

Traffic and Traveller Information (TTI) — TTI Messages via Traffic Message Coding —

**Part 1: Coding Protocol for Radio Data
System — Traffic Message Channel
(RDS-TMC) (RDS-TMC using ALERT C)
Version 3.0**

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National foreword

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It is being issued in the Draft for Development series of publications and is of a provisional nature because the level of innovation on this subject is currently high. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained. It replaces DD ENV 12313-1:1997 which is withdrawn.

Comments arising from the use of this Draft for Development are requested so that UK experience can be reported to the European organization responsible for its conversion into a European Standard. A review of this publication will be initiated 2 years after its publication by the European organization so that a decision can be taken on its status at the end of its three-year life. The commencement of the review period will be notified by an announcement in *Update Standards*.

According to the replies received by the end of the review period, the responsible BSI Committee will decide whether to support the conversion into a European Standard, to extend the life of the prestandard or to withdraw it. Comments should be sent in writing to the Secretary of BSI Technical Committee EPL/278, Road transport informatics, at 389 Chiswick High Road, London W4 4AL, giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the ENV title page, pages 2 to 37 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

This Draft for Development, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 15 July 1998

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English version

Traffic and Traveller Information (TTI) — TTI Messages via Traffic Message Coding — Part 1: Coding Protocol for Radio Data System — Traffic Message Channel (RDS-TMC) (RDS-TMC using ALERT C) Version 3.0

This European Prestandard (ENV) was approved by CEN on 26 April 1998 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

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Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 278 “*Road transport and traffic telematics*”, the secretariat of which is held by NNI.

This European Prestandard supersedes ENV 12313-1:1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This Prestandard was prepared by Working Group 4 (Sub-Working Group 4.1) of CEN/TC 278: Road Traffic and Transport Telematics. In the field of Traffic and Traveller Information, the innovative rate is high, with many research and development projects under way in many countries, and there is a need to establish prospective standards which allow competitive manufacturers to introduce products to the market in the knowledge that they can accommodate the future issues of the standard(s) without fundamental change to equipment.

It has been submitted as a first draft to TC278 for consideration and review by TC278 plenary meeting members, for initial comment, as CEN Stage 32. All comments have been reviewed and the document updated. It was issued to CEN Central Secretariat. It was distributed by CEN Central Secretariat for approval.

Necessary technical changes have been identified, have been submitted to CEN TC 278 for approval in form of addendum and corrigendum and are included in this final version.

No known national standards (identical or conflicting) exist on this subject.

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Introduction

Traffic and traveller information may be disseminated through a number of services or means of communication, covering static displays, inter-active terminals and in-vehicle equipment.

For all such services, the data to be disseminated and the message structure involved in the various interfaces require clear definition and standard formats, in order to allow competitive products to operate with any received data.

This pre-standard focuses on the data specification for TTI messages, their network layer and their service layer, to be conveyed by the RDS-TMC feature, specified in CENELEC EN 50067:1997. Other pre-standards are being developed by CEN TC 278 Working Group 4 to cover TTI messages which may be conveyed by other carriers.

There are many functional responsibilities associated with the provision of an RDS-TMC service, ranging from road based data collection, to message compilation and finally transmission. In the course of CEN TC 278 SWG 4.1 work, it was noted that the functional responsibilities and their names were not commonly understood. The key functions are defined to help give a general understanding, whilst using this standard.

Data Service Provider

An organisation that manages any data service, by gathering data, processing data and selling the data service. A Data Service Provider then negotiates for the use of the necessary data bandwidth with a Broadcaster and/or Transmission Operator. A Data Service Provider is responsible for the “quality” of data to his customers and must provide suitable customer support. Editorial control over the data may be part of a “data bit-rate contract” agreement,. (For example a TMC service may require the Broadcaster to apply some editorial control, so that both TMC messages and other broadcast services, such as spoken or teletext traffic and travel information, possibly derived from more than one source, are not contradictory.)

Programme Service Provider

An organisation that manages and originates programming and associated data for broadcast. This will often be carried out by a Broadcaster but allows for the subtle distinction, where a separate company is commissioned to produce a programme, together with associated data, eg text of teachers notes for an educational series.

Broadcaster

A traditionally incorporated organisation responsible for a continuous strand of programmes, their quality and programme associated data, as well as responsible for overall coordination of “broadcast transmissions” (often a Broadcaster is the licensee of a national regulator). A Broadcaster may also be a Programme Service Provider and sometimes be a Data Service Provider.

Network Operator

An organisation contracted to supply both programme and data circuits interconnecting Data Service Provider, Programme Service Provider, Broadcaster and Transmission Operator. According to the connections, various protocols may be used, eg ALERT C, EBU Universal Encoder Communications Protocol.

Transmission Operator

Organisation responsible for the actual transmission of the full broadcast signal including the audio programme, programme associated data and data services. Normally a Transmission Operator is contracted to perform the transmission task by a Broadcaster.

Broadcasters already provide valuable TTI services to motorists, in countries throughout Europe, using spoken reports and teletext information. Due to the widespread adoption of the Radio Data System, there is now the possibility of transmitting coded TTI messages digitally and “silently” using the TMC feature, which avoids the interruption of planned programmes. Potentially this has two advantages: messages can be decoded into the “language” of the user, regardless of location and many more messages can be made available.

ALERT C Protocol defined in this specification supports a digital, silent broadcasting service for motorists, providing information about many kinds of traffic events. This includes roadworks, weather and traffic incident information relating to major national and international routes, regional routes and local or urban roads.

The present pre-standard is based on the “ALERT C traffic message coding protocol” (proposed pre-standard), which was a major product of DRIVE Project V1029, “RDS Advice and Problem Location for European Road Traffic”. The RDS-ALERT project aimed to define standards for RDS-TMC throughout Europe, working in conjunction with the European Broadcasting Union (EBU) and the European Conference of Ministers of Transport (ECMT).

Changes that have been made in the present document in comparison with earlier versions and the original ALERT C proposal of 1990 are based on comments that have been received from many parties, and have been thoroughly discussed in CEN TC278 Sub-working group 4.1.

All parts referring to location referencing are dealt separately by **CEN TC278 SWG7.3** and are not included in this document.

RDS type 3A groups are used to convey, the network layer and the service layer of the TMC service and they are detailed in this standard, whereas the type 8A group is detailed in this pre-standard but also described in EN 50067:1997.

Two approaches are generally distinguished in the RDS-TMC world:

The first approach is based on the idea of an “universal” ALERT C service. This is possible if a continuous and inter-operable network of ALERT C free-access services is in place in a country or around a continent. A good example could be the RDS-TMC Pan-European Service (PES).

The second approach gives a more important role to the data service provider and is suitable for operating added value, generally paid-for, services. In that case, the ALERT C Protocol is used to transmit event-orientated messages and the ALERT Plus Protocol to transmit status-orientated messages.

For historical reasons, two RDS-TMC Open Data Applications (ODA) have been defined. The first ODA only allows the implementation of the ALERT C service, including PES. The PES can be operated using this first ODA. The second ODA takes into account both approaches (ALERT C with ALERT Plus), allowing to operate the PES as well as an added value TMC service on the same transmitter. A service provider is thus able to offer the PES service, and to propose in parallel to his clients a more sophisticated information such as travel times. This additional service may be paid-for and encrypted while the basic ALERT C service may remain free-access. Finally this second solution has the advantages of being backward compatible with the existing implementation using the 1A/8A ALERT C, as well as ALERT Plus format.

These two ODAs are fully compatible, since mixed ALERT C with ALERT Plus ODA is exactly the same as the protocol of the pure ALERT C ODA. For instance a service provider may operate the PES using indifferently one of both ODA. Only the transmitted Application Identifier (AID) is different. A RDS-TMC receiver must be aware of the two different AID’s and that is all. The user messages, as well as the system messages are the same.

Message management issues were also felt to be an area where further discussion is required prior to “fixing”. Concern has also been expressed about the desirability of fixing items where the wording had been deliberately left open pending field trial results. As a result of this, the term “cycle” referred to in the fixed parts of the text, should not be considered as prescribing a rigid structure of cycles at this stage.

Scope

General Scope

The ALERT C Protocol is designed to provide mostly **event-orientated road driver information** messages. Many “hooks” have been left for future development and indeed a **few status-orientated road driver** information messages were included. This protocol is designed to be closely linked to the ALERT Plus Protocol which is specifically designed for **status-orientated road driver information**; both protocols may be available in the same RDS transmission. Future extensions of the ALERT C Protocol will be undertaken by means of a system of continued liaison between EBU and ECMT, to permit an orderly evolution of the standard in response to needs agreed at a European level.

Content

The presentation section of the ALERT C Protocol specifies messages which can be presented to the user in accordance with the general requirements set out above. It defines the message structure and content, and its presentation to the driver.

TMC messages are language-independent, and can be presented in the language of the user’s choice. ALERT utilises a standard European list of weather and traffic problem descriptions at all levels.

ALERT defines two categories of information within messages: basic and optional items. In principle, basic information is present in all messages. Optional information can be added to messages where necessary. Standard TMC user messages provide the following five basic items of explicit, broadcast information:

- 1) **Event description**, giving details of the weather situation or traffic problem (e.g. congestion caused by accident) and where appropriate its severity (e.g. resulting queue length).
- 2) **Location**, indicating the area, highway segment or point location where the source of the problem is situated.
- 3) **Direction and Extent**, identifying the adjacent segments or specific point locations also affected by the incident, and where appropriate the direction of traffic affected.
- 4) **Duration**, giving an indication of how long the problem is expected to last.
- 5) **Diversion advice**, showing whether or not drivers are recommended to find and follow an alternative route.

Optional information can be added to any message using one or more additional RDS data groups. This optional addition can give greater detail or can deal with unusual situations. Any number of additional fields can in principle be added to each basic message, subject only to a maximum message length of five RDS data groups.

Message Management

The message management section deals with the message management functions of TMC. The ALERT C Protocol distinguishes between user messages and system messages. User messages are those potentially made known to the driver, as defined in the presentation section. System messages are of use only to the TMC decoder, for message management purposes.

Transmission

The transmission section conveys the messages over-air. TMC information is conveyed in type 8A RDS groups. Most messages comprise only one group. If System messages are used, they will also be transmitted using only one group, but several may be needed for the full information, e.g. for alternative frequencies or service provider name.

Sequences of two or more type 8A groups are used to convey additional information. In a multi-group TMC message the first group contains basic information, followed by other groups with additional optional information. The maximum number of groups comprising any one TMC message is five.

The ALERT C Protocol retains the fundamental approach of earlier work, which aimed to code most messages in a single RDS group. Upward compatible multi-group messages are also defined, to deal with the smaller number of more complex situations.

Event list

The ALERT C "Event list" contains all event descriptions. It is described separately as prENV12313-2 (Part 2 of this document).

Normative references

- a) RDS — Radio Data System, CENELEC EN50067:1997, Specification of the radio data system (RDS)
- b) prENV/278/7/3/0004, CEN TC278 WG7.

Definitions

A) Definitions

For the purpose of this standard, the following definitions apply:

event description

giving details of the weather situation or traffic problem (e.g. congestion caused by accident) and where appropriate its severity (e.g. resulting queue length)

location

indicating the area, highway segment or point location where the source of the problem is situated

direction and extent

identifying the adjacent segments or specific point locations also affected by the incident, and where appropriate the direction of traffic affected

duration

giving an indication of how long the problem is expected to last

diversion advice

showing whether or not drivers are recommended to find and follow an alternative route

B) Abbreviations

RDS	Radio Data System
TMC	Traffic Message Channel
ALERT C	Advice and Problem Location for European Road Traffic, Version C
ALERT Plus	Advice and Problem Location for European Road Traffic, Version Plus
EBU	European Broadcasting Union
ECMT	European Conference of Ministers of Transport
CEMT	Conference Européenne des Ministères de Transport
UER	Union Européenne de Radio-Télévision

1 Application

Broadcast traffic messages already provide a valuable information service to motorists in countries throughout Europe. New digital broadcasting techniques have now become available due to the widespread adoption of the Radio Data System (RDS). RDS will enable traffic messages to be carried digitally and silently by a Traffic Message Channel (TMC), without necessarily interrupting the audio programme.

The ALERT C Protocol defined in this specification supports a digital, silent broadcast service for motorists, providing information about many kinds of traffic events. This includes roadworks, weather and traffic incident information relating to major national and international routes, regional routes and local or urban roads.

Only some basic information about public transport are included within the scope of the current protocol except in the special case of ferries and short rail links designed to carry road vehicles, such as Alpine tunnels or the Channel Tunnel.

1.1 Definition of the TMC “travel service”

ALERT C defines the Traffic Message Channel (TMC) as a travel service digitally and silently broadcast using RDS, which can provide a mobile user with:

- event-orientated driver information on the nature, severity and probable evolution of both urban and interurban traffic problems;
- reduced frustration and uncertainty due to this provision of timely and helpful information;
- assistance with journey planning, including rerouting and rescheduling of trips to avoid current or projected strategic traffic situations;
- details of local traffic incidents which may be avoidable through the use of minor diversions;
- in future, status-orientated information on traffic conditions which can help to support intelligent on-vehicle route guidance equipment; and
- additional data on roadside amenities and tourism information which can in future complement and update on-vehicle mobile databases.

1.2 TMC virtual terminal

Information broadcast digitally and silently can only be interpreted by suitable RDS-TMC receiver/decoders. These TMC decoders provide the user interfaces with the TMC service. Their functionality may vary substantially according to technical developments and market requirements, which cannot be wholly predicted in advance. Instead, a **virtual terminal** model is defined which covers a range of actual decoder functions, including:

- simple decoders with a limited message repertoire and restricted locational database;

- more sophisticated decoders offering full TMC message features and/or a wide range of strategic and tactical location databases;
- decoders which monitor only a single, selected TMC programme service, and others which employ more sophisticated search strategies of several or many channels;
- decoders which are active before the start of a journey, and others which must acquire their TMC data after the journey begins;
- decoders which provide output via speech synthesis and/or visual displays, and others which interface to more sophisticated on-vehicle route guidance equipment;
- in future, decoders which will offer additional functions and services yet to be defined.

1.3 Event-orientated driver information messages

The ALERT C Protocol defines only **event-orientated driver information** messages. Provision is also made for the subsequent definition of other types of message, such as **status-orientated route guidance** information, or such other applications as may be desired in future.

Driver information messages are those designed primarily to service an in-vehicle decoder offering information directly to drivers via speech synthesis and/or displays. Decoders can also be used in home and office receivers or public access terminals, to assist in pre-trip journey planning.

Event-orientated messages describe deviations from the normal traffic equilibrium state, and include problems such as congestion, roadworks, adverse weather conditions, accidents, ferry delays or cancellations, etc.

Route guidance information messages would be designed primarily to service an intelligent on-board unit, providing traffic-responsive route selection recommendations in real time.

Status-orientated messages describe current travel situations such as highway section fluidity, travel speeds, link travel times, available car parking spaces, roadside amenities, etc. They are intended to support on-vehicle mobile databases with real-time travel service information.

Route guidance information and status oriented messages are not covered by this protocol but will be dealt within future standards of ALERT Plus.

1.4 Strategic and tactical information

ALERT C follows EBU Guidelines on Broadcasts for Motorists, revised June 1990, in distinguishing between strategic information, of value for trip planning and route selection in the medium term, and tactical information likely to be of relevance for immediate local diversions around current traffic problems.

In more detail, broadcast traffic information comprises:

- 1) Immediate “tactical” information, for transmission as soon as possible, with frequent repeats.
- 2) Medium-term “strategic” information, for transmission at intervals, according to available channel capacity.
- 3) Long-term “background” information, for transmission from time to time.
- 4) Forecasts such as weather and expected road conditions, traffic density, coming events, etc.
- 5) Tourist and other messages, including public transport information which may be relevant for motorists.

The ALERT C Protocol follows these existing guidelines, aiming to allow as many as possible of the existing spoken messages to be carried in similar forms using the digital TMC medium.

1.5 Geographic relevance (CEN TC278 SWG7.3)

ALERT C utilizes location coding strategies prepared in guidelines developed within the DRIVE Project. These guidelines adopt hierarchical principles of structuring the location database in accordance with EBU Broadcast for Motorists group functional recommendations for strategic and tactical messages. This will be dealt by CEN TC278 SWG7.3.

This protocol does not address the internal management of traffic messages by broadcasters in respect of geographic relevance. In the following it is assumed, that broadcasters will arrange to transmit messages with a priority that is appropriate to its geographic relevance. This means, that the frequency with which a message is inserted into the TIC-cycle is not only dependent on the event but is also a function of the location in relation to the broadcasting area. Extremely urgent messages (X-messages) have to be included by all relevant services that cover the respective area in which the X-message is located.