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SPECIFICATION FOR RADIO APPARATUS:

VHF LAND MOBILE SERVICE

USING AMPLITUDE MODULATION WITH
12.5 kHz CARRIER FREQUENCY SEPARATION

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CONTENTS

1. SCOPE

This Specification covers the minimum requirements for base and mobile amplitude modulated equipment operating in the VHF land mobile services with a channel spacing of 12.5 kHz. This specification does not necessarily include all characteristics which may be required by a user, nor does it necessarily represent the maximum performance achievable.

Refer to document RFS 48 for information concerning procedures for obtaining Certificates of Compliance (Type Acceptance and Type Approval).

2. MECHANICAL AND ELECTRICAL DESIGN

The Radio Frequency Service reserves the right to refuse to accept equipment for testing to this specification if, in the opinion of the Radio Frequency Service it does not conform to good standards of engineering practice.

All components used in the equipment shall operate within the component manufacturers' ratings.

All controls for aligning and adjusting the circuits shall be of the pre-set type. It shall not be possible to obtain access to, or alternatively to adjust such controls without the use of tools.

2.1. Synthesisers and PLL-Systems

If use is made of a synthesiser and/or a phase locked loop system for determining the transmitter frequency, the transmitter shall be inhibited when synchronisation is absent.

3. BASIC OPERATIONAL REQUIREMENTS

3.1. Class of Emission

The equipment shall transmit and receive class A3E amplitude modulated telephony emissions only except that signalling systems for the purpose of squelch control and other approved uses shall also be permitted.

3.2. Frequency Range

The equipment shall meet the requirements of this specification on any channel in the land mobile band for which equipment compliance is granted.

3.3. Method of Operation

The equipment may be designed for single-channel or for multi-channel operation. Where the equipment is designed for multi-channel operation the following shall apply:

(a) The switching range of the equipment shall be the bandwidth within which channel switching is practicable without re-tuning the equipment.

(b) The switching range shall be specified by the manufacturer.

(c) The equipment shall meet the requirements of sections 5 and 6 of this specification throughout the stated switching range.

3.4. Coded Squelch

If base and mobile equipment is fitted with a coded signalling system which suppresses the audio output from the receiver except when a wanted signal is received, means shall be provided to indicate aurally to a user whether that channel is in use, prior to any transmission on that channel.

3.5. Transmit Time Limiting

Mobile equipment only, shall automatically cease transmission after a period not greater than 3 minutes in the transmit condition.

Provision is to be made internally, for the time limiting to be disabled during testing.

3.6. Transmitter 'Transmit' Condition Indicator

A visual indicator on the front panel or the remote control panel (if provided) of mobile equipment shall show both in darkness and in daylight when the equipment is in the 'transmit' condition.

4. STANDARD TEST CONDITIONS

4.1. General

Standard test conditions are those conditions which shall apply for the purpose of testing for the minimum requirements according to this specification. They are identified throughout the specification by initial capital letters, and are defined in the following clauses.

During compliance testing the power supply for the equipment shall be provided by a test power source, capable of producing normal and extreme test voltages as specified in Clauses 4.2 and 4.4. The internal impedance of the test power source shall be low enough for its effects on the test results to be negligible.

For handheld equipment which is not provided with a socket for connection of an external antenna, the manufacturer shall provide a suitable access to the transmitter output and receiver input for equipment compliance testing purposes. If the impedance at the point of access is not 50 ohms a suitable matching device to provide this impedance shall be supplied by the manufacturer. The access provided and any matching device shall be subject to the approval of the Radio Frequency Service.

4.2. Standard Test Voltage

The Standard Test Voltage shall be measured at the point of connection of the power supply to the equipment. If the equipment is provided with a permanently connected power cable the test voltage shall be measured at the point of connection of the power cable to the equipment. For equipment in which batteries are incorporated, the test power source shall be applied as close to the battery terminals as practicable.

When the equipment is capable of being operated from more than one type of power supply or battery it shall meet the requirements of this specification for each type of supply or battery.

The Standard Test Voltages are as follows:

4.2.1. Mains Voltage

The Standard Test Voltage shall be 230 volts ±2%. The frequency shall be between 49 and 51 Hz.

4.2.2. Regulated Lead-Acid Battery Source On Vehicles

When radio equipment is intended for operation from the usual types of regulated lead-acid battery power sources of vehicles, the Standard Test Voltage shall be 1.1 times the nominal voltage of the battery (6 volts, 12 volts, etc.).

4.2.3. Nickel-Cadmium Battery

When the equipment is intended for operation from the usual type of nickel-cadmium battery, the Standard Test Voltage shall be the nominal voltage of the battery (1.2 volts per cell).

4.2.4. Other Power Sources

For operation from other power sources or types of battery (primary or secondary), the Standard Test Voltage shall be that declared by the equipment manufacturer. The Standard Test Voltage shall be agreed between the equipment manufacturer and the Radio Frequency Service as being appropriate for the particular equipment and type of battery.

4.3. Standard Ambient Temperature

For the duration of the tests the Standard Ambient Temperature shall be a temperature between +15 degrees Celsius and +30 degrees Celsius except where otherwise specified.

4.4. Extremes of Supply Voltage and Ambient Temperature

4.4.1. General

Equipment shall, where specified, be tested under the conditions of supply voltage and ambient temperature specified in this clause.

4.4.2. Supply Voltage

When the equipment is capable of being operated from more than one type of power supply or battery it shall meet the requirements of this specification for each type of supply or battery.

4.4.2.1. Mains Voltage

The Extreme Test Voltages for equipment to be connected to an AC mains source shall be the Standard Test Voltage ± 10%. The frequency of the test power source shall be between 49 and 51 Hz.

4.4.2.2. Regulated Lead-Acid Battery Source On Vehicles

When the equipment is intended for operation from the usual types of regulated lead-acid battery power sources of vehicles, the Extreme Test Voltages shall be 1.3 and 0.9 times the nominal voltage of the battery (6 volts, 12 volts, etc.).

4.4.2.3. Nickel-Cadmium Battery

When the equipment is intended for operation from the usual type of nickel-cadmium battery, the Extreme Test Voltages shall be 1.25 and 0.85 times the nominal voltage of the battery.

4.4.2.4. Other Power Sources

The lower Extreme Test Voltages for equipment with power sources using primary batteries shall be as follows:

(a) For the Leclanche type of battery:
0.85 times the nominal voltage of the battery;

(b) For the mercury type of battery:
0.9 times the nominal voltage of the battery;

(c) For other types of primary battery:
End point voltage declared by the equipment manufacturer and agreed to by the Radio Frequency Service as being appropriate for the particular equipment and type of battery.

The battery end point voltage shall be the voltage at which there is no significant battery capacity remaining and/or at which the equipment performance has deteriorated to the extent that continued operation by a user is most unlikely.

4.4.3. Extreme Temperatures

Tests at extreme temperatures shall be made at -10 degrees Celsius to +40 degrees Celsius.

Measurements to ensure that the equipment's basic operational parameters are within limits under the terms of this paragraph are to be made under the following conditions:

(a) The equipment shall be placed in a temperature controlled chamber and the temperature shall be reduced to -10 degrees Celsius and shall remain at this value for at least one hour, or for such a period as may be judged by the Radio Frequency Service to be necessary for thermal equilibrium to be attained. The equipment shall be switched off during the temperature stabilising period. The equipment shall be switched on for 10 minutes in the receive condition and the parameters then measured at Standard Test Voltage and at the Extremes of Supply Voltage. The requirements of this specification shall be met at all times after the initial 10 minutes of operation in the receive condition.

(b) The temperature of the equipment shall be maintained at Standard Ambient Temperature and the parameters measured at Standard Test Voltage and at the Extremes of Supply Voltage.

(c) The equipment shall be placed in a temperature controlled chamber and the temperature shall be increased to +40 degrees Celsius and

shall remain at this value for at least one hour, or for such a period as may be judged by the Radio Frequency Service to be necessary for thermal equilibrium to be attained. The equipment shall be operated at Standard Test Voltage and switched on in the receive condition for the whole of this period.

The equipment parameters shall then be measured at Standard Test Voltage at the Extremes of Supply Voltage. In the case of transmitter measurements these shall follow 5 minutes of continuous, unmodulated emission at the Standard Test Voltage except that for handheld equipment the 5 minute emission period shall be replaced by 1 minute of continuous operation.

4.5. Standard Test Modulation

For standard tests any signalling system(s) shall be disabled and the transmitter shall be modulated by a 1000 Hz sinusoidal tone to a depth of 50%.

The total harmonic distortion of the 1000 Hz tone shall not exceed 1 percent.

4.6. Standard Test Load

The transmitter Standard Test Load shall be a 50 ohm resistance.

4.7. Standard Test Signal

The Standard Test Signal to be applied to the receiver shall be amplitude modulated to a depth of 30% with a modulation frequency of 1000 Hz. The total harmonic distortion of the test signal envelope shall not exceed 2%.

4.8. Source Impedance

The receiver shall be fed from a source impedance of 50 ohms (resistive).

4.9. Receiver Test Signal Input Arrangements

4.9.1. Single Signal

The level of signal applied to the receiver input shall be expressed in terms of the power delivered by the signal generator when terminated by a 50 ohm resistance. The nominal output impedance of the signal generator shall be 50 ohms resistive.

4.9.2. Two or Three Simultaneous Signals

The combining arrangement for the simultaneous application of the outputs of two or three signal generators to the input of the receiver consists of a

screened star network formed by connecting together one end of each of four 25 ohm resistors. The nominal output impedance of the signal generators shall be 50 ohms resistive. The outer ends of three of the resistors shall be connected to the input terminals of the network and the outer end of the fourth resistor shall be connected to the output terminal.

The level of the signals applied to the receiver input shall be expressed in terms of the power delivered by the particular signal generator to a 50 ohm resistive load connected in place of the receiver input terminals. The loss in the combining network (9.5 dB) must be taken into account.

When only two signal generators are being used the unused input terminal shall be terminated by a 50 ohm resistance.

Other arrangements such as hybrid junctions may be used to connect signal generators to the receiver input provided that adequate isolation between the generators is obtained.

4.10. Standard Output Power (Receiver)

The receiver Standard Output Power to be used during tests to this specification shall be declared by the manufacturer and shall be measured in a resistive load equal to the nominal impedance of the load normally connected to the receiver.

4.11. Signal-to-Noise

The term signal-to-noise shall be taken to mean the ratio of the signal plus noise to noise at the receiver audio output.

4.12. Nominal Tune Frequency

The term Nominal Tune Frequency shall be taken to mean the centre frequency of the channel on which the equipment is to be tested.

4.13. Standard Test Receiver Specification

The power measuring receiver consists of a mixer, an IF filter, an oscillator, a variable attenuator, an amplifier and an RMS value indicator (please note that the attenuator should precede the amplifier to obtain maximum dynamic range for the adjacent channel power measurement). The variable attenuator, amplifier and RMS indicator may be replaced by a suitable selective voltmeter. The technical characteristics of the power measuring receiver are given below.

4.13.1.IF Filter

The IF filter shall be within the limits of the selectivity characteristic shown in fig 1.

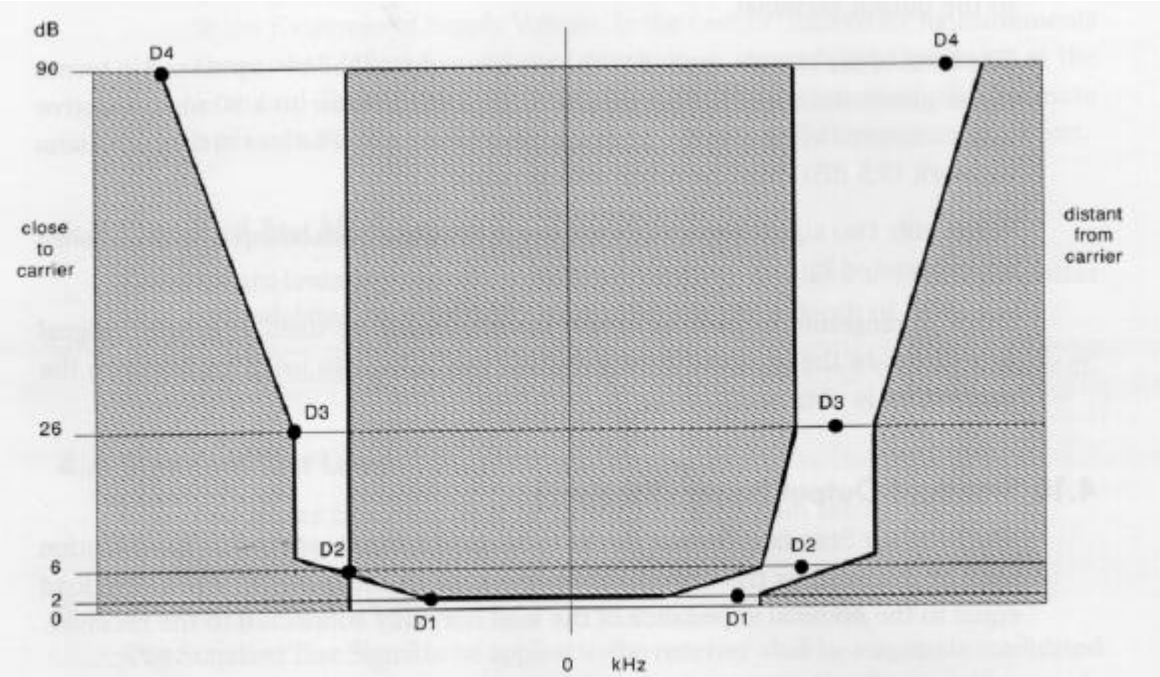

Figure 1
IF Filter Characteristics

The selectivity characteristic of the filter shall be defined by values of frequency separation given in the following tables:

Frequency separation of filter curve from nominal centre frequency of adjacent channel (kHz)				
	Dl	D2	D3	D4
	3.00	4.25	5.50	9.50

The attenuation points shall not exceed the following tolerances:

Attention Points	**Tolerance range (kHz)**			
	D1	D2	D3	D4
Close to Carrier	+1.35	±0.1	+0.00	+0.00

	-0.00		-1.35	-5.35
Distant from Carrier	±2.0	±2.0	±2.0	+2.0 -6.0

The minimum attenuation of the filter outside the 90 dB attenuation points must be equal to or greater than 90 dB.

4.13.2.Attenuation Indicator

The attenuation indicator shall have a minimum range of 80 dB and a reading accuracy of 1 dB.

4.13.3.RMS Value Indicator

The instrument shall indicate accurately non-sinusoidal signals in a ratio of up to 10:1 between peak value and RMS value.

4.13.4.Oscillator and Amplifier

The oscillator and the amplifier shall be designed in such a way that the measurement of the adjacent channel power of a low noise unmodulated transmitter, whose self noise has a negligible influence on the measurement result, yields a measured value of less than -80 dB referred to the carrier.

4.14. Test Fixture

The manufacturer may be required to supply a test fixture suitable to allow relative measurements to be made on the submitted sample.

The test fixture shall provide a 50 ohm radio frequency terminal at the working frequencies of the equipment.

The test fixture shall provide means of making external connections to the modulation input and audio output, and of replacing the power source by an external power supply.

The performance characteristics of this test fixture under normal and extreme conditions are subject to the approval of the Radio Frequency Service.

5. TRANSMITTER PERFORMANCE

5.1. Power Output

5.1.1. Method of Measurement

The transmitter shall be connected to the Standard Test Load and the carrier power delivered by the transmitter to this load shall be measured under the conditions of Clause 4.4.

5.1.2. Minimum Standard

The measured carrier power shall not exceed the limits shown in the following table:

Equipment	At Standard Test Voltage and Standard Ambient Temperature	Under the Conditions of Clause 4.4
Base	33 watts	50 watts
Mobile and Handheld	25 watts	40 watts

The conditions of Clause 4.4 shall apply.

5.2. Accuracy and Stability of Carrier Frequency

5.2.1. Method of Measurement

The carrier frequency shall be measured in the absence of modulation with the transmitter connected to the Standard Test Load. The measurement shall be made under Standard Test Conditions. The conditions of Clause 4.4 shall apply.

5.2.2. Minimum Standard

The difference between the measured carrier frequency and the Nominal Tune Frequency shall not exceed the values given below:

Mobile and Handheld transmitters	1000 Hz
Base transmitters	500 Hz

5.3. Modulation Response

5.3.1. Method of Measurement

Standard Test Modulation shall be applied to the transmitter.
Then with the same audio signal input level, the modulation frequency shall be varied from 300 Hz to 10 kHz and the depth of modulation shall be measured.

5.3.2. Minimum Standard

The depth of modulation at modulating frequencies above 3 kHz shall not exceed that of a linear response falling at a rate of 24 dB per octave and passes through a point at 4 kHz which is -6 dB relative to the maximum depth of modulation below 3 kHz.

5.4. Unwanted Power in Adjacent Channels

5.4.1. Definition

The unwanted power in adjacent channels is that part of the total power output of a transmitter under defined conditions of modulation, which falls within a specified passband centred on the nominal frequency of either of the adjacent channels.

5.4.2. Method of Measurement

The unwanted power in adjacent channels may be measured with a standard test receiver which conforms with Clause 4.13 (referred to in this Clause as the receiver).

The specified tolerance on the frequency response of the IF filter used to perform this measurement is asymmetrical (the lower frequency side of the filter response is more accurately defined than the higher side).

When measuring the unwanted power in adjacent channels the IF resulting from the transmitter carrier must always be lower in frequency than the lower frequency side of the IF filter as indicated on the selectivity characteristic given in Clause 4.13.1.

Lower adjacent channel power measurement:

(a) The transmitter shall be operated at the carrier power determined in Clause 5.1 at standard test voltage and ambient temperature (Clauses 4.2 and 4.3). The output of the transmitter shall be linked to the input of the 'receiver' by a connecting device such that the impedance presented to the transmitter is 50 ohms and the level at the 'receiver' input is appropriate.

(b) With the transmitter unmodulated, the 'receiver' local oscillator frequency is set to the sum of the transmitter carrier frequency and the 'receiver' IF. The local oscillator frequency is then adjusted to obtain the maximum ‘receiver' output level. This level is the 0 dB reference. The 'receiver' attenuator setting and the reading of the 'receiver' output level shall be recorded.

(c) The 'receiver' local oscillator frequency is adjusted lower in frequency (approx. 4.25kHz) until the 'receiver' output drops by 6 dB. The 'receiver' local oscillator is then set a further 8.25 kHz lower in frequency.

(d) The transmitter shall be modulated with 1250 Hz at a level which is 20 dB higher than that required to produce a modulation depth of 60%.

(e) The 'receiver' variable attenuator shall be adjusted to obtain the same ‘receiver' output level as in step (b) or a known relationship to it.

(f) The ratio of the adjacent channel power to transmitter carrier power is the difference between the attenuator settings in steps (b) and (e), corrected for any differences in the 'receiver' output level.

Upper adjacent channel power measurement:

(a) The transmitter shall be operated at the carrier power determined in Clause 5.1 at standard test voltage and ambient temperature (Clauses 4.2 and 4.3). The output of the transmitter shall be linked to the input of the 'receiver' by a connecting device such that the impedance presented to the transmitter is 50 ohms and the level at the 'receiver' input is appropriate.

(b) With the transmitter unmodulated, the 'receiver' local oscillator frequency is set to the difference of the transmitter carrier frequency and the receiver' IF. The local oscillator frequency is then adjusted to obtain the maximum 'receiver' output level. This level is the 0 dB reference. The receiver' attenuator setting and the reading of the 'receiver' output level shall be recorded.

(c) The 'receiver' local oscillator frequency is adjusted higher in frequency (approx. 4.25 kHz) until the 'receiver' output drops by 6 dB. The 'receiver' local oscillator is then set a further 8.25 kHz higher in frequency.

(d) The transmitter shall be modulated with 1250 Hz at a level which is 20 dB higher than that required to produce a modulation depth of 60%.

(e) The 'receiver' variable attenuator shall be adjusted to obtain the same receiver' output level as in step (b) or a known relationship to it.

(f) The ratio of the adjacent channel power to transmitter carrier power is the difference between the attenuator settings in steps (b) and (e), corrected for any differences in the 'receiver' output level.

5.4.3. Limits

The unwanted power in adjacent channels shall not exceed a value of 60 dB below the carrier, but need not be lower than 0.2 microwatts.

5.5. Modulator Dynamic Response

5.5.1. Method of Measurement

(a) Standard Test Modulation shall be applied to the transmitter. The audio input level shall then be increased by 12 dB (in one step) for a period of at least 5 seconds and then restored to the previous level (in one step). The pulse rise time shall be less than 0.5 milliseconds and the fall time less than 10 milliseconds.

(b) The attack and decay time at the output of the transmitter shall be measured by observation of the modulation envelope on a suitable oscilloscope and a modulation meter with peak hold facility.

(c) The test shall be repeated with the initial audio input level at +10 dB relative to Standard Test Modulation.

5.5.2. Limits

5.5.2.1. Instantaneous Peak and trough

If the peak hold measurements for the peak and trough do not exceed 90%, record the peak reading and no further testing to this clause is required.

5.5.2.2. Attack time

If either of the peak hold readings exceeds 90% the time interval between the application of the level increase and the instant when the modulation has decreased to and remains less than 90% (peak and trough) shall be no longer than 10 milliseconds.

5.5.2.3. Decay Time

If either of the peak hold readings exceeds 90% the time interval between the application of the level decrease and the instant when the modulation increases to 0.75 times its new steady state percentage shall not be less than 0.5 second or greater than 2.5 seconds if a feedback, gain adjusting system is used.

5.6. Spurious Emissions

Emissions at any frequency other than those of the carrier and the sidebands associated with normal modulation shall be considered as spurious, irrespective of whether radiation takes place via the antenna, or by direct radiation from the circuit components and wiring.

5.6.1. Method of Measurement

Measurements shall be made with the transmitter unmodulated and with Standard Test Modulation applied. The conditions of Clause 4.4 shall apply.

5.6.2. Limits

The emission of spurious frequencies by direct radiation shall be minimised. The power of individual spurious signals delivered by the transmitter to the antenna transmission line at any frequency separated from the carrier frequency by more than 19 kHz shall not exceed -26 dBm for Base, Mobile and Handheld equipment.

6. RECEIVER PERFORMANCE

6.1. General

During all tests on the receiver, any sensitivity controls (other than the audio power output control) available to the user shall be adjusted for maximum sensitivity. The automatic gain control system shall be allowed to function normally.

6.2. Sensitivity

6.2.1. Method of Measurement

A Standard Test Signal at the Nominal Tune Frequency of the receiver shall be applied to the receiver input at a level of -101 dBm. The receiver shall be adjusted to produce Standard Output Power and the Signal-to-Noise ratio shall be measured. The level of the Standard Test Signal shall then be increased to -61 dBm and the Signal-to-Noise ratio measured again. The conditions of Clause 4.4 shall apply.

6.2.2. Minimum Standard

The Signal-to-Noise ratio measured at the receiver output shall not be less than 10 dB for an input of -101 dBm and not less than 30 dBm for an input of -61 dBm.

6.3. Selectivity (including desensitisation)

6.3.1. Method of Measurement

The selectivity shall be measured by a two-signal method in which two signal generators 'A' and 'B' are connected to the input of the receiver through an input network according to Clause 4.9.2 above. Signal generator 'A' shall be used to apply a Standard Test Signal at the Nominal Tune Frequency of the receiver. Signal Generator 'B' shall be modulated with a 800 Hz tone to produce a modulation depth of 50% and shall be set initially at a frequency 11 kHz above the frequency of signal generator 'A'.

With signal generator 'B' switched off in a manner which does not affect its output impedance, the output level of signal generator 'A' shall be adjusted to produce a Signal-to-Noise ratio of 10 dB at the receiver output. The receiver shall be adjusted to produce Standard Output Power. Signal generator 'B' shall then be switched on and its output level adjusted to be 70 dB above the level of signal generator 'A' at Standard Test Voltage and Standard Ambient Temperature and 60 dB under the conditions of Clause 4.4. The Signal-to-Noise ratio and the audio output level change at the receiver output shall be recorded. The test shall be repeated with signal generator 'B' set at a frequency 11 kHz below the frequency of signal generator 'A'.

The conditions of Clause 4.4 shall apply.

6.3.2. Minimum Standard

(a) The Signal-to-Noise ratio at the output of the receiver shall not be less than 7 dB; and

(b) The audio output level from the receiver when modulated test signals from both signal generator 'A' and signal generator 'B' are applied to its input shall not alter by more than 3 dB from that when signal generator 'B' is switched off.

6.4. Blocking

6.4.1. Method of Measurement

Two signal generators, 'A' and 'B' shall be connected to the input of the receiver through an input network according to Clause 4.9.2 above. With signal generator 'B' switched off in such a manner which does not alter its output impedance a Standard Test Signal at the Nominal Tune Frequency shall be applied from signal generator 'A' at the level required to produce a Signal-to-Noise ratio of 10 dB. The receiver shall be adjusted to produce Standard Output Power.

An unmodulated signal from signal generator 'B' shall then be applied at various frequencies and at a level of -23 dBm at the receiver input simultaneously with the signal from signal generator ',N.

6.4.2. Minimum Standard

The signal from signal generator 'B' at any frequency (other than spurious response frequencies) removed from the frequency of signal generator 'A' by 150 kHz or more shall not cause the output power of the receiver to change by more than 3 dB or the Signal-to-Noise ratio to be less than 7 dB.

6.5. Spurious Responses

6.5.1. Method of Measurement

A Standard Test Signal at the Nominal Tune Frequency shall be applied to the receiver input at the level at which a 10 dB Signal-to-Noise ratio at the receiver output is obtained. The receiver shall be adjusted to produce Standard Output Power.

The input level shall then be increased by at least 70 dB and the frequency varied over the range from the lowest intermediate frequency to 1000 MHz. At any frequency at which a response is obtained the Signal-to-Noise ratio shall be measured.

6.5.2. Minimum Standard

At any frequency removed from the Nominal Tune Frequency by more than 12.5 kHz the Signal-to-Noise ratio at the output of the receiver shall be less than 10 dB.

6.6. Intermodulation

6.6.1. Method of Measurement

Three signal generators, 'A', 'B' and 'C' shall be connected to the input of the receiver through an input network according to Clause 4.9.2 above. A Standard Test Signal shall be applied to the receiver from signal generator 'A' alone at the Nominal Tune Frequency and at the level required to produce a Signal-to-Noise ratio of 10 dB at the receiver output. The receiver shall be adjusted to produce Standard Output Power. Signal generator 'B' shall then be used to apply an unmodulated signal at a frequency 12.5 kHz above the Nominal Tune Frequency; at the same time signal generator 'C' shall be used to apply a test signal modulated at 400 Hz to a depth of 50% at a frequency 25 kHz above the Nominal Tune Frequency.

The outputs of signal generators 'B' and 'C' shall be at the same level and shall be increased until the Signal-to-Noise ratio resulting from signal generator 'A' is reduced to 7 dB. The frequency of signal generator 'B' shall be adjusted slightly for the purpose of this test to produce maximum

interference due to intermodulation products, including any beat note that may be present. The ratio of the output level of signal generator 'B' (or signal generator 'C') to that of signal generator 'A' measures the intermodulation response.

The test shall be repeated with signal generator 'A' set to produce the signal levels shown in the minimum standard table below.

The whole test shall be repeated with signal generators 'B' and 'C' set to 12.5 kHz and 25 kHz respectively below the Nominal Tune Frequency.

6.6.2. Minimum Standard

Output of signal generator 'A' relative to the output at which a 10 dB Signal-to-Noise ratio is obtained.	Output level ratio of signal generator 'B' (or 'C') to signal generator 'A.
0 dB	+57 dB
+20 dB	+47 dB
+40 dB	+37 dB

6.7. Spurious Radiation

The spurious signal power at the antenna terminal, when terminated in its source impedance (Clause 4.8), shall not exceed -47 dBm at any frequency.

Radiation of spurious frequencies from components and wiring of receivers shall be minimised.

6.8. Cross Modulation

6.8.1. Method of Measurement

Two signal generators 'A' and 'B' shall be connected to the input of the receiver through an input network according to Clause 4.9.2 above. With signal generator 'B' switched off in a manner which does not alter its output impedance, a Standard Test Signal from signal generator 'A' shall be applied at the nominal tune frequency to the receiver input at a level of -55 dBm. The receiver shall be adjusted to give Standard Output Power.

The modulation shall be switched off, and the Standard Test Signal from signal generator 'B' shall also be applied at various frequencies to the receiver input at a level of -23 dBm.

6.8.2. Minimum Standard

The simultaneous application of a Standard Test Signal from signal generator 'B' at any frequency (other than spurious response frequencies) removed from the Nominal Tune Frequency by more than 150 kHz, shall not result in an output power greater than -20 dB relative to that due to the Standard Test Signal from signal generator 'A'.

7. EQUIPMENT IDENTIFICATION

The serial number of the equipment, the name, the type of unit, the manufacturer's name as well as any other information required to identify the equipment shall be indelibly marked on the unit in a conspicuous and/or readily accessible location, and in a manner to ensure its permanency during the expected lifetime of the equipment in its normal environment.