	1	1	25							26	
Korea	HL7465	Korean Air Lines CO. LTD.	Korea	38DC65	France	1					4	14	13	9	40	71B8CA?, 1 bit shift
Korea	HL7281	Korean Air Lines CO. LTD.	Korea	713A81	Saudi Arabia	1		1							1	
Malaysia	9MMHL	Malaysian Airlines System	Malaysia	750000	Malaysia	2	6	10	2	7					25	

Registration Country	Registration Number	Operation Airline	Operation Airline Country	Mode S Address	Mode S Address country	code*	2000 1st half	2000 2nd half	2001 1st half	2001 2nd half	2002 1st half	2002 2nd half	2003 1st half	2003 2nd half	Total	Remarks
Malaysia	9MMPI	Malaysian Airlines System	Malaysia	7D0034	Australia	1				4	2	1			7	750034? bit 5 error
Malaysia	9MMPM	Malaysian Airlines System	Malaysia	F7007A	No assignment	1	5	9	6	1					21	
Russian Federation	RPC3223	Philippine Air Lines Inc.(PAL)	Philippine	77801D	Syria	1						5	5	1	11	
United Kingdom?	MM62173	Private?	-	33FFF8	Italy	1					2				2	
China	BHXA	Cathay Pacific Airways LTD.	China	70015B	Afghanistan	1	3								3	
China	B16103	EVA Airlines Corporation	China	81908B	India	1			1						1	
United States	N201YT	Private?	-	E1A484	Argentina	1				2					2	
United States	N527MC	China Airlines	Taiwan	000005	No assignment	1	1	4							5	
United States	N213MT	Private?	-	E19242	Argentina	1				2					2	
United States	N307FV	Private?	-	000000	No assignment	3				2					2	
United States	N496AN	Private	-	04C034	Kenya	1						2			2	
United States	N526MD	World Airlines	United States	44B24D	Belgium	1						4			4	
United States	N660US	Northwest Orient Airlines INC.	United States	E83F8F	No assignment	1							3		3	A83F8F? 2MSB Error

Registration Country	Registration Number	Operation Airline	Operation Airline Country	Mode S Address	Mode S Assignment country	code* code 3	2000 1st half	2000 2nd half	2001 1st half	2001 2nd half	2002 1st half	2002 2nd half	2003 1st half	2003 2nd half	Total	Remarks	
United States	N666US	Northwest Orient Airlines INC.	United States	88CC56	Japan	1	21	16							37		
United States	N142SW	Northwest Orient Airlines INC.	United States	780009	China	1	2								2		
United States	N881Q	Private?	-	C7DC05	No assignment	1				2					2		
China	BHLC	Cathay Pacific Airways LTD.	China	F80126	No assignment	1								7	7		
Japan	JA190A	ORANGE CARGO Inc.	Japan	A0D020	United States	1								29	29		
United States	N641NW	Northwest Orient Airlines INC.	United States	886A33	Thailand	1						1	1		2		
<b>TOTAL NUMBER</b>							39	65	27	25	14	37	22	46	275		
No. of Unauthorized aircraft							7	6	5	8	6	9	4	4	49		

\*code 1 : The nationality of the Registration Number differs from that of Mode-S address.

\*code 2 : The bits for individual assignments are all zeroes.

\*code 3 : All bits are zeroes.

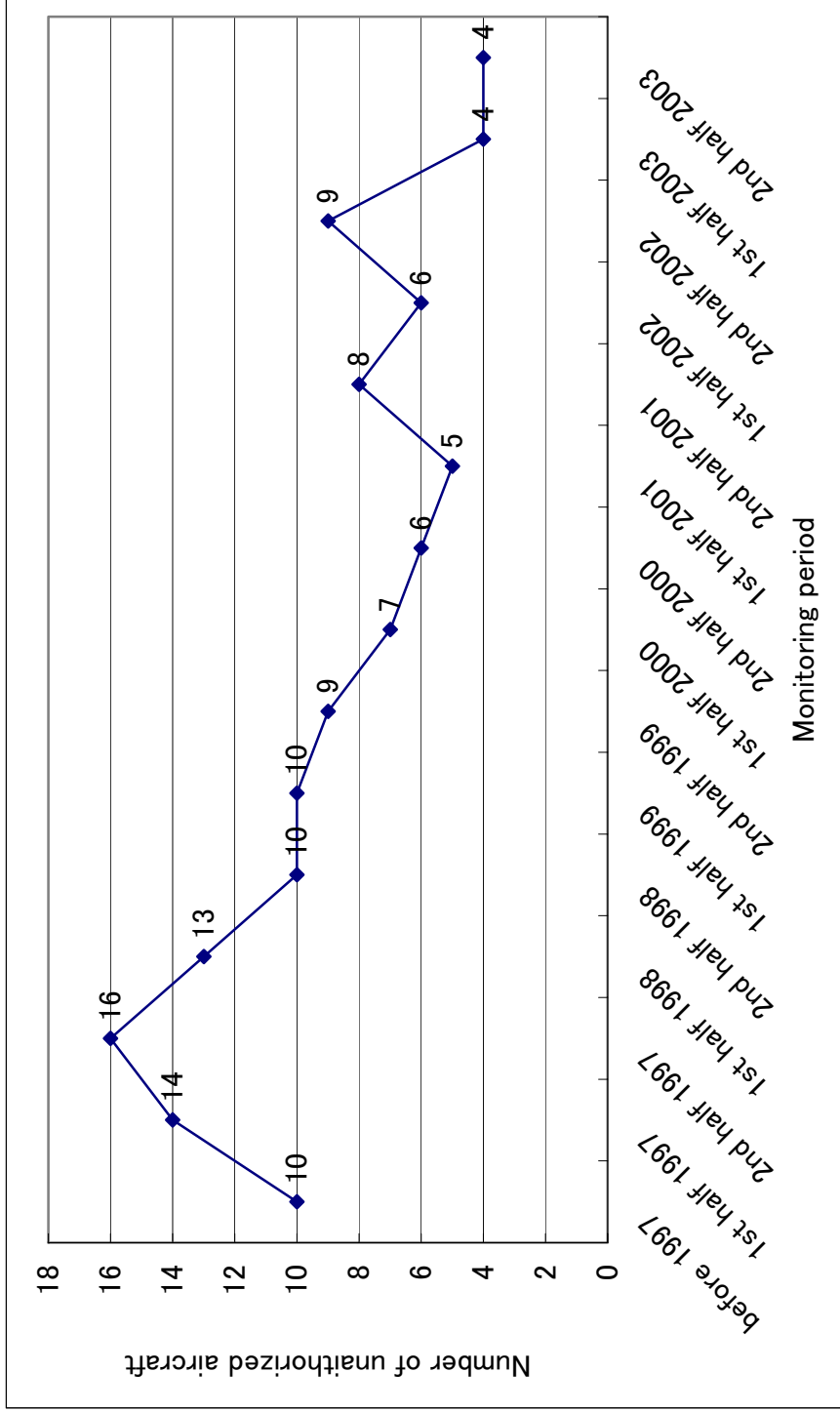


Fig-1: Transition of number of unauthorized address aircraft