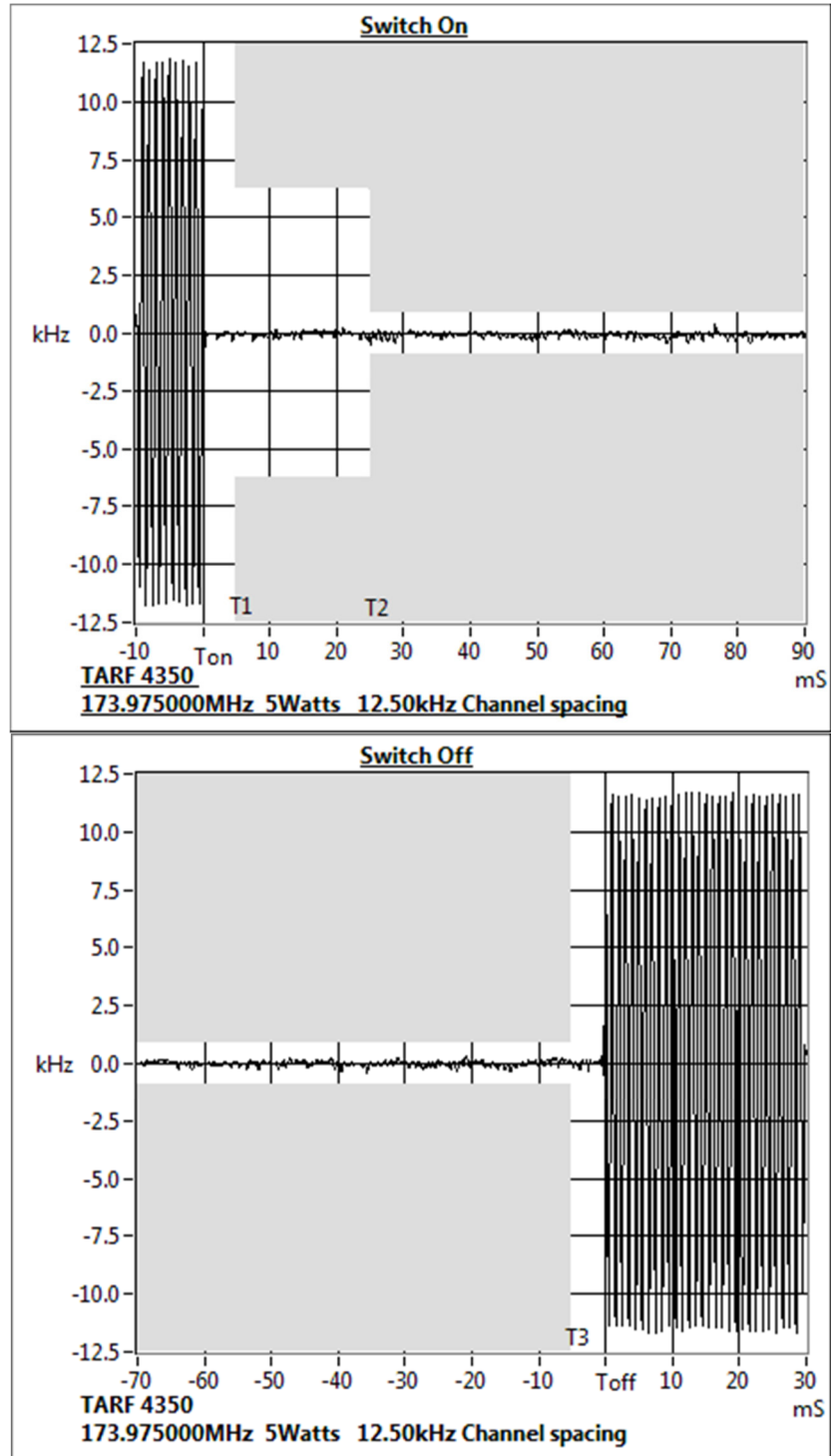


Transient Frequency Behaviour

SPECIFICATION: FCC 47 CFR 90.214

RSS-119 5.9

Tx FREQUENCY: 173.975 MHz 5 W 12.5 kHz Channel Spacing



Transient Frequency Behaviour

SPECIFICATION: FCC 47 CFR 90.214

RSS-119 5.9

Tx FREQUENCY: 148.025 MHz

5 W

12.5 kHz Channel Spacing

TRANSIENT RESPONSE PERIOD	CARRIER PEAK VARIATION FROM NORMAL	
	Key ON (kHz)	Key OFF (kHz)
t1	-0.6	N/A
t2	-0.4	N/A
t3	N/A	1.5

Confirm that during periods t1 and t3 the frequency difference does not exceed the value of one channel separation.	YES	NO
	✓	☐
Confirm that during the period t2 the frequency difference does not exceed half a channel separation.	YES	NO
	✓	☐
Confirm that during the period t2 to t3 the frequency difference does not exceed the frequency error limit.	YES	NO
	✓	☐

LIMIT: FCC 47 CFR 90.214

TRANSIENT PERIODS	FREQUENCY RANGE	
	150 MHz – 174 MHz	421 MHz – 512 MHz
t1 (ms)	5 ms	10 ms
t2 (ms)	20 ms	25 ms
t3 (ms)	5 ms	10 ms

LIMIT: RSS-119 5.9

Transient Frequency Behaviour for Equipment Designed to Operate on 12.5 kHz Channels			
TRANSIENT PERIODS	Maximum Frequency Difference	FREQUENCY RANGE	
		138 – 174 MHz	406.1 – 470 MHz
t1 (ms)	± 12.5 kHz	5 ms	10 ms
t2 (ms)	± 6.25 kHz	20 ms	25 ms
t3 (ms)	± 12.5 kHz	5 ms	10 ms

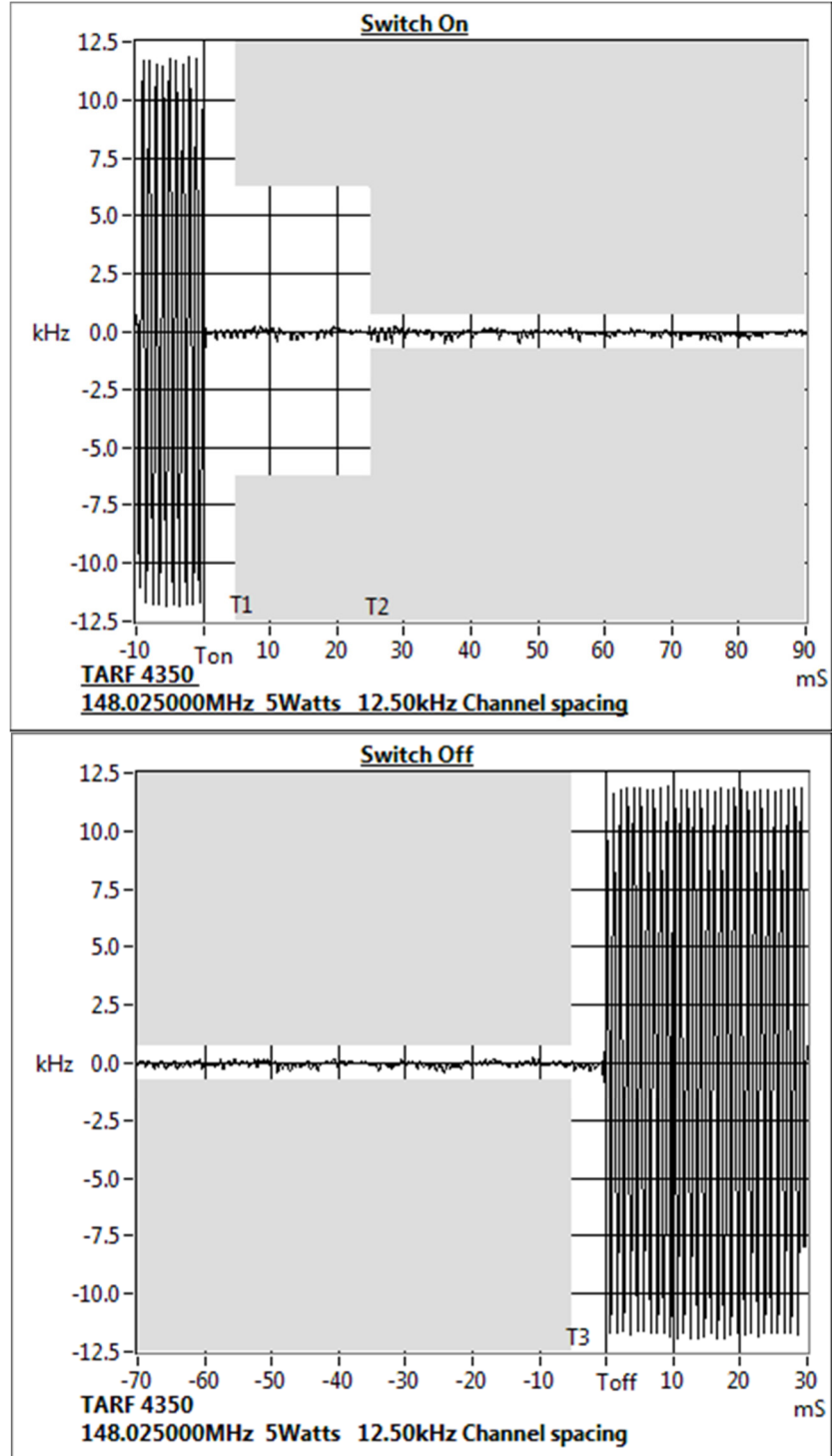
Note: RSS-119 5.9 - If the transmitter carrier output power rating is 6 Watts or less, the frequency difference during the time periods t1 and t3 may exceed the maximum frequency difference for these time periods.

Transient Frequency Behaviour

SPECIFICATION: FCC 47 CFR 90.214

RSS-119 5.9

Tx FREQUENCY: 148.025 MHz 5 W 12.5 kHz Channel Spacing



TRANSMITTER FREQUENCY STABILITY - TEMPERATURE

SPECIFICATION: FCC 47 CFR 2.1055 (a) (1)

RSS-119 5.3

GUIDE: ANSI C63.26 5.6.4

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The EUT was tested for frequency error from -30°C to $+50^{\circ}\text{C}$ in 10°C increments
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT UNCERTAINTY: $\pm 0.05\text{ppm}$

MEASUREMENT RESULTS:

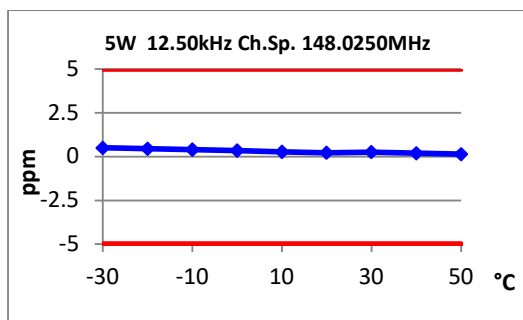
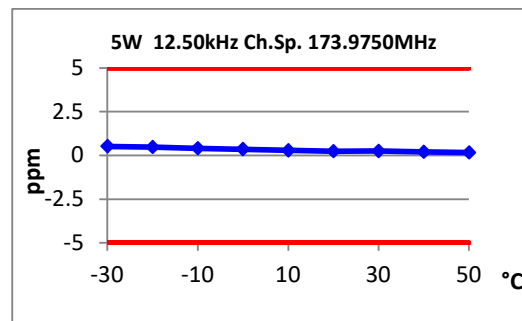
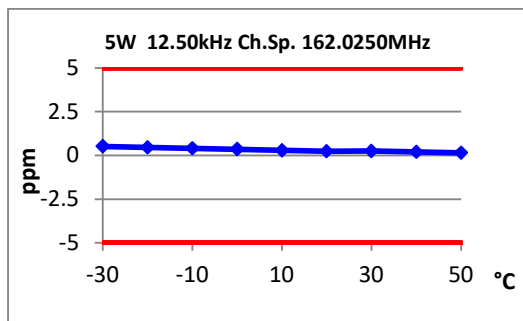
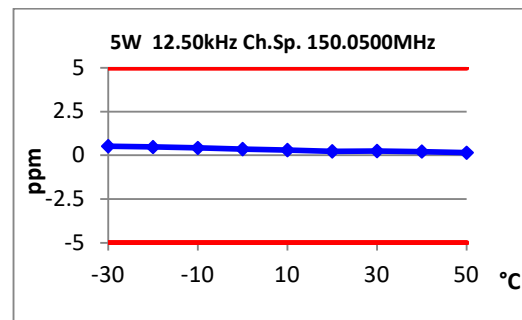
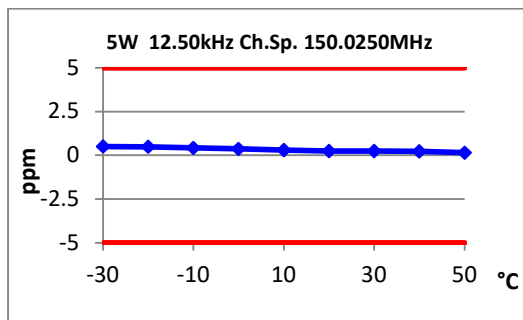
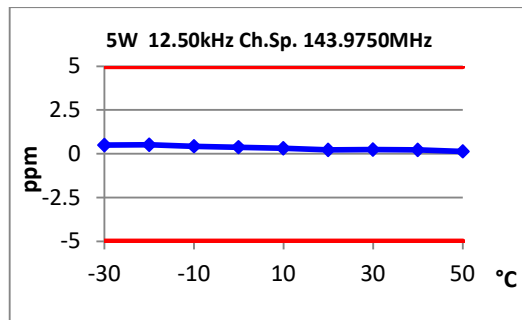
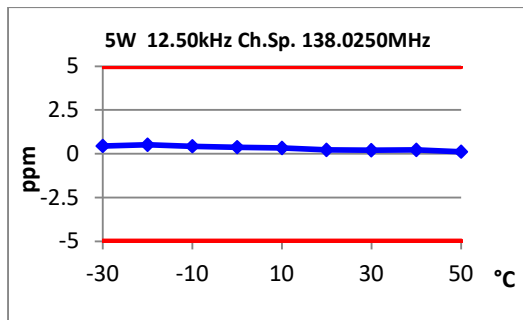
See the plots on the following pages for 12.5 kHz channel spacing.

Temperature ($^{\circ}\text{C}$)	Error (ppm)						
	138.025 MHz	143.975 MHz	150.025 MHz	150.05 MHz	162.025 MHz	173.975 MHz	148.025 MHz
-30	0.45	0.49	0.5	0.52	0.52	0.52	0.51
-20	0.51	0.51	0.49	0.47	0.46	0.47	0.45
-10	0.43	0.42	0.41	0.41	0.4	0.41	0.4
0	0.38	0.38	0.37	0.35	0.36	0.36	0.34
10	0.33	0.31	0.3	0.29	0.28	0.29	0.28
20	0.23	0.23	0.24	0.22	0.23	0.24	0.23
30	0.21	0.24	0.25	0.24	0.25	0.25	0.26
40	0.22	0.23	0.22	0.21	0.21	0.2	0.19
50	0.12	0.13	0.14	0.15	0.15	0.16	0.15

LIMIT: FCC 47 CFR 90.213 RSS-119 5.3

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	5.0

Transmitter Frequency Stability – Temperature



TRANSMITTER FREQUENCY STABILITY - VOLTAGE

SPECIFICATION: FCC 47 CFR 2.1055 (d) (1)

RSS-119 5.3

GUIDE: ANSI C63.26 5.6.5

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The EUT was tested for frequency error at an input voltage to the radio of 7.5V nominal battery voltage and battery end point of 6.375 V DC
3. The frequency error was recorded in parts per million (ppm).

MEASUREMENT UNCERTAINTY: $\pm 0.05\text{ppm}$

MEASUREMENT RESULTS:

	FREQUENCY ERROR (ppm) for 12.5 kHz	
	7.5 V _{DC}	6.375 V _{DC}
138.025 MHz	0.07	0.09
143.975 MHz	0.11	0.11
150.025 MHz	0.13	0.13
150.05 MHz	0.13	0.14
162.025 MHz	0.15	0.15
173.975 MHz	0.15	0.16
148.025 MHz	0.16	0.17

LIMIT CLAUSES: FCC 47 CFR 90.213

RSS-119 5.3

Channel Spacing (kHz)	Frequency Error (ppm)
12.5	5.0

TEST EQUIPMENT LIST

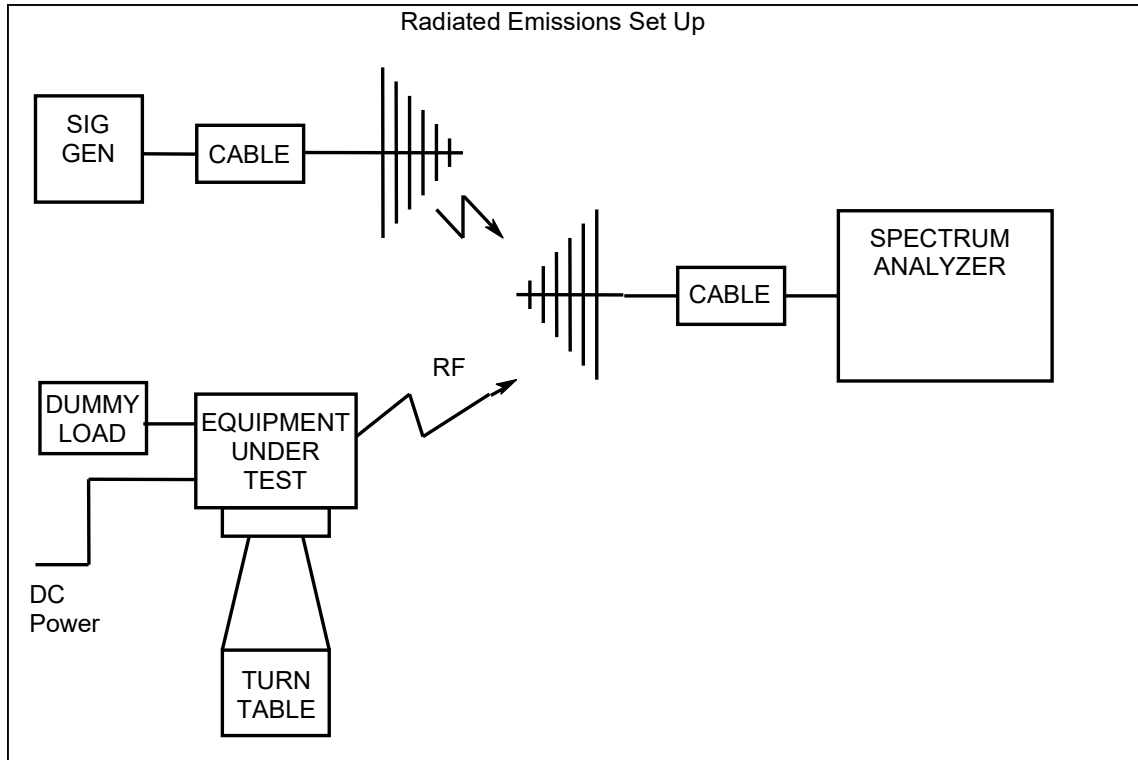
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
Antenna	Reference Dipoles	Emco	3121C DB1	9510-1164	E3559	29-Apr-24
Antenna	18GHz DRG	Emco	DRG3115	9512-4638	E3560	
Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-885	E4857	
Antenna	Reverb - 1-18GHz DRG	Schwarzbeck	BBHA 9120 D	9120D-884	E4858	
Antenna	Precision Dipole 30 to 300MHz	Schwarzbeck	VHAP	1068	E4973	
Antenna	Precision Dipole 30 to 300MHz	Schwarzbeck	VHAP	1069	E4974	
Antenna	Precision Dipole 300 to 1000MHz	Schwarzbeck	UHAP	1041	E4975	
Antenna	Precision Dipole 300 to 1000MHz	Schwarzbeck	UHAP	1042	E4976	
Audio Analyser	TREVA2	Hewlett Packard	HP8903B	2818A04275	E3710	11-Oct-24
Coax Cable	OATS Turntable Cable 1	Intelcom	RG214	OATS1	E4621	8-Oct-24
Coax Cable	OATS Tower Cable	Intelcom	RG214	OATS2	E4622	8-Oct-24
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack2	E4623	8-Oct-24
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack3	E4624	8-Oct-24
Coax Cable	Reverb - 4.5m Multiflex 141	TeltestBlue6	MF 141	TeltestBlue6	E4843	8-Oct-24
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue5	MF 141	TeltestBlue5	E4844	8-Oct-24
Coax Cable	Reverb - 2m Multiflex 141	TeltestBlue4	MF 141	TeltestBlue4	E4845	8-Oct-24
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue3	MF 141	TeltestBlue3	E4846	8-Oct-24
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue2	MF 141	TeltestBlue2	E4847	8-Oct-24
Coax Cable	Reverb - 1m Multiflex 141	TeltestBlue1	MF 141	TeltestBlue1	E4848	8-Oct-24
Coax Cable	2m Black	Suhner	RG214HF/Nm/Nm/2000	TeltestBlack6	E4849	8-Oct-24
Coax Cable	1.5m Blue	Suhner	Sucoflex 126EA	502868/126E A	E5028	8-Oct-24
Environ. Chamber	Chest	Contherm	Chest	E3397	E3397	28-Nov-24
Filter High Pass/ Notch	135 to 175MHz	Tait		N/A	E3382	7-Jun-24
Modulation Analyser	TREVA2	Hewlett Packard	HP8901B (Opt 002)	2441A00393	E3073	11-Oct-24
OATS	Controller	Electrometrics	EM-4700	119	E4445	
OATS	Turntable	Electrometrics	EM-4704A	105	E4446	
OATS	Antenna Tower	Electrometrics	EM-4720-2	112	E4447	
Oscilloscope	100MHz Digital	Tektronics	TDS340	B013611	E3585	8-Oct-25
Power Meter	TREVA2 Power Head for HP8901	Hewlett Packard	HP11722A	2716A02037	1575	10-Oct-24
Power Meter	Reverb - USB interface for NRT Z44	Rohde & Schwarz	NRT Z5	100586	E4852	
Power Meter	Reverb - 0.2 - 4GHz directional power meter	Rohde & Schwarz	NRT Z44	105151	E4853	11-Oct-24
Power Meter	Power Sensor- 6GHz Reverb FWD	Raditeq	RPR2006C	2201014	E1136 6	12-Oct-24
RF Amplifier	+21.7 dB 1GHz	Tait	ZFL-1000LN	E3660	E3360	15-Aug-24
RF Amplifier	Pre-amplifier	Agilent	87405C	MY47010688	E4941	16-Oct-24
RF Attenuator	20dB 50W	Weinschel	24-20-44	AW1266	E3562	8-Oct-24
RF Attenuator	TREVA2 3dB	Weinschel	Model 1	BL9950	E4080	8-Oct-24

TELTEST Laboratories
Tait International Ltd
Report Number 4350

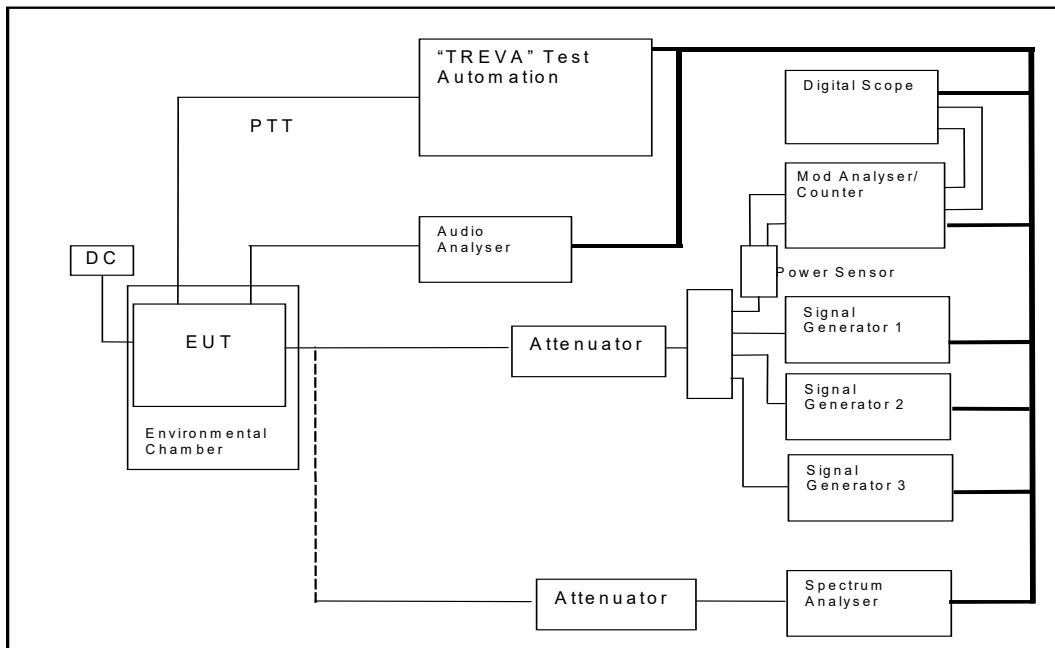
Equipment Type	Information	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
RF Attenuator	3dB 0.5W	Weinschel	Model 1	CH6863	E5013	8-Oct-24
RF Chamber	S-LINE TEM CELL	Rohde & Schwarz	1089.9296.02	338232/003	E3636	7-May-25
RF Chamber	Reverb - Stirrer controller for reverb chamber	Teseq	Stirrer Controller	29765.1	E4854	
RF Chamber	Reverb - 0.5 - 18GHz Reverberation Chamber	Teseq	RVC XS	29765	E4855	
RF Combiner	TREVA2	Minicircuits	ZFSC-4-1	-	E4084	
RF Load	50W	Weinschel	F1426	BF0487	E3675	8-Oct-24
Signal Generator	Analog 3.2GHz	Hewlett Packard	HP8648C	3443U00543	E3558	8-Oct-24
Signal Generator	Analog 12.75GHz	Rohde & Schwarz	SMB100A	183236	E11369	28-Mar-25
Spectrum Analyser	13.2GHz	Agilent	PSA E4445A	MY42510072	E4139	18-Oct-24
Spectrum Analyser	26.5GHz	Agilent	PXA N9030A	MY49432161	E4907	2-Mar-25
Temp & Humidity datalogger		Hobo	U21-011	10134275	E4980	7-Aug-24
TREVA 2		Teltest	-	2	-	23-Oct-24
Testware	Conducted Emissions		March 2018	-	-	
Testware	Frequency Vs Temperature		April 2018	-	-	
Testware	Occupied Bandwidth		TTEL_OCCBW 2.00.01	-	-	
Testware	P25 Standard Patterns		TTEL_P25STDPATT 2.00.00	-	-	
Testware	Reverb Emissions		TTEL_REVEMIS 2.00.03	-	-	
Testware	Sideband Spectrum		February 2017	-	-	
Testware	S-Line Radiated Emissions		TTEL_SLINERADE M 2.00.01	-	-	
Testware	TREVA		TTEL_TREVA 2.00.00	-	-	

* NOTE: Items without calibration dates are calibrated immediately before use, or set using calibrated instruments.

ANNEX A – TEST SETUP DETAILS



All other testing is performed using the Teltest Radio **E**VAuation system (TREVA), which is configured as shown below. The Spectrum Analyser is connected to the EUT via the attenuator network for Conducted Emissions testing, Sideband Spectrum and Occupied Bandwidth.



END OF REPORT