International Telecommunication Union

ITU-R

Radiocommunication Sector of ITU

# Recommendation ITU-R BT.1872

(03/2010)

# User requirements for digital electronic news gathering

BT Series

Broadcasting service (television)

International Telecommunication Union

## Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

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### Series of ITU-R Recommendations

(Also available online at http://www.itu.int/publ/R-REC/en)

| Series | Title |
|---|---|
| **BO** | Satellite delivery |
| **BR** | Recording for production, archival and play-out; film for television |
| **BS** | Broadcasting service (sound) |
| **BT** | **Broadcasting service (television)** |
| **F** | Fixed service |
| **M** | Mobile, radiodetermination, amateur and related satellite services |
| **P** | Radiowave propagation |
| **RA** | Radio astronomy |
| **RS** | Remote sensing systems |
| **S** | Fixed-satellite service |
| **SA** | Space applications and meteorology |
| **SF** | Frequency sharing and coordination between fixed-satellite and fixed service systems |
| **SM** | Spectrum management |
| **SNG** | Satellite news gathering |
| **TF** | Time signals and frequency standards emissions |
| **V** | Vocabulary and related subjects |

***Note***: *This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.*

*Electronic Publication*
Geneva, 2010

# RECOMMENDATION ITU-R BT.1872

## User requirements for digital electronic news gathering

(Question ITU-R 89/6)

(2010)

**Scope**

This Recommendation deals with user requirements for broadcast auxiliary services (BAS). It contains typical operational requirements for digital TVOB, ENG and EFP, which may be used by administrations when planning usage of their fixed and mobile TVOB, ENG and EFP applications.

The ITU Radiocommunication Assembly,

*considering*

a) that electronic news gathering (ENG), television outside broadcast (TVOB) and electronic field production (EFP) are more generically referred to as SAP (services ancillary to programme making) and broadcast auxiliary services (BAS);

b) that some administrations have implemented television SAP/BAS applications in SDTV and HDTV modes which have varying bandwidth requirements;

c) that SAP/BAS applications are required to operate in many parts of the world, and in locations where events of national, regional and international importance may occur;

d) that coverage produced by SAP/BAS applications must be delivered to the appropriate network facility, which is often remote from the area where the BAS applications operate;

e) that delivery of SAP/BAS coverage may be effected, depending on circumstances:

– by physical delivery of recorded media;

– by transmission of the signal over portable microwave links; and

– by injection of the signal in a switched telecommunication network;

f) that the user requirements specific to SAP/BAS operations in terms of:

– received picture quality;

– received sound quality;

– number of sound channels;

– transmission channel bandwidth and reliability;

– equipment size and weight; and

– talkback facilities, etc.,

are often different from those that apply to normal sound and television broadcasting contribution transmissions, and they are often specific to the operating environment of SAP/BAS in a serviced or originating administration;

g) that such user requirements are generally independent of the delivery method used,

*noting*

a) that Report ITU-R BT.2069 – Spectrum usage and operational characteristics of terrestrial electronic news gathering (ENG), television outside broadcast (TVOB) and electronic field production (EFP) systems, provides specifications for BAS;

b) that Recommendation ITU-R F.1777 – System characteristics of television outside broadcast, electronic news gathering and electronic field production in the fixed service for use in sharing studies, provides user requirements for BAS in the fixed service;

c) that Recommendation ITU-R M.1824 – System characteristics of television outside broadcast, electronic news gathering and electronic field production in the mobile service for use in sharing studies, provides operational characteristics for BAS in the mobile service,

*recognizing*

a) that some administrations operate extensive terrestrial SAP/BAS under fixed service operations;

b) that some administrations operate extensive terrestrial SAP/BAS under mobile service operations;

c) that some administrations have extended SAP/BAS to airborne and seaborne applications;

d) that SAP/BAS applications have been increasingly linked to emergency and disaster relief situations and global circulation of radiocommunication equipment, taking into account Recommendation ITU-R M.1637,

*recommends*

**1** that the description of the user requirements and key characteristics for digital HDTV/SDTV transmissions in the fixed and mobile services of digital terrestrial BAS in Annex 1 should be referred to by administrations when considerations are made toward interoperability and harmonization of SAP/BAS operational practices.

# Annex 1

## User requirements for digital electronic news gathering

The user requirements for digital ENG are provided for the information of administrations seeking to operate services ancillary to broadcasting when considerations are made toward interoperability and harmonization for the operation of BAS within one administration which may extend to another administration.

Table 1 provides user requirements and technical parameters in terms of basic video and audio quality for transmission of digital HDTV/SDTV using ENG systems.

Table 2 provides user requirements and the example of technical parameters for transmission of digital HDTV/SDTV using ENG systems when assigned in the fixed service.

Table 3 provides user requirements and the example of technical parameters for transmission of digital HDTV/SDTV using ENG systems when assigned in the mobile service.

Whilst in practice a range of operating parameters may be employed, these examples provide an indication of current system parameters.

TABLE 1

**User requirements and technical parameters in terms of basic video and audio quality for transmission of digital HDTV/SDTV signals**

| Item | User requirements | Technical parameters |
|---|---|---|
| Basic video signal quality | Degradation of picture quality ≤ 12% with DSCQS method as specified in Rec. ITU-R BT.1868. (See also Rec. ITU-R BT.1203) | HDTV: |
| | | Video bit rate for 3 codecs in tandem:<br>– 52 Mbit/s (using ISO/IEC 13818-2\| ITU-T Rec. H.262, 4:2:2P@HL)<br>– 35 Mbit/s (using ISO/IEC 14496-10 \| ITU-T Rec. H.264, Level 4/ High 4:2:2, see Report ITU-R BT.2069) |
| | | Video bit rate for single codec:<br>21 Mbit/s (using ISO/IEC 14496-10 \| ITU-T Rec. H.264 Level 4/ High 4:2:2, see Report ITU-R BT.2069) |
| | | SDTV: |
| | | Video bit rate: 15 Mbit/s<br>(using ISO/IEC 13818-2\| ITU-T Rec. H.262, 4:2:2P@ML with long-GOP) |
| | | Video bit rate: 10 Mbit/s<br>(using ISO/IEC 14496-10 \| ITU-T Rec. H.264, Level 3/High 4:2:2) |
| Basic sound signal quality | Audio quality ≥ 4.5 in the impairment 5° scale as specified in Rec. ITU-R BS.1548.<br>Comparable to uncompressed Linear PCM (48 kHz, 16 bit/ch). | Uncompressed 768 kbit/s per channel<br>MPEG-1 layer II 250 kbit/s per channel<br>MPEG-4 HE-AAC v2 with 96 kbit/s per channel |

TABLE 2

**User requirements and the example of technical parameters for transmission of digital HDTV/SDTV signals in the fixed service**

| Item | | User requirements | Example of technical parameters |
|---|---|---|---|
| Latency | | As short delay as possible | < 500 ms |
| Transmission bandwidth | | 8 MHz, 9 MHz, 18 MHz and 24 MHz | See Rec. ITU-R F.1777 |
| Transmission power | | 1.76-7 dBW | |
| Frequency | | 6-7 GHz, 10 GHz and 13 GHz bands | |
| Antenna | Tx | 0.6 m dish | Transmission distance:<br>6-7 GHz: 50-100 km (depending on necessary margin)<br>10 GHz: 7 km (with necessary rain margin)<br>13 GHz: 5 km (with necessary rain margin) |
| | Rx | 0.6 m dish | |
| Modulation | | Multi-QAM (16, 32, 64); QPSK-OFDM | See Rec. ITU-R F.1777 |
| Transmission capacity | | To support all the above transmission parameters | Up to 66 Mbit/s (depending on bandwidth and modulation, see Rec. ITU-R F.1777) |
| Environmental reliability | | System should be reliable in all possible environmental conditions (temperature, humidity, etc.) | Temperature: 0° to 50° C (outdoor units)<br>5° to 45° C (indoor units)<br>Relative humidity: 95% non condensing |
| Ease of alignment | | System should have built-in facility to generate certain test signals | Colour bar generator with 16 character identity |
| Size and weight | | Small in size and light in weight for easy and quick operationalization | |
| Recording media | | Should have facility to record using all accepted media types | Tapes; DVDs; Blu Ray discs and hard discs |

TABLE 3

**User requirements and the example of technical parameters for transmission of digital HDTV/SDTV signals in the mobile service**

| Item | | User requirements | Example of technical parameters |
|---|---|---|---|
| Latency | | As short delay as possible | < 500 ms |
| Transmission bandwidth | | 9 MHz, 18 MHz, 27 MHz and 80 MHz | See Rec. ITU-R M.1824 |
| UHF | Transmission power | 7 dBW | Transmission distance: 4 km |
| | Frequency | 800 MHz band | |
| | Tx antenna | Co-linear | |
| | Rx antenna | Yagi | |
| Microwave | Transmission power | 4 dBW, 7 dBW | Transmission distance: 4 km |
| | Frequency | 6-7 GHz, 10 GHz and 13 GHz bands | |
| | Tx antenna | Horn, parabolic, helix | |
| | Rx antenna | 0.3 m dish | |
| Airborne | Tx antenna | 0.2 m dish | Transmission distance:<br>6-7 GHz: 50-65 km<br>(depending on necessary margin)<br>10 GHz: 7 km<br>(with necessary rain margin)<br>13 GHz: 5 km<br>(with necessary rain margin) |
| | Rx antenna | 1.2 m dish | |
| Modulation | | Multi-QAM (16, 32, 64), QPSK-OFDM | See Rec. ITU-R M.1824 |
| Transmission capacity | | To support all the above transmission parameters | Up to 60 Mbit/s (depending on bandwidth and modulation, see Rec. ITU-R M.1824) |
| Environmental reliability | | System should be reliable in all possible environmental conditions (temperature, humidity etc.) | Temperature: 0° to 50° C (outdoor units)<br>5° to 45° C (indoor units)<br>Relative humidity: 95% non condensing |
| Ease of alignment | | System should have built-in facility to generate certain test signals for ease of alignment process | Colour bar generator with 16 character identity |
| Size and weight | | Small in size and light in weight for easy and quick operationalization | |