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**USE OF CIRCUITS FOR  
VOICE-FREQUENCY TELEGRAPHY**

**ITU-T Recommendation M.800**

(Extract from the *Blue Book*)

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## NOTES

1 ITU-T Recommendation M.800 was published in Fascicle IV.2 of the *Blue Book*. This file is an extract from the *Blue Book*. While the presentation and layout of the text might be slightly different from the *Blue Book* version, the contents of the file are identical to the *Blue Book* version and copyright conditions remain unchanged (see below).

2 In this Recommendation, the expression “Administration” is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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## **USE OF CIRCUITS FOR VOICE-FREQUENCY TELEGRAPHY**

### **1 Composition and nomenclature**

Figure 1/M.800 illustrates the composition of an international voice-frequency telegraph system and the nomenclature used.

#### *1.1 The international voice-frequency telegraph system*

This is the whole of the assembly of apparatus and lines including the terminal voice-frequency telegraph equipment. In Figure 1/M.800 the system illustrated provides 24 duplex telegraph circuits, but other numbers of telegraph circuits can be provided.

#### *1.2 The international voice-frequency telegraph link (sometimes referred to as the bearer circuit)*

1.2.1 Four-wire telephone-type circuits are used for international voice-frequency telegraph links. The link comprises two unidirectional transmission paths, one for each direction of transmission, between the terminal voice-frequency telegraph equipments.

1.2.2 The international voice-frequency telegraph link consists of an international voice-frequency telegraph line together with any terminal national sections connecting the international telegraph line to the voice-frequency telegraph terminal equipment and may be constituted entirely on carrier channels (on symmetric pairs, coaxial pairs, radio-relay systems, etc.) or on audio-frequency lines or combinations of such lines.

1.2.3 The nominal links for voice-frequency telegraphy have no terminating units, signalling equipment or echo suppressors.

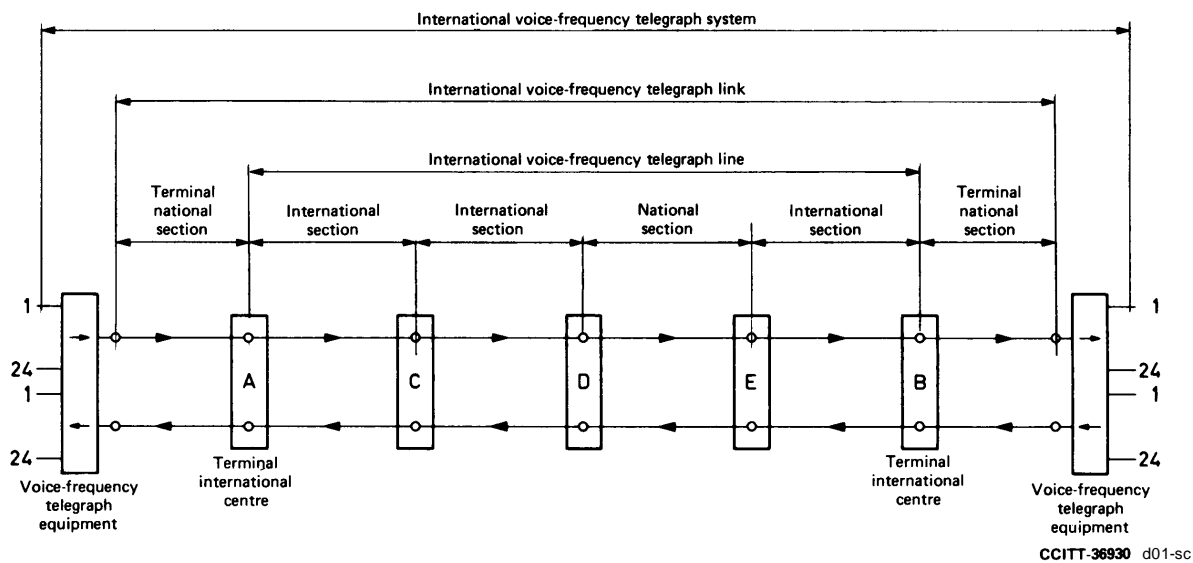
#### *1.3 The international voice-frequency telegraph line*

1.3.1 The international voice-frequency telegraph line may be constituted by using a channel in a carrier group or channels in tandem on a number of groups. National and international sections can be interconnected to set up an international voice-frequency telegraph line. See Figure 1/M.800, but note that § 1.3.2 below details a preferred method.

The international voice-frequency telegraph line could equally well be set up between, for example, only A and C or between C and D, in which case A and C or C and D would be the terminal international centres.

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<sup>1)</sup> See also Recommendations R.77 [1] and H.21 [2].



(At the intermediate centres C, D and E at the terminal international centres A and B, the signals transmitted are at audio-frequencies. At these points it is possible to make measurements.)

FIGURE 1/M.800  
The components of an international voice-frequency telegraph system

1.3.2 Wherever possible, an international voice-frequency telegraph line should be provided on a channel of a single carrier group, thereby avoiding intermediate audio-frequency points. In some cases, such a direct group may not exist or, for special routing reasons, it may not be possible to set up the international telegraph line in the preferred way. In such cases, the international telegraph line will consist of channels in tandem on two or more groups with or without audio sections, depending on the line available and the routing requirements.

#### 1.4 Terminal national sections connected to the international voice-frequency telegraph line

In many cases the voice-frequency telegraph terminal equipment is remote from the terminal international centre of the international voice-frequency telegraph line (Figure 1/M.800), and such cases necessitate the provision of terminal national sections in order to establish international voice-frequency telegraph links. These sections may be in short-distance local audio cables, amplified or unamplified, or may be routed in long-distance carrier groups or on amplifier audio plant.

## 2 Reserve arrangements for international voice-frequency telegraph links

All necessary action should be taken to enable the duration of interruption of international voice-frequency telegraph links to be reduced to a minimum and, for this purpose, it is expedient to standardize some of the methods to be adopted for replacing defective portions in the link.

Although it does not appear necessary for these methods to be the same in detail in every country, it would be advisable to reach agreement regarding the general directives to be followed.

The make-up of a reserve voice-frequency telegraph link will in general be similar to that of the normal voice-frequency telegraph link. However, if the voice-frequency telegraph terminal equipment is not located at the terminal international centres, the line portion of an international telephone circuit can be used to replace only the international voice-frequency telegraph line of the voice-frequency telegraph link.

## 2.1 *Reserve international lines*

2.1.1 Wherever possible, a reserve international line should be provided between the two terminal international centres by means of the line portion of an international telephone circuit (between A and B in Figure 1/M.800).

2.1.2 The telephone line used as a reserve should be chosen wherever possible so as to follow a different route from that of the normal international telegraph line. Where this cannot be done, as much as possible of the line or its sections should be alternatively routed.

2.1.3 If there is a choice, the use of manually-operated circuits as reserve lines for voice-frequency telegraphy is technically and operationally preferable to the use of automatic circuits.

It should be possible, after prior agreement between the controlling officers at the international terminal exchanges concerned, for an operator to break into a call in progress to advise the correspondents that the circuit is required elsewhere and that the call will have to be transferred to another circuit if it lasts longer than six minutes.

2.1.4 If the telephone circuit used as a reserve is automatic or semiautomatic a direct indication should be given at the changeover point. If it is not available when needed the reserve circuit should be blocked against any further call.

## 2.2 *Reserve sections for the sections of the international voice-frequency telegraph link*

Where it is not possible to provide a reserve international line or a reserve international voice-frequency telegraph link either because there are no suitable telephone circuits or because the number of telephone circuits does not permit the release of a circuit for reserve purposes, a reserve section should be provided wherever possible for each of the component sections. For these sections, national or international telephone lines or, where they exist, spare channels, circuits, etc., should be used.

## 2.3 *Reserve arrangements for the terminal national sections connecting the voice-frequency telegraph terminal equipment to the international voice-frequency telegraph line*

For the terminal national sections of an international voice-frequency telegraph link, reserve sections should be constituted using national telephone-type circuits or spare channels, lines, etc.

## 2.4 *Changeover arrangements from normal to reserve lines*

2.4.1 When an international telephone line (i.e. part of an international telephone circuit) is used to provide a reserve for the international voice-frequency telegraph line (or for one of its sections as mentioned in § 2.2 above), there should be changeover arrangements to enable the changeover from the normal line to the reserve line to be made as rapidly as possible. The changeover arrangements (Figure 2/M.800) should be such that on changeover, all signalling equipment, echo suppressors, etc., associated with the telephone circuit that is used as a reserve for the international voice-frequency telegraph line are disconnected on the line side. When the fault is cleared on the normal line, it should be possible to join it to the signalling equipment, echo suppressors, etc., of the telephone circuit used, until the agreed time for restoration to the normal routing.

It is desirable to introduce as little disturbance as possible when changing back from reserve to normal. Arrangements of cords and parallel jacks can be devised to achieve this.

2.4.2 The changeover arrangements shown in Figure 2/M.800 could be applied to sections of the international voice-frequency telegraph line mentioned under § 2.2 above when it is not possible to obtain an overall reserve for the international voice-frequency telegraph line. Normal sections and the corresponding reserve sections should be routed via suitable changeover arrangements at the stations concerned.

2.4.3 Making manual, automatic or semiautomatic international telephone circuits available for reserve purposes for voice-frequency telegraphy should be in accordance with the instructions issued and the arrangements made by the respective Administrations. Should the normal and reserve lines both be faulty, the technical services of the Administration concerned should take immediate joint action to find a temporary remedy.

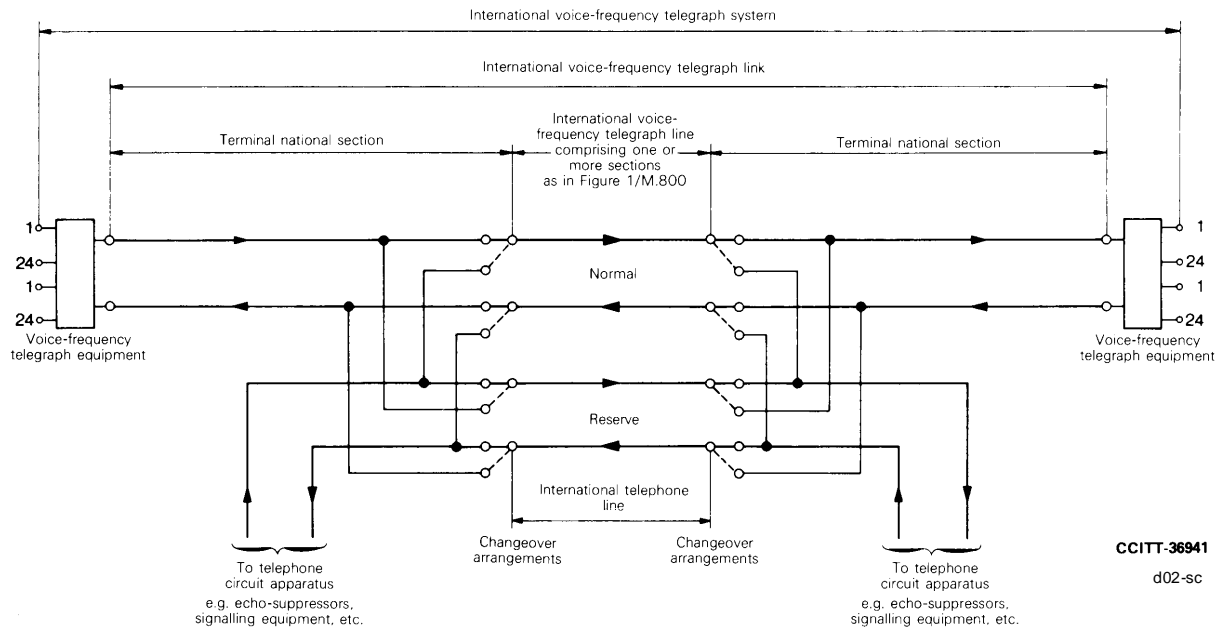


FIGURE 2/M.800  
**An example of how an international telephone line can be used as the reserve for the international voice-frequency telegraph line of an international voice-frequency telegraph system**

## 2.5 Designation and identifying marks

Normal and reserve links, etc., should be clearly distinguishable from other circuits both from the point of view of designation (see Recommendation M.140 [3]) and identifying marks (see Recommendation M.810).

### References

- [1] CCITT Recommendation *Use of bearer circuits for voice-frequency telegraphy*, Vol. VII, Rec. R.77.
- [2] CCITT Recommendation *Composition and terminology of international voice-frequency telegraph systems*, Vol. III, Rec. H.21.
- [3] CCITT Recommendation *Designation of international circuits, groups, group and line links, digital blocks, digital paths, data transmission systems and related information*, Vol. IV, Rec. M.140.