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Traffic and Traveller Information (TTI) - TTI Messages via Traffic Message Coding - Part 4: Coding Protocol for Radio Data System - Traffic Message Channel (RDS-TMC) - RDS-TMC using ALERT Plus with ALERT C

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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FOREWORD

This European Prestandard has been prepared by FORCE/ECORTIS WP 13.6 expert team on ALERT Plus coding protocol and location referencing and by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NNI**.**

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.

INTRODUCTION

The ALERT Plus function is a compatible extension of the ALERT C function and makes it possible to use RDS-TMC broadcast status-orientated information. This information is related to:

- the road traffic, such as level of service or travel time,
- the car park occupancy,
- the public transport, such as travel time, frequency or headway.

Other status-orientated information have still to be considered, such as the information about snow on the road, water height, wind force, pollution, « time delay » lost due to traffic condition... The coding mechanisms are the same.

This function constitutes an additional response to the information needs of road users, particularly in dense urban areas, by taking into account the constraints which affect the road network or the public transport operators.

The ALERT Plus broadcasting protocol provides an information coding technique which allows the recipient to recover the broadcast information in its entirety. The transmitted messages contain dynamic data (statuses) which can only be interpreted with reference to static data (locations...). To facilitate broadcasting, locations are grouped together in addresses called collections. Both transmitter and receiver must be aware of all elements.

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. Because it was noted that the functional responsibilities and their names were not commonly understood, the key functions are defined in the ENV 12313-1, ALERT C Protocol, *date*. These definitions are also useful to understand the standard described in this document. However they have to be completed by the following definition which characterises a functional responsibility of importance for the ALERT Plus function:

Road Network Operator:

A public or private authority responsible for part of the road network of a country.

Without making assumptions regarding the agreements which data service provider may enter into with road network operators, the standard allows information to be broadcast in unscrambled or scrambled form using either the public collections which belong to road network operators, if such collections exist, or private collections.

The present pre-standard describes the broadcasting of dynamic data. All parts referring to location referencing are dealt separately by CEN TC278 SWG7.3 and are not included in this document.

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 « ALERT ».

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, ALERT C protocol is used to transmit event-orientated messages and ALERT Plus protocol to transmit status-orientated messages.

For historical reasons, two RDS-TMC Open Data Applications (ODA) have been defined. With the first one, you are limited to the first kind of service since only ALERT C is specified. The «ALERT» service can be operated using this first ODA. The second ODA takes into account both approaches (ALERT C and ALERT Plus), allowing to operate the «ALERT» service as well as an added value TMC service on the same transmitter. A service provider is thus able to offer the «ALERT» 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.

This two ODA’s are fully compatible, since the ALERT C part of the mixed ALERT C/ALERT Plus ODA is exactly the same as the protocol of the pure ALERT C ODA. For instance a service provider may operate the «ALERT» service 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.

This document describes the mixed ALERT C/ALERT Plus ODA, but systematically refers to the pure ALERT C ODA (RDS - TMC ALERT C Protocol, CEN ENV 12313-1, June 1997) when dealing with the ALERT C protocol. The 1A/5A/8A format is also standardised in order to take into account existing implementations. However in the future all RDS-TMC services should migrate into the ODA format.

1. SCOPE

1.1 APPLICATION

The ALERT Plus function is an extension of the ALERT C function. While ALERT C covers event-orientated information to be conveyed by the RDS medium, ALERT Plus deals with status-orientated information to be conveyed by the same medium.

The ALERT Plus function informs motorists about the changes affecting the status of traffic at pre-defined locations. Different **status types** are defined such as level of service on road sections or areas, travel times on road sections, car park occupancy, status of public transport traffic...

A location can be a road section, a pole, a car park, ..., referenced in the **location table**. Location referencing is however dealt separately by CEN TC278 SWG7.3 and is not included in this document.

A part of the document is valid for other data transmission media such as AM or SWIFT broadcast data systems, the digital cellular radio system (GSM), and the digital audio broadcasting (DAB). At least the user messages content is medium independent.

1.2 PRESENTATION

This document deals with the coding protocol for the multiplex broadcasting of event-orientated and status-orientated information, but it essentially describes the content of status-orientated messages. The event-orientated messages are described in the ENV 12313-1, ALERT C Protocol, *date*.

The presentation section describes the way in which messages are coded for broadcasting.

The main coding principle for status-orientated messages is to gather together the information which relates to several locations in the same message, and to transmit a so called collection number instead of transmitting directly location numbers like in the ALERT C protocol. Each collection identifies a set of locations according to the **collection table**.

Status-orientated messages contain three fields:
- message format,
- collection number,
- statuses of the locations identified by the collection.

The transmitted **message format** makes it possible to differentiate between two types of messages, those which give information about five different locations and those which give information about seven different locations. This difference in the format allows more flexibility according to the status type and the location type.