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SPECIFICATION  
FOR RADIO APPARATUS

TELECOMMAND AND TELEMETRY

Communications Division  
Ministry of Commerce  
WELLINGTON

## SERVICE DEFINITIONS

1. **Telecommand:** The use of telecommunication for the transmission of signals to initiate, modify or terminate functions of equipment at a distance.
2. **Telemetry:** The use of telecommunication for automatically indicating or recording measurements at a distance from the measuring instrument.

## TECHNICAL REQUIREMENTS

3. The electrical and mechanical construction of the radio apparatus shall be sufficiently rigid and weatherproof so that when subjected to normal handling and wear the frequency, power and spurious emissions remain within the specified tolerances at all times.
4. No external control for the adjustment of a transmitter frequency except a simple switching device is permitted. Other controls are optional provided they have no effect on the frequency of the transmitted signal.
5. The maximum permitted power is:  
  
5.0 watts (e.i.r.p.) for the ISM, A, B, C, D and E Bands  
0.5 watts (e.i.r.p.) for the F Band
6. Amplitude or frequency modulation (including phase and FSK) is permitted.
7. For AM operation the modulation depth must not exceed 100%.
8. For FM operation the peak frequency deviation shall not exceed  $\pm 2.5$  kHz for Band A and  $\pm 5$  kHz for Bands B,C,D,E and F
9. With normal modulation all emissions beyond the permitted bandwidth must be attenuated to at least -23 dBm (eirp).

## ISM BANDS

10. The following designated ISM (Industrial, Scientific and Medical) Bands are also available for Telecommand and Telemetry:

Centre Frequency	Bandwidth	Centre Frequency	Bandwidth
6.780 MHz	30 kHz	2450 MHz	100 MHz
13.560 MHz	14 kHz	5800 MHz	150 MHz
27.120 MHz	326 kHz	24.125 GHz	250 MHz
35.700 MHz	600 kHz	61.250 GHz	500 MHz
40.680 MHz	40 kHz	122.50 GHz	1000 MHz
925 MHz	8 MHz	245.00 GHz	2000 MHz

<b>BAND A</b>		<b>BAND B</b>		<b>BAND C</b>	
(29.800 - 30.000 MHz)		(36.000 - 36.600 MHz)		(160.100 - 160.600 MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
TT1A	29.835	TT1B	36.050	TT1C	160.1375
TT2A	29.845	TT2B	36.150	TT2C	160.1625
TT3A	29.855	TT3B	36.250	TT3C	160.1875
TT4A	29.865	TT4B	36.350	TT4C	160.2125
TT5A	29.875	TT5B	36.450	TT5C	160.2375
TT6A	29.885	TT6B	36.550	TT6C	160.2625
TT7A	29.915			TT7C	160.2875
TT8A	29.925			TT8C	160.3125
TT9A	29.935			TT9C	160.3375
TT10A	29.945			TT10C	160.3625
TT11A	29.955			TT11C	160.3875
TT12A	29.965			TT12C	160.4125
TT13A	29.975			TT13C	160.4375
TT14A	29.985			TT14C	160.4625
TT15A	29.995			TT15C	160.4875
				TT16C	160.5125
				TT17C	160.5375
				TT18C	160.5625
				TT19C	160.5875
Bandwidth: 10 kHz		Bandwidth: 20 kHz		Bandwidth: 20 kHz	
Tolerance: ±1.5 kHz		Tolerance: ±2.5 kHz		Tolerance: ±2.5 kHz	

<b>BAND D</b> (466.800 - 466.850 MHz & 471 - 471.5 MHz)		<b>BAND E</b> (470.000 - 470.475 MHz)		<b>BAND F</b> (40.510 - 40.770 MHz)	
		Medical Telemetry only (ie.Hospital ECG monitoring)		Aeronautical Model Control Only	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
TT1D	466.8125	TT1E	470.0250	TT1F	40.510
TT2D	466.8375	TT2E	470.0500	TT2F	40.530
TT3D	471.0250	TT3E	470.0750	TT3F	40.550
TT4D	471.0500	TT4E	470.1000	TT4F	40.570
TT5D	471.0750	TT5E	470.1250	TT5F	40.590
TT6D	471.1000	TT6E	470.1500	TT6F	40.610
TT7D	471.1250	TT7E	470.1750	TT7F	40.630
TT8D	471.1500	TT8E	470.2000	TT8F	40.650
TT9D	471.1750	TT9E	470.2250	TT9F	40.710
TT10D	471.2000	TT10E	470.2500	TT10F	40.730
TT11D	471.2250	TT11E	470.2750	TT11F	40.750
TT12D	471.2500	TT12E	470.3000	TT12F	40.770
TT13D	471.2750	TT13E	470.3250		
TT14D	471.3000	TT14E	470.3500		
TT15D	471.3250	TT15E	470.3750		
TT16D	471.3500	TT16E	470.4000		
TT17D	471.3750	TT17E	470.4250		
TT18D	471.4000	TT18E	470.4500		
TT19D	471.4250	TT19E	470.4750		
TT20D	471.4500				
TT21D	471.4750				
Bandwidth: 20 kHz		Bandwidth: 20 kHz		Bandwidth: 20 kHz	
Tolerance: ±2.5 kHz		Tolerance: ±2.5 kHz		Tolerance: ±2.5 kHz	