

REPORT ON

FCC ID: OHL R290 SAT

Ericsson Jekyll Portable Handset terminal designed to work on the
Satellite Personal Communications Network operated by Globalstar

Report No: WZ 900206

March 2000

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UK

REPORT ON:

Ericsson Jekyll Portable Handset terminal designed to work on the Satellite Personal Communications network operated by Globalstar

Report No: WZ 900206

3rd March 2000

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DISTRIBUTION:

Federal Communications
Commission
Ericsson Mobile
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Note: The test results reported herein relate only to the item tested, as identified above and on the Status Page

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EXECUTIVE SUMMARY

Testing of an Ericsson Jekyll Portable Handset terminal designed to work on the Satellite Personal Communications Network operated by Globalstar

Project Engineer : M Glasspool

1.1	<u>STATUS</u>	
1.1.1	MANUFACTURING DESCRIPTION	Globalstar Hand Portable Unit (PE)
1.1.2	STATUS OF TEST	Regulatory
1.1.3	APPLICANT	Ericsson Mobile Communications (UK) Ltd.
1.1.4	CLASS	Globalstar Class II (Portable Equipment)
1.1.5	MANUFACTURER	Ericsson Mobile Communications (UK) Ltd.
1.1.6	TYPE NUMBER	1180101-BV
1.1.7	MODEL NUMBER	R290 Satellite
1.1.8	HARDWARE REVISIONS	Globalstar RF board BoM Issue P1E
1.1.9	SOFTWARE VERSION	Jek_2.04c
1.1.10	SERIAL NUMBER	GA2B06COM1
1.1.11	TEST SPECIFICATIONS	FCC CFR 47 Part 15, Subpart B; 1998 FCC CFR 47 Part 25; 1998 FCC 98-338
1.1.12	BABT PRODUCT SERVICE LTD. REGISTRATION NUMBER	WZ 900206
1.1.13	RECEIPT OF TEST SAMPLES	4 th February 2000
1.1.14	START OF TEST	4 th February 2000
	FINISH OF TEST	28 th February 2000

1.2 **SUMMARY**

- 1.2.1 The Ericsson Jekyll submitted for testing is a Dual mode Globalstar/GSM User Terminal (R290) designed to work on the Globalstar Satellite Personal Communications Network and the GSM 900 Network. This testing is only applicable to the device operating in Globalstar mode. It is a Globalstar Class II hand portable device.
- 1.2.2 The Jekyll submitted for testing consisted of a Hand Portable R290 Type 1180101-BV Dual mode Globalstar/GSM User Terminal a standard battery and AC an adapter / charger. A dummy battery (battery eliminator) was also supplied for FCC CFR 47 Part 25.202 (d) Frequency Tolerance Testing to enable extreme DC voltage supplies to be used.
- 1.2.3 All testing was performed at BABT Product Service Ltd, Titchfield, England. All tests performed yielded results that were compliant with the requirements of the FCC specifications.
- 1.2.4 The following Federal Communications Commissions (FCC) parts are covered by this test report:-
- Part 15.107 (Class B) Conducted Emissions.
Part 15.109 (Class B) Radiated Emission Limits.
Part 25.202(d) Frequency Tolerance.
Part 25.202(f) Emission Limitations.
Part 25.213(b) Protection of the radio navigation-satellite service.
FCC 98-338 Section 25.200 Interim equipment authorisation Part (c).
- FCC 99-37 was also referenced for the testing in this report, but not specifically used.
- Details of test methods can be found in Section 2.3, Test Conditions, of this report.
- 1.2.5 The following Federal Communications Commissions (FCC) parts require a declaration from the applicant in support of the overall FCC application. The following declarations are provided in the supporting documentation:-
- Part 25.136 (a)
Part 25.136 (b)
Part 25.202(a)(4)
Part 25.213(a)(1)
- 1.2.6 Specific Absorption Rate testing is not covered by this report.

TEST DETAILS

Ericsson Jekyll Portable Handset terminal designed to work on the
Satellite Personal Communications Network operated by Globalstar

Test Engineers: **A. Guy**
 J. M. Lea
 S. Wells

2.1

TEST EQUIPMENT

2.1.1

The following Laboratory Test Equipment (LTE) was used.

Instrument Description	Manufacturer	Model Number	BABT PS Inventory No.	Calibration Due Date (Interval)
Turntable Controller	HD	HD 050	4051	TU
Turntable	HD	DS 405	4052	TU
Biconical Antenna	R&S	HUF-Z3	2207	19/03/2000 (Y)
Log Periodic Antenna	R&S	HUF-Z2	2206	19/03/2000 (Y)
Double Ridge Guide Horn Antenna	EMCO	3115	3549	19/03/2000 (Y)
Double Ridge Guide Horn Antenna	EMCO	3115	3777	02/08/2000 (Y)
Double Ridge Guide Horn Antenna	EMCO	3115	EMC2397	22/04/2000 (Y)
Dipole Antenna	EMCO	3121C-DB4	2322	19/03/2000 (Y)
Quad Mode Dual Power Supply	TTI	PL 330 QMD	4077	TU
Power Splitter	W	1506 A	4038	13/12/2000 (Y)
10dB Attenuator	W	23-10-34	4063	22/03/2000 (Y)
High Pass Filter	LM	5HP7-2500-SR	3998	10/08/2000 (Y)
Notch Filter	LM	6CN-1610.73/ X2-SM/SM	3996	10/08/2000 (Y)
Bandstop Filter	LM	7BR4-1620.5/ X13-S	3997	10/08/2000 (Y)
FSEM 20 Spectrum Analyser	R&S	1080.1505	4034	05/11/2000 (Y)
Digital Volt Meter	F	70 III	3550	07/12/2000 (Y)
SWM.02 Signal Generator 10 MHz to 18 GHz	R&S	814.7016.02	2477	19/03/2000 (Y)
SMX Signal Generator 100 kHz to 1 GHz	R&S	826.4517.52	2478	19/03/2000 (Y)
Signal Generator	HP	8672A	EMC411	26/01/2001 (Y)
Signal Generator	Mal	2031	EMC 1741	10/05/2000 (Y)
Low Noise Amplifier 1-8 GHz	M	AMF-3d- 0010A0-18	EMC2457	TU
Low Noise Amplifier 8-18 GHz	M	AMF-4E- 080180-15	EMC2430	TU
Low Noise Amplifier 2-18 GHz	M	JSK-02001800- 50-5A	4258	TU
Hygrometer	R	I1061CWXXP1 WF1V1D	3229	27/08/2000 (Y)
Hygrometer	R	I1061CWXXP1 WF1V1D	3227	22/09/2000 (Y)
Spectrum Analyser	HP	8568B	EMC184	06/02/2000* (Y)
Quasi-Peak Adaptor	HP	85650A	EMC1302	07/02/2000* (Y)
RF Preselector	HP	85685A	EMC1370	08/02/2000* (Y)
Computer	HP	310	-	TU
Biconical Antenna	A	94455-1	EMC422	09/09/2000 (Y)
Log Periodic Antenna	AR	AT1000	EMC829	09/09/2000 (Y)
Line Impedance Stabilisation Network	C	MN 2050	EMC1269	10/03/2000 (Y)
Transient Limiter	HP	11947A	-	TU
Automatic Turntable & Controller	EMCO	1060	EMC1322	TU
Automatic Antenna Mast & Controller	EMCO	1050	EMC1323	TU
Printer	HP	THINK JET	-	TU
Plotter	HP	7550A	-	TU
Atomic Frequency Standard	EFRATOM	FRK	EMC2152	09/02/2001 (Y)
Temperature Chamber	HV	VM 04/100	1755	01/08/2000 (6M)
Temperature Chamber	MI	2F3	826	26/05/2000 (Y)

Table 1 Test Equipment Used for FCC Testing

General Key

- * Calibrated at the time testing was performed
- TU Traceability Unscheduled (Equipment not used for calibrated measurements or calibrated at the time of test)
- (Y) Calibration required every year

(6M) Calibration required every 6 months

2.1 **TEST EQUIPMENT** continued

2.1.1 continued...

Key of Manufacturers

A	Ailtech
AR	Amplifier Research
C	Chase
F	Fluke
HD	Heinrich Diesel
HP	Hewlett Packard
HV	Heraeus Vötsch
LC	Le Croy
LM	Lorch Microwave
M	Miteq
Mal	Marconi Instruments
MI	Montford Instruments
R&S	Rohde and Schwarz
R	Rotronic
TTI	Thurlby Thandar Instruments
W	Weinschel

2.1.2 The Special Test Equipment (STE) used in the testing was a proprietary Anritsu MT8803G Globalstar User Terminal tester. This was used to set all the test modes required during the testing where a carrier on mode was required. This equipment was not used in any testing requiring calibrated measurements. The Anritsu MT 8803G was set to 'Service option 2001' for all CARRIER ON testing with the maximum data rate (9600 bits/s). This produces maximum power and maximum modulation.

Part Number: MT8803G
Serial Number: MB07087

2.1.3 The following equipment was also used at BABT Product Service Ltd for the testing of the MES for the characterisation of Part 25.202 (f) radiated emission testing:
Hemford fully lined Anechoic Chamber, External dimensions: length 10 metres x width 5 metres x height 5 metres. Absorption material details: All walls, ceiling and floor are lined with Emmerson & Cummins Eccosorb type VHP-36-NRL.

2.2 **TEST SOFTWARE**

2.2.1 The following was used to control the Anritsu MT8803G Globalstar User Terminal tester on all tests:-

Release Number:- release 31.1
Tester Version:- v2.4.5
Baseband Version:- v0.15.11.4 build 3324
DDSP Version:- v1.10

TEST CONDITIONS**Part 15.107 Conducted Emission Test Methods**

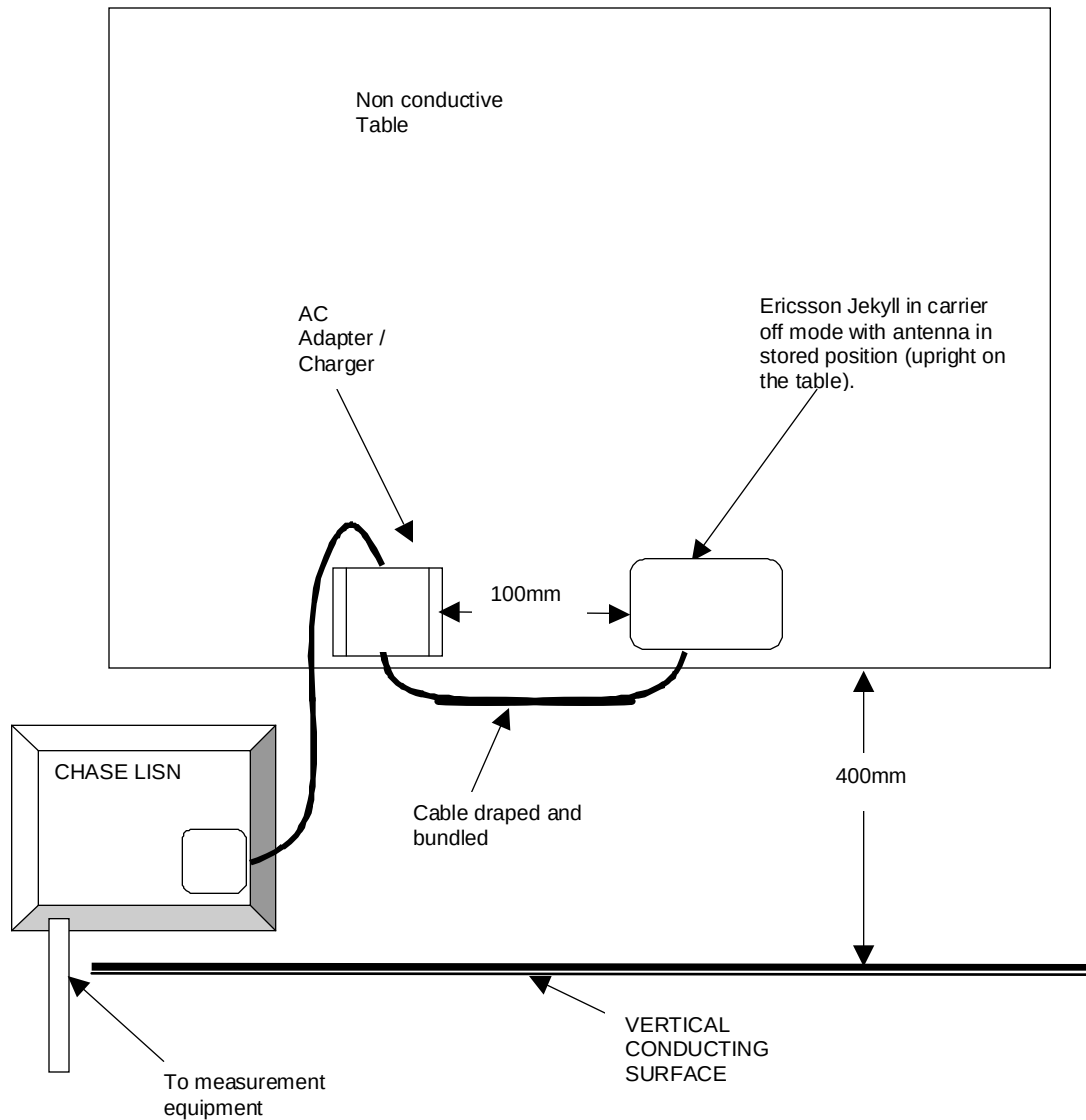
The test was performed in accordance with ANSI C63.4.

All Conducted Emission Measurements were undertaken within the Characterisation Chamber. Conducted Emission measurements were undertaken on the Live and Neutral Lines.

The emissions were formally measured using a Quasi-Peak Detector which meets the CISPR requirements. The details of the highest emissions were then recorded in the Job Log Book. Details of the highest emissions for the Live and Neutral Lines are presented in Tables 1(a) and 1(b) respectively.

The Conducted Emission measurements were made using a Hewlett Packard Spectrum Analyser, Preselector and Quasi-Peak Adaptor.

The Ericsson Jekyll was connected to a 110V 60Hz supply via a Chase Line Impedance Stabilisation Network (LISN).



DRAWING NOT TO SCALE

Figure 1: Ericsson Jekyll CFR 47 Part 15.107 Conducted Emission Set up (Plan View)

2.3 **TEST CONDITIONS** continued

2.3.2 Part 15.109 Radiated Emission Test Methods

The test was performed in accordance with ANSI C63.4.

A preliminary profile of the Radiated Electric Field emissions was obtained by placing the Ericsson Jekyll in a Characterisation Chamber; measurements were taken at a 3m distance. Measurements of emissions from the Ericsson Jekyll were obtained with the measurement antenna in Horizontal and Vertical Polarisations. The characterisation produced a list of the highest emissions, their bearing and associated antenna polarisation. The product was operated in a Carrier Off stand-by mode where it was not in receipt of the Globalstar network.

The EUT was connected to a 110V 60Hz supply via a Chase LISN with a 50 Ω termination on the RF conducted port.

The product was then transferred to the Open Field Site and placed on a remotely controlled turntable. Using the information from the preliminary profiling exercise, a search was made of the frequency spectrum from 30MHz to 13 GHz (greater than 5 times the highest frequency generated by the product). The list of the highest emissions was then confirmed or updated under Open Site conditions. These emissions were then formally measured using a Quasi-Peak Detector which met the CISPR 16 requirements. The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification. The details of these highest emissions were then recorded in the Job Log Book. Details of the highest emissions are presented in Table 2 in the results section of this report. The Radiated Electric Field emission measurements were made using a Hewlett Packard Spectrum Analyser, Preselector and Quasi-Peak detector.

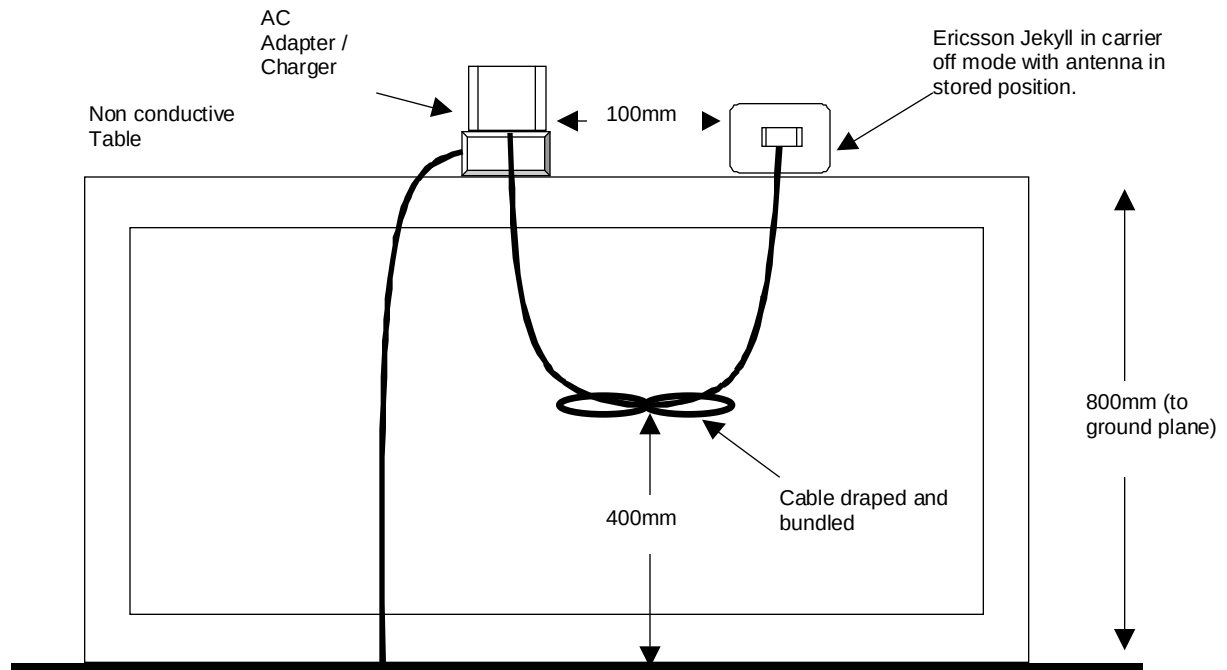


Figure 2: Ericsson Jekyll CFR 47 Part 15.109 Radiated Emission Set up (Rear View)

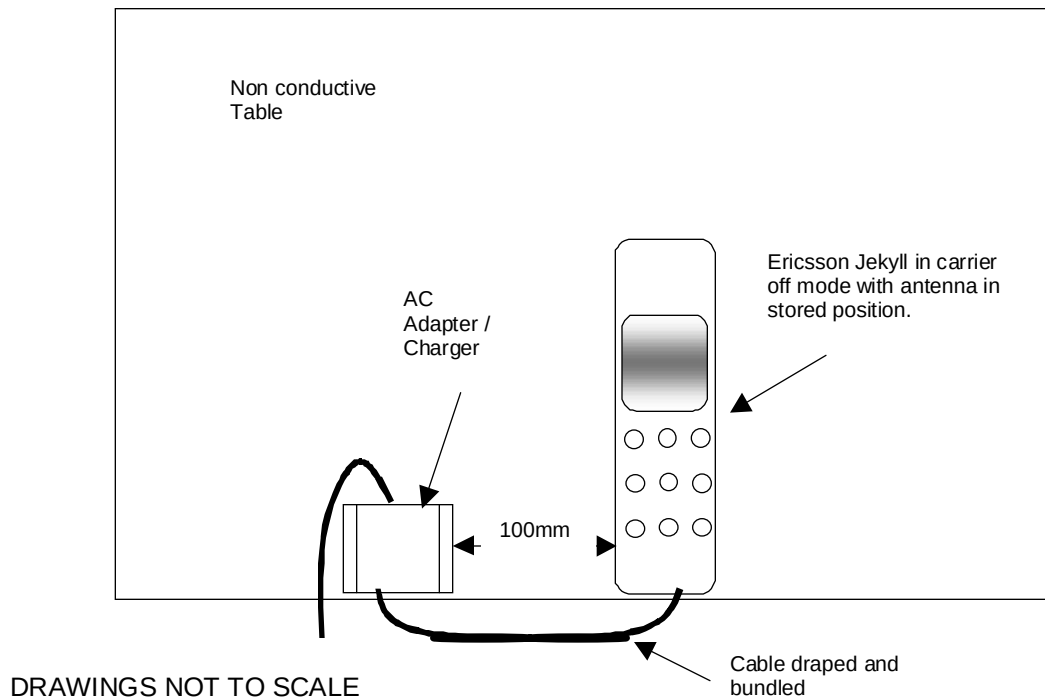


Figure 3: Ericsson Jekyll CFR 47 Part 15.109 Radiated Emission Set up (Plan View)

2.3 **TEST CONDITIONS** continued

2.3.3 Part 25.202(d) Frequency Tolerance Test Methods

Testing was performed in accordance with Equipment Authorisation Procedure Part 2.1055. Frequency tolerance measurements were recorded from -30°C to +50°C in 10°C steps.

The test power source voltages used (as declared by the manufacturer) were:

Higher Extreme: 8.2 Volts DC

Lower Extreme: 6.4 Volts DC

Testing was performed on the bottom, middle and top carrier frequencies of the device. This equates to Globalstar Channel 1 at 1610.73 MHz, Globalstar Channel 7 at 1618.11 MHz and Globalstar Channel 13 at 1625.49 MHz. The Ericsson Jekyll was placed in a Thermal Chamber. A temperature stabilisation period of ≥ 1 hours was used prior to any frequency tolerance measurements being made. The Ericsson Jekyll was put in a conversation mode with the Globalstar Anritsu test set at maximum carrier power. Measurements were made on a spectrum analyser with an external frequency reference derived from an Atomic Frequency Standard. The details of these test results are presented in Table 2 in the results section of this report.

Testing was performed in accordance with FCC Equipment Authorisation Procedure Part 2.1057 (Frequency spectrum to be investigated). Emission Limitation measurements were recorded from 9 kHz to 16.5 GHz (the tenth harmonic of the highest fundamental frequency of the product). Conducted emission measurements were performed on the antenna ports from 9 kHz to 30 MHz in accordance with FCC Equipment Authorisation Procedure Part 2.1051 (Measurements required: Spurious emissions at the antenna terminals). Conducted emission measurements were performed in this frequency range as this is an industry standard method for measuring emissions from antenna ports. Radiated emissions were measured from 30 MHz to 16.5 GHz. A preliminary profile of the Radiated EIRP emission measurements were obtained by placing the Ericsson Jekyll in a Characterisation Chamber; measurements were taken at a 3m distance. Measurements of emissions from the Ericsson Jekyll were obtained with the measurement antenna in Horizontal and Vertical Polarisations. The characterisation produced a list of the highest emissions, their bearing and associated antenna polarisation.

The EUT was connected to a 110V 60Hz supply via a Chase LISN with a 50Ω termination on the RF conducted port.

Testing was performed on the bottom, middle and top carrier frequencies of the device. This equates to Globalstar Channel 1 at 1610.73 MHz, Globalstar Channel 7 at 1618.11 MHz and Globalstar Channel 13 at 1625.49 MHz. A communications link was established with the Globalstar Anritsu MT 8803G Test Set. The Anritsu MT 8803G was set to 'Service option 2001' for all Carrier On testing with the maximum data rate (9600 bits/s). This produces maximum power and maximum modulation.

The Authorised bandwidth of a Globalstar device is 16.5 MHz (1610 MHz to 1626.5 MHz). The limit ranges for each of the Globalstar channels under test were calculated using this Authorised bandwidth figure.

The Ericsson Jekyll maximum power = +26 dBm/1.23MHz. Using the standard bandwidth conversion method this equates to:-

$26 - 10\log_{10}(1.23\text{M}/4\text{k}) - 30 = -28.9 \text{ dBW}/4\text{kHz}$. The following limit tables were produced:-

Globalstar Channel 1, Frequency = 1610.73 MHz.

Frequency Range	Limit (dBc)	Calculated EIRP Limit (dBW/4kHz)
9 kHz to 1569.48 MHz	-39*	-67.9
1569.48 MHz to 1594.23 MHz	-35	-63.9
1594.23 MHz to 1602.48 MHz	-25	-53.9
1602.48 MHz to 1618.98 MHz	No Requirement	N/A
1618.98 MHz to 1627.23 MHz	-25	-53.9
1627.23 MHz to 1651.98 MHz	-35	-63.9
1651.98 MHz to 16.1073 GHz	-39*	-67.9

* $-(43 + 10 \log_{10}(\text{device power in Watts} = 0.398))$

Globalstar Channel 7, Frequency = 1618.11 MHz.

Frequency Range	Limit (dBc)	Calculated EIRP Limit (dBW/4kHz)
9kHz to 1576.86 MHz	-39*	-67.9
1576.86 MHz to 1601.61 MHz	-35	-63.9
1601.61 MHz to 1609.86 MHz	-25	-53.9
1609.86 MHz to 1626.36 MHz	No Requirement	N/A
1626.36 MHz to 1634.61 MHz	-25	-53.9
1634.61 MHz to 1659.36 MHz	-35	-63.9
1659.36 MHz to 16.1811 GHz	-39*	-67.9

$$* -[43 + 10 \log_{10}(\text{device power in Watts} = 0.398)]$$

2.3 TEST CONDITIONS continued

2.3.4 Part 25.202(f) Emission Limitation Test Methods continued

Globalstar Channel 13, Frequency = 1625.49 MHz.

Frequency Range	Limit (dBc)	Calculated EIRP Limit (dBW/4kHz)
9 kHz to 1584.24 MHz	-39*	-67.9
1584.24 MHz to 1608.99 MHz	-35	-63.9
1608.99 MHz to 1617.24 MHz	-25	-53.9
1617.24 MHz to 1633.73 MHz	No Requirement	N/A
1633.73 MHz to 1641.99 MHz	-25	-53.9
1641.99 MHz to 1666.74 MHz	-35	-63.9
1666.74 MHz to 16.2549 GHz	-39*	-67.9

* $-[43 + 10 \log_{10}(\text{device power in Watts} = 0.398)]$

Conducted emission measurements were performed from 9kHz to 30 MHz with direct connection to the antenna port in line with recognised industry practice. Testing was performed using a Rohde and Schwarz FSEM 20 Spectrum Analyser connected via a power splitter to both the Ericsson Jekyll and the Anritsu MT 8803G Globalstar test set. All measurements were performed taking an allowance for the path losses of any cabling, attenuation and the power splitter.

The product was then transferred to the Open Field Site and placed on a remotely controlled turntable. Using the information from the preliminary profiling of the product, a search was made of the frequency spectrum from 30 MHz to 16.5 GHz. The list of the highest emissions was then confirmed or updated under Open Field Site conditions. These emissions were then formally measured as an EIRP measurement. The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification. The harmonics of the fundamentals were measured and if found greater than the noise floor were measured. All measurements were taken using antenna substitution techniques. The details of these highest emissions were then recorded in the Job Log Book. Details of the highest emission levels are presented in Table 3 in the results section of this report.

2.3.5 Part 25.213(b) Radiated Emission Test Methods

The product was set up in the Open Field Site and placed on a remotely controlled turntable. Using the information from the preliminary profiling exercise, a search was made of the frequency spectrum from 1574.397 MHz to 1576.443 MHz. The list of the highest emission levels was then confirmed or updated under Open Site conditions. These emissions were then formally measured as an EIRP measurement. The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification. All measurements were taken using substitution techniques. The frequency band under test was video averaged over 20 milliseconds at the maximised position.

The EUT was connected to a 110V 60Hz supply via a Chase LISN with a 50Ω termination on the RF conducted port.

Testing was performed on the bottom, middle and top carrier frequencies of the device. This equates to Globalstar Channel 1 at 1610.73 MHz, Globalstar Channel 7 at 1618.11 MHz and Globalstar Channel 13 at 1625.49 MHz. A communications link was established with the Globalstar Anritsu MT 8803G Test Set. The Anritsu MT 8803G was set to 'Service option 2001' for all Carrier On testing with the maximum data rate (9600 bits/s). This produces maximum power and maximum modulation.

2.3 **TEST CONDITIONS** continued

2.3.6 FCC 98-338 Section 25.200 Interim equipment authorisation (c)

The product was set up in the Open Field Site and placed on a remotely controlled turntable. Using the information from the preliminary profiling exercise, a search was made of the frequency spectrum from 1559 MHz to 1605 MHz. The list of the highest emissions was then confirmed or updated under Open Site conditions. These emissions were then formally measured as an EIRP measurement. The readings were maximised by adjusting the antenna height, polarisation and turntable azimuth, in accordance with the specification. All measurements were taken using antenna substitution techniques. The frequency band under test was video averaged over 20 milliseconds at the maximised position in a 1 MHz bandwidth. A search was also conducted using a 500 Hz measurement bandwidth.

The EUT was connected to a 110V 60Hz supply via a Chase LISN with a 50 Ω termination on the RF conducted port.

Testing was performed on the bottom, middle and top carrier frequencies of the device. This equates to Globalstar Channel 1 at 1610.73 MHz, Globalstar Channel 7 at 1618.11 MHz and Globalstar Channel 13 at 1625.49 MHz. A communications link was established with the Globalstar Anritsu MT 8803G Test Set. The Anritsu MT 8803G was set to 'Service option 2001' for all Carrier On testing with the maximum data rate (9600 bit/s). This produces maximum power and maximum modulation.

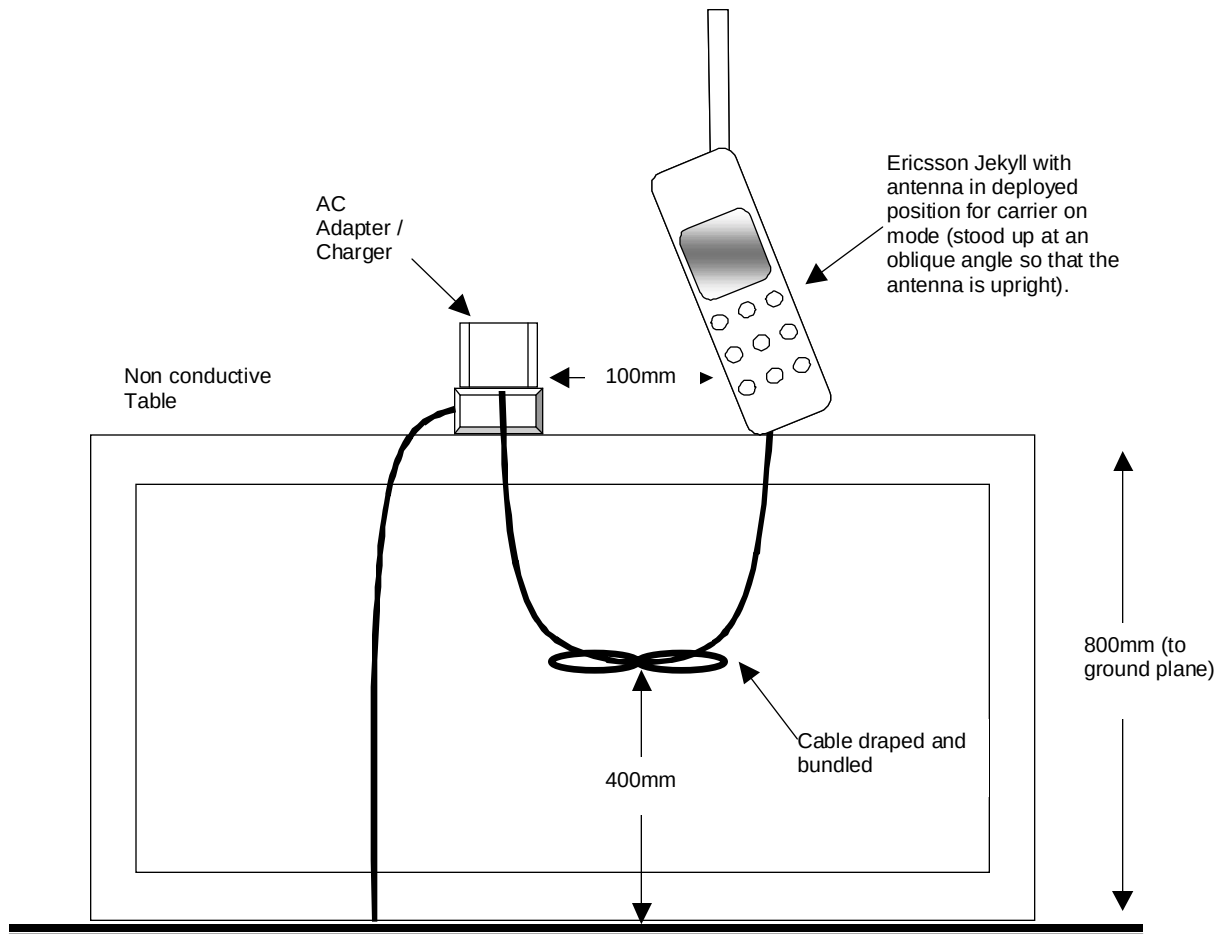
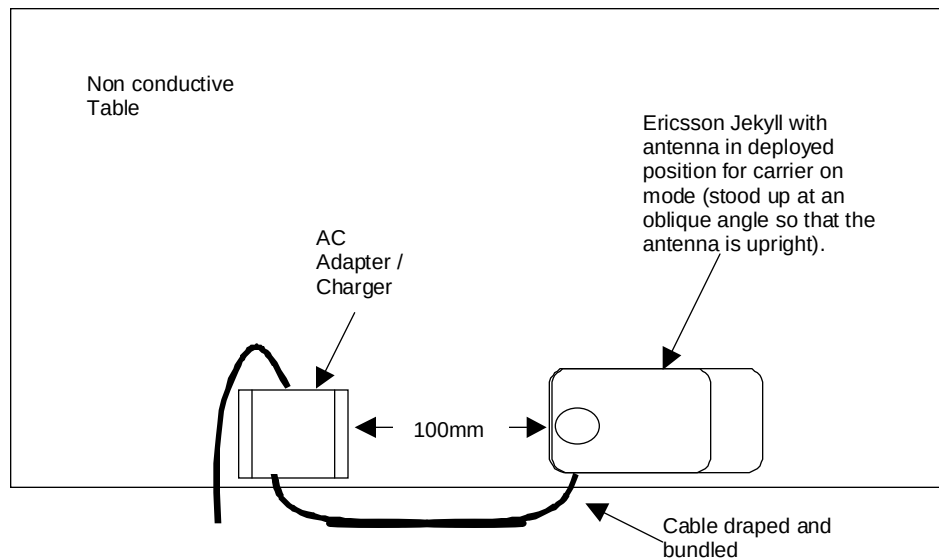


Figure 4: Ericsson Jekyll CFR 47 Part 25 Radiated Emission Set up (Rear View)



DRAWINGS NOT TO SCALE

Figure 5: Ericsson Jekyll CFR 47 Part 25 Radiated Emission Set up (Plan View)

MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems, in accordance with the recommendations of the United Kingdom Accreditation Service (UKAS - our ISO Guide 25 and EN 45001 measurement accreditation body) document NIS 81 Edition 1, May 1994 are :-

For Radiated Emission, Quasi-Peak Measurements taken in Zero Span using the Hewlett Packard Spectrum Analyser, Preselector and Quasi-Peak Adaptor:-

Frequency	$\pm 2 \times 10^{-7} \times \text{Centre Frequency (up to 1 GHz)}$ $\pm 2 \times 10^{-6} \times \text{Centre Frequency (above 1 GHz)}$
Amplitude	+4.45dB (30-200MHz; 3m Measurements) -4.42dB (30-200MHz; 3m Measurements) +4.80dB (200-1000MHz; 3m Measurements) -3.81dB (200-1000MHz; 3m Measurements) $\pm 3.0\text{dB}$ (1 GHz to 13GHz; 3m Measurements)

For Radiated Emission measurements using the Rohde and Schwarz FSEM 20 Spectrum Analyser, also EIRP measurements and antenna substitution methods:-

Frequency	$\pm 2 \times 10^{-7} \times \text{Centre Frequency (30 MHz to 16.5 GHz)}$
Amplitude	$\pm 2.7\text{dB}$ (30 MHz to 16.5 GHz)

For Conducted Emission measurements using the Rohde and Schwarz FSEM 20 Spectrum Analyser and antenna substitution methods:-

Frequency	$\pm 2 \times 10^{-7} \times \text{Centre Frequency (9 kHz to 30 MHz)}$
Amplitude	$\pm 1.4 \text{ dB}$ (9 kHz to 30 MHz)

For Frequency Tolerance Measurements using the Rohde and Schwarz FSEM 20 Spectrum Analyser, Atomic (Rubidium-derived) Frequency Standard and Thermal Chamber:-

Frequency	$\pm 50 \text{ Hz}$ ($3.1 \times 10^{-8} \times \text{Centre Frequency}$)
Temperature	$\pm 2.0 \text{ }^{\circ}\text{C}$ (worst case on Thermal Chamber)

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SECTION 2.5

TEST RESULTS

(Pages 20 to 25)

2.5

TEST RESULTS

2.5.1

Part 15.107 Conducted Emission Test Results

Equipment Designation : Unintentional Radiator.

The Ericsson Jekyll met the Class B requirements of FCC Part 15 Subpart B for Conducted Emissions.

Conducted Emissions Live Line : A search was made of the frequency spectrum from 450kHz to 30MHz. The levels of the seventeen highest emissions were measured in accordance with the specification and are presented in Table 1(a) below :-

Frequency	Measured Level	Cable Loss	Sensor Factor	Absolute Level		Spec Limit	
MHz	dBμV	DB	DB	dBμV	μV	DBμV	μV
0.458	30.3	0.0	10.0	40.3	103.5	48	250
0.505	29.8	0.0	10.0	39.8	97.7	48	250
0.924	32.1	0.0	10.0	42.1	127.4	48	250
0.932	32.3	0.0	10.0	42.3	130.3	48	250
1.103	31.7	0.0	10.0	41.7	121.6	48	250
1.105	31.6	0.0	10.0	41.6	120.2	48	250
1.150	32.6	0.0	10.0	42.6	134.9	48	250
1.280	30.1	0.0	10.0	40.1	101.2	48	250
1.494	30.5	0.0	10.1	40.6	107.2	48	250
1.713	31.7	0.0	10.1	41.8	123.0	48	250
1.887	29.7	0.0	10.1	39.8	97.7	48	250
1.932	32.4	0.0	10.1	42.5	133.4	48	250
2.106	30.6	0.0	10.1	40.7	108.4	48	250
2.237	30.4	0.0	10.1	40.5	105.9	48	250
2.327	31.6	0.0	10.1	41.7	121.6	48	250
2.500	29.3	0.0	10.1	39.4	93.3	48	250
2.545	31.4	0.0	10.1	41.5	118.9	48	250

Table 2 (a), Part 15.107 Conducted Emission Test Results (Live Line)

2.5 **TEST RESULTS** continued

2.5.1 Part 15.107 Conducted Emission Test Results continued

Conducted Emissions Neutral Line : A search was made of the frequency spectrum from 450kHz to 30MHz. The levels of the eight highest emissions were measured in accordance with the specification and are presented in Table 1(b) below :-

Frequency	Measured Level	Cable Loss	Sensor Factor	Absolute Level		Spec Limit	
MHz	dBμV	DB	DB	dBμV	μV	dBμV	μV
0.477	22.6	0.0	10.2	32.8	43.7	48	250
0.912	26.1	0.0	10.4	36.5	66.8	48	250
1.126	26.4	0.0	10.4	36.8	69.2	48	250
1.344	27.4	0.0	10.4	37.8	77.6	48	250
1.822	27.9	0.0	10.3	38.2	81.3	48	250
2.124	27.0	0.0	10.3	37.3	73.3	48	250
2.384	26.5	0.0	10.3	36.8	69.2	48	250
2.774	25.1	0.0	10.3	35.4	58.9	48	250

Table 2 (b), Part 15.107 Conducted Emission Test Results (Neutral Line)

2.5 **TEST RESULTS** continued

2.5.2 Part 15.109 Radiated Emission Test Results

Equipment Designation : Unintentional Radiator.

The Ericsson Jekyll met the Class B requirements of FCC Part 15 Subpart B for Radiated Electric Field Emissions.

The emissions have been measured at 3 m.

Open Field Results : The levels of the five highest emissions measured in accordance with the specification are presented in Table 1 below :-

Frequency MHz	Pol H/V	Hgt Cm	Azm deg	Level at 3 m DB μ V	Amplifier Gain* and Cable Loss DB	Antenna Factor dB	F.S at 3m		Spec Limit	
							dB μ V/ m	μ V/m	dB μ V/ m	μ V/m
49.118	V	100	71	21.1	-1.2	11.1	31.0	35.5	40	100
49.121	H	267	213	18.8	-1.2	11.1	28.7	27.2	40	100
1487.76	V	122	159	43.2	-33.0	25.1	35.3	58.0	54	500
1487.76	V	113	279	41.8	-33.0	25.1	33.9	49.5	54	500
2975.55	V	164	119	33.7	-31.0	30.4	33.1	45.2	54	500

Table 3, Part 15.109 Radiated Emission Test Results

* Amplifier required for frequencies above 1 GHz.

ABBREVIATIONS FOR ABOVE TABLE

H	Horizontal Polarisation	V	Vertical Polarisation
Pol	Polarisation	Hgt	Height
deg	degree	Azm	Azimuth
Spec	Specification	F S	Field Strength

Procedure Test Performed in accordance with ANSI C63.4.

Part 25.202 (d) Frequency Tolerance

The Ericsson Jekyll met requirements of FCC Part 25.202 (d) frequency Tolerance that the carrier frequency shall be maintained within 0.001 percent of the reference frequency.

The results of the testing are shown below.

Globalstar Channel Number	Carrier Frequency (MHz)	Temperature (°C)	High Voltage (8.2Vdc) Frequency Tolerance (kHz)	Low Voltage (6.4Vdc) Frequency Tolerance (kHz)	Frequency Tolerance Limit (kHz)
1	1610.73	+50	-0.214	-0.379	±16.1073
7	1618.11	+50	-0.319	-0.407	±16.1811
13	1625.49	+50	-0.663	-0.527	±16.2549
1	1610.73	+40	+0.291	+0.222	±16.1073
7	1618.11	+40	+0.303	+0.255	±16.1811
13	1625.49	+40	+0.198	+0.259	±16.2549
1	1610.73	+30	+0.359	+0.259	±16.1073
7	1618.11	+30	+0.383	+0.423	±16.1811
13	1625.49	+30	+0.242	+0.399	±16.2549
1	1610.73	+20	+0.246	+0.178	±16.1073
7	1618.11	+20	+0.101	+0.141	±16.1811
13	1625.49	+20	+0.139	+0.278	±16.2549
1	1610.73	+10	+0.146	+0.243	±16.1073
7	1618.11	+10	+0.131	+0.299	±16.1811
13	1625.49	+10	+0.315	+0.295	±16.2549
1	1610.73	0	+0.126	+0.186	±16.1073
7	1618.11	0	+0.039	+0.131	±16.1811
13	1625.49	0	-0.059	-0.075	±16.2549
1	1610.73	-10	-0.114	-0.226	±16.1073
7	1618.11	-10	-0.255	-0.242	±16.1811
13	1625.49	-10	-0.214	-0.242	±16.2549
1	1610.73	-20	+0.095	+0.023	±16.1073
7	1618.11	-20	-0.035	-0.083	±16.1811
13	1625.49	-20	-0.149	-0.119	±16.2549
1	1610.73	-30	+0.559	+0.399	±16.1073
7	1618.11	-30	+0.275	+0.203	±16.1811
13	1625.49	-30	+0.129	+0.157	±16.2549

Table 4, Part 25.202 (d) Frequency Tolerance Results

2.5 **TEST RESULTS** continued

2.5.4 Part 25.202 (f) Conducted and Radiated Emission Test Results

The Ericsson Jekyll met the Class B requirements of FCC Part 25.202 (f) for Conducted and Radiated Emissions.

(a) Conducted Emissions were measured from 9 kHz to 30 MHz with a direct connection onto the Ericsson Jekyll antenna port. No Emissions were found with a level greater than 20 dB below the specification limit.

(b) EIRP Radiated Emissions were measured at 3 m.

Open Field Results : The levels of the highest emissions measured in accordance with the specification are presented in Table 3 below :-

Globalstar Channel 1 Results (Carrier Frequency = 1610.73 MHz)

Frequency (MHz)	Polarity H/V	EIRP (dBW/4kHz)	Calculated EIRP limit (dBW/4kHz)
1480.35	H	-86.7	-67.9
2960.70	H	-97.4	-67.9

Table 5(a), Part 25.202 (f) Radiated Emissions (Globalstar Channel 1 Test Results)

Globalstar Channel 7 Results (Carrier Frequency = 1618.11 MHz)

Frequency (MHz)	Polarity H/V	EIRP (dBW/4kHz)	Calculated EIRP limit (dBW/4kHz)
1487.73	H	-87.1	-67.9
2975.46	H	-97.3	-67.9

Table 5(b), Part 25.202 (f) Radiated Emissions (Globalstar Channel 7 Test Results)

Globalstar Channel 13 Results (Carrier Frequency = 1625.49 MHz)

Frequency (MHz)	Polarity H/V	EIRP (dBW/4kHz)	Calculated EIRP limit (dBW/4kHz)
1495.11	H	-86.0	-67.9
2990.22	H	-97.2	-67.9

Table 5(c), Part 25.202 (f) Radiated Emissions (Globalstar Channel 13 Test Results)

2.5 TEST RESULTS continued

2.5.5 Part 25.213 (b) Radiated Emission Test Results

The Ericsson Jekyll met the requirements of FCC Part 25.213 (b) for radiated emissions. No emissions were found in the frequency range of 1574.397 MHz to 1576.443 MHz at a level within 20 dB of the specification limit of -70 dBW/MHz for broadband emissions.

No discrete spurious (narrow band) emissions were found within 20dB of the -80dBW/600Hz limit in the same frequency range.

2.5.6 FCC 98-338 Section 25.200 Interim equipment authorisation (c)

The Ericsson Jekyll met the requirement of FCC 98-338 Section 25.200 Interim equipment authorisation part (c). The following emissions were measured in a 1 MHz measurement bandwidth. No other emissions were detected within 20dB of the -70dBW/MHz limit.

No discrete spurious (narrow band) emissions were found within 20dB of the -80dBW/700Hz limit in the same frequency range.

Globalstar Channel 1 Results (Carrier Frequency = 1610.73 MHz)

Frequency (MHz)	Polarity H/V	EIRP (dBW/MHz)	Calculated EIRP limit (dBW/MHz)
1600.48	H	-86.4	-70

Table 6(a), FCC 98-338 Radiated Emissions (Globalstar Channel 1 Test Results)

Globalstar Channel 7 Results (Carrier Frequency = 1618.11 MHz)

Frequency (MHz)	Polarity H/V	EIRP (dBW/MHz)	Calculated EIRP limit (dBW/MHz)
1600.02	H	-88.0	-70

Table 6(b), FCC 98-338 Radiated Emissions (Globalstar Channel 7 Test Results)

Globalstar Channel 13 Results (Carrier Frequency = 1625.49 MHz)

Frequency (MHz)	Polarity H/V	EIRP (dBW/MHz)	Calculated EIRP limit (dBW/MHz)
1603.710	V	-86.7	-70

Table 6(c), FCC 98-338 Radiated Emissions (Globalstar Channel 13 Test Results)

Ericsson Jekyll Portable Handset terminal designed to work on the
Satellite Personal Communications Network operated by Globalstar

SECTION 2.6

RECORD PHOTOGRAPHS

(Pages 27 to 31)



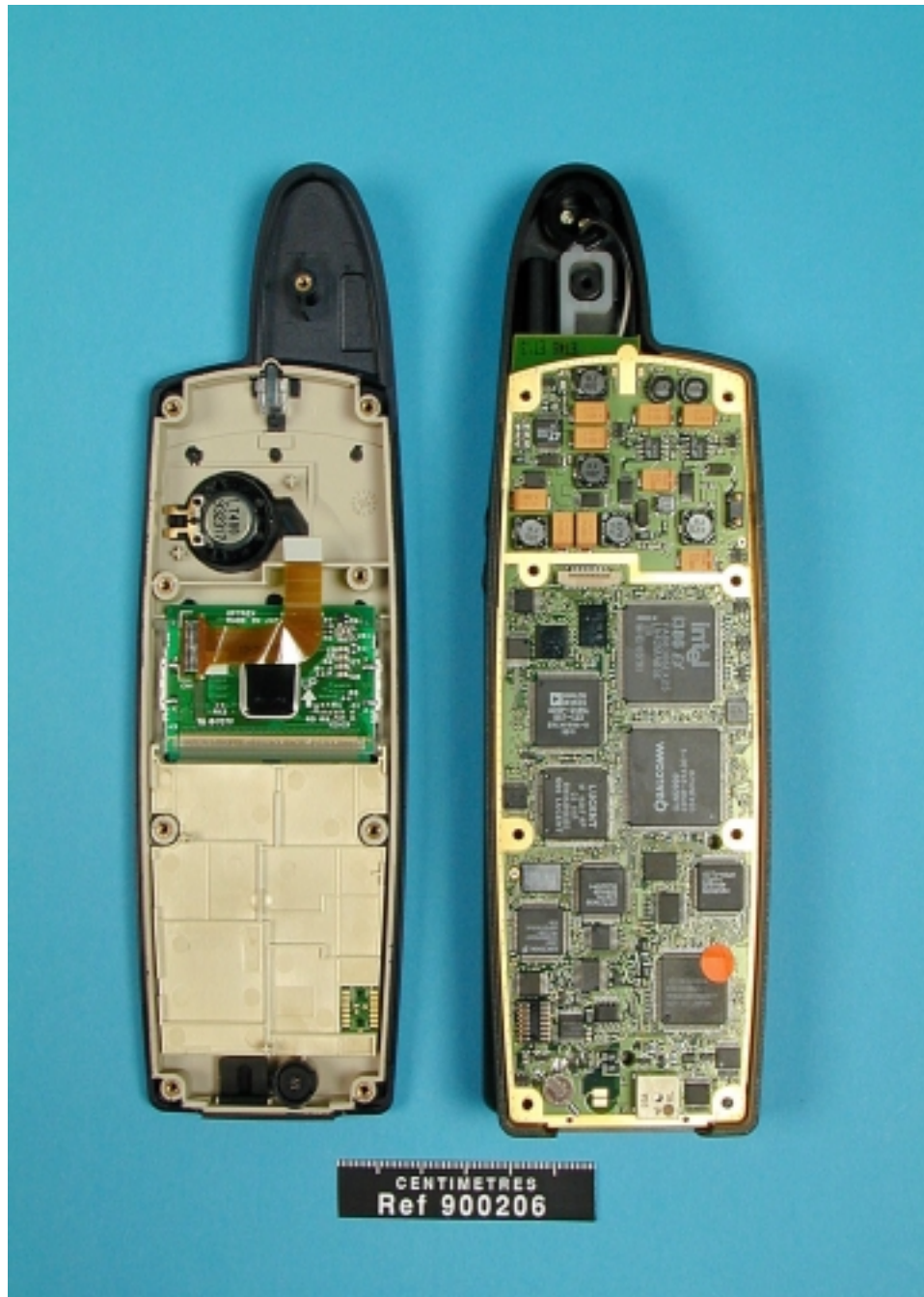
Photograph One: Front view of Ericsson Jekyll submitted for testing with antenna in stored position.



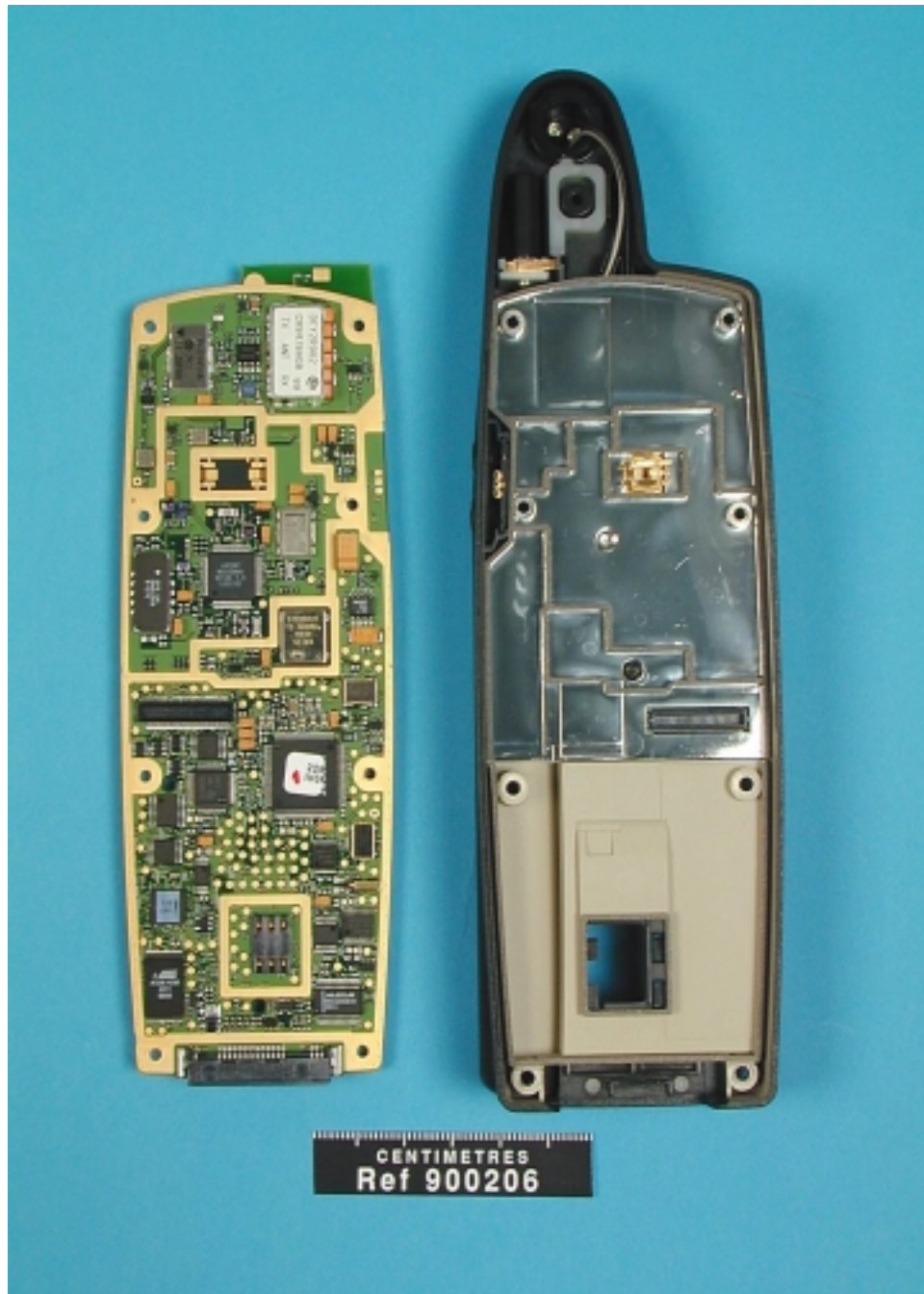
Photograph Two: Rear view of Ericsson Jekyll submitted for testing with antenna in stored position.



Photograph Three: Rear view of Ericsson Jekyll submitted for testing with antenna in deployed position and connector blanking panel removed.



Photograph Four: Ericsson Jekyll with front panel (including keyboard and display) removed showing side 1 of main pcb.



Photograph Five: Underside of main pcb of Ericsson Jekyll showing SIM interface and RF sections.

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