



R041-12-103246-1A - DM / CV - CHB

# RADIO TEST REPORT

According to the standard(s):

OET Bulletin 65 (1997), RSS 102 (2010)

Equipment under test:

HF AM1 OMNII  
 FCC ID: GM3HFAM1XT10  
 IC ID: 2739D-HFA1XT10


Company:

PSION TEKLOGIX

Diffusion: Mr BONNEFOY

(Company: PSION EUROPE)

Number of pages: 15 including 1 annex

Ed.	Date	Modified page(s)	Written by		Technical verification Quality approval	
			Name	Visa	Name	Visa
0	30-Aug-12	Creation	David MONTAULON		Régis GONZALEZ	

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*NAME OF THE EQUIPMENT UNDER TEST (E.U.T.)* : HF AM1 OMNII

*Serial number* : None

*Part number* : None

*Software Version* : None

*MANUFACTURER'S NAME* : PSION TEKLOGIX

*APPLICANT'S ADRESS:*

*Company* : PSION TEKLOGIX

*Adress* : 135 rue de la Duranne  
BP 421000 - 13591 AIX EN PROVENCE  
CEDEX 3.  
FRANCE

*Person(s) present during the tests* : Mr FORNIER

*Responsible* : Mr BONNEFOY

*DATE(S) OF TESTS* : July 9<sup>th</sup> and 10<sup>th</sup> of 2012

*TESTS LOCATION(S)* : Emitech Grand Sud Laboratory in  
Vendargues (34)  
Open area test site in Salinelles (30)  
FCC Registration number: 8127-19  
IC Filling number : 4379C-1

*TESTS SUPERVISOR(S)* : None

*TESTS OPERATOR(S)* : David MONTAULON

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### 1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment HF AM1 OMNII (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below. Worst case configuration is used between WAP-C, WAP-S, antenna and with or without docking station.

### 2. REFERENCE DOCUMENT(S)

FCC Part 15 (February 2006)

Code of Federal Regulations  
Title 47 – Telecommunications  
Chapter 1 – Federal Communications Commission  
Part 15 – Radio frequency devices  
Subpart C – Intentional Radiators

ANSI C 63.4:2003

American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

FCC part 22:2005

Public Mobile Services  
Subpart H: Cellular Radiotelephone Service

### 3. EQUIPMENT UNDER TEST CONFIGURATION

**Product description:**

FCC ID: GM3HFAM1XT10

IC :2739D-HFA1XT10

Utilization: RFID TAG reader

Antenna type: Incorporated antenna

Antenna gain: Unknown

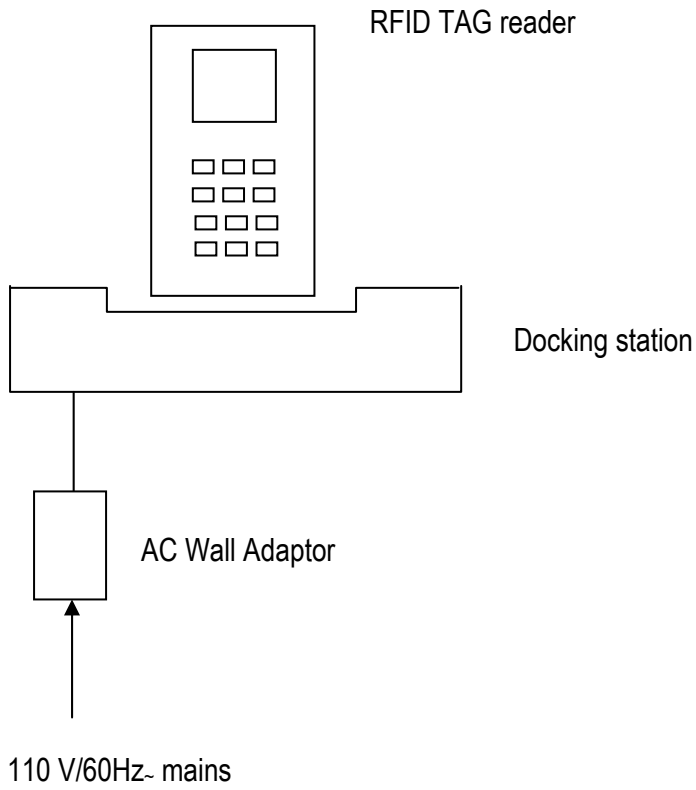
Operating frequency range: 13.56MHz (Rfid); 2402MHz (Bluetooth); 2457MHz (Wifi); 836.4MHz (GSM); 1860MHz (GSM)

Internal highest frequency: 2457MHz

Power source: 5 Vdc (stand alone) or mains voltage (with docking)

Power level and frequency range are not user adjustable

**4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME**



**5. SUMMARY OF TEST RESULTS**

Tests designation	Results satisfying?	Comments
Radiated emissions section 15-247 – RSS-210:2010	YES	
ERP EIRP and spurious measurement sections 22.913 and 22.917 and subpart H	YES	
Radiated emissions section 15.209 – RSS-210:2010	YES	

N.P.: Not Performed.

N.A.: Not Applicable.

**6. RADIATED EMISSIONS - SECTION 15-247**
Radiated emissions (above 1GHz)

Standard: FCC part 15.247: 2011– RSS-210:2010

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Configuration	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
1GHz-18GHz	Open area measurement	1MHz	1MHz	Peak	80cm

For each measured frequency, receiving antenna height varies between 1 m and 4 m, E.U.T. is set on a turntable in order to find the highest level.

E.U.T. internal functions are all active (GSM 850 or 1900, Wifi is active, Bluetooth is active, Rfid is active). GSM communication link is established via a CMU 200(Rohde & Schwarz).

Test method deviation: Wifi and Bluetooth are in permanent emission, measurements are done in peak detection (worst case).

Measuring distance: 3 m

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	ETS LINDGREN	3117	8387	04/03/2008	04/08/2012
Antenna mast	Heinrich Deisel	MA240	4037	-	-
Cable	N	14m	8146	09/03/2013	09/05/2013
Cable	Cables & Connetiques	N-1.5m	4203	27/10/2011	27/12/2013
Controler	Heinrich Deisel	HD100	4036	-	-
Open area test site	Emitech	Salinelles	3482	04/03/2011	04/05/2014
Preamplifier	Microwave	C005180F-4B1	2165	06/10/2011	06/12/2012
Radio communication tester	Rohde & Schwarz	CMU 200	7015	25/10/2011	25/12/2013
Receiver	Agilent	E4440A	5824	24/08/2011	24/08/2013
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Board(s) hereafter

**1) Wifi radiated field strength:**

Frequency (MHz)	Polarization	Azimuth (degrees)	Antenna height (cm)	Peak Measure (dB $\mu$ V/m)	Standard limit (dB $\mu$ V/m)	Comments
2457.00	Vertical	195	100	108.73	125.2 (*)	C
2457.00	Horizontal	258	103	106.83	125.2 (*)	C

C= Compliant

NC= Not compliant

No Wifi spurious radiations were detected

**3) Bluetooth radiated field strength:**

Frequency (MHz)	Polarization	Azimuth (degrees)	Antenna height (cm)	Measure (dB $\mu$ V/m)	Standard limit (dB $\mu$ V/m)	Comments
2402.00	Vertical	206	130	94.24	125.2 (*)	C
2402.00	Horizontal	72	103	92.95	125.2 (*)	C

No bluetooth spurious radiations were detected

All other radiated emissions are more than 20 dB below the limit.

(\*) This limit is a theoretical conversion of standard limit given for 1W conducted power. E.U.T. antenna gain is less than 6dBi. Limit is reached by the following calculation:

$$E = \frac{\sqrt{30 \times P \times G}}{d}$$

with P in Watt (conducted power limit)  
G= 1 (dipole antenna theoretical gain)  
d= 3 m (test distance)  
E= Equivalent radiated electric field (V/m)



## 7. ERP, EIRP AND SPURIOUS MEASUREMENT

Standard: FCC part 22.913 and 22.917: 2005 and subpart H

Test method: ANSI C63.4:2003

Test configuration: Spurious emission level is measured by substitution method. Test are done in vertical and horizontal antenna polarization, E.U.T. is set on a turntable in order to find the highest level. Only highest levels are recorded.

Frequency band	Configuration	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
824-849MHz	Open area measurement	100kHz	300kHz	Peak	80cm
1850-1910MHz	Open area measurement	100kHz	300kHz	Peak	80cm

For each measured frequency, receiving antenna height varies between 1 m and 4 m, E.U.T. is set on a turntable in order to find the highest level.

E.U.T. internal functions are all active (GSM 850 or 1900, Wifi is active, Bluetooth is active, Rfid is active). GSM communication link is established via a CMU 200 (Rohde & Schwarz).

Test method deviation: Wifi and Bluetooth are in permanent emission. Measurements are done in peak detection (worst case).

Measuring distance: 3 m

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	ETS LINDGREN	3117	5456	04/03/2008	04/08/2012
Antenna	ETS LINDGREN	3117	8387	04/03/2008	04/08/2012
Antenna	Rohde & Schwarz	HL223	3126	03/03/2011	03/05/2015
Antenna	Schwarzbeck	UHA 9105	4660	03/03/2011	03/05/2015
Antenna mast	Heinrich Deisel	HD100	4036	-	-
Antenna mast	Heinrich Deisel	MA240	4037	-	-
Cable	N	14m	8146	09/03/2013	09/05/2013
Cable	Cables & Connetiques	N-1.5m	4203	27/10/2011	27/12/2013
Cable	Huber Sumner	N-10m	8472	03/11/2013	03/01/2014
Filter	Micro-Tronics	HPM 11630	4392	19/01/2012	19/03/2014
Open area test site	Emitech	Seminoles	3482	04/03/2011	04/05/2014
Preamplifier	Microwave	C005180F-4B1	2165	06/10/2011	06/12/2012

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Radio communication tester	Rohde & Schwarz	CMU 200	7015	25/10/2011	25/12/2013
Receiver	Agilent	E4440A	5824	24/08/2011	24/08/2013
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Board(s) hereafter

1) GSM850 radiated field strength:

Frequency (MHz)	Polarization	Field strength (dBm)	Standard limit (dBm)	Comments
836.95	Vertical	30.08	38	C
836.95	Horizontal	28.50	38	C

C= Compliant

NC= Not compliant

No GSM850 spurious radiations were detected

1) GSM1900 radiated field strength:

Frequency (MHz)	Polarization	Field strength (dBm)	Standard limit (dBm)	Comments
1870.00	Vertical	25.47	33	C
1870.00	Horizontal	25.06	33	C

C= Compliant

NC= Not compliant

No GSM1900 spurious radiations were detected

**1. RADIATED EMISSIONS – SECTION 15.209 – RSS-210:2010**

Temperature (°C): 22

Humidity (%HR): 55

Pressure (hPa): 1005

**b) Radiated emissions pre-measurement (above 30MHz)**
Standards: FCC part 15 Subpart C 15.209 (07/2008) & RSS-210: 2010 (§2.7)

Test methods: ANSI C63.4:2003 & RSS-Gen: 2010

Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
30MHz-1GHz	Front side (pre-measurement in semi anechoic chamber)	100kHz	300kHz	Peak	80cm

For each measured frequency, receiving antenna height varies between 1 m and 4 m, E.U.T. is set on a turntable in order to find the highest level.

E.U.T. internal functions are all active (GSM 850 or 1900, Wifi is active, Bluetooth is active, Rfid is active).  
GSM communication link is established via a CMU 200 (Rohde & Schwarz)

Test method deviation: No

Measuring distance: 3 meters

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Emco	3115	1053	04/03/2008	04/08/2012
Antenna	Electro-Metrics	BIA-30HF	0824	03/03/2011	03/05/2015
Antenna	Electro-Metrics	LPA-30	0855	03/03/2011	03/05/2015
Cable		N-1.5m	3621	25/07/2011	25/09/2013
Cable	Cables & Connetiques	N-1.5m	4202	27/10/2011	27/12/2013
Cable	C&C	N-1.5m	5016	05/12/2011	05/02/2014
Cable	C&C	N-8m	5014	18/08/2010	18/10/2012
Filter	Micro-Tronics	HPM 11630	4392	19/01/2012	19/03/2014
Preamplifier	Microwave	C005180F-4B1	2165	06/10/2011	06/12/2012
Radio communication tester	Rohde & Schwarz	CMU 200	7015	25/10/2011	25/12/2013
Receiver	Agilent	E4440A	5824	24/08/2011	24/08/2013
Software	Nexio	BAT EMC	0000	-	-

*BAT-EMC software version: V3.6.0.24*
Results: See Graph(s) (indoor pre-measurement)

**Radiated electric emission (measurement)**

**EMI930**

**Front side**

- C.E.M. (civil)/EN 55022 - Class: B - Moyenne/3.0m/
- C.E.M. (civil)/EN 55022 - Class: B - Crête/3.0m/
- C.E.M. (civil)/EN 55022 - Class: B - Crête/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class: B - Moyenne/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class: B - Crête/3.0m/
- Mes.Peak (Horizontale)
- ◊ Peak/LimQ-Peak (Horizontale)

Date: 09/07/2012 09:33:36

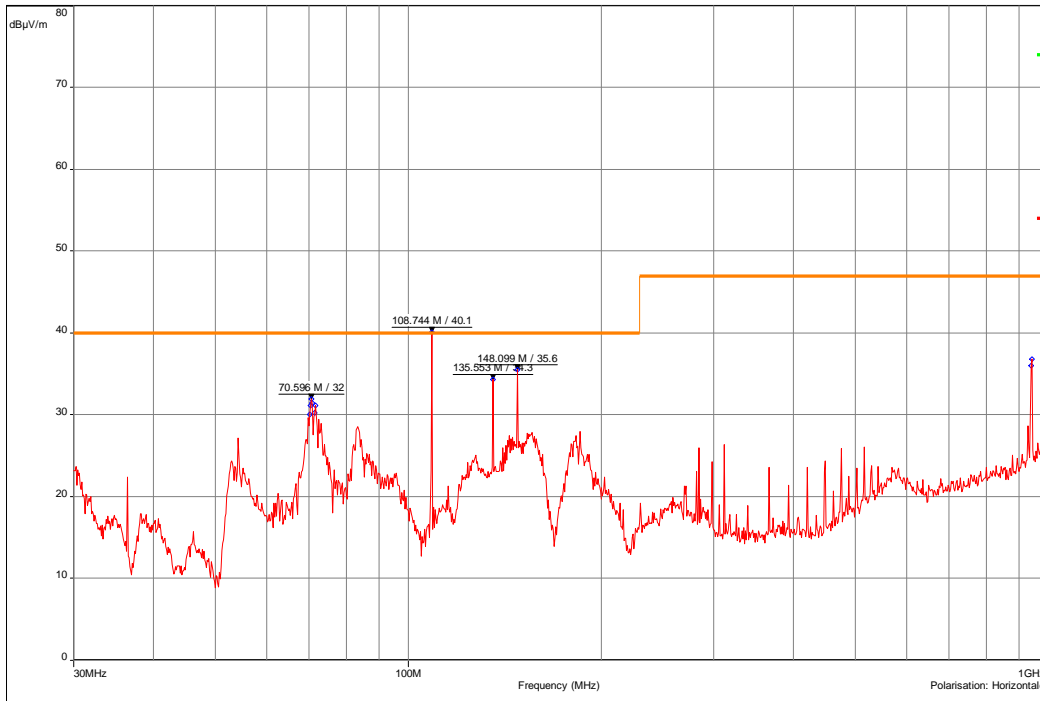
Technician: DM

Class: B of the standard

Detection:  
Peak

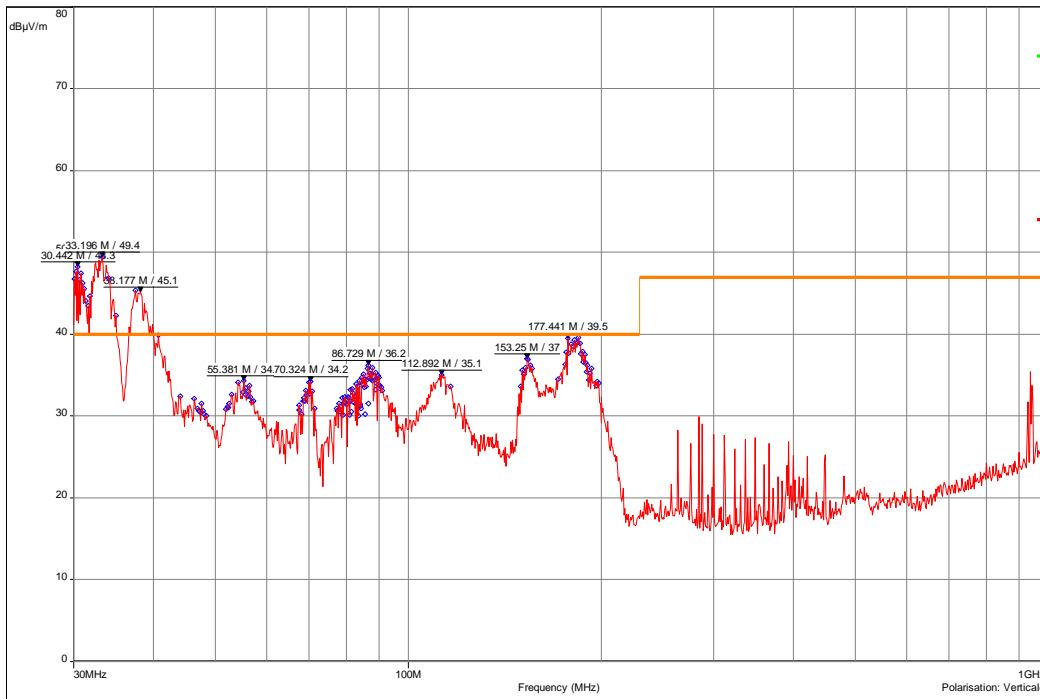
T (°C): 23  
H (%): 55  
P (hpa): 1005

Modification(s) during test:



Face avant - 07/09/2012 09:33 - 930

- C.E.M. (civil)/EN 55022 - Class: B - Moyenne/3.0m/
- C.E.M. (civil)/EN 55022 - Class: B - Crête/3.0m/
- C.E.M. (civil)/EN 55022 - Class: B - Crête/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class: B - Moyenne/3.0m/
- C.E.M. (civil)/FCC Part.15 - Class: B - Crête/3.0m/
- Mes.Peak (Verticale)
- ◊ Peak/LimQ-Peak (Verticale)



Face avant - 07/09/2012 09:33 - 930

c) Final radiated electric emission on Open Area Test Site

Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
30MHz-1GHz	(Open area measurement)	120kHz	300kHz	Quasi peak	3cm

For each measured frequencies, E.U.T. is set via a turntable in order to find the highest level. Test antenna is set between 1m and 4m in order to find the highest level in vertical and horizontal polarization.

Only highest levels are recorded.

E.U.T. is powered at its nominal power supply. E.U.T. power supply is monitored via a multimeter.

Measuring distance: 3 meters

Test equipment list (Open area measurement):

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Electro-Metrics	BIA-30HF	1107	03/03/2011	03/05/2015
Antenna	Rohde & Schwarz	HL223	3126	03/03/2011	03/05/2015
Antenna mast	Heinrich Deisel	HD100	4036	-	-
Antenna mast	Heinrich Deisel	MA240	4037	-	-
Cable	N	14m	8146	09/03/2011	09/05/2013
Open area test site	Emitech	Salinelles	3482	04/03/2011	04/05/2014
Radio communication tester	Rohde & Schwarz	CMU 200	7015	25/10/2011	25/10/2013
Receiver	Agilent	E4440A	5824	24/08/2011	24/10/2013
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Board(s) below

Frequency (MHz)	Polarization	Azimet (degree)	Antenna Height (cm)	Measure (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Comments
30.00	Vertical	180	100	31.60	40	C
54.23	Vertical	180	100	29.63	40	C
72.70	Vertical	180	100	26.14	40	C
83.20	Vertical	180	100	24.84	40	C
112.80	Vertical	185	100	23.32	43	C
153.00	Vertical	180	100	19.89	43	C
183.40	Vertical	185	100	28.79	43	C
67.00	Horizontal	188	213	19.43	40	C
108.74	Horizontal	0	100	16.95	43	C
135.50	Horizontal	0	100	23.25	43	C
148.00	Horizontal	210	100	23.32	43	C

C= Compliant

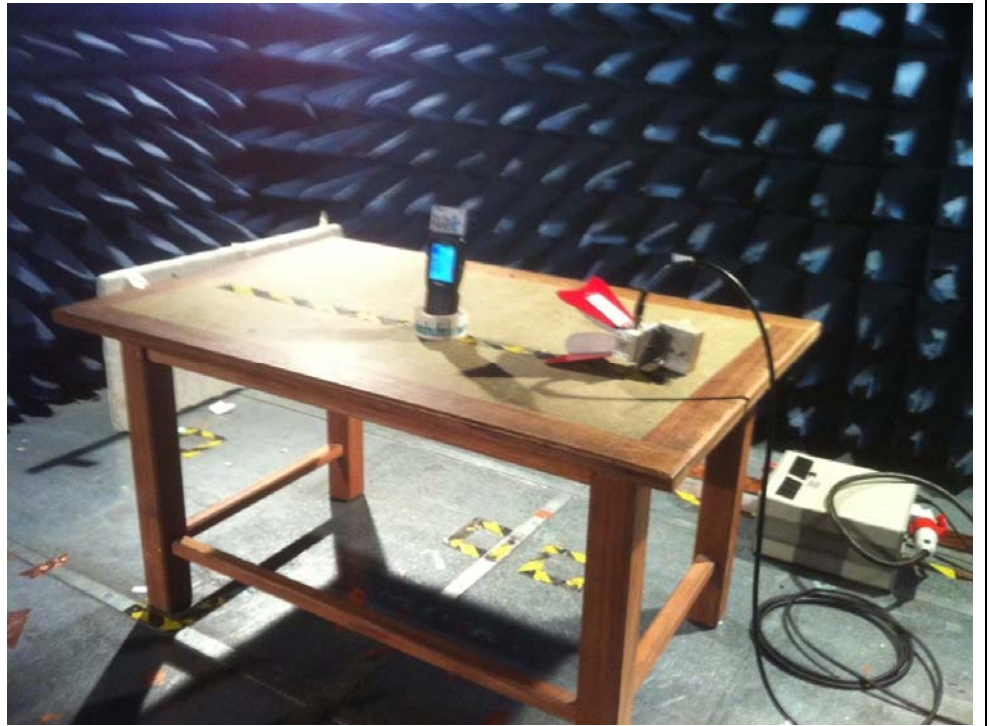
NC= Not compliant

# **ANNEX: PHOTOGRAPH(S)**

EQUIPEMENT UNDER TEST (E.U.T.) PHOTOGRAPH(S)

HF AM1 OMNII

Radiated electric field emission on anechoic chamber



Radiated electric field emission on OATS

