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TEST REPORT

SIMOCO SRP9180TU 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:

Andrew Cutler- General Manager

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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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	SRP9180TU
Product	Portable Radio with Antenna Microphone
Manufacturer	ComGroup Australia Pty Ltd
Designed in	Australia
Manufactured in	China
Serial Number	ET9AX09170038
FCC ID	STZSRP9170TU

3. COMPLIANCE STATEMENT AND RESULT SUMMARY

The **SIMOCO SRP9180TU 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	RF power output	Noted
90.205	Power and antenna height limits	Complies
2.1047	Modulation Characteristics	Noted
2.1047(a)	Low pass filter response	Noted
2.1047(b)	Modulation limiting characteristics	Noted
90.211(a)	Modulation characteristics	Not tested
2.1049	Occupied bandwidth	Noted
2.202	Bandwidths	Noted
22.357	Emission types	Not tested
22.359(a)	Emission masks	Not tested
90.207	Types of emissions	Not tested
90.209	Bandwidth limitations	Not tested
90.210	Emission masks	Not tested
2.1051	Spurious emissions at antenna terminals	Complies
2.1053	Field strength of spurious radiation	Complies
2.1055	Frequency stability	Noted
22.355	Frequency stability	Not tested
90.213	Frequency stability	Not tested
90.214	Transient frequency behaviour	Not tested
15.109	Receiver radiated emissions	Complies
15.111	Receiver local oscillator voltage	Complies
1.1310	Radio frequency exposure limits	See SAR 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	435.075	5.0	12.5	F3E
3	440.075	5.0	12.5	F3E
4	460.075	5.0	12.5	F3E
5	479.975	5.0	12.5	F3E

FCC Bands

Part 90: 406.1 - 512 MHz

FCC Radio Band

Part 90: 406.1 - 480 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 SRP9180TU UHF Portable 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.

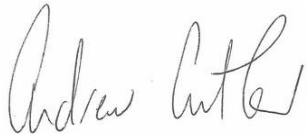
This report does not contain corrections or erasures.

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 STZSRP9170TU.

Modifications have b een 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: 435.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
870.150	-65.0	-20.0
1305.225	-53.0	-20.0
1740.300	<-60.0	-20.0
2175.375	<-60.0	-20.0
2610.450	<-60.0	-20.0
3045.525	<-60.0	-20.0
3480.600	<-60.0	-20.0
3915.675	<-60.0	-20.0
4350.750	<-60.0	-20.0

Frequency: 440.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
880.150	-63.1	-20.0
1320.225	-52.0	-20.0
1760.300	<-60.0	-20.0
2200.375	<-60.0	-20.0
2640.450	<-60.0	-20.0
3080.525	<-60.0	-20.0
3520.600	<-60.0	-20.0
3960.675	<-60.0	-20.0
4400.750	<-60.0	-20.0

Frequency: 460.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
920.150	-60.0	-20.0
1380.225	-57.2	-20.0
1840.300	<-60.0	-20.0
2300.375	<-60.0	-20.0
2760.450	<-60.0	-20.0
3220.525	<-60.0	-20.0
3680.600	<-60.0	-20.0
4140.675	<-60.0	-20.0
4600.750	<-60.0	-20.0

Frequency: 479.975 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
959.950	-66.1	-20.0
1439.925	-47.3	-20.0
1919.900	<-60.0	-20.0
2399.875	<-60.0	-20.0
2879.850	<-60.0	-20.0
3359.825	<-60.0	-20.0
4319.775	<-60.0	-20.0
4799.750	<-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 10^{th} 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 10^{th} harmonic.

Result: Complies
Measurement Uncertainty: ±3.3 dB

Receiver spurious emissions at antenna terminals

Receive frequency: 435.075 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
390.075	-86.7	-57.0

Receive frequency: 440.075 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
395.075	-88.7	-57.0

Receive frequency: 460.075 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
415.075	-87.6	-57.0

Receive frequency: 479.975 MHz

Frequency (MHz)	Level (dBm)	Limit (dBm)
434.975	-81.0	-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: 435.075 MHz

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dBm)	Polarity	Margin (dB)
870.150	43.0	-54.4	-20.0	Vertical	34.4
870.150	45.5	-51.9	-20.0	Horizontal	31.9
1305.225	43.4	-54.0	-20.0	Vertical	34.0
1305.225	44.5	-52.9	-20.0	Horizontal	32.9
1740.300	51.0	-46.4	-20.0	Vertical	26.4
1740.300	49.6	-47.8	-20.0	Horizontal	27.8
2175.375	47.5	-49.9	-20.0	Vertical	29.9
2175.375	47.0	-50.4	-20.0	Horizontal	30.4
2610.450	52.0	-45.4	-20.0	Vertical	25.4
2610.450	50.6	-46.8	-20.0	Horizontal	26.8
3045.525	48.8	-48.6	-20.0	Vertical	28.6
3045.525	46.3	-51.1	-20.0	Horizontal	31.1
3480.600	54.0	-43.4	-20.0	Vertical	23.4
3480.600	48.0	-49.4	-20.0	Horizontal	29.4
3915.675	48.1	-49.3	-20.0	Vertical	29.3
3915.675	48.1	-49.3	-20.0	Horizontal	29.3
4350.750	48.8	-48.6	-20.0	Vertical	28.6
4350.750	48.8	-48.6	-20.0	Horizontal	28.6

Frequency: 479.975 MHz

Frequency (MHz)	Level (dBµV/m)	Level (dBm)	Limit (dBm)	Polarity	Margin (dB)
959.950	58.4	-58.4	-20.0	Vertical	38.4
959.950	55.4	-55.4	-20.0	Horizontal	35.4
1439.925	50.6	-50.6	-20.0	Vertical	30.6
1439.925	49.8	-49.8	-20.0	Horizontal	29.8
1919.900	42.0	-42.0	-20.0	Vertical	22.0
1919.900	43.0	-43.0	-20.0	Horizontal	23.0
2399.875	42.1	-42.1	-20.0	Vertical	22.1
2399.875	40.4	-40.4	-20.0	Horizontal	20.4
2879.850	43.4	-43.4	-20.0	Vertical	23.4
2879.850	49.3	-49.3	-20.0	Horizontal	29.3
3359.825	46.4	-46.4	-20.0	Vertical	26.4
3359.825	47.4	-47.4	-20.0	Horizontal	27.4
3839.800	48.4	-48.4	-20.0	Vertical	28.4
3839.800	49.4	-49.4	-20.0	Horizontal	29.4
4319.775	47.4	-47.4	-20.0	Vertical	27.4
4319.775	48.4	-48.4	-20.0	Horizontal	28.4
4799.750	43.0	-43.0	-20.0	Vertical	23.0
4799.750	46.6	-46.6	-20.0	Horizontal	26.6

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 10^{th} harmonic.

Result: Complies
Measurement Uncertainty: ±4.1 dB

Field strength of the receiver spurious emissions

Frequency: 435.075 MHz

Frequency MHz	Level dBµV/m	Polarity	Limit dBµV/m	Margin dB
390.075	21.5	Horizontal	57.0	35.5
390.075	26.5	Vertical	57.0	30.5
780.150	24.0	Horizontal	57.0	33.0
780.150	24.0	Vertical	57.0	33.0
1170.225	-	Horizontal	47.0	-
1170.225	-	Vertical	47.0	-
1560.300	-	Horizontal	47.0	-
1560.300	-	Vertical	47.0	-
1950.375	-	Horizontal	47.0	-
1950.375	-	Vertical	47.0	-

Frequency: 479.975 MHz

Frequency MHz	Level dBµV/m	Polarity	Limit dBµV/m	Margin dB
434.9750	18.6	Horizontal	57.0	38.4
434.9750	19.6	Vertical	57.0	37.4
869.950	24.0	Horizontal	57.0	33.0
869.950	24.0	Vertical	57.0	33.0
1304.925	-	Horizontal	47.0	-
1304.925	-	Vertical	47.0	-
1739.900	-	Horizontal	47.0	-
1739.900	-	Vertical	47.0	-
2174.875	-	Horizontal	47.0	-
2174.875	-	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 in 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 photographs