

**ECMA**

**EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION**

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**STANDARD ECMA-29**

**FOR**

**CONVERSATIONAL INFORMATION  
TRANSFER**

**An Extension of the Basic Mode Control Procedures  
for Data Communication Systems  
According to Standard ECMA-16**

September 1971

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ECMA European Computer Manufacturers Association  
114 Rue du Rhône — 1204 Geneva (Switzerland)

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### BRIEF HISTORY

Technical Committee TC 9 of ECMA issued in May 1968 their Standard ECMA - 16 for Basic Mode Control Procedures for Data Communications Systems using the Ecma 7-bit Code. Further work was undertaken on procedures for conversational information transfer. A proposal by ECMA was filed in June 1970 with ISO/TC97/SC6 and approved by the various delegations.

The present Standard ECMA - 29 was accepted by the General Assembly of ECMA on June 2 - 3, 1971.

INTRODUCTION

The present Standard ECMA - 29 is an extension of the Basic Mode Standard ECMA - 16. It defines the procedures which allow two stations connected by a data link to reverse their master/slave status without leaving the information transfer phase.

## 1. SCOPE

This Standard is an optional extension of Standard ECMA - 16 on Basic Mode Control Procedure for Data Communication Systems. This means that:

- i) Those systems which conform to Standard ECMA - 16 do not necessarily have to include the functions in the following Standard.
- ii) Those systems implementing the functions described hereafter must comply with the present Standard to conform to Standard ECMA - 16 on Basic Mode Control Procedures.

This Standard defines a Conversational Information Transfer as an extension to the Basic Mode Control Procedures for Data Communication Systems using Information Transfer either 7-bit coded or code independent. This Standard refers only to those classes of systems using acknowledgements, i.e. ACK and NAK.

## 2. DEFINITION OF CONVERSATIONAL OPERATION

Conversational Operation is defined as "a procedure which allows two stations connected by a data link to reverse their master/slave status (thereby reversing the directions of the information transfer) without leaving phase 3, information transfer."

During one conversation process considered here, only two stations are involved at one time. Conversation with any other station must pass through termination and establishment of another data link.

This procedure applies to the following system configurations:

Point to Point  
Centralized Multipoint  
Non-Centralized Multipoint

## 3. PROCEDURE OF CONVERSATIONAL OPERATION

(See Figure 1).

- 3.1 The positive acknowledgement can be replaced by the transfer of an information message in the opposite direction.

- 3.2 The information message can be sent in lieu of the positive acknowledgement only when the received message is terminated by ETX (or DLE.ETX) and not by ETB.
- 3.3 The opening character of the returned message (i.e. STX, SOH or DLE.STX, DLE.SOH) shall be considered as having the additional meaning of positive acknowledgement.
- 3.4 If there is no information message to be transferred in the opposite direction and the returned message is correctly received, the positive acknowledgement shall be used.
- 3.5 An information message shall never be sent in lieu of a negative acknowledgement.
- 3.6 Switching from master to slave and from slave to master status occurs upon transmission and reception of STX or SOH (or DLE.STX; DLE.SOH).

Note: Typical applications require one reversal of transmission only. If multiple reversals occur, the error protection may be degraded. Particularly if no forward numbering scheme is used, consecutive reversals may lead to loss or duplication of messages or to conflicting situations (e.g. master/slave decision). In these cases, operator intervention may be required.

#### 4. RECOVERY PROCEDURE

(See Figure 2).

- 4.1 In the case of no reply or an invalid reply to an information message, the information message should be repeated. This procedure can lead to a duplication of blocks. Alternatively, ENQ can be transmitted to request the replying station to repeat its previous response or message.

This implies that the station which has reversed its status to master must be prepared to receive ENQ in reply to an information message requesting it to repeat that message.

- 4.2 In either case a numbering scheme may be needed to ensure that blocks are neither added nor deleted.

The numbering in one direction may be independent of the numbering in the opposite direction. In any case, the rules for the numbering scheme need agreement between sender and receiver.



FIG.1 PROCEDURE OF CONVERSATIONAL OPERATION

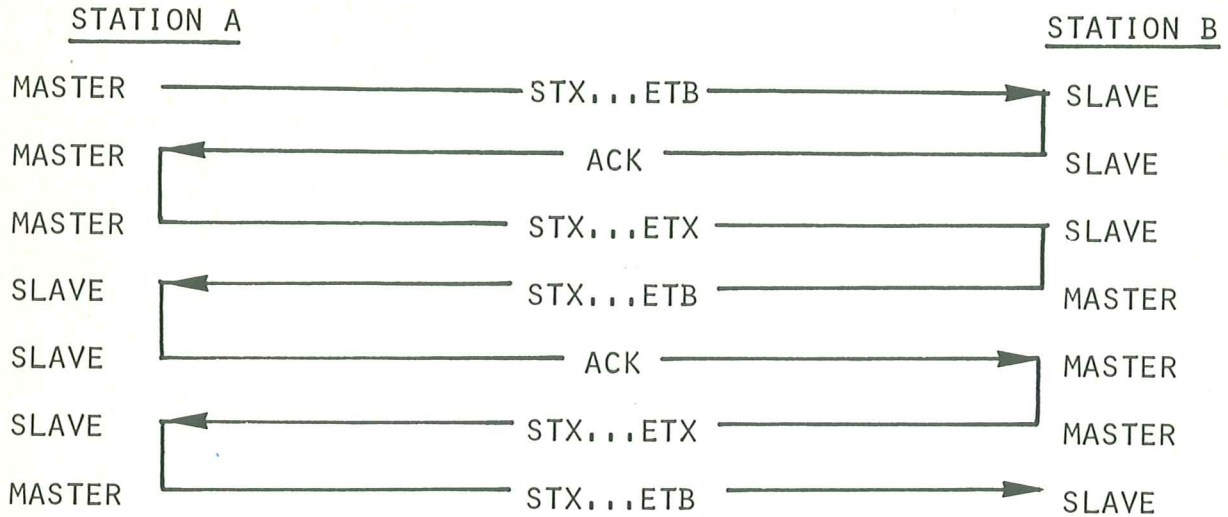
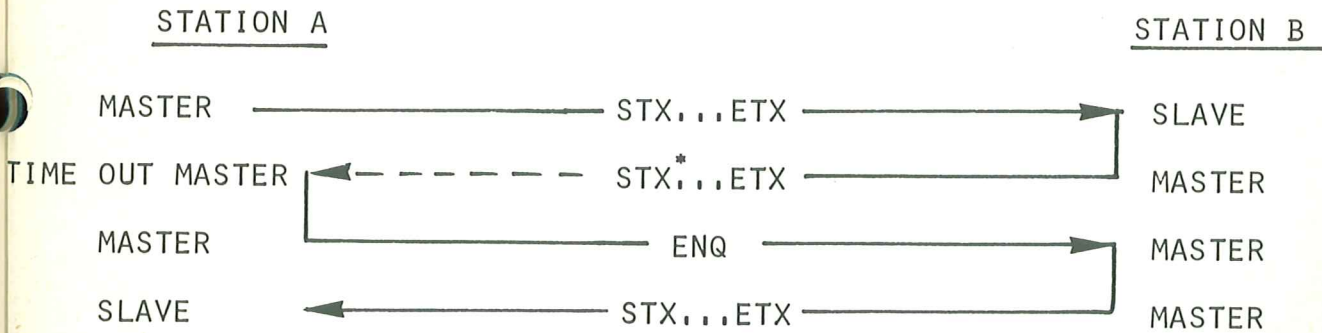


FIG.2 RECOVERY PROCEDURE



\* message garbled

