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TEST REPORT

**SIMOCO SRP9180AC Portable Radio
with PAR-9180LMR4
Antenna Microphone**

tested to the

Code of Federal Regulations (CFR) 47

Part 90 –Private Land Mobile Services

Part 15 – Radio Frequency Device

for

ComGroup Australia Pty Ltd

This Test Report is issued with the authority of:

A handwritten signature in black ink, appearing to read "Andrew Cutler".

Andrew Cutler- General Manager



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1. CLIENT INFORMATION

Company Name ComGroup Australia Pty Ltd
Address 1270 Ferntree Gully Rd
Scorsby
State VIC
Country Australia
Contact Mr Robert Stowell

2. DESCRIPTION OF TEST SAMPLE

Brand Name SIMOCO
Model Number SR9180AC
Product Portable Radio with Antenna Microphone
Manufacturer ComGroup Australia Pty Ltd
Designed in Australia
Manufactured in China
Serial Number ET9AX09100103
FCC ID STZSRP9170AC

3. COMPLIANCE STATEMENT AND RESULT SUMMARY

The **SIMOCO SRP9180AC Personal Mobile Station with PAR-9180LMR4 Antenna Microphone** complies with the limits defined in 47 CFR Part 15, 47 CFR Part 90 and 47 CFR Part 2 when tested in-accordance with the test methods described in 47 CFR Part 2.

Clause	Description	Result
90.203	Certification required	Noted
2.1046 90.205	RF power output Power and antenna height limits	Noted Complies
2.1047 2.1047(a) 2.1047(b) 90.211(a)	Modulation Characteristics Low pass filter response Modulation limiting characteristics Modulation characteristics	Noted Noted Noted Not tested
2.1049 2.202 22.357 22.359(a) 90.207 90.209 90.210	Occupied bandwidth Bandwidths Emission types Emission masks Types of emissions Bandwidth limitations Emission masks	Noted Noted Not tested Not tested Not tested Not tested Not tested
2.1051	Spurious emissions at antenna terminals	Complies
2.1053	Field strength of spurious radiation	Complies
2.1055 22.355 90.213	Frequency stability Frequency stability Frequency stability	Noted Not tested Not tested
90.214	Transient frequency behaviour	Not tested
15.109 15.111	Receiver radiated emissions Receiver local oscillator voltage	Complies Complies
1.1310	Radio frequency exposure limits	See SAR test report

4. TEST SAMPLE DESCRIPTION

The sample tested has the following specifications:

Rated Transmitter Output Power

5.0 Watts (37.0 dBm)

Test frequencies

Chl	Frequency MHz	Power Watts	Spacing kHz	Mode
2	150.075	5.0	12.5	F3E
3	155.075	5.0	12.5	F3E
4	162.075	5.0	12.5	F3E
5	173.975	5.0	12.5	F3E

FCC Bands

Part 90: 150 - 174 MHz

Emission Designators / Modes of operation

F3E – Analogue speech

Power Supply

DC voltage supply typically 7.4 Vdc

5. TEST CONDITIONS

Standard Temperature and Humidity

Temperature: +15°C to + 30° maintained.

Relative Humidity: 20% to 75% observed.

Standard Test Power Source

Standard Test Voltage: 7.4 Vdc.

Extreme Temperature

High Temperature: + 50°C maintained.

Low Temperature: - 30 °C maintained.

Extreme Test Voltages

Low Voltage: 6.8 Vdc

6. ATTESTATION

The **SIMOCO SRP9180AC Personal Mobile Station with PAR-9180LMR4 Antenna Microphone complies** with the Code of Federal Regulations (CFR) 47 Part 90 –Private Land Mobile Services and 47 Part 15 – Radio Frequency Devices.

This report describes the tests and measurements performed for the purpose of determining compliance with the specification with the following conditions:

The client selected the test sample.

The report relates only to the sample tested.

This report does not contain corrections or erasures.

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both Class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

In addition this equipment has been tested in accordance with the requirements contained in the appropriate Commission regulations.

To the best of my knowledge, these tests were performed using measurement procedures that are consistent with industry or Commission standards and demonstrate that the equipment complies with the appropriate standards.

I further certify that the necessary measurements were made by EMC Technologies NZ Ltd, 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand.



Andrew Cutler
General Manager
EMC Technologies NZ Ltd

7. TEST RESULTS

Certification required

FCC Class 2 permissive change certification is being sought for this device.

This device has previously been certified with an FCC ID of STZSRP9170AC.

Modifications have been made to this device with testing being carried out to ensure that compliance has not been compromised.

The modification made has moved the antenna from the case of the transmitter to the handset speaker/ microphone.

No other changes have been made to the operation of the radio.

Therefore spurious emission measurements have been performed.

In addition revised SAR measurements have been made.

Result: Complies.

Transmitter spurious emissions at the antenna terminals

Frequency: 150.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
300.150	-45.0	-20.0
450.225	-46.5	-20.0
600.300	-58.0	-20.0
750.375	<-60.0	-20.0
900.450	-58.0	-20.0
1050.525	<-60.0	-20.0
1200.600	<-60.0	-20.0
1350.675	<-60.0	-20.0
1500.750	<-60.0	-20.0

Frequency: 155.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
310.150	-48.5	-20.0
465.225	-51.6	-20.0
620.300	-57.4	-20.0
775.375	<-60.0	-20.0
930.450	-57.6	-20.0
1085.525	<-60.0	-20.0
1240.600	<-60.0	-20.0
1395.675	<-60.0	-20.0
1550.750	<-60.0	-20.0

Frequency: 162.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
324.15	-44.0	-20.0
486.225	-57.5	-20.0
648.300	-53.3	-20.0
810.375	-58.0	-20.0
972.450	<-60.0	-20.0
1134.525	<-60.0	-20.0
1296.600	<-60.0	-20.0
1458.675	<-60.0	-20.0
1620.750	<-60.0	-20.0

Frequency: 173.975 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
347.950	-53.0	-20.0
521.925	-55.3	-20.0
695.900	<-60.0	-20.0
869.875	-55.0	-20.0
1043.850	<-60.0	-20.0
1217.825	<-60.0	-20.0
1391.800	<-60.0	-20.0
1565.775	<-60.0	-20.0
1739.750	<-60.0	-20.0

Limit:

Part 90.210(d) Mask D, (3) on any frequency removed from the centre of the authorised bandwidth by a displacement frequency of more than 12.5 kHz shall be attenuated by at least 50 + 10 log (P) or 70 dB whichever is the lesser attenuation.

The spurious emission limit defined by Mask D has been applied as this transmitter can operate using channel spacings of 12.5 kHz.

Part 2.1051 states that emissions greater than 20 dB below the limit need not be specified.

Part 2.1057 states that the spectrum should be investigated up to the 10th harmonic if the transmitter operates below 10 GHz.

A rated power of 5.0 watts gives a limit of -20.0 dBm.

No measurements were made above the 10th harmonic.

Result: Complies

Measurement Uncertainty: ±3.3 dB

Receiver spurious emissions at antenna terminals

Receive frequency: 150.075 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
195.075	<-100.0	-57.0

Receive frequency: 155.075 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
200.075	<-100.0	-57.0

Receive frequency: 162.075 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
207.075	-90.0	-57.0

Receive frequency: 173.975 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
218.975	-87.5	-57.0

The receiver has an intermediate frequency of 45 MHz

No other emissions within 30 dB of the limit were observed.

Limit:

In accordance with CFR 47 Part 15, section 15.111 the power of any emission at the antenna terminal should not exceed 2 nW (-57.0 dBm).

Result: Complies

Measurement Uncertainty: ± 3.3 dB

Field strength of the transmitter spurious emissions

Frequency: 155.075 MHz

Frequency (MHz)	Level (dB μ V/m)	Level (dBm)	Limit (dBm)	Polarity	Margin (dB)
310.1500	38.0	-59.4	-20.0	Vertical	39.4
310.1500	39.0	-58.4	-20.0	Horizontal	38.4
465.2250	30.0	-67.4	-20.0	Vertical	47.4
465.2250	32.5	-64.9	-20.0	Horizontal	44.9
620.3000	29.0	-68.4	-20.0	Vertical	48.4
620.3000	24.0	-73.4	-20.0	Horizontal	53.4
775.3750	28.8	-68.6	-20.0	Vertical	48.6
775.3750	32.0	-65.4	-20.0	Horizontal	45.4
930.4500	30.1	-67.3	-20.0	Vertical	47.3
930.4500	33.6	-63.8	-20.0	Horizontal	43.8
1085.525	30.2	-67.2	-20.0	Vertical	47.2
1085.525	38.0	-59.4	-20.0	Horizontal	39.4
1240.600	36.6	-60.8	-20.0	Vertical	40.8
1240.600	38.7	-58.7	-20.0	Horizontal	38.7
1395.675	37.1	-60.3	-20.0	Vertical	40.3
1395.675	33.0	-64.4	-20.0	Horizontal	44.4
1550.750	38.0	-59.4	-20.0	Vertical	39.4
1550.750	37.8	-59.6	-20.0	Horizontal	39.6

Frequency: 173.975 MHz

Frequency (MHz)	Level (dB μ V/m)	Level (dBm)	Limit (dBm)	Polarity	Margin (dB)
347.9500	37.0	-60.4	-20.0	Vertical	40.4
347.9500	41.0	-56.4	-20.0	Horizontal	36.4
521.9250	25.5	-71.9	-20.0	Vertical	51.9
521.9250	25.0	-72.4	-20.0	Horizontal	52.4
695.9000	24.8	-72.6	-20.0	Vertical	52.6
695.9000	28.0	-69.4	-20.0	Horizontal	49.4
869.8750	29.0	-68.4	-20.0	Vertical	48.4
869.8750	34.2	-63.2	-20.0	Horizontal	43.2
1043.850	41.5	-55.9	-20.0	Vertical	35.9
1043.850	47.3	-50.1	-20.0	Horizontal	30.1
1217.825	33.0	-64.4	-20.0	Vertical	44.4
1217.825	31.0	-66.4	-20.0	Horizontal	46.4
1391.800	32.6	-64.8	-20.0	Vertical	44.8
1391.800	33.0	-64.4	-20.0	Horizontal	44.4
1565.775	36.0	-61.4	-20.0	Vertical	41.4
1565.775	34.6	-62.8	-20.0	Horizontal	42.8
1739.750	38.8	-58.6	-20.0	Vertical	38.6
1739.750	38.0	-59.4	-20.0	Horizontal	39.4

The transmitter was tested while transmitting continuously while attached to a dummy load.

When operating in transmit mode no significant emissions were detected between the harmonic emissions that were detected.

Device was tested on an open area test site at a distance of 3 metres.

Testing was carried out at EMC Technologies NZ Ltd Open Area Test Site, which is located at Driving Creek, Orere Point, Auckland. Details of this site have been filed with the Commission, Registration Number: 90838, which was last updated in February 2011.

Limit:

All spurious emissions are to be attenuated by at least $50 + 10 \log (P)$.

The rated power of 5.0 watts gives a limit of -20 dBm.

No measurements were made above the 10th harmonic.

Result: Complies

Measurement Uncertainty: ± 4.1 dB

Field strength of the receiver spurious emissions

Frequency: 155.075 MHz

Frequency MHz	Level dB μ V/m	Polarity	Limit dB μ V/m	Margin dB
200.075	22.0	Horizontal	57.0	35.0
200.075	18.0	Vertical	57.0	39.0
400.150	16.6	Horizontal	57.0	40.4
400.150	16.0	Vertical	57.0	41.0
600.225	-	Horizontal	47.0	-
600.225	-	Vertical	47.0	-
800.300	-	Horizontal	47.0	-
800.300	-	Vertical	47.0	-
1000.375	-	Horizontal	47.0	-
1000.375	-	Vertical	47.0	-

Frequency: 173.975 MHz

Frequency MHz	Level dB μ V/m	Polarity	Limit dB μ V/m	Margin dB
218.975	22.4	Horizontal	57.0	34.6
218.975	18.2	Vertical	57.0	38.8
437.950	18.0	Horizontal	57.0	39.0
437.950	18.0	Vertical	57.0	39.0
656.925	-	Horizontal	47.0	-
656.925	-	Vertical	47.0	-
875.900	-	Horizontal	47.0	-
875.900	-	Vertical	47.0	-
1094.875	-	Horizontal	47.0	-
1094.875	-	Vertical	47.0	-

The receiver has an intermediate frequency of 45 MHz

Device was tested on an open area test site at a distance of 3 metres.

Testing was carried out at EMC Technologies NZ Ltd Open Area Test Site, which is located at Driving Creek, Orere Point, Auckland. Details of this site have been filed with the Commission, Registration Number: 90838, which was last updated in February 2011.

Below 1000 MHz a quasi peak detector was used with a bandwidth of 120 kHz.

Above 1000 MHz an average detector was used with a bandwidth of 1 MHz.

The receiver was tested while receiving continuously while attached to a dummy load.

Limit:

The field strength limits as per CFR 47 Part 15, section 15.109 have been applied.

Result: Complies

Measurement Uncertainty: ± 4.1 dB

8. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial #	Asset	Cal due
Aerial Controller	EMCO	1090	9112-1062	RFS 3710	N/a
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708	N/a
Attenuator 20 dB	Tenuline	8323	1045	E1217	N/a
Audio Analyzer	Hewlett Packard	8903A	2216A01713	E1146	29/09/11
Biconical Antenna	Schwarzbeck	BBA 9106	-	RFS 3612	17/01/14
Frequency Counter	Hewlett Packard	HP 5342A	1916A01713	E1224	17/12/12
Level generator	Anritsu	MG443B	M61689	E1143	10/11/13
Log Periodic	Schwarzbeck	VUSLP9111	9111-228	3785	03/03/13
Receiver	Rohde & Schwarz	ESIB 40	100171	4003	10/06/12
Modulation Analyzer	Rohde & Schwarz	FMA	837807/020	E1552	07/12/12
Modulation Analyzer	Hewlett Packard	8901B	2608A00782	E1090	27/01/12
Oscilloscope	Tektronics	745A	B010643	1569	07/12/12
Power Attenuator	Weinschel	49-20-43	GC104	E1308	N/a
Power Supply	Hewlett Packard	6032A	2743A-02859	E1069	N/a
RF Power Meter	Hewlett Packard	HP 436A	2512A22439	E1198	29/10/11
Selective Level Meter	Anritsu	ML422C	M35386	E1140	29/09/11
Signal Generator	Rohde & Schwarz	SMHU.58	838923/028	E1493	07/12/12
Thermal chamber	Contherm	M180F	86025	E1129	01/06/12
Thermometer	DSIR	RT200	035	E1049	01/06/12
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709	N/a
Horn antenna	EMCO	3115	9511-4629	E1526	21/02/14

9. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies NZ Ltd registration with the Federal Communications Commission as a listed facility, Registration Number: 90838, which was last updated on February 2011.

All testing has been carried out in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to ISO/IEC 17025.

All measurement equipment has been calibrated in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to ISO/IEC 17025.

10. PHOTOGRAPH (S)





Radiated emissions test set up photos



