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**Satellite Earth Stations and Systems (SES);
Centralized control and monitoring functions
for Very Small Aperture Terminal (VSAT) networks**

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Contents

Foreword	5
1 Scope	7
2 Normative references	7
3 Definitions	7
4 Abbreviations	8
5 Test report	8
6 Specifications	8
6.1 Receive signal level monitoring facility	8
6.2 Frequency-error monitoring facility	9
6.3 Control Channel(s)	9
6.4 Suppression of VSAT transmissions	9
6.5 VSAT transmission validation	10
6.5.1 VSAT transmission validation by the CCMF using internal CC(s)	10
6.5.2 VSAT transmission validation by the CCMF using external CC(s)	11
6.6 Enabling VSAT transmission	11
History	12

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Foreword

This final draft second edition European Telecommunication Standard (ETS) has been produced by the Satellite Earth Stations and Systems (SES) Technical Committee of the European Telecommunications Standards Institute (ETSI), and is now submitted for the Voting phase of the ETSI standards approval procedure.

Every ETS prepared by ETSI is a voluntary standard. This ETS may contain text concerning type approval of the equipment to which it relates. This text should be considered only as guidance and does not make this ETS mandatory.

Proposed transposition dates	
Date of latest announcement of this ETS (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

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1 Scope

This second edition European Telecommunication Standard (ETS) is applicable to two-way (transmit and receive) as well as transmit only Very Small Aperture Terminals (VSATs) operating in the framework of a satellite network for digital communications purposes. In these networks there is a set of control and monitoring functions at each VSAT and a separate set of Centralized Control and Monitoring Functions (CCMF). The control and monitoring functions are designed to limit interferences to users of the frequency spectrum due to a fault condition at a VSAT.

ETS 300 160 [2] specifies the control and monitoring functions of VSATs, as defined in ETS 300 159 [1] and ETS 300 332 [3]. These CCMF are applicable to VSAT networks operating in any configuration including star, mesh and point-to-point connections.

This ETS specifies the CCMF.

NOTE: The use of the term "centralized" does not imply any particular topology VSAT system. It refers to the fact that functions are implemented at system level.

The CCMF which are the subject of this ETS constitute the set of functional entities that, at system level, monitor and control the correct operation of all VSATs in a network.

The VSATs of such networks are designed for unattended operation and with transmission capability limited to baseband digital signals. Transmission and reception at a VSAT relate to transmission and reception over the satellite.

2 Normative references

This ETS incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to, or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 159: "Satellite Earth Stations and Systems (SES); Transmit/receive Very Small Aperture Terminals (VSATs) used for data communications operating in the Fixed Satellite Service (FSS) 11/12/14 GHz frequency bands".
- [2] ETS 300 160: "Satellite Earth Stations and Systems (SES); Control and monitoring functions at a Very Small Aperture Terminal (VSAT)".
- [3] ETS 300 332: "Satellite Earth Stations and Systems (SES); Transmit/receive Very Small Aperture Terminals (VSATs) used for data communications operating in the Fixed Satellite Service (FSS) 6 GHz and 4 GHz frequency bands".

3 Definitions

For the purposes of this ETS, the following definitions apply:

control channel(s): A channel or channels by which VSATs receive control information from the CCMF.

response channel(s): A channel or channels by which VSATs transmit monitoring information to the CCMF.

network: In this ETS a network is any network configuration including star, mesh and point-to-point configurations.

internal control channel: A control channel which is carried by the VSAT network via the same satellite as used for transmission of user data and within the internal protocol structure of the VSAT system.

external control channel: A control channel which is either (i) carried by the VSAT network via the same or another satellite, but not within the internal protocol structure of the VSAT system, or (ii) carried by the PSTN or some other means.

internal response channel: A response channel which is carried by the VSAT network via the same satellite as used for transmission of user data and within the internal protocol structure of the VSAT system.

external response channel: A response channel which is either (i) carried by the VSAT network via the same or another satellite, but not within the internal protocol structure of the VSAT system, or (ii) carried by the PSTN or some other means.

4 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

CC	Control Channel
CCD	Central Control Disable
CCE	Central Control Enable
CCMF	Centralized Control and Monitoring Functions
PSTN	Public Switched Telephone Network
RC	Response Channel
VSAT	Very Small Aperture Terminal

5 Test report

The test report shall contain:

- the type of control channel(s) (CC);
- the characteristics of the external CC(s) including protocols;
- the test results.

6 Specifications

6.1 Receive signal level monitoring facility

Purpose:

To be able to monitor the received signal level from any transmitting VSAT.

Specification:

This specification applies if required by the manufacturer.

At the CCMF there shall be a feature which shall be able to monitor the signal level of any VSAT transmission, on demand, at least one at a time.

Verification:

Compliance by documentary evidence, demonstration, and explanation on how the CCMF detects a designated VSAT transmitting a carrier with an abnormal signal level.

6.2 Frequency-error monitoring facility

Purpose:

To be able to monitor whether the error on the transmit frequency of a VSAT exceeds a predefined threshold.

Specification:

This specification applies if required by the manufacturer.

At the CCMF, there shall be a feature which shall be able to monitor the transmit frequency-error of a VSAT, with respect to the nominal carrier frequency, for any VSAT transmission, on demand, at least one at a time.

It shall be possible to modify the error threshold.

Verification:

Compliance by documentary evidence, demonstration, and explanation on how the CCMF detects a designated VSAT transmitting a carrier with an incorrect frequency.

6.3 Control Channel(s)

Purpose:

To provide for remote monitoring and control of VSATs operating in the VSAT network.

Specification:

The CCMF shall have at least one control channel with each VSAT. The CC(s) shall be either internal to the VSAT network (via the same satellite and within the internal protocol structure of the system), or external to it (e.g. via the same or another satellite system, via the Public Switched Telephone Network (PSTN), etc.).

NOTE 1: The availability of the external CC(s) and the number of the external CC(s) are not within the scope of this ETS.

NOTE 2: Some satellite operators may require that internal CC(s) are available.

Verification

Compliance by documentary evidence and demonstration.

6.4 Suppression of VSAT transmissions

Purpose:

To inhibit transmissions from any VSAT or all VSATs with the CCMF.

Specification:

It shall be possible to suppress all transmissions from any individual VSAT. Additionally, for VSAT networks with internal CC(s), it shall be possible to suppress all transmissions from all VSATs.

The CCMF shall provide the mechanism to send the appropriate inhibit commands by, for instance, transmitting Central Control Disable (CCD) messages to the VSATs concerned on the CC(s).

The execution by the system of the suppression of the transmissions from any VSAT, shall take no more than 1 minute via an internal CC, or no more than 1 minute via an external CC once the external CC is set-up with the VSAT.

The execution by the system of the suppression of the transmissions from all VSATs, shall take no more than 1 minute via an internal CC.

The suppression of transmissions of a VSAT is defined in ETS 300 160 [2].

Verification:

Compliance by documentary evidence and demonstration.

6.5 VSAT transmission validation

For VSATs using internal CC(s), one of the two following methods shall be implemented to confirm that the transmissions by each VSAT are correctly received.

- VSAT transmission validation by the CCMF. For this method the specification in subclause 6.5.1 shall apply;
- VSAT transmission validation by any receiving station. For this method the relevant specification given in ETS 300 160 [2] shall apply, and there is no specification for the CCMF.

For VSATs using external CC(s) the specification in subclause 6.5.2 shall apply.

6.5.1 VSAT transmission validation by the CCMF using internal CC(s)

Purpose:

For networks with transmit and receive VSATs with internal CC(s) to check the VSAT transmission with an internal RC with the CCMF, and to validate its transmission.

Specification:

The CCMF shall instruct each VSAT, which has been enabled to transmit, to transmit a status message either once or periodically by means of a "poll-for-status" message.

The "poll-for-status" message shall be sent simultaneously with, or immediately after, an enable command, and may be sent on a regular basis.

The "status message" shall be received via an internal RC. The "status message" shall be used by the CCMF to verify the correct transmission of the VSAT.

Failure to receive the status message within a predefined system specific time period shall result in an alarm identifying the VSAT.

Verification:

Compliance by documentary evidence and demonstration.

6.5.2 VSAT transmission validation by the CCMF using external CC(s)

Purpose:

To validate the ability of the VSAT to continue to transmit.

Specification:

The CCMF shall be able on demand to send to any VSAT, at least one at a time, a "poll for status message" via the CC(s), and it shall be able to receive the corresponding "status message".

The "status message" shall be either:

- received via an external RC. In that case, it will contain the values of the assigned EIRP and carrier frequencies of the VSAT; or
- received via an internal RC. The "status message" shall be used by the CCMF to verify the correct transmission of the VSAT.

Verification:

Compliance by documentary evidence and demonstration.

6.6 Enabling VSAT transmission

Purpose:

To re-enable transmissions from a VSAT, or VSATs, whose transmissions have previously been suppressed.

Specification:

At the CCMF it shall be possible, by means of a Central Control Enable (CCE) message, to re-authorize transmission for any, or all VSATs, whose transmission have previously been suppressed.

Verification:

Compliance by documentary evidence and demonstration.

History

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