Recommendation T/R 25-01 (Interlaken 1968, revised in Puerto de la Cruz 1974)

CO-ORDINATION OF FREQUENCIES IN THE LAND MOBILE SERVICE IN THE 80, 160 AND 460 MHz BANDS

Recommendation proposed by the "Radiocommunications" Working Group T/WG 3 (R)

Text of the Recommendation adopted by the "Telecommunications" Commission:

"The European Conference of Postal and Telecommunications Administrations,

considering

(a) that on examination of Question R13 every effort was made to achieve harmonisation of the assignment of frequencies to the land mobile service in CEPT member countries,

(b) that a complete alignment of all parameters relating to the use of a given frequency is not possible at the moment,

(c) that the rapid development of the land mobile service makes the problem of assigning frequencies increasingly difficult,

(d) that each new frequency assignment must be co-ordinated with frequencies already assigned in a given geographical area,

(e) that the probability of obtaining a successful co-ordination diminishes rapidly as a function of the number of radio stations,

(f) that a great number of these co-ordinations must take place beyond the borders of various countries,

(g) that the difficulties encountered with this co-ordination will depend on a great number of parameters (technical, operational or topographical),

recommends to CEPT member Administrations, in order to reduce harmful interference in border areas:

that they should endeavour to comply with the following directives when assigning frequencies to stations in the land mobile service."

1. DIRECTIVES RELATED TO OPERATING CONDITIONS

1.1. Re-utilisation of frequency bands for specific types of use in different countries

With regard to the following types of use at least, the frequency bands allocated in the different countries should have common (literally) "portions" which should be as extensive as possible:

"The common portions/segments of the frequency bands allocated in the different countries should be as broad/extensive as possible."

Railways

Production, transport and energy distribution companies

Radio link networks

Demonstration

Subscriber installations, public mobile services, stand-by links

Test and research

Security services (customs, police, etc.) for cross-border links

Radio broadcasting (studio, news reporting)

Life-saving services (ambulances, doctors, water and mountain rescue) for cross-border links

1.2. **Use of common frequencies**

In border areas, frequencies may be divided between the users in bordering adjacent countries so as to be used most effectively.

A common frequency is a frequency which is assigned in a given area to users whose traffic conditions are similar and who use technically similar equipment. The number of stations used per frequency is co-ordinated between the Administrations concerned.

1.3. **Use of multi-channel equipment**

In so far as (an) economy in the use of frequencies requires the use of several base stations with different frequencies instead of one long range station, mobile multi-channel stations should be given preference in spite of their disadvantages from the operational point of view.

2. DIRECTIVES OF A TECHNICAL NATURE

2.1. **Propagation curves**

The curves contained in Annex 1 (pages 4 and 5) may be used to determine the intensity of the interference field in ordinary cases. For all special cases (maritime propagation, etc.) interested Administrations will, by mutual agreement, determine the curves to be consulted.

2.2. **Network characteristics**

The location, the power and the antenna heights of all stations in the network must be selected in such a way that their range is confined, as far as possible, to the zone to be covered. Excessive antenna heights and transmitter outputs should be avoided by using several locations of lesser/reduced height wherever possible.

To facilitate co-ordination between Administrations, it would be advisable to adopt a single frequency simplex operation.

2.3. **Choice of frequency band and useful range**

When there are restricted zones, frequencies in the highest bands should be preferred and frequencies in the lowest bands should be preferred for long range networks.

By way of illustration the following values could be used as a basis for the useful ranges:

Frequency Band	Useful Range
80 MHz	30 km and more
160 MHz	approximately 20 km
460 MHz	approximately 10 to 15 km

These figures are valid for relatively uneven ground.

2.4. **Use of the upper and lower bands within a dual frequency simplex or duplex operation**

If possible, the frequencies of emission of base stations should be placed in the upper band and those of mobile stations in the lower band. The same positions of upper and lower bands should be selected for bordering/adjacent countries (see examples in Annex 2 (page 6)).

2.5. **Frequency spacing in a duplex or simplex dual frequency channel and location of sub-bands**

In so far as Administrations are in a position to define the spacing, the following values and the respective positions of the sub-bands given in Annex 2 (page 6) should be taken into consideration:

80 MHz band	*)
160 MHz band	4.6 MHz
460 MHz band	10.0 MHz

*) Amongst the various spacings used in the 80 MHz band, a spacing of 9.8 MHz is used by several countries.

2.6. **Channel spacing**

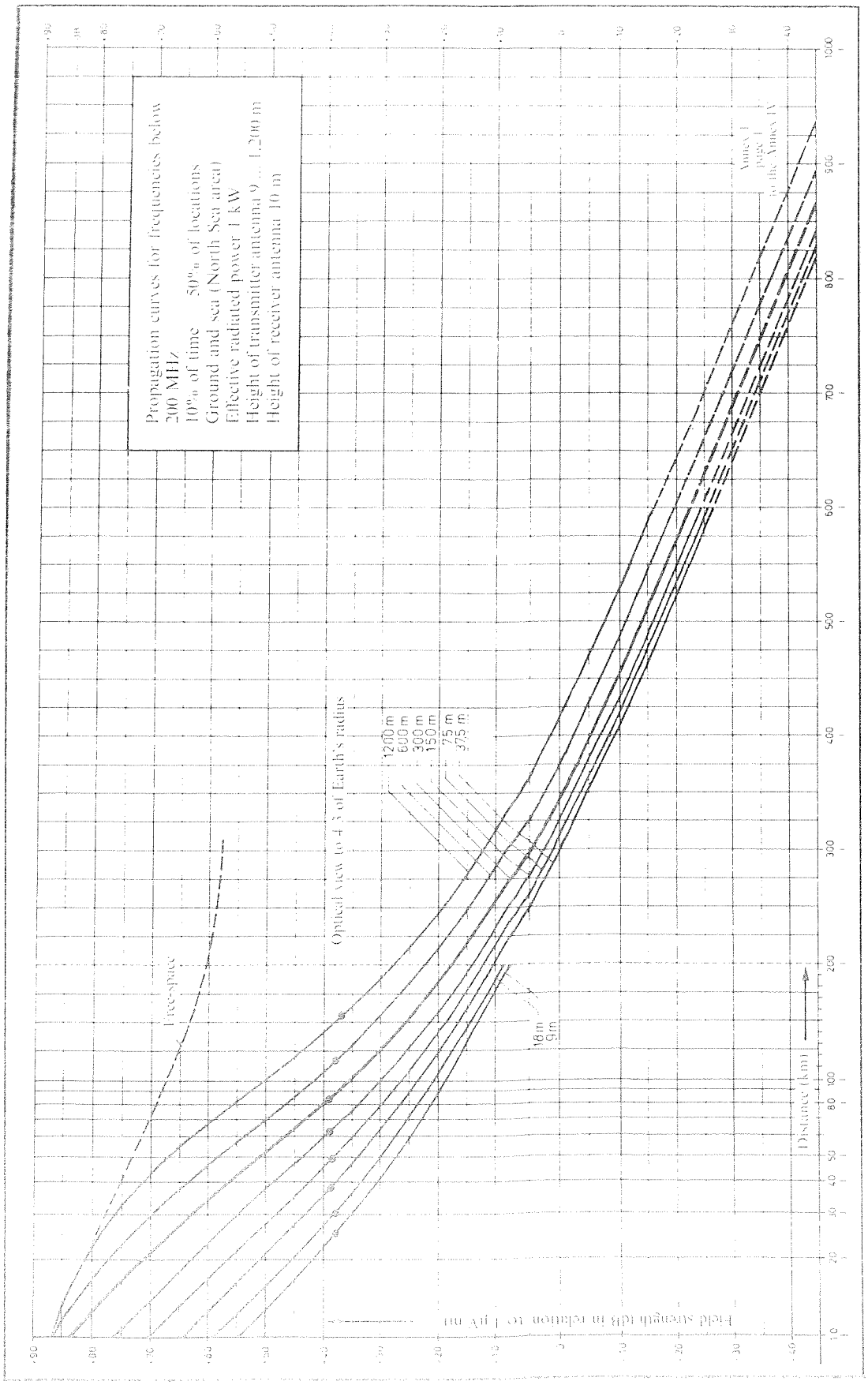
For new installations, the adjacent channel spacing should not exceed 25 kHz.

3. CO-ORDINATION OF FREQUENCY ASSIGNMENTS BETWEEN ADMINISTRATIONS

The fundamental characteristics of which the Administration concerned must be informed when co-ordination takes place are contained in Annex 3 (page 7).

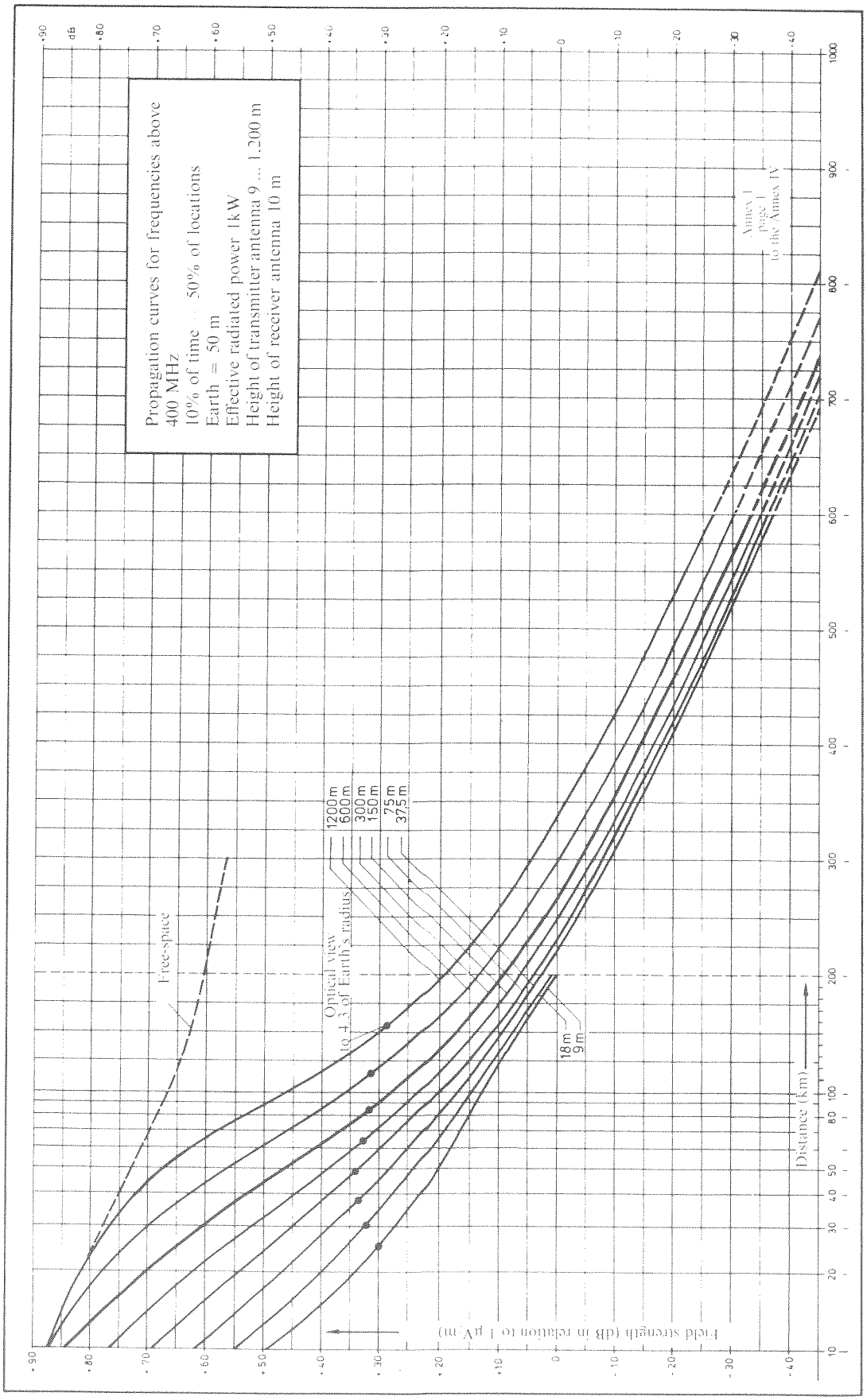
Annex 1

PROPAGATION CURVES FOR FREQUENCIES LOWER THAN 200 MHz



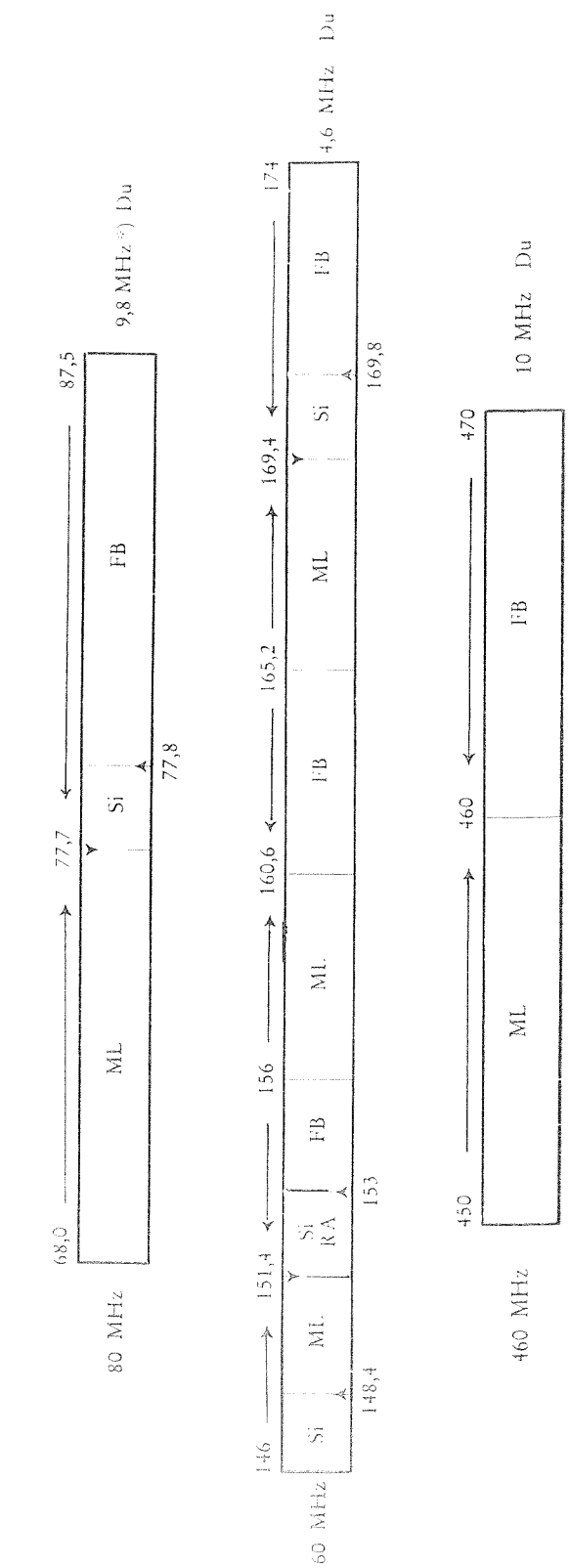
Annex 1 (*continued*)

PROPAGATION CURVES FOR FREQUENCIES ABOVE 400 MHz



Annex 2

DUPLEX SPACING AND USE AND LOCATION OF UPPER AND LOWER BANDS



Annex 3

CO-ORDINATION OF FREQUENCY ASSIGNMENTS FOR STATIONS IN THE VHF/UHF LAND MOBILE SERVICE

Column

1) Assigned frequency (MHz).

2c) Planned date for bringing into use.

4a) Name of transmitting station.

4b) Country in which the transmitting station is located.

4c) Geographical details of the position of the transmitter (longitude and latitude) in degrees and minutes.

5a) Locality (localities) or zone(s) with which communication is established.

5b) Maximum range of transmission required (in km).

6) Class of the station and nature of service provided.

7) Class of emission, necessary bandwidth and nature of transmission.

8) Maximum effective radiated power (in W).

9a) Azimuth of maximum radiation (symbol ND if antenna is non-directional).

9d) Maximum effective height of the transmitting antenna in accordance with CCIR Recommendations.

10) Hours of the day during which the station is ready for operation (one only of the following abbreviations should be used: H24, HX[1], HX[2], HJ or HN).

13c) Further information if necessary such as:

(a) Group of users to whom the frequency is assigned (symbols, see Appendix I (page 8)).

(b) Protection code (symbols, see Appendix I (page 8)). Indications given under (a) and (b) may be inserted in column 6 or 13c.

(c) All further information concerning the height of the antenna, a reduction in the height of the antenna in the direction of the country likely to be affected, radiated diagrams, etc., necessary to be able to assess the probability of harmful interference.

(d) Limitation of radiated power in the direction of a country likely to be affected.

(e) Approximate number of mobile stations located in a single network and operating on the same frequency (only if possible) and, where appropriate, the call-sign or other means of identification.

The above-mentioned points are numbered to correspond to the numbers of the columns of the ITU international list of frequencies. The same applies to the abbreviations used in column 10.

Notes: [1]) Occasional, relatively regular use.

[2]) Occasional, irregular use.

These two definitions do not correspond with Appendix 10 to the Radio Regulations, Geneva 1959.

Appendix I to Annex 3

FURTHER INDICATIONS ACCORDING TO THE TYPE OF USE
(for col. 6 or 13c)

A Air navigation, air safety.
B Railways (excluding mountain railways).
C Diplomatic corps.
D Mountain railways.
E Production, transport and energy distribution (electricity, gas, water) firms.
F Fire services.
G Military (mainly for internal use).
H Radio relay networks.
HH Local call.
I Demonstration.
K Public transport companies.
L Subscriber installations, public mobile services, stand-by links.
M Navigation (in ports, on the Rhine, etc.).
N Tests and research.
O
P Security services (police, customs, etc.).
Q Entries not falling within other categories on this list (cordless microphones, etc.).
R Radio broadcasting (studio, news reporting).
S Rescue services (ambulances, doctors, water and mountain rescue).
T Other services provided by telecommunications Administrations.
U Industrial operators.
V Road traffic service.
W Taxi and car hire firms.
X Other private services.
Y Reserved specific application, not allocated.
Z Other private multiple use networks.

Protection Code:

1 Highly sensitive to interference.
2 Highly sensitive to interference, automatic.
3 Sensitive to interference.
4 Not very sensitive to interference.
5 Not at all sensitive to interference.