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Nemko Italy S.p.A., Via del Carroccio 4, 20853, Biassono, Italy.

Report number:	199067TRFMPE
Apparatus:	VS3000 GTW/806-870
Applicant:	SELEX Elsag S.p.A. Via Giacomo Puccini, 2 - 16154 Genova- Italy
FCC ID:	X5Y774-0850

Test specification:

MPE ASSESSMENT
Federal Communications Commission Office of Engineering & Technology
Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

Reviewed by: Signature — 2012-08-07 Date
G. Curioni, Wireless/EMC Specialist

Tested by: Signature — 2012/08/07 Date
D. Guarnone, Wireless/EMC Specialist

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Section 1: Report summary

This report contains an assessment of apparatus against specifications based upon tests carried out on samples submitted at Nemko Italy SpA.

Test specification:

Federal Communications Commission Office of Engineering & Technology
Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

Compliance status:	Complies
Exclusions:	None
Non-compliances:	None
Report release history:	Original release
Test location:	SELEX ELSAG Via Eugenio Barsanti, Firenze, Italy.
Registration number:	481407 (10 m Semi anechoic chamber)

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Italy's ISO/IEC 17025 accreditation.

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Section 2: Equipment under test

2.1 Identification of equipment under test (EUT)

The following information identifies the EUT under test:

Type of equipment:	Mobile Radio Unit
Product marketing name:	SELEX ELSAG Secure Networking Solutions
Code number:	774-0850/01
Model number:	VS3000 GTW/806-870
Serial number:	A0029
FCC ID:	X5Y774-0850
Date of receipt:	2012-07-02
Label	

2.2 Accessories and support equipment

The following information identifies accessories used to exercise the EUT during testing:

Item # 1	
Type of equipment:	Digital Radio Test Set
Brand name:	IFR
Model name or number:	3901
Serial number:	298001223
Nemko sample number:	--
Connection port:	RF
Cable length and type:	--
Item # 2	
Type of equipment:	Portable Field Meter + Electric Field Probe
Brand name:	PMM
Model name or number:	8053 + EP330
Serial number:	298001223
Nemko sample number:	0220J00421 + 1010J00228
Connection port:	RF
Cable length and type:	--

Section 2: Equipment under test, continued

2.3 EUT description

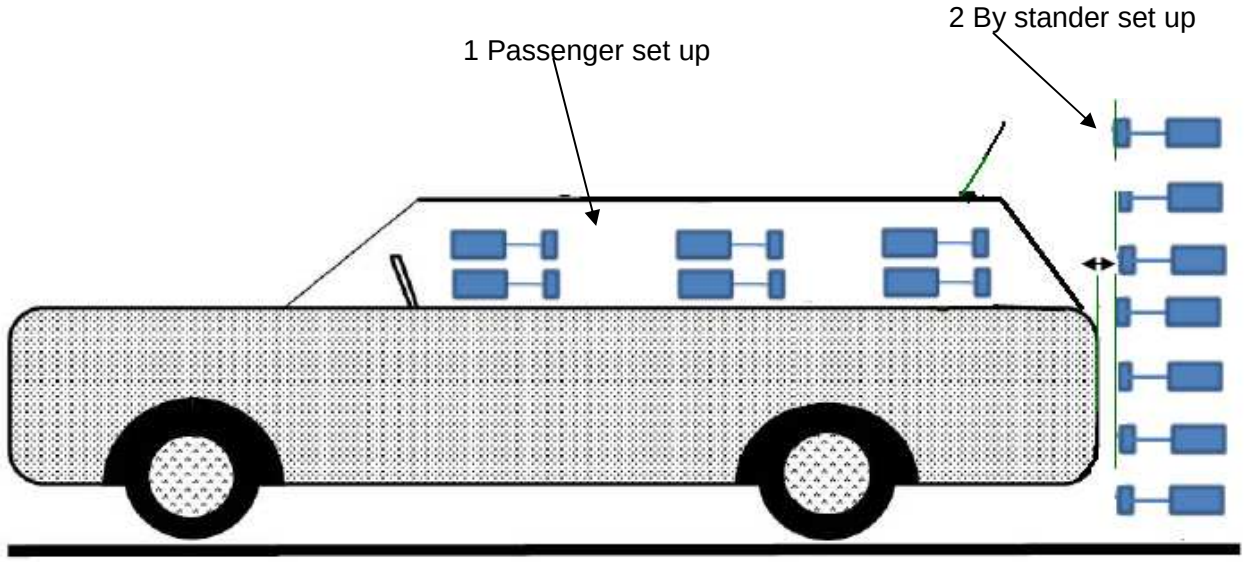
- Mobile Radio Unit

2.4 Technical specifications of the EUT

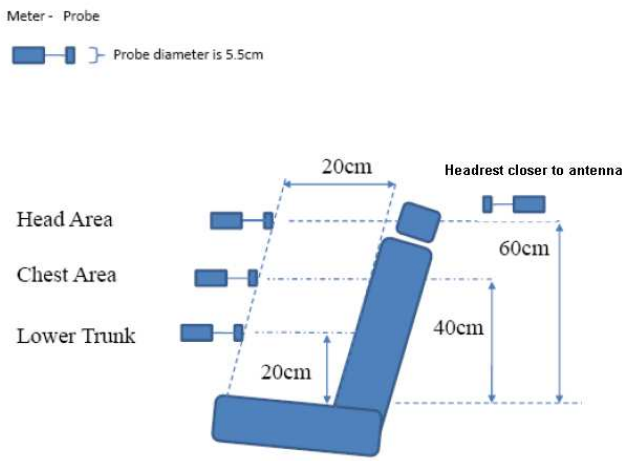
Operating frequency:	817-824/862-869 MHz
Modulation type:	Π/4 DQPSK
Occupied bandwidth:	25 kHz
Emission designator:	21K0D1E, 21K0D1W, 21K0D1D
Antenna type:	Equipment that has an external 50 Ω RF connector
Power source	Battery operated
Temperature range:	-10 to 45℃

Section 2: Equipment under test, continued

2.5 EUT setup diagram



Seat scan areas
(Applicable to both front and back seats)



2.6 Operation of the EUT during testing

Transmitting at maximum power and normal modulation to:

1) 817.0125MHz
2) 823.9875MHz
3) 862.0125MHz
4) 868.9875 MHz

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3: Test conditions

3.1 Deviations from laboratory tests procedures

No deviations were made from laboratory test procedures.

3.2 Test conditions, power source and ambient temperatures

Normal temperature, humidity and air pressure test conditions	Temperature: 15–30 ℃ Relative humidity: 20–75 % Air pressure: 860–1060 hPa When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.
Power supply range:	The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

3.3 Measurement uncertainty

Nemko S.p.A. measurement uncertainty has been calculated using the standard CISPR 16-4-2 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modeling – Uncertainty in EMC measurements“. All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko S.p.A. document WML1002.

3.4 Test equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Next cal.
Portable Field Meter	PMM	8053	0220J00421	2012/12
Electric Field Probe	PMM	EP330	1010J00228	2012/12

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use
(*) Equipment supplied by manufacturer’s

Section 4: Result summary

4.1 MPE: Test results

Part	Test method	Test description	Required	Result
§--	--	MPE calculation	Y	Pass

Note:

Appendix A: Test results

MPE CALCULATION

a) Mobile Devices

This section describes the requirements of Section 2.1091 of the FCC's Rules (47 CFR § 2.1091) that apply to "mobile" devices. For purposes of these requirements mobile devices are defined as transmitters designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fundamental aspect of the exposure guidelines is that they apply to power densities or the squares of the electric and magnetic field strengths that are spatially averaged over the body dimensions. Spatially averaged RF field levels most accurately relate to estimating the wholebody averaged SAR that will result from the exposure and the MPEs specified in Table 1 of Appendix A are based on this concept. This means that local values of exposures that exceed the stated MPEs may not be related to non-compliance if the spatial average of RF fields over the body does not exceed the MPEs. Further discussion of spatial averaging as it relates to field measurements can be found in Section 3 of this bulletin and in the ANSI/IEEE and NCRP reference documents noted there.

Assessment was performed with mobile radio installed inside the vehicle at test specified distance and test locations.

1) External bystander MPE measurements:

Antenna is located in the rear side of roof.

Mpe measurement for by stander conditions are determined by taking the average of 10 measurements in a 2 m vertical line for each of three by stander test locations with 20 cm height increment with antenna to probe separation distances of 72 cm directly behind the vehicle, 110 cm (45 radial),102cm (90 radial).

The measuring probe is positioned orthogonal to antenna (typically parallel to ground with a vertically mounted antenna) and aimed directly at antenna axis.

These measurements are representative of person other than the operator standing next to the vehicle.

2) Internal Passenger vehicle MPE measurements

Antenna is located in the rear side of roof at a minimum distance of …. Backseats passenger.

User are instructed, per installation manual to mount antenna on the roof only if a minimum distance of can't be achieved.

MPE measurements for passenger front seat and backseat conditions are determined by taking the average of three measurements (Head, Chest, and lower Trunk) inside the vehicle for both the front and back seats.

The probe handle is oriented parallel to the ground and pointed towards to the back of vehicle.

The probe is scanned continuously along three test axis which are parallel to seat angle and are 20 cm from seat surface. One test axis is at the head height, another is at the chest height and another is at lower Trunk height.

The MPE is determined by averaging these three maximum values

MPE CALCULATION, continue..

Mpe limits:

Frequency Range (MHz)	FCC OET Bulletin 65 Supplement C mW/cm^2	IEEE C95.1 1992/1999 mW/cm^2	RSS 102 issue 4 – 2010 W/m^2
30 – 300	0.2		*2.0
10 – 400			
100 – 300		0.2	
100 – 400			
300 – 1,500	f/1,500		f/150
400 – 2,000			
300 – 15,000		f/1,500	
1,500 – 15,000			10.0
1,500 – 100,000	1.0		
2,000 – 100,000			
2,000 – 300,000			

*Power density limit is applicable at frequencies greater than 100MH

Test date: 2012-07-03

Test results: Pass

Test data

Bystander, test position 1

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm$^{2)}$)	FCC Limit (mW/cm2)	% to specific Limit
Roof	1	E Field	--	T-AT9007.01-BU	10.9	10	817.0125	0.00643	0.54468	1.1807
				T-AT9007.01-BU	10.5	10	823.9875	0.00223	0.54933	0.4062
				T-AT9007.01-BU	10.3	10	862.0125	0.00196	0.57468	0.3405
				T-AT9007.01-BU	10.4	10	868.9875	0.00276	0.57933	0.4757

Bystander, test position 2

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm^2)	FCC Limit (mW/cm^2)	% to specific Limit
Roof	2	E Field	--	T-AT9007.01-BU	10	10	817.0125	0.00068	0.54468	0.1251
				T-AT9007.01-BU	10.9	10	823.9875	0.00039	0.54933	0.0717
				T-AT9007.01-BU	10.5	10	862.0125	0.00041	0.57468	0.0717
				T-AT9007.01-BU	10.3	10	868.9875	0.00073	0.57933	0.1257

Bystander, test position 3

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm$^{2)}$)	FCC Limit (mW/cm^2)	% to specific Limit
Roof	3	E Field	--	T-AT9007.01-BU	10.9	10	817.0125	0.00076	0.54468	0.1401
				T-AT9007.01-BU	10.5	10	823.9875	0.00045	0.54933	0.0812
				T-AT9007.01-BU	10.3	10	862.0125	0.00049	0.57468	0.0851
				T-AT9007.01-BU	10.4	10	868.9875	0.00055	0.57933	0.0942

Test data

Passenger, front seat, left

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm^2)	FCC Limit (mW/cm^2)	% to specific Limit
Roof	Passenger, front seat, left	E Field	-	T-AT9007.01-BU	10.9	10	817.0125	0.00000	0.54468	0.0000
				T-AT9007.01-BU	10.5	10	823.9875	0.00000	0.54933	0.0000
				T-AT9007.01-BU	10.3	10	862.0125	0.00019	0.57468	0.0336
				T-AT9007.01-BU	10.4	10	868.9875	0.00013	0.57933	0.0224

Passenger, front seat, right

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm^2)	FCC Limit (mW/cm^2)	% to specific Limit
Roof	Passenger, front seat, right	E Field	--	T-AT9007.01-BU	10.9	10	817.0125	0.00007	0.54468	0.0125
				T-AT9007.01-BU	10.5	10	823.9875	0.00007	0.54933	0.0119
				T-AT9007.01-BU	10.3	10	862.0125	0.00006	0.57468	0.0112
				T-AT9007.01-BU	10.4	10	868.9875	0.00007	0.57933	0.0112

Test data

Passenger, back seat,right

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (W)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm^2)	FCC Limit (mW/cm2)	% to specific Limit
Roof	Passenger back seat right	E Field	-	T-AT9007.01-BU	10.9	10	817.0125	0.00109	0.54468	0.2001
				T-AT9007.01-BU	10.5	10	823.9875	0.00098	0.54933	0.1792
				T-AT9007.01-BU	10.3	10	862.0125	0.00167	0.57468	0.2913
				T-AT9007.01-BU	10.4	10	868.9875	0.00156	0.57933	0.2693

Passenger, back seat, left

Roof	Test position	E/H Field	Angle (degree)	Antenna model	Max PWR (w)	Nominal Pwr (W)	Test Frequency (MHz)	Max calculation P.D. (mW/cm^2)	FCC Limit (mW/cm2)	% to specific Limit
Roof	Passenger back seat left	E Field	--	T-AT9007.01-BU	10	0	817.0125	0.00136	0.54468	0.2501
				T-AT9007.01-BU	10.9	10	823.9875	0.00105	0.54933	0.1911
				T-AT9007.01-BU	10.5	10	862.0125	0.00116	0.57468	0.2016
				T-AT9007.01-BU	10.3	10	868.9875	0.00143	0.57933	0.2468

Remarks: Calculation P.D.= Average over body x Probe calibration factor x Duty Cycle
Max calculation P.D.= Average over body x Probe calibration factor x Duty Cycle x Max PWR/Nominal Pwr
Probe calibration factor=1
Duty Cycle=0.25

Test data

Position 1

				Bystander (BS) Position										E.U.T. Max TX factor	Average over the body mW/cm²	Calc P.D. (mW/cm²)	Max Calc. P.D. (mW/cm²)	FCC lim (mW/cm2)
TX FREQUENCY	Max pwr	Initial power	PROBE CAL FACTOR	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
817.0125	10.9	10	1	0	0	0	0	0.002	0.003	0.007	0.013	0.109	0.192	0.25	0.0236	0.0059	0.006431	0.544675
823.9875	10.5	10	1	0	0	0	0	0.002	0.001	0.004	0.013	0.031	0.034	0.25	0.0085	0.002125	0.00223125	0.549325
862.0125	10.3	10	1	0	0	0	0	0.005	0.003	0.003	0.011	0.028	0.026	0.25	0.0076	0.0019	0.001957	0.574675
868.9875	10.4	10	1	0	0	0	0.001	0.004	0.002	0.003	0.01	0.029	0.057	0.25	0.0106	0.00265	0.002756	0.579325

Position 2

				Bystander (BS) Position										E.U.T. Max TX factor	Average over the body mW/cm²	Calc P.D. (mW/cm²)	Max Calc. P.D. (mW/cm²)	FCC lim (mW/cm2)
TX FREQUENCY	Max pwr	Initial power	PROBE CAL FACTOR	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
817.0125	10.9	10	1	0	0	0	0	0.001	0.001	0.001	0.001	0.006	0.015	0.25	0.0025	0.000625	0.00068125	0.544675
823.9875	10.5	10	1	0	0	0	0	0	0.001	0.001	0.001	0.004	0.008	0.25	0.0015	0.000375	0.00039375	0.549325
862.0125	10.3	10	1	0	0	0	0	0	0	0	0.001	0.005	0.01	0.25	0.0016	0.0004	0.000412	0.574675
868.9875	10.4	10	1	0	0	0	0	0	0	0.001	0.001	0.008	0.018	0.25	0.0028	0.0007	0.000728	0.579325

Position 3

				Bystander (BS) Position										E.U.T. Max TX factor	Average over the body mW/cm²	Calc P.D. (mW/cm²)	Max Calc. P.D. (mW/cm²)	FCC lim (mW/cm2)
TX FREQUENCY	Max pwr	Initial power	PROBE CAL FACTOR	20 cm	40 cm	60 cm	80 cm	100 cm	120 cm	140 cm	160 cm	180 cm	200 cm					
817.0125	10.9	10	1	0	0	0	0.001	0.001	0.002	0.002	0.004	0.003	0.015	0.25	0.0028	0.0007	0.000763	0.544675
823.9875	10.5	10	1	0	0	0	0	0.001	0.001	0.001	0.003	0.003	0.008	0.25	0.0017	0.000425	0.00044625	0.549325
862.0125	10.3	10	1	0	0	0	0	0.001	0.001	0	0.003	0.004	0.01	0.25	0.0019	0.000475	0.00048925	0.574675
868.9875	10.4	10	1	0	0	0	0	0.001	0	0	0.001	0.001	0.018	0.25	0.0021	0.000525	0.000546	0.579325

Passenger front seat left

				Passenger position				E.U.T. Max TX factor	Average over the body mW/cm²	Calc P.D. (mW/cm²)	Max Calc. P.D. (mW/cm²)	FCC lim (mW/cm2)
TX FREQUENCY	Max pwr	Initial power	PROBE CAL FACTOR	Head	Chest	Lower Trunck	Headrest rear					
817.0125	10.9	10	1	0	0	0	0	0.25	0	0	0	0.54468
823.9875	10.5	10	1	0	0	0	0	0.25	0	0	0	0.54933
862.0125	10.3	10	1	0	0.001	0.002	0	0.25	0.00075	0.0001875	0.000193125	0.57468
868.9875	10.4	10	1	0.001	0.001	0	0	0.25	0.0005	0.000125	0.00013	0.57933

Passenger front seat right

				Passenger position				E.U.T. Max TX factor	Average over the body mW/cm²	Calc P.D. (mW/cm²)	Max Calc. P.D. (mW/cm²)	FCC lim (mW/cm2)
TX FREQUENCY	Max pwr	Initial power	PROBE CAL FACTOR	Head	Chest	Lower Trunck	Headrest rear					
817.0125	10.9	10	1	0	0	0	0.001	0.25	0.00025	0.0000625	0.000068125	0.544675
823.9875	10.5	10	1	0	0	0	0.001	0.25	0.00025	0.0000625	0.000065625	0.549325
862.0125	10.3	10	1	0	0	0	0.001	0.25	0.00025	0.0000625	0.000064375	0.574675
868.9875	10.4	10	1	0	0	0	0.001	0.25	0.00025	0.0000625	0.000065	0.579325

Test data

Passenger back seat right

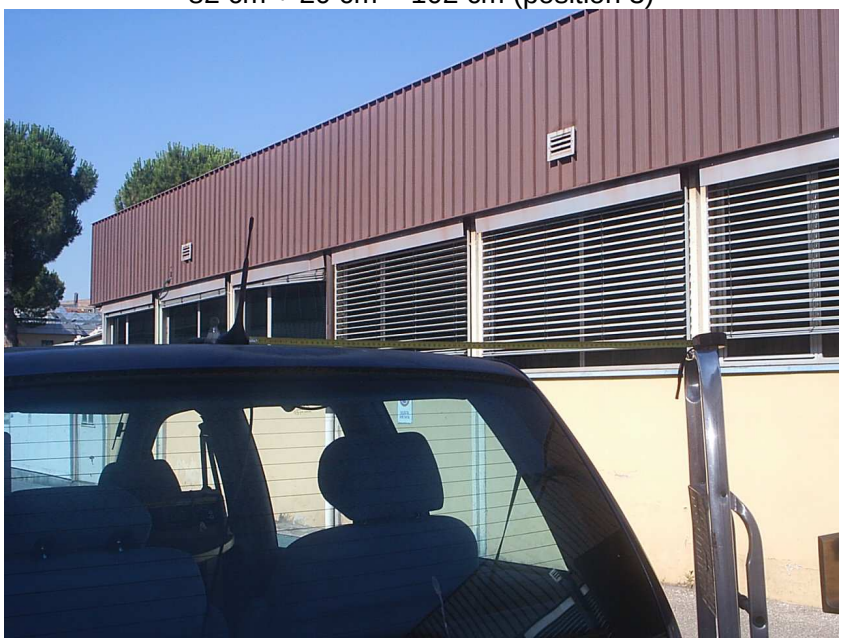
				Passenger position				E.U.T. Max TX Factor	Average over the body mW/cm²	Calc P.D. (mW/cm²)	Max Calc. P.D. (mW/cm²)	FCC lim (mW/cm2)
TX FREQUENCY	Max pwr	Initial power	PROBE CAL FACTOR	Head	Chest	Lower Trunck	Headrest rear					
817.0125	10.9	10	1	0.001	0	0	0.015	0.25	0.004	0.001	0.00109	0.544675
823.9875	10.5	10	1	0.001	0	0	0.014	0.25	0.00375	0.0009375	0.000984375	0.549325
862.0125	10.3	10	1	0.009	0.001	0.001	0.015	0.25	0.0065	0.001625	0.00167375	0.574675
868.9875	10.4	10	1	0.004	0.002	0.001	0.017	0.25	0.006	0.0015	0.00156	0.579325

Passenger back seat left

				Passenger position				E.U.T. Max TX Factor	Average over the body mW/cm²	Calc P.D. (mW/cm²)	Max Calc. P.D. (mW/cm²)	FCC lim (mW/cm2)
TX FREQUENCY	Max pwr	Initial power	PROBE CAL FACTOR	Head	Chest	Lower Trunck	Headrest rear					
817.0125	10.9	10	1	0.002	0.001	0	0.017	0.25	0.005	0.00125	0.0013625	0.544675
823.9875	10.5	10	1	0.002	0	0	0.014	0.25	0.004	0.001	0.00105	0.549325
862.0125	10.3	10	1	0.002	0.001	0	0.015	0.25	0.0045	0.001125	0.00115875	0.574675
868.9875	10.4	10	1	0.003	0.001	0.001	0.017	0.25	0.0055	0.001375	0.00143	0.579325

Set up photo

82 cm + 20 cm = 102 cm (position 3)

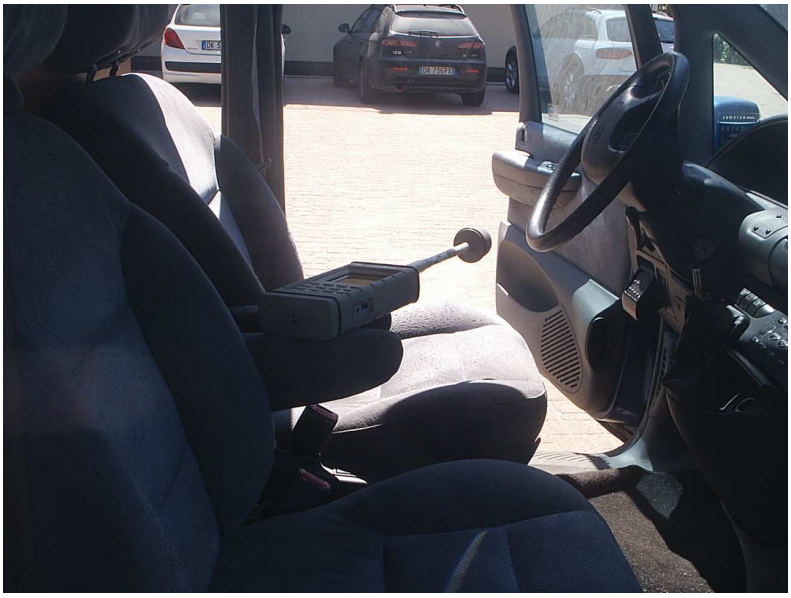


90 cm +20 cm=110 cm (position 2)

Set up photo

52 cm + 20 cm =72 cm (position 1)

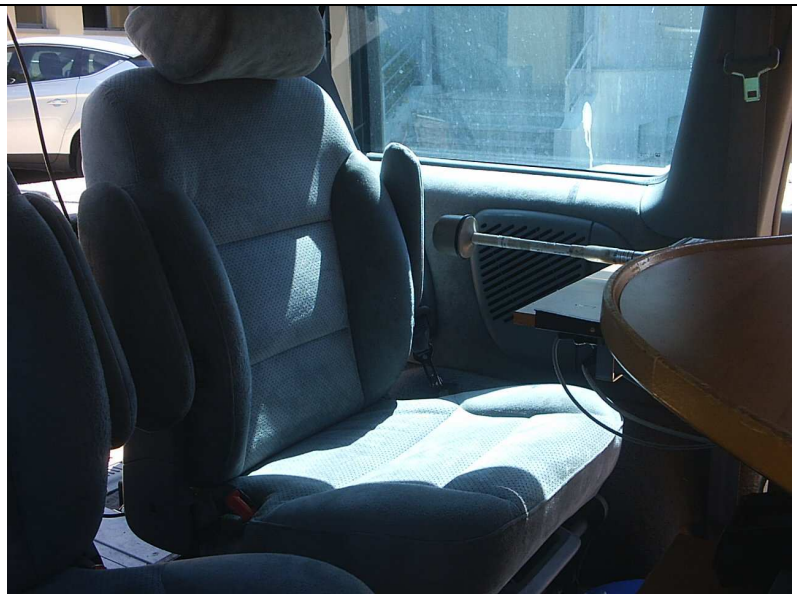
Set up photo



Front seat left

Set up photo

Front seat right



Back seat left

Antenna

Set up photo

Radio Equipment

Set up photo

Point 2

Point 3