INTERNATIONAL TELECOMMUNICATION UNION

ITU-T Q.479

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

SPECIFICATIONS OF SIGNALLING SYSTEM R2

SIGNALLING PROCEDURES

ECHO-SUPPRESSOR CONTROL - SIGNALLING REQUIREMENTS

ITU-T Recommendation Q.479

(Extract from the *Blue Book*)

NOTES

1 ITU-T Recommendation Q.479 was published in Fascicle VI.4 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.

5.7 ECHO-SUPPRESSOR CONTROL - SIGNALLING REQUIREMENTS

5.7.1 *Introduction*

Recommendations Q.42 and Q.115 give fundamental requirements with which the employment of echo suppressors must comply.

There are two methods of connecting echo suppressors to a circuit. One method is by use of permanently connected echo suppressors and the other is by the insertion of echo suppressors from a pool, when required.

In System R2 (see Recommendation Q.441) two forward signals (I-12 and I-14) and one backward signal (A-14) are provided to indicate whether or not an incoming half-echo suppressor (IHES) is required.

A third forward signal (I-11) is also available for use by bilateral agreement to indicate that an outgoing half-echo suppressor (OHES) must be employed.

The following principles must be taken into account.

5.7.2 *Principles of echo-suppressor control*

5.7.2.1 The outgoing international exchange may be able to determine the need for echo suppressors in the connection by analysing the received country code.

5.7.2.2 In direct traffic between 2 countries the use of echo suppressors generally takes place according to fixed rules. Echo-suppressor control signalling is not, therefore, necessary in these cases unless it is applied for the sake of uniformity.

5.7.2.3 In international transit traffic the outgoing half-echo suppressor (OHES) will normally be employed at the outgoing international exchange, and the incoming half-echo suppressor (IHES) at the incoming international exchange, unless other arrangements are agreed upon with the Administration of the international transit exchange(s) (see § 5.7.2.5 below).

However, in cases where an outgoing satellite link is selected by a transit exchange without the knowledge of the outgoing international exchange, the signal I-12 may be sent over the satellite link. In such cases half-echo suppressors are required and will normally be permanently fitted at each end of the satellite link.

5.7.2.4 An incoming international exchange, equipped for the connection of IHES, must ask the outgoing international exchange whether or not an IHES must be employed unless this is known from other criteria (e.g. line classification). It will do this by sending the backward signal A-14 as an acknowledgement of the discriminating or language digit (Z-digit).

When a satellite link is used in the connection the exchange situated at the incoming end of the satellite link responds to the A-14 signal instead of the outgoing international exchange (see Recommendation Q.7).

5.7.2.5 It may be agreed upon bilaterally that in international transit traffic the OHES (IHES) will not be employed in the outgoing (incoming) international exchange, but in the international transit exchange, e.g. in the case where most of the traffic on the circuit group between the outgoing exchange and the transit exchange (between the transit exchange and the incoming exchange) needs no echo-suppressor.

a) When echo suppressors are needed and the OHES must be employed at the international transit exchange the outgoing international exchange sends the signal I-11 as a country code indicator.

   If an international connection is routed via two or more transit exchanges, signal I-11 must not be sent beyond the first transit exchange. Therefore the outgoing exchange, after having sent the signal I-11 once, must send the signal I-14 if the country code indicator is requested again (signal A-11).

b) When echo suppressors are needed and the IHES must be employed at the international transit exchange this is known by the international transit exchange. In this case the incoming international exchange will not send signal A-14.

5.7.2.6 When echo suppressors are employed they will remain disabled until the answer signal is received. This condition is necessary in order to permit compelled interregister signalling to (e.g. national) exchanges further on in the connection.

Alternatively, when the ability exists to detect that interregister signalling has been completed, the echo-suppressor may be enabled at that time without awaiting the answer signal.

5.7.3 *Examples of echo-suppressor control signalling*

The following situations may arise:

5.7.3.1 *Direct interregister signalling between two countries A and B.*

a) No echo-suppressor control signalling is applied.

This may be for one of two reasons. Either the connection does not normally require echo suppressors or echo suppressors are required and are permanently connected to the circuit.

The signalling procedure is indicated in Table 11/Q.479, column a. If echo suppressors are necessary, the OHES is employed at A and the IHES is employed at B.

b) Echo-suppressor control signalling is applied.

There are two cases:

i) No echo suppressors are required (see column b of Table 11/Q.479).

ii) Echo suppressors are required (see column c of Table 11/Q.479). The OHES is employed at A and the IHES is employed at B.

5.7.3.2 *Traffic between two countries A and D via two international transit exchanges B and C*

There are two cases:

5.7.3.2.1 The connection is via terrestrial circuits only.

a) No echo suppressors are required (see column a of Table 12/Q.479).

b) Echo suppressors are required (see columns b, c, d, e of Table 12/Q.479).

The following examples may be mentioned:

- OHES in A: IHES in D (column b);
- OHES in B: IHES in D (column c).

The country code indicator I-11 is used by bilateral agreement and indicates that B must employ the OHES. When the country code indicator is to be sent to C, B asks A to do this by sending signal A-11. A, now sends signal I-14 instead of signal I-11, because B has employed the OHES. The signal A-14, which is sent from D as an acknowledgement of the Z-digit will, of course, also be answered by signal I-14.

- OHES in A: IHES in C (column d).

In accordance with § 5.7.2.5 b) above, C knows that D cannot employ an IHES and C itself will therefore make the connection. D will naturally not send signal A-14.

- OHES in B: IHES in C (column e).

5.7.3.2.2 The connection includes a satellite link.

The following examples are given as typical situations that may arise:

a) The first link in the connection is via satellite.

In Table 13/Q.479, P and Q both know that echo suppressors are required.

If Q has a permanently connected IHES then:

- OHES in P; IHES in Q (column a).

When R or S is able to employ an IHES then:

- OHES in P; IHES in R (column c);
- OHES in P; IHES in S (column b).

b) A later link in the connection is via satellite.

In Table 14/Q.479:

When P knows that Q-R is via satellite:

- OHES in P; IHES in R or S (column b or d).

When P does not know that Q-R is via satellite:

- OHES in Q; IHES in R or S (column a or c).

TABLE 11/Q.479

Signalling procedure on direct connections

A — B	a	b	c
Seizing →			
Z-digit →			
←	A-1	A-14	A-14
→	N1	N1	I-14
←	A-1	A-1	A-1
→	N2	N2	N1
Echo suppressor employed	YES/NO	NO	YES

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TABLE 12/Q.479

Signalling procedures on international transit connections via terrestrial circuits

A — B — C — D	a	b	c	d	e
Seizing →					
Country code indicator →	I-12	I-14	I-11	I-14	I-11
← A-1					
I-1 →					
← A-1					
I-2 → Seizing →					
← A-11					
Country code indicator →	I-12	I-14	I-14	I-14	I-14
← A-1					
I-1 →					
← A-1					
I-2 → Seizing →					
← A-12					
Z-digit →					
←	A-14	A-14	A-14	A-1	A-1
→	N1	I-14	I-14	N1	N1
←	A-1	A-1	A-1	A-1	A-1
→	N2	N1	N1	N2	N2
Echo suppressors employed at	–	A,D	B,D	A,C	B,C

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TABLE 13/Q.479

Signalling procedures on international transit connection when the first link is via satellite

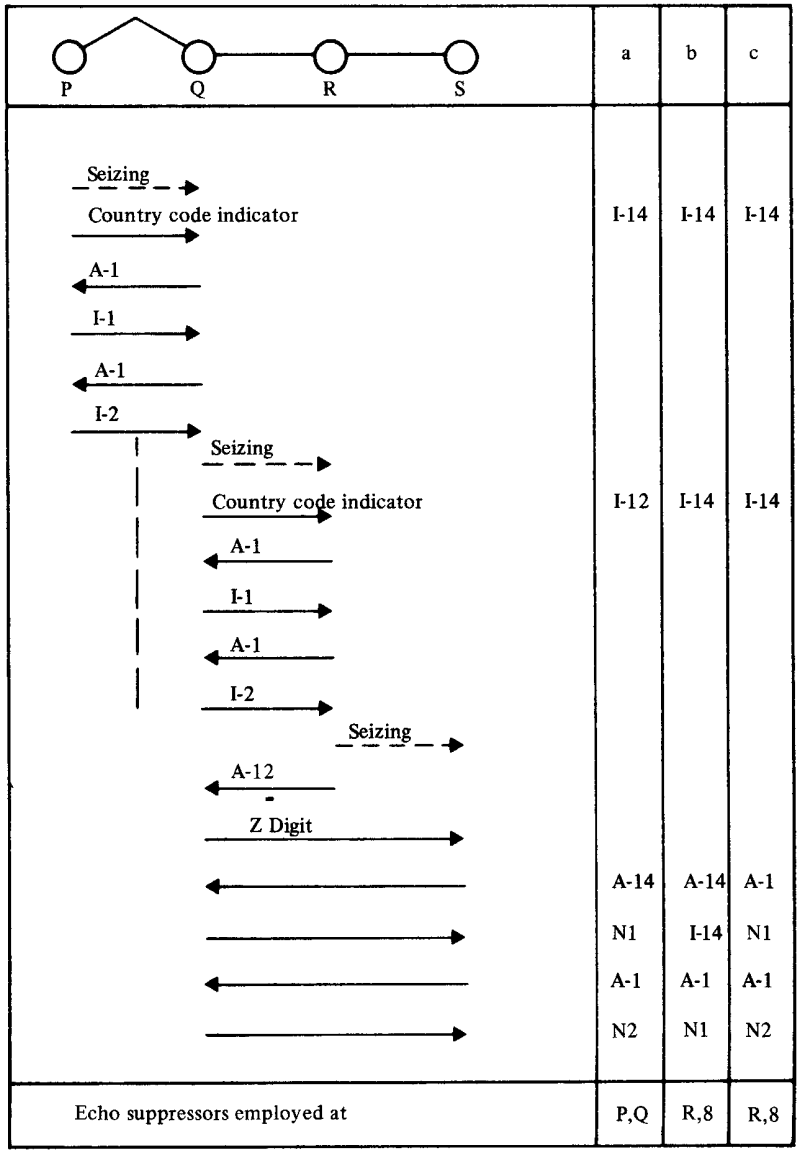

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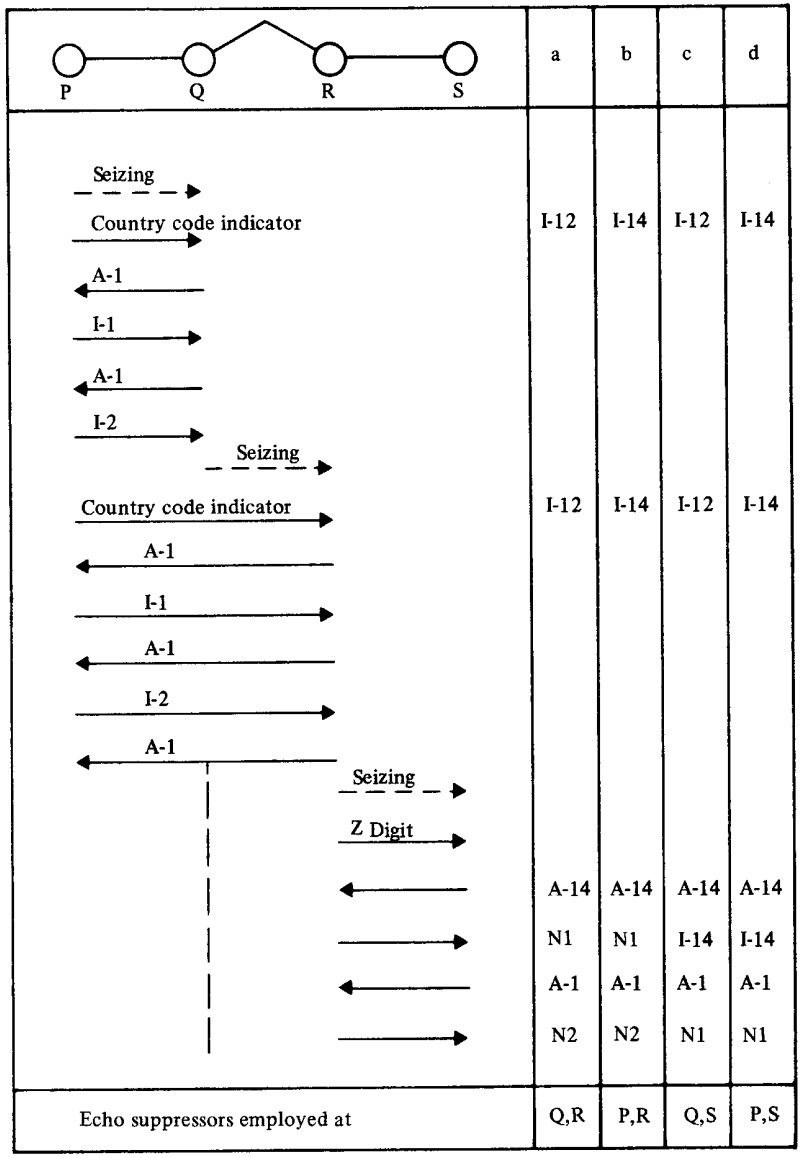
TABLE 14/Q.479

Signalling procedures on international transit connection when a subsequent link is via satellite



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