The presentation by
prof. M. Krivocheev (RF, NIIR),
Honorary Chairman of the ITU-R SG 6, former Chairman of the CCIR SG 11 (TV broadcasting),
at the ceremony
“40 years of digital television broadcasting studies in ITU-R”

There is a question:

Why just the 40th anniversary to be celebrated?

Not only a big job during 40 years have been done, but the main reason is that just in 2012, the last year of the 4th decade, the achieved international decisions and the progress in technology raised a strict requirement to update the initial concepts of digital TV broadcasting and gave a start to new approaches and development strategies taking into account the realities and prospects.

GENEVA, 30 OCTOBER 2012

A meeting of the CCIR Study Group 11 (Geneva, 5-18 July 1972), where studies on the digital TV broadcasting and HDTV were initiated.
From left to right: Director of the CCIR (1966 – 1974) J. Herbstreit (USA), Acting Chairman SG 11, then the Chairman SG 11 to 2000 M. Krivosheev (USSR, Russian Federation), CCIR Counsellor R. Froom

Founder and the first Chairman CCIR Study Group 11 (TV Broadcasting) Eric Esping (Sweden, Stockholm, 1948)

The Chairman of ITU-R Study Group 6 (2000-2006) A. Magenta (Italy)

Chairman ITU-R SG 6 (Broadcasting) since 2007 Christoph Dosch (Germany) with his wife Ursula

GENEVA, 30 OCTOBER 2012

Documents
C.C.I.R. Study Groups
Period 1970 – 1973

Doc. 11/104-E
14 June 1972
page 1

Received : 12 June 1972

Subject : Chairman's Report

ACTING CHAIRMAN, STUDY GROUP 11

(Original language : Russian)

REPORT BY THE ACTING CHAIRMAN, STUDY GROUP 11

TELEVISION

Because of the illness of the Chairman of Study Group 11, Mr. Eric Esping, the Director of the C.C.I.R. recently entrusted me with the task of organizing and conducting the forthcoming Interim Meeting of Study Group 11 in accordance with number 792 of the I.T.U. Convention, (Montreux, 1965). I hope that, in the circumstances, the Study Group will excuse the slight delay in the preparation of this document. At the same time I am sure that the participants in the meeting will want to join me in wishing Mr. Esping a complete and speedy recovery.

At the XIIth Plenary Assembly at New Delhi in 1970 the terms of reference of Study Group 11 were substantially extended.

The present terms of reference include the study of :

1. the technical aspects of the broadcasting service (television),
2. standards for television recording to facilitate the international exchange of programmes.

The Report of Acting Chairman CCIR SG 11 for the meeting of Study Group in July 1972. The agenda for first time included the issues of digital TV broadcasting and HDTV

Documents
C. C. I. R. Study Groups
Period 1970 – 1973

Doc. 11/31-E
17 March 1972
page 1

Received: 13 December 1971

Subject: Question 1/11

JAPAN
(Original language: English)

PROPOSAL FOR A NEW STUDY PROGRAMME

High definition television

1. Introduction

As compared with high-fidelity sound broadcasting, the quality of television pictures is not satisfactory, it is especially inferior to motion pictures and printed pictures as regards sharpness. A higher quality television system will be required in the future, for entertainment and education. True stereoscopic television is considered to be the ultimate goal for the television systems, but the present state of development is not yet sufficient for its realization. Binocular stereoscopic television using the parallax effect is possible at present, but because of eye fatigue [1] usage may by limited to particular fields, as in stereoscopic motion pictures.

The next stage in the development of television standards prior to the true stereoscopic television system will naturally be the use of large screen, high definition television systems.

The first proposal for a new study of HDTV

INTERNATIONAL RADIO CONSULTATIVE COMMITTEE

C.C.I.R.

DOCUMENTS OF THE XIth PLENARY ASSEMBLY
OSLO, 1966

STUDY GROUP XI

(Television)

Terms of reference:

Technical aspects of television

Chairman: Mr. E. ESPING (Sweden)

Vice-Chairman: Mr. G. Hansen (Belgium)

INTRODUCTION BY THE CHAIRMAN, STUDY GROUP XI

...

3. Television standards

Between the Xth and XI Plenary Assemblies of the C.C.I.R., the most important question on the Study Group's agenda was that of colour television standards in bands IV and V.

Not all the countries represented at the XIth Plenary Assembly were ready for the adoption of a common standard. It was considering that investigations should be pursued. Despite these studies, Study Group XI was unable, either at the Interim Meeting, Vienna, 1965, or at the XIth Plenary Assembly, Oslo, 1966, to issue a Recommendation urging the European countries to adopt a single common standard.

It was only able to approve Report 407 (Characteristics of colour-television systems), which reproduced, for information purposes, the standards of the various colour-television systems, either in use or under consideration at the time the XIth Plenary Assembly met.

Report 406 gives a brief analysis of the behaviour of three-colour television systems (NTSC 625-line, PAL and SECAM-III) from the standpoint of the technical factors mentioned in Question 118 (XI).

By 1972, when the introduction of colour TV had already started, indignation towards CCIR for the decisions adopted at the CCIR Assembly in Oslo in 1966 increased even more. The World was divided by three incompatible systems: NTSC, PAL and SECAM. Many people lost their hope concerning possible reaching an agreement on common standards in such a diverse world.

In the early studies on digital TV broadcasting the main task was to radically change the situation and inspire faith into the people on the capabilities of the CCIR.

A fundamentally new global approach was put forward - to begin implementing and standardizing digital TV broadcasting by the transmission of compressed unified signals of digital TV studios through standard channels.

At first time such way was proposed by Vice-Chairman CCIR SG 11 on round table on the ITU Telecom'71, Geneva.

Such a policy and strategy meant primarily the preservation of frequency assignments, frequency plans, channel bandwidths of terrestrial and satellite systems, and ensured second life to millions of analog TV sets using digital set-top boxes.

Alternatives were not proposed, but there were skeptics doubting the reality of achieving the required compression. Such approach was active supported by the Director of the CCIR J. Herbstreit (USA), W. Anderson (U.K.), L. Goussot (France), T. Kilvington (U.K.), R. Theile (Germany), C. Terzani (Italy), F. Remley (USA) and others.

Base on this strategy the concepts for the terrestrial TV broadcasting where radio channel bandwidths are 6, 7 and 8 MHz, for standard TV systems TV-6-7-8 and HDTV-6-7-8 were formulated.

Documents
C.C.I.R. Study Groups
Period 1970 - 1973

Doc. 11/198-E
15 July 1972

Original : English

WORKING GROUP 11-B

DRAFT STUDY PROGRAMME

BIT-RATE REDUCTION IN DIGITAL CODING OF TELEVISION SIGNALS

The C.C.I.R.,

CONSIDERING

that the large channel capacity required for the digital transmission and recording of television signals introduces problems which are both technical and economic;

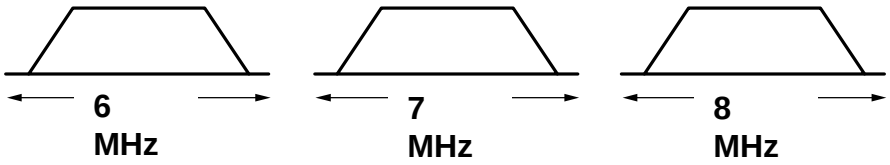
DECIDES that the following studies should be carried out :

1. the methods which can be used to reduce the required bit-rate without reducing perceptibly the quality of the reproduced picture;

2. the ways in which removal of redundant information, and knowledge of the characteristics of the human eye can best be exploited to reduce the bit rate.

The first Study Programme on the digital encoding of TV signals

First task - transmission of digital TV signals through standard radio channels of TV broadcasting.



Proposed concepts:

- HDTV broadcasting – HDTV-6-7-8
- Multiprogramme TV broadcasting – MPTV-6-7-8

SEVEN DAYS

№41

October

1991

Chronology for 60 years of TV broadcasting in the USSR

… 1946 – V. Gorshunov developed the "heart" of the 625-line TV system– sync pulse generator. This was the first time when the 625-line television raster appeared on the screen using a scanning unit complying with the new standard developed by M. Krivosheev.

Most countries in the world (all countries in the RRC 2004/2006 Plan) are using the 625-line television standard during conversion to digital TV broadcasting. The 625-line television standard was developed by the Soviet experts in 1944. The first TV image of this standard was obtained in 1946.

SEVEN DAYS

№42

October

1991

Chronology for 60 years of TV broadcasting in the USSR

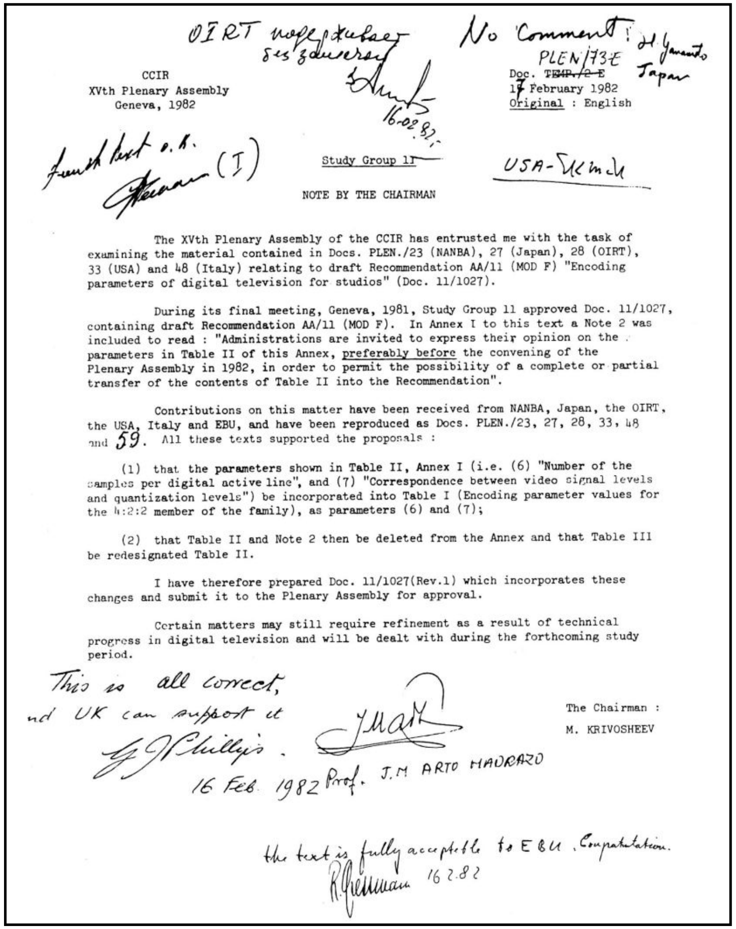
… 1948 –a first phase of reconstruction of Moscow Television Centre was completed… The 3d of September is the first time in the world when experimental TV programme based on 625-line standard was switched on the air by M. Krivosheev (the Head of the TV production department of the Moscow Television Centre).

CCIR SG 11 (TV broadcasting) was established at the V CCIR Plenary Assembly, Stockholm, July 1948. At that time, TV production complex of the Moscow Television Centre was the only one in the world, where professionals from many countries, including a lot of participants to the CCIR SG 11, may witness demonstrated features of the new 625-line TV standard.

International Telecommunication Union

The first result was a development of Recommendation ITU-R BT.601, which has become world standard for studio encoding of digital TV. Hence, there appeared a possibility to dispose of the equipment of three analog colour TV systems and install unified digital systems in studios all over the world. Thus the way was opened to create a unified initial portion of TV broadcasting digital path.

The agreed draft unified Recommendation for digital TV studios, submitted by the CCIR SG11 Chair and approved by the XV CCIR Plenary Assembly, Geneva, 1982. The National Academy of Television Arts and Sciences of USA awarded the CCIR with the Emmy statuette.



No Comment!

CCIR
XVth Plenary Assembly
Geneva, 1982

Doc. PLEN/73-E
17 February 1982
Original : English

Study Group 11

NOTE BY THE CHAIRMAN

The XVth Plenary Assembly of the CCIR has entrusted me with the task of examining the material contained in Docs. PLEN./23 (NANBA), 27 (Japan), 28 (OIRT), 33 (USA) and 48 (Italy) relating to draft Recommendation AA/11 (MOD F) "Encoding parameters of digital television for studios" (Doc. 11/1027).

During its final meeting, Geneva, 1981, Study Group 11 approved Doc. 11/1027, containing draft Recommendation AA/11 (MOD F). In Annex I to this text a Note 2 was included to read : "Administrations are invited to express their opinion on the parameters in Table II of this Annex, preferably before the convening of the Plenary Assembly in 1982, in order to permit the possibility of a complete or partial transfer of the contents of Table II into the Recommendation".

Contributions on this matter have been received from NANBA, Japan, the OIRT, the USA, Italy and EBU, and have been reproduced as Docs. PLEN./23, 27, 28, 33, 48 and 59. All these texts supported the proposals :

(1) that the parameters shown in Table II, Annex I (i.e. (6) "Number of the samples per digital active line", and (7) "Correspondence between video signal levels and quantization levels") be incorporated into Table I (Encoding parameter values for the 4:2:2 member of the family), as parameters (6) and (7);

(2) that Table II and Note 2 then be deleted from the Annex and that Table III be redesignated Table II.

I have therefore prepared Doc. 11/1027(Rev.1) which incorporates these changes and submit it to the Plenary Assembly for approval.

Certain matters may still require refinement as a result of technical progress in digital television and will be dealt with during the forthcoming study period.

This is all correct, and UK can support it

16 Feb 1982

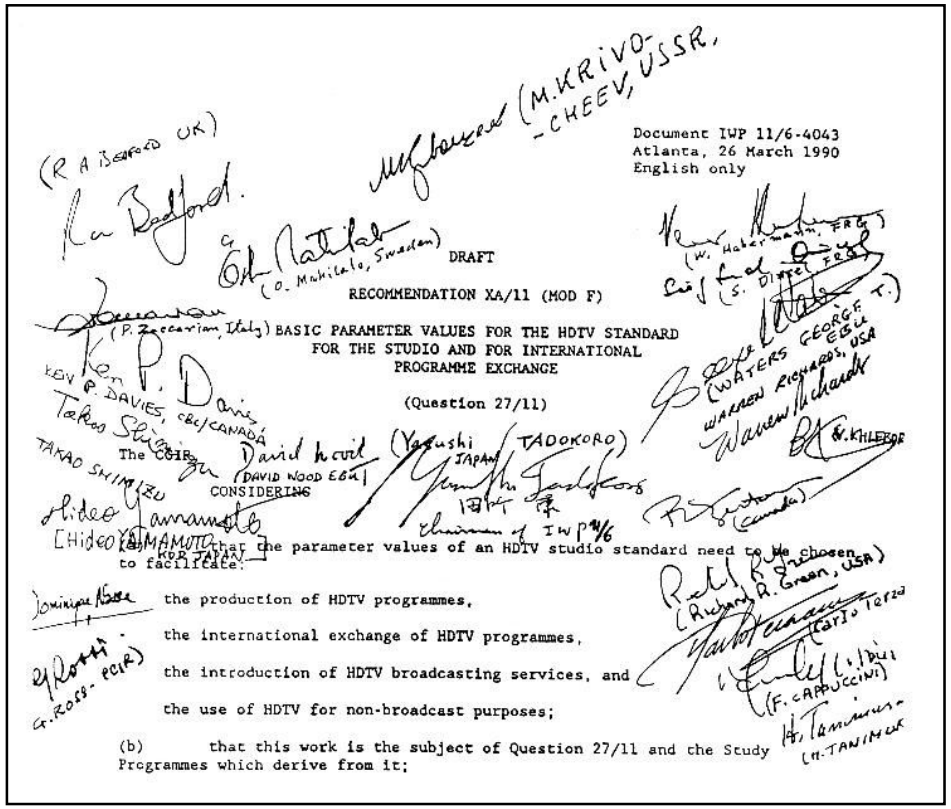
The Chairman :
M. KRIVOSHEEV

Mr. R. Kirby, the Director of the CCIR, stated that since it had been impossible to achieve a single standard for colour television in the 1950's and 1960's, this achievement represents a milestone in international cooperation among the technical community (Doc. 10/155, 11/196, 27 Sept. 1983).

GENEVA, 30 OCTOBER 2012

The world changed its attitude from wrath to mercy.
A presentation of the Emmy Award for the development of Recommendation **BT**.601.
Meeting of the CCIR SG 11, Geneva, 14 September 1983
Standing from left to right: Director CCIR (1974 -1993) R. Kirby (USA),
Chairman CCIR SG 11 M. Krivosheev (USSR)

GENEVA, 30 OCTOBER 2012



Document IWP 11/6-4043
Atlanta, 26 March 1990
English only

DRAFT

RECOMMENDATION XA/11 (MOD F)

BASIC PARAMETER VALUES FOR THE HDTV STANDARD FOR THE STUDIO AND FOR INTERNATIONAL PROGRAMME EXCHANGE

(Question 27/11)

The CCIR

CONSIDERING

(a) that the parameter values of an HDTV studio standard need to be chosen to facilitate:

the production of HDTV programmes,

the international exchange of HDTV programmes,

the introduction of HDTV broadcasting services, and

the use of HDTV for non-broadcast purposes;

(b) that this work is the subject of Question 27/11 and the Study Programmes which derive from it;

Agreed draft
first Recommendation on basic parameter values for the HDTV standard for the studio and for international programme exchange
(Recommendation CCIR **BT**.709)
Atlanta, March 1990
HDTV – 1080**x**1920

Documents
CCIR Study Groups
Period 1990-1994

Revision 1 to
Document 11-1/TEMP/19-E only
15 November 1991
Original: English

Task Group 11-1

DRAFT NEW RECOMMENDATION

DIGITAL TV TERRESTRIAL BROADCASTING IN THE VHF/UHF BANDS

The CCIR

considering

(a) that Question [47/11] [AAX-11] addresses the terrestrial broadcasting of digital [HD]TV signals;

(b) that digital television terrestrial broadcasting (which includes HDTV) may be introduced by some countries in the VHF/UHF bands (see annex);

(c) that the VHF/UHF bands are currently used for analogue television broadcasting (Recommendation 470), and they are quite congested in some countries;

(d) that consequently the VHF/UHF terrestrial bands will likely be shared between analogue television broadcasting and digital television broadcasting,

recommends

1. that digital television terrestrial broadcasting should fit in the channels (6, 7 and 8 MHz) intended for analogue television emission in the VHF/UHF bands;

2. that digital terrestrial broadcasting, as an objective, should not cause interference subjectively greater than that considered acceptable with current broadcasting services in the VHF/UHF bands;

3. that digital terrestrial broadcasting should have sufficient immunity against interference to be able to coexist with current broadcasting services in the VHF/UHF bands.

The first draft Recommendation on digital terrestrial TV broadcasting. On this base the development of modern digital terrestrial TV broadcasting systems was started, as well as national, regional and international standards in this area for transmission of digital TV programs in 6, 7, 8 MHz channels. So the first possibility for formation of “digital dividend” has been set.

After approval of the draft first Recommendation on digital HDTV by ITU-R SG11 Geneva, 1 June 1999

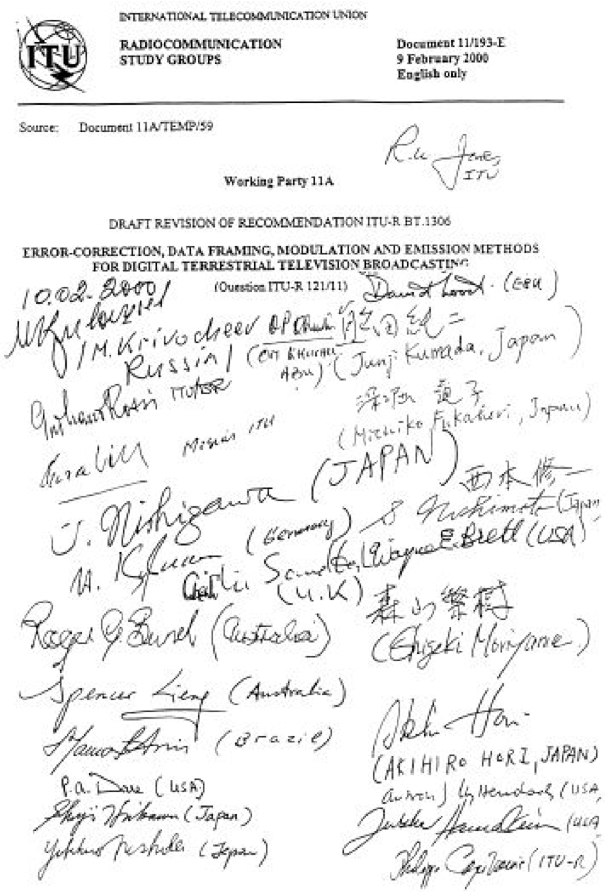
From left to right: J. Raiser (FCC, USA), T. Utendall (**ABC**, USA), P. Griffis (Microsoft, USA), V. Stepanian (Radio TV, Iran), Chairman ITU-R SG 11 M.I. Krivocheev (Russia), D. Wood (EBU), J. Flaherty (USA), Chairman of Technical Committee World Broadcasting Unions

From left to right: R. Barton (FACT, Australia), R. Bunch (FACT, Australia), M.I. Krivocheev, The Chairman of ITU-R SG 11 (Russia), J. Flaherty (USA), the Chairman of Technical Committee of World Broadcasting Unions

GENEVA, 30 OCTOBER 2012

Awarding of the ITU-R in connection with the 25th anniversary of the beginning of HDTV broadcasting in Europe on Recommendation ITU-R **BT**.709.
At the center – Director of the ITU-R V.V. Timofeev, rightmost – Secretary-General of the ITU H. Toure, leftmost – representative of DTG B. Slamin. Geneva, ITU, 16 October 2007

GENEVA, 30 OCTOBER 2012


INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION STUDY GROUPS

Document 11/193-E
9 February 2000
English only

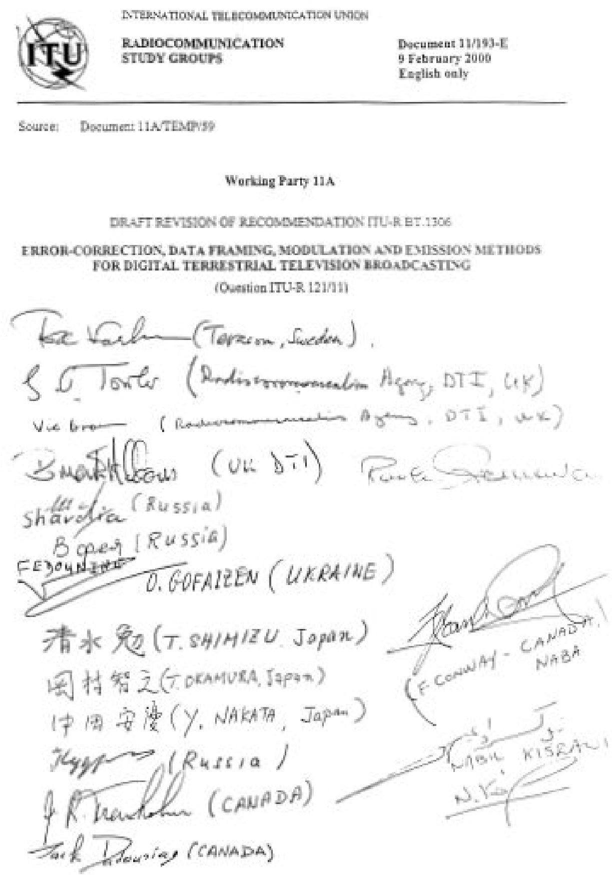
Source: Document 11A/TEMP/59

Working Party 11A

DRAFT REVISION OF RECOMMENDATION ITU-R BT.1306

ERROR-CORRECTION, DATA FRAMING, MODULATION AND EMISSION METHODS FOR DIGITAL TERRESTRIAL TELEVISION BROADCASTING

(Question ITU-R 121/11)


INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION STUDY GROUPS

Document 11/193-E
9 February 2000
English only

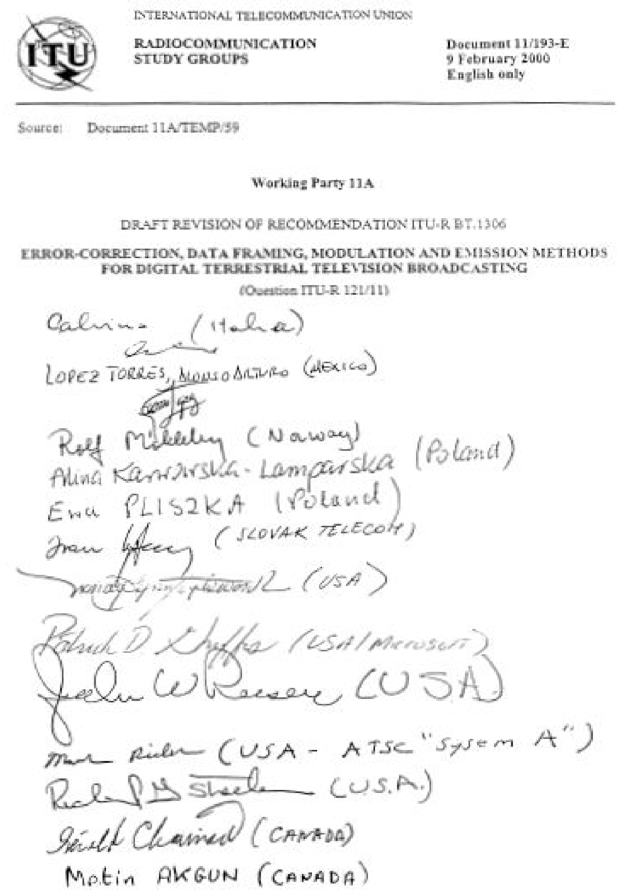
Source: Document 11A/TEMP/59

Working Party 11A

DRAFT REVISION OF RECOMMENDATION ITU-R BT.1306

ERROR-CORRECTION, DATA FRAMING, MODULATION AND EMISSION METHODS FOR DIGITAL TERRESTRIAL TELEVISION BROADCASTING

(Question ITU-R 121/11)


INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION STUDY GROUPS

Document 11/193-E
9 February 2000
English only

Source: Document 11A/TEMP/59

Working Party 11A

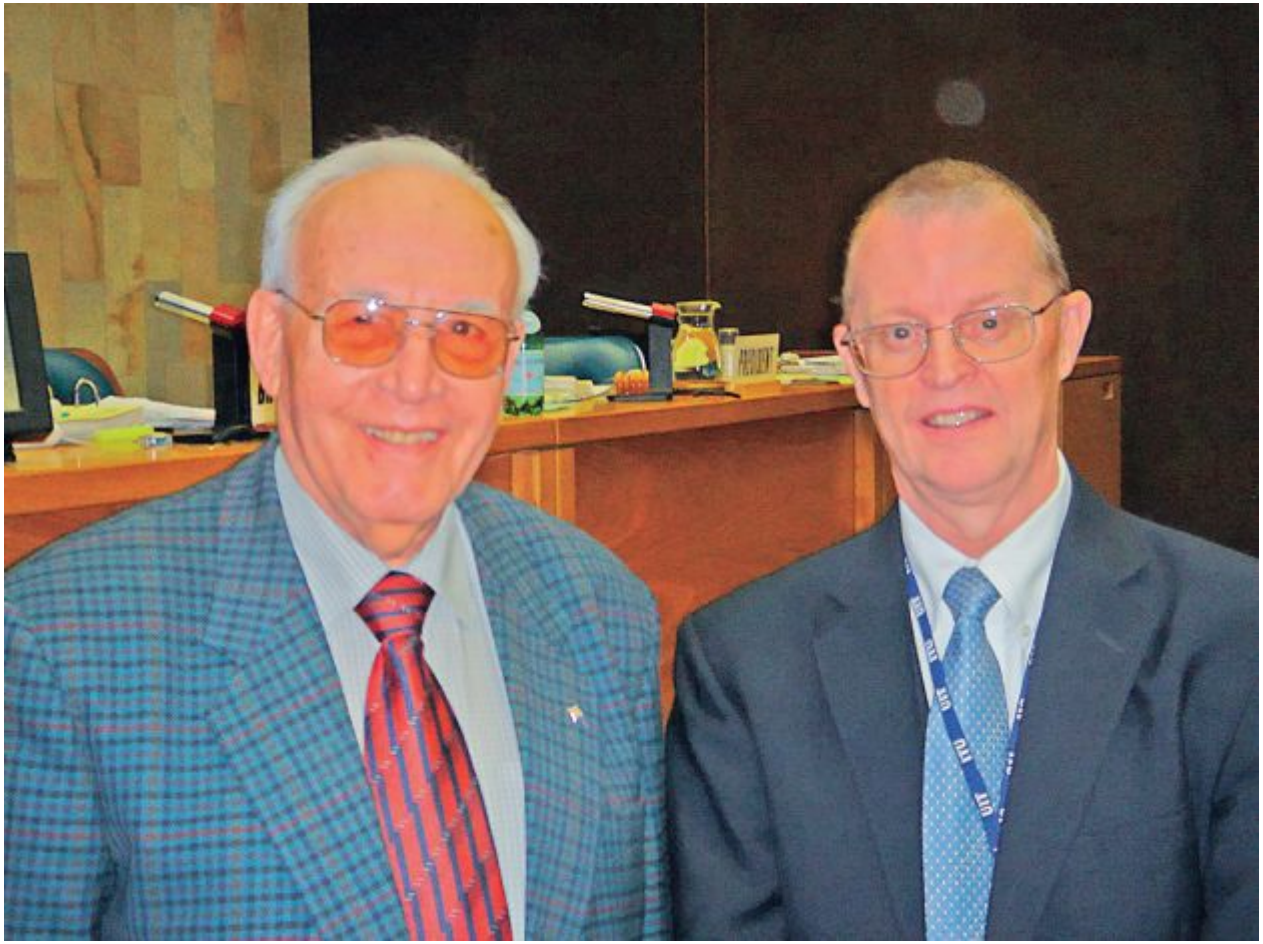
DRAFT REVISION OF RECOMMENDATION ITU-R BT.1306

ERROR-CORRECTION, DATA FRAMING, MODULATION AND EMISSION METHODS FOR DIGITAL TERRESTRIAL TELEVISION BROADCASTING

(Question ITU-R 121/11)

In 10 February 2000, SG 11 agreed the draft revision of the ITU-R Recommendation BT.1306 which described specifications for the following three systems of digital terrestrial TV broadcasting: A (ATSC), B (DVB) and C (ISDB). In 2011, the Recommendation was supplemented with parameters about the fourth new rather perfect system D (DTMB), developed in the People's Republic of China.

GENEVA, 30 OCTOBER 2012



Geneva, ITU, 21 March 2006. The Chairman of the First Session of RRC-2004/2006 M.I. Krivocheev (Russia) and the Chairman of ITU-R SG 6 WG 6E L. Olson (USA) after the Final meeting of WG 6**E**, which headed the work on creation of the technical foundations of the RRC-2004/2006

GENEVA, 30 OCTOBER 2012

RRC-2004 Plenary meeting.
From left to right: Acting Co-Chairs of the Conference K. Arasteh (Iran) and C. Van Diepenbeek (Netherlands); General secretary of the ITU Y. Utsumi; the Chairman of the Conference, Deputy Head of the Delegation of the Russian Federation M.Krivosheev; secretary of the Conference T. Gavrilov (ITU-R); Director of the ITU Radiocommunication Bureau V. Timofeev; Director of the ITU Telecommunication Development Bureau H. Touré. Geneva, ITU, 12 May 2004

Revolutionary video standard — H.264 | MPEG-4 AVC — recognized by US TV Academy

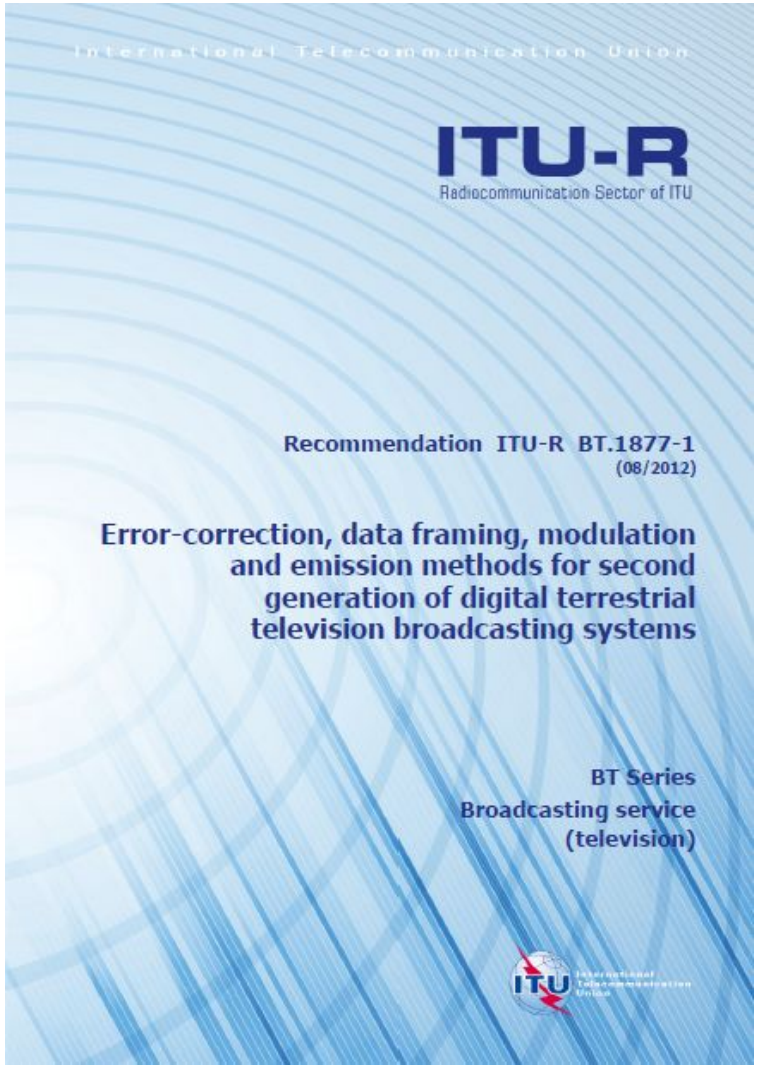
Geneva, 25 August 2008 — The US Academy of Television Arts & Sciences awarded the prestigious Primetime Emmy Award for Excellence to ITU, ISO and IEC — global leaders in making standards — for their work in producing an advanced video coding standard, formally known as Recommendation ITU-T H.264 | ISO/IEC Standard 14496-10 on Advanced Video Coding (AVC).

The Joint Video Team (JVT), made up of experts from the three international standards organizations, received industry recognition for its landmark achievement in developing a "high profile" that extends the reach of high quality video from mobile telephones right through to High Definition Television (HDTV). The JVT was formed in 2001 by the ITU Video Coding Experts Group (VCEG) and the ISO/IEC Moving Picture Experts Group (MPEG).

H.264 | MPEG-4 AVC is a highly efficient video compression method that substantially reduces the bandwidth needed to deliver high quality video and the space required to store it. Seven sets of capabilities, referred to as "profiles", have been created for use in specific applications. It is a combination of the great efficiency of the codec as well as its scalability in delivering excellent quality across the entire bandwidth spectrum — from high definition television to videoconferencing and 3G-mobile multimedia — that has led to its increasing popularity.

The award was given at a ceremony in Hollywood, Los Angeles on 23 August and received by Malcolm Johnson, Director of ITU's standardization bureau, and Scott Jameson, Chair of the ISO/IEC Joint Technical Committee on Information Technology (ISO/IEC JTC 1) together with representatives of the JVT management team. In his acceptance speech on behalf of the three organizations, Malcolm Johnson said, "H.264 | MPEG-4 AVC is a jewel in the crown of international standards collaboration. This standard's versatility has been recognized and applauded across an amazing spectrum of industry. Its widespread adoption is testament to the flexibility and efficiency that has been engineered by a group of people that have dedicated themselves to achieving this goal. It also demonstrates a sincere and strong belief in the power of international standards." ...

Emmy Award to ITU, ISO and IEC



ITU-R Recommendation **BT**.1877-1 (08/2012) on DVB-T2 system

High Efficiency Video Coding (HEVC) is a draft video compression standard, a successor to H.264/MPEG-4 AVC (Advanced Video Coding) currently under joint development by the ISO/IEC Moving Picture Experts Group (MPEG) and ITU-T Video Coding Experts Group.

The Committee Draft of HEVC was approved in February 2012. The Draft International Standard was approved in July 2012 at the meeting held in Stockholm. HEVC is expected to be finalized in January 2013.

The October 2012 draft defines three profiles: Main - allows for a color depth of 8-bits per color, Main 10 - allows for a color depth of up to 10-bits per color, and Main Still Picture - allows for a single still picture to be encoded with the same constraints as the Main profile. A profile is a defined set of coding tools that may be used to create a bitstream that conforms to that profile.

The HEVC Main Profile (MP) has been compared in coding efficiency to H.264/MPEG-4 AVC High Profile (HP), MPEG-4 Advanced Simple Profile, H.263 High Latency Profile, and H.262/MPEG-2 Main Profile.

HEVC MP has also been compared to H.264/MPEG-4 AVC HP for subjective video quality. The overall subjective bitrate reduction for HEVC MP compared to H.264/MPEG-4 AVC HP was 49.3%.

QUESTION ITU-R 40/6

Extremely high-resolution imagery

(1993-2002)

The ITU Radiocommunication Assembly,

considering

a) that TV technology at a number of levels of quality may find applications in both broadcast and non-broadcast services;

b) that the Radiocommunication Sector is studying a range of TV systems for broadcast uses;

c) that in some applications (for example: computer graphics, printing, motion pictures) an extremely high resolution is expected;

d) that studies on digital image architecture are being conducted in some organizations,

decides that the following Question should be studied

1 What kind of approach should be taken to realize such an extremely high-resolution imagery system for broadcasting and non-broadcasting applications?

2 What features such a system should have to allow for future applications in broadcasting and to assure harmonization between different applications?

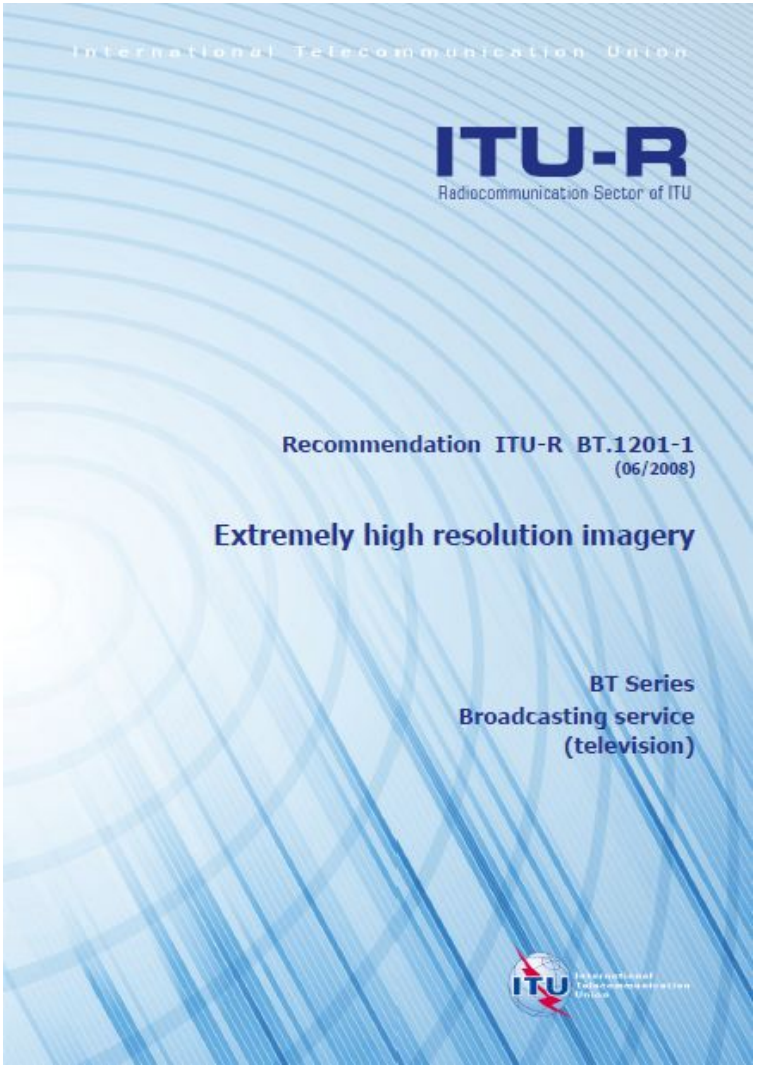
3 What kind of parameters should be determined for these systems in program origination?

further decides

1 that the results of the above studies should be included in (a) Recommendation(s);

2 that the above studies should be completed by 2005.

ITU-R Question on extremely high-resolution imagery has been prepared by the proposal of the CCIR SG 11 Chairman at the TG 11/4 meeting, Washington, 13-15 October 1992 [ITU-R Doc.11F/34, 10 November 1994, Doc.11/76, 1 May 1995]



First Recommendation on extremely high-resolution imagery

GENEVA, 30 OCTOBER 2012

The presentation of the Super Hi-Vision system (UHDTV),
which was demonstrated NHK (Japan) in ITU, Geneva
26 -27 September 2011

In a press release «Ultra High Definition Television: Threshold of a new age», 24 May 2012

ITU Secretary-General Hamadoun Touré praised the work of ITU-R Study Group 6: "*UHDTV is an earth-shaking development in the world of television*".

David Wood, Chairman of ITU-R Working Party 6C (WP 6C), which developed the draft new Recommendation, said, "This is the dawn of *a new age for television* that will bring unprecedented levels of realism and viewer enjoyment. *It's a historic moment*".

Chairman of ITU R Study Group 6 Christoph Dosch added, "This is clearly a major achievement for ITU-R Study Group 6 of which we can be proud. The Recommendation means that *organizations around the world can safely begin work to make UHDTV* a reality."

Director of ITU's Radiocommunication Bureau François Rancy said, "I've personally seen the pictures with 8K UHDTV system, and it's absolutely stunning – the sense of being there is superb. *This agreement shows the great and continuing strength of the ITU-R and Study Group 6*".

ADDRESS TO ITU-R WORKSHOP ON ENHANCED TELEVISION, AUCKLAND, 3-5 OCTOBER 1993

GLOBAL OPTIONS FOR ENHANCED TELEVISION

Prof. Dr. Mark Krivocheev, Chairman of ITU-R Study Group 11, NIIR, Russian Federation.

... Interactive broadcasting computer systems constitute a new field of study. Their development will be facilitated by MPTV systems, which substantially increase the number of programmes provided, which can be ordered up by the viewer by telephone, and also using satellite and mobile radiocommunication system in both real time and in videotecque "memory"...

Start of International standardization on the interactivity in broadcasting. From the Letter of greetings by the CCIR SG 11 Chairman to the Workshop on enhanced-resolution television (Auckland, 3 – 5 October 1993). Now approved 11 ITU-R Recommendation on interactive broadcasting.

The slogans of the first interactive Telecom 97

1. “It is now crystal clear that the formulation for strategy for further progress in telecommunications is inconceivable without a comprehensive and fundamental solution to the problems of interactivity”
Prof. Mark Krivocheev, NIIR, Russian Federation.
2. “Multimedia has become a key-element of the currently emerging information society”
Philippe Douste-Blazy, Minister of Culture, France
3. “New initiatives around the world talk of building an ‘information highway’. But what is the appropriate policy response, and how can we ensure that this new infrastructure is truly international?”
Pekka Tarjanne, Secretary General, ITU
4. “In the 21st century, the capacity to communicate will almost certainly be a key human right. Eliminating the distinction between information rich and information poor countries is also critical to improving the quality of life of all humanity”
Nelson Mandela, President, South Africa
5. “We can now at last create a planetary information network that transmits messages and images with the speed of light from the largest city to the smallest village on every continent. To accomplish this purpose, legislators, regulators, and business people must do this: build and operate a Global Information Infrastructure”
Al Gore, US Vice-President

Worldwide Broadcasting Roaming (WBR)

The concept of broadcasting roaming is borrowed from the mobile communication. In this case, the concept implies in the first place the ability of access to a content in different media and areas of broadcasting, even when different standards are used.

For the purpose of interactive TV broadcasting this idea was proposed for the concept of the first ITU Telecom-Interactive-1997. The need harmonising on this issue was noted in the Key Points on Opening Ceremony ITU TELCOM'12 (Dubai, 14 October 2012).

Traditional broadcasting systems

↓

Universal subscriber terminal, automatically adapting to receive multiplicity of known standards in different media and broadcasting areas.

Hybrid systems

Internet

↓

Personal choice of the only desired content from the great amount of Internet supplied content to users worldwide, and access by global IP-standards.

Development of WBR and a progress in the information and communication technologies (Internet, Mobile IP, SmartPhones, etc.) are reflected in the comprehensive concept of Worldwide Information Roaming (WIR) (Standard, 2011, **№** 9).

GENEVA, 30 OCTOBER 2012

Radiocommunication Study Groups

Received: 19 September 2011
Source: Documents 6A/546, 6/371
Subject: Worldwide Broadcasting Roaming

Document 6A/593-E
Document 6B/302-E
22 September 2011
English only

Russian Federation

PREPARATION OF NEW QUESTION ON THE STUDY OF WORLDWIDE BROADCASTING ROAMING

ITU is aimed at production of united worldwide standards but sometimes this aim is unachievable. An important regional and national characteristics are exist that cannot be ignored. These characteristics lead to development and adoption of regional and national standards. Multiple standards in TV and radio broadcasting, multimedia and other information services can be noted at present. Quick advance of programming tools and technologies may stimulate the development of such new systems.

The search of the paths is needed facilitating the overcome of the difficulties caused by multiple standards in TV and radio broadcasting now and in prospect.

In this regard for harmonization and integration of international, regional and national standards in the field of TV, radio broadcasting and other information services a concept of Worldwide Broadcasting Roaming (WBR) is proposed for universal (general-service) subscriber terminals. WBR is automatically facilitated with programmable multifunctional interfaces and other means on the base of advances of technologies. The owner of such terminal will be able to use automatically the signals of different standards in any broadcasting zone he located.

It is known that the term "roaming" (from the word "roam" – travel, wander), using in mobile telecommunications, characterizes a set of operations that are automatically carried out during interoperation between subscriber terminal and network operator for duplex communication of terminals, working in the networks of various operators. The definition of the term "roaming" for IMT-2000 is set in Recommendation ITU-R M.1224: the ability of a user to access wireless telecommunication services in areas other than the one(s) where the user issubscribed.Extension of this term on the field of broadcasting is explained by the fact that the possibility of operation in the networks of various operators need to be provided automatically in this case also. However, the maindifferencesconsistin:

– the number of standards for mobile telecommunications is not so large, but there are many different specific standards for TV, radio, multimedia broadcasting in various media and for other involved information services;

– the requirements to the transmission of audiovisual information are much more higher in broadcasting;

Radiocommunication Study Groups

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Subject: Question ITU-R 136/6

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29 October 2012
English only

Working Party 6A

DRAFT REVISION OF QUESTION ITU-R 136/6
Worldwide broadcasting roaming

(2012)

The ITU Radiocommunication Assembly,

considering

a) that there is an increasing demand to use portable broadcast receivers worldwide (worldwide roaming);

b) that the service requirements for digital sound broadcasting systems in different bands have been developed and adopted in ITU-R (Recommendation ITU-R BS.1348 for the bands below 30 MHz; Recommendation ITU-R BS.774 for VHF/UHF bands);

....

m) that modern broadcast receives are often equipped with an interface that allows the additional connection to the Internet (for, e.g., interactivity and downloads);

n) that methods of broadcast content delivery via future interactive and existing systems for example, MBMS (Recommendation ITU-R BT.1833) are in progress in addition to terrestrial broadcasting;

~~*n)*~~ *o)* that worldwide broadcasting roaming may facilitate the regional, national and international harmonization of broadcasting;

~~*o)*~~ *p)* that worldwide broadcasting roaming offers the possibility of intersystem interoperability for information services in disaster and emergency situations, navigation, safety, etc.,

decides that the following Questions should be studied

1 What are the service requirements and features for worldwide broadcasting roaming?

....

Proposals to study worldwide broadcasting roaming, and the new Question ITU-R 136/6

INTERNATIONAL TELECOMMUNICATION
RADIOCOMMUNICATION
ASSEMBLY
GENEVA, 2-6 JUNE 2003, 3

Document 6/1001-E
8 April 2003

Chairman, Study Group 6
CHAIRMAN'S REPORT
BROADCASTING SERVICES

7 Results of the extraordinary meetings of Study Group 6

……..

At its meeting in October 2001, Study Group 6 took the Decision (Document 6/184) that Task Group 6/9 on digital cinema broadcasting be established, subject to the approval of draft new Question ITU-R 15/6 "Digital cinema (D-cinema) broadcasting". Question ITU-R 15/6 was subsequently approved by correspondence by ITU-R Member States. Task Group 6/9 is chaired by Mr J. Flaherty (USA).

At the first meeting of the Steering Committee of Study Group 6 in September 2002, the Administration of the United States of America referred to the document "Review of the scope of Task Group 6/9" (Document 6/301) and proposed that Question ITU-R 15/6 should be reviewed by "a wider group of potentially affected parties with a goal of narrowing the scope of the work of TG 6/9 to radiocommunication related matters appropriate for consideration by the ITU-R".

The Steering Committee of Study Group 6 established an ad hoc Group chaired by Mr V. Stepanian (Iran) to consider the Terms of Reference of TG 6/9. It was decided that if the scope of the TG 6/9 were to change, then Question ITU-R 15/6 would need to be reviewed.

Following the conclusion of the work of the ad hoc Group, the Steering Committee of Study Group 6 established a Drafting Group chaired by Mr S. Lieng (Australia) on 11 September 2002 to review Question ITU-R 15/6, by taking into account the work of the ad hoc Group (Document 6/320).

At the Study Group 6 meeting in September 2002, it considered the reports of the ad hoc Group and of the Drafting Group on Question ITU-R 15/6 set up by the Steering Committee. However, it was not possible to reach a unanimous consensus on the revision of Question ITU-R 15/6. As a consequence, the Chairman of Study Group 6 decided to convene an Extraordinary Meeting of Study Group 6 on 18 March 2003, dedicated to solving the issue.

For the collaboration and harmonization of international studies on numerous large screen applications the Honorary Chairman of Study Group 6, Prof. M. Krivocheev (Russia), proposed to use a new term "large screen digital imagery" as the title of this revised Question.

Beginning of studies on large screen digital imagery

List of ITU-R Recommendations on LSDI systems (Large Screen Digital Imagery), developed by TG 6/9 under the chairmanship of Dr J.Flaherty (USA):

- BT.1662 General reference chain and management of post-processing headroom for programme essence in large screen digital imagery applications
- BT.1663 Expert viewing methods to assess the quality of systems for the digital display of large screen digital imagery in theatres
- BT.1664 Representation of various image aspect ratios into the image of large screen digital imagery applications that use a 16:9 raster
- BT.1665 Considerations for colour encoding and spatial resolution for large screen digital imagery display
- BT.1666 User requirements for large screen digital imagery applications intended for presentation in a theatrical environment
- BS.1679 Subjective assessment of the quality of audio in large screen digital imagery applications intended for presentation in a theatrical environment
- BT.1680 Baseband imaging format for distribution of large screen digital imagery applications intended for presentation in a theatrical environment
- BT.1686 Methods of measurement of image presentation parameters for large screen digital imagery programme presentation in a theatrical environment
- BT.1687 Video bit-rate reduction for real-time distribution of large screen digital imagery applications for presentation in a theatrical environment
- BS.1688 Baseband sound system and audio source-coding at delivery interfaces of large screen digital imagery applications
- BT.1689 Guidelines on the presentation in large screen digital imagery environments of programmes that are provided in image formats conforming to Recommendation ITU-R BT.601
- BT.1690 Assumed characteristics of venues intended for large screen digital imagery programme presentation in a theatrical environment
- BR.1694 International exchange of videocassette recordings of large screen digital imagery programmes intended for presentation in a theatrical environment
- BT.1721 Objective measurement of perceptual image quality of large screen digital imagery applications for theatrical presentation
- BT.1727 Terrestrial and satellite delivery of programme material to large screen digital imagery venues
- BS.1734 Basic performance requirements for the sound components of large screen digital imagery applications for presentation in a theatrical environment
- BT.1769 Parameter values for an expanded hierarchy of large screen digital imagery image formats for production and international programme exchange.

Radiocommunication Study Groups

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Russian Federation

PROPOSAL ON DRAFT REVISION OF QUESTION ITU-R 13/6

Multimedia evolution and common content format

Currently information in population centers is being represented by traditional, mostly static means, in particular posters, broadsheets, other kinds of advertisement, etc. Some large imagery systems installed in crowded places (squires, railway stations, stadiums, subways, streets, routes with extensive traffic, etc.) also represent various kinds of multimedia information for business, advertising, concerts, shows, sport, cultural and other mass activity. But in many cases they are not sufficiently effective and do not provide the high quality of the represented information. So the efficient mass information servicing of population requires new approaches.

Progress of informational, communicational and nanotechnologies, methods of digital TV signals formation, processing, compression, transmission and representation gives the possibility to execute this social order with the help of the new multifunctional, video informational (demonstration) systems on the basis of digital HDTV and EHRI technologies (Recommendation ITU-R BT.709 "Parameter values for the HDTV standards for production and international programme exchange", Recommendation ITU-R BT.1201 "Extremely high resolution imagery" and Recommendation ITU-R BT.1769 "Parameter values for an expanded hierarchy of LSDI image formats for production and international programme exchange"), which allow viewers to discern even the smallest nuances of the demonstrated pictures.

Video informational systems as integrated parts of digital TV broadcasting production and post production centers will allow broadcasters to organize new business applications with the help

of multimedia content transmission in the form of data streams, which, in particular could be parts of the broadcasted programs' transport streams. A possibility will occur to provide advertising business and various mass informational servicing structures with new digital TV multimedia broadcasting service. Broadcasters may play an important role in this process as leaders in this perspective area. It will allow to increase substantially the role and importance of digital TV broadcasting in creation and development of the information society and will contribute to the radical broadening of the spectrum of services with good economical prospects.

Numerous telecommunication services are also interested in the development of such systems as potential sources of additional traffic.

Beginning of studies and international VIS standardization issues to the Question ITU-R 13/6

The term video information systems (VIS) - a multifunctional interactive system displaying video information with high quality on screens of various sizes in places for collective viewing both in open areas (squares, streets, stadiums and other) and in large premises (halls, shopping centres, underground stations and the like) (Rec. ITU-R BT.2000). Luminescent VIS screens can operate both in daylight and in the dark, in any weather and in different climatic conditions.

VIS thus brings new meaning to the concept of “outdoor television broadcasting”, with fragments of conventional TV programmes, programming designed specifically for such presentation, public warning, advertising and, generally speaking, any other services calling for the display of video information for viewing under the aforementioned conditions.

Screen installation places and VIS content should be regulated. The wide implementation of the VIS will be the most effective means of viewing targeted TV content (important government, public and other certain content at certain time lessens) and for the first time will provide a mass screening implementation in the society.

At the international “Expo-2010” exhibition in Shanghai, a new VIS was presented demonstrating sound accompaniment to the images on the display screens with various languages by means of mobile communication terminals.

Merging multiple omnipresent interactive VIS screens with multi-billion fleet of mobile terminals will dramatically increase traffic to mobile and other telecommunication facilities. This new area of mass interactive screen-viewing will make important contribution to the development of information society.

REPORT ITU-R BT.2249-1

Digital broadcasting and multimedia video information systems

(2011-2012)

. . . . . .

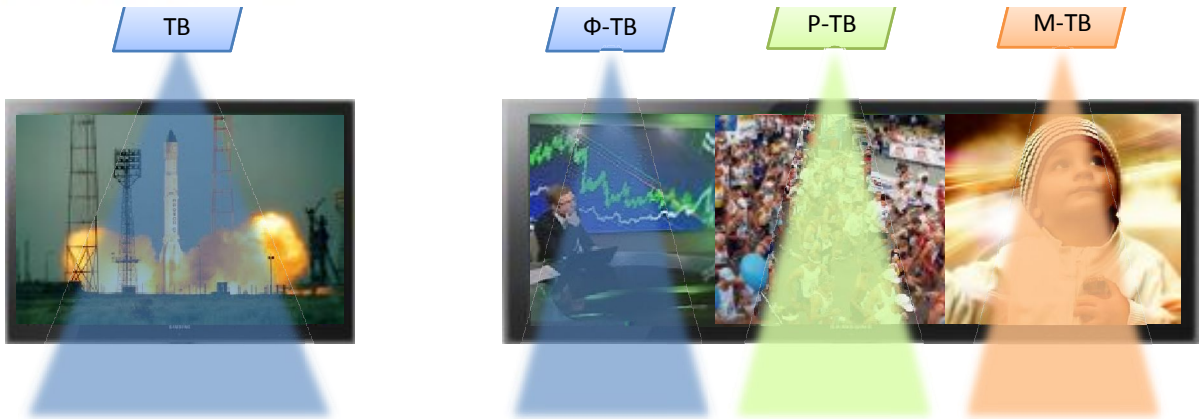
Narrow-beam systems

Narrow-beam sound systems are suitable for indoor and outdoor audio delivery.

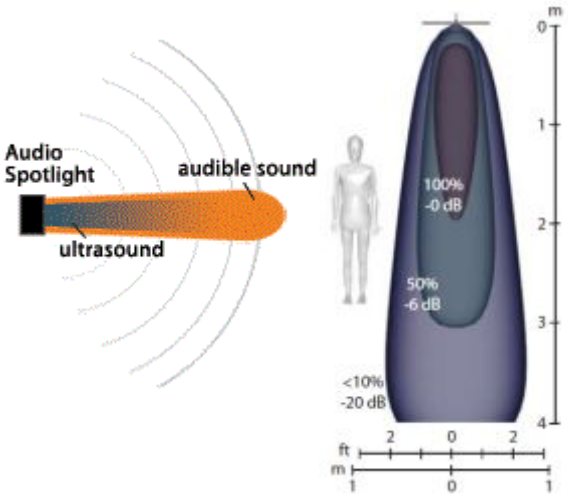
They are widely used for audio delivery at exhibitions, museums and showrooms. The sound beam can be directed towards a specific area while at other areas the sound will be unheard.

This technology creates a high-density narrow beam of sound that can be steered with the same precision as light beam. A diameter of sound beam can be from 2 to 200 meters. Uniform sounding in case of 2 meters beam diameter will be provided by two adjacent sound emitters horizontally spaced by about 2 meters (http://www.holosonics.com/brochure/Audio_Spotlight-Brochure.pdf).

Distributed sound delivery to open spaces such as mass public events can be reached using sound reflectors and diffusers.



Sound Field Distribution



Proposals about using audio spotlights for VIS (Russian Federation, Doc. 6B/20, 13 April 2012)

In 1993 the Radiocommunication Assembly approved the proposal of the Chairman of ITU-R SG 11 (Report of the SG 11 Chairman, Doc. 11/1001, 30 September 1993) on the harmonization of digital systems for delivery of TV services to the consumers, and technologies of TV broadcasting with advanced computers. Soon a new Question ITU-R 95/6 was studied, the Report was prepared, and then the first draft Recommendation on the use of computer technology and Internet in TV broadcasting was agreed (ITU-R SG 11 Chairman's Report, Doc.11/13, 5 March 1998). The Recommendation complemented TV sets with a number of intelligent features.

With the advances and progress in the broadcasting systems it is viable to consider in new TV receivers the possibility of utilization of standardized interfaces, which enables not to replace the receiver as a whole in the case of the broadcasting standard change, but adapt or replace the necessary module only.

International efforts have led to the achievement of the cherished goal - production of modern TV sets interworking with the Internet and providing for other information and communication services. New Recommendation BT.1888 (09/2011) on basic elements of file-based broadcasting systems initiated by Japan was approved.

Initiated by Dr. Hamadoun Touré, the ITU Secretary-General, the first international Broadband Commission was created within the ITU in Geneva, 2010.

In the recent two years the Commission has reached significant results. Nowadays global development of broadband may be planned with a sufficient certainty up to 2015.

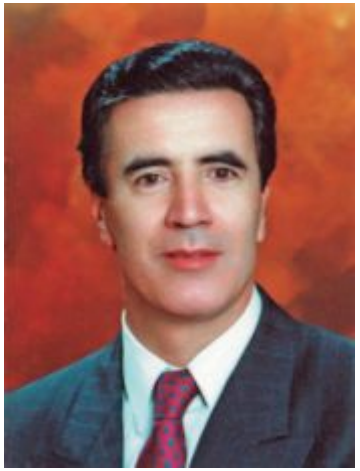
This is a significant contribution facilitating the implementation of digital TV broadcasting and many other services. Particularly it will enable the development of new concepts for the Internet and similar networks taking into account interfacing and harmonization of national and international interests, specifics of delivered services, etc.

Studies on digital TV broadcasting in the ITU were initiated by CCIR (ITU-R) SG 11 in 1972 and lasted until 2000. Then the studies were continued by ITU-R SG 6. The challenges of digital TV were successfully solved in close cooperation with CMTT (CCIR/CCITT), other SGs of the ITU-R (CCIR), ITU-T and ITU-D, as well as ITU-TELECOM, SMPTE, IEEE, ISO, IEC, MPEG, DVB, etc. These traditions were continued by SG 6, which established contact with the Management Committee of the Future of Broadcast Television (FoBTV) Initiative.

Books on TV measurements, digital TV and prospects of TV, written by Prof. M.I. Krivocheev (NIIR) solely and in cooperation with his pupils and colleagues.

Total: 30 books (10121 pages), published and translated in several countries in 9 languages (Russian, English, French, Spanish, Chinese, Polish, Hungarian, Czech, Rumanian) in 345340 copies.

Dr. Paolo Zaccarian (Italy) and his wife Nevart. He is Vice-Chairman of ITU-R SG 6, participated in CCIR SG 11 studies from 1968. 1968-1980 – Chairman of Working Party G (Production Technology) in the EBU. 1987-2001 – Secretary General of the International Electronic Cinema Festival, Tokyo-Montreux. The ITU-R (CCIR) Working Parties chaired by Dr. Zaccarian under SG 10 and 11 and then SG 6, developed the 60 ITU-R recommendations on recording and international exchange of sound and television programs on tape and film.



In 1976 Mr. Kavouss Arasteh (Iran) in CCIR Study Group 11 chaired a joint group to prepare, for the first time, terminology related to digital broadcasting. In 1977 he chaired a group concerned with quality assessment in digital systems.
K. Arasteh — the Acting Co-Chairman of the First Session of RRC-2004, the Chairman of the Second Session of RRC-2006, the Chairman of SPM to WCR-2007, the Deputy Chairman of the Telecommunication Development Advisory Group (TDAG) of the ITU-D.

Directors of the CCIR (ITU-R)

Van der Pol
(Netherlands)
(1948 – 1956)

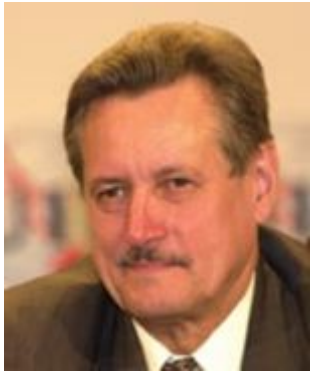
E. Metzler
(Switzerland)
(1956 – 1963)

L. Hayes
(Great Britain)
(1963 -1966)

J. Herbstreit
(USA)
(1966 – 1974)

R. Kirby
(USA)
(1974 – 1992)

R. Jones
(Canada)
(1993 – 2002)



V. Timofeev
(Russian Federation)
(2003 – 2010)

F. Rancy
(France)
(2011 - ...)

Great contributions to the activities
of CCIR (ITU-R) SG 11 and ITU-R SG6 were made by:

- Counsellor R.Froom
- Counsellor G.Grotelueshen
- Senior Counsellor R.L.Nicolson
- Head of the Study Groups department G.Rossi
- Counsellor G.Mesies
- Counsellor N.Venkatesh

SUMMARY

1. It is gratifying to know that CCIR (ITU-R) SG 11 and then ITU-R SG 6 received worldwide recognition as the pioneer and incubator for many important ideas and proposals encouraging the formation and development of a new era in the world - the era of digital TV broadcasting and related information and communication services.

To the date of the 40th anniversary, ITU-R SG 6 confirmed its role as the world leading forum on study and development of recommendations on key issues of multifunctional digital TV broadcasting.

These issues include frequency planning and specification of promising new systems for digital terrestrial TV, Quality of TV picture and sound, multichannel audio systems, interactivity, HDTV, LSDI, 3D TV and hybrid broadcasting, EHRI, UHDTV, file transmission systems, interactive video information systems, worldwide broadcasting roaming, accessibility to broadcasting services for person with disabilities, ecological protection of TV viewers, etc.

SUMMARY

2. The phenomenon of ITU activity on digital TV broadcasting consists in that at the beginning of the study on digital TV broadcasting, a global approach to the problem, a new forward-looking policy and a strategy for its implementation were adopted considering mistakes and omissions of colour TV. The efforts of the leading scientists and experts from many countries were combined and mobilized. Their joint efforts under the auspices of ITU created a package of the more than 100 recommendations, many of which became international standards. They opened a way to a historic milestone - the transition from analogue to digital TV, and now they are widely used in the industry and information services.

SUMMARY

3. Harmonization of the interests of broadcasters and mobile service providers and smoothing over contradictions of their interrelations should replace the confrontation between them for use of frequency bands. Necessary prerequisites were created for the problems associated with terrestrial TV broadcasting, broadband and mobile communication, to be studied using a new way taking into account the hybrid approaches and the technology progress.

4. The true uniqueness of the current situation is that nowadays each portion of the digital path, any studio, digital TV set, terrestrial or satellite station have embedded fruitful outcomes of the policy and strategy elaborated at the beginning of studies, but now on the basis of modern technology.

SUMMARY

5. Three conditions of TV viewing were set:

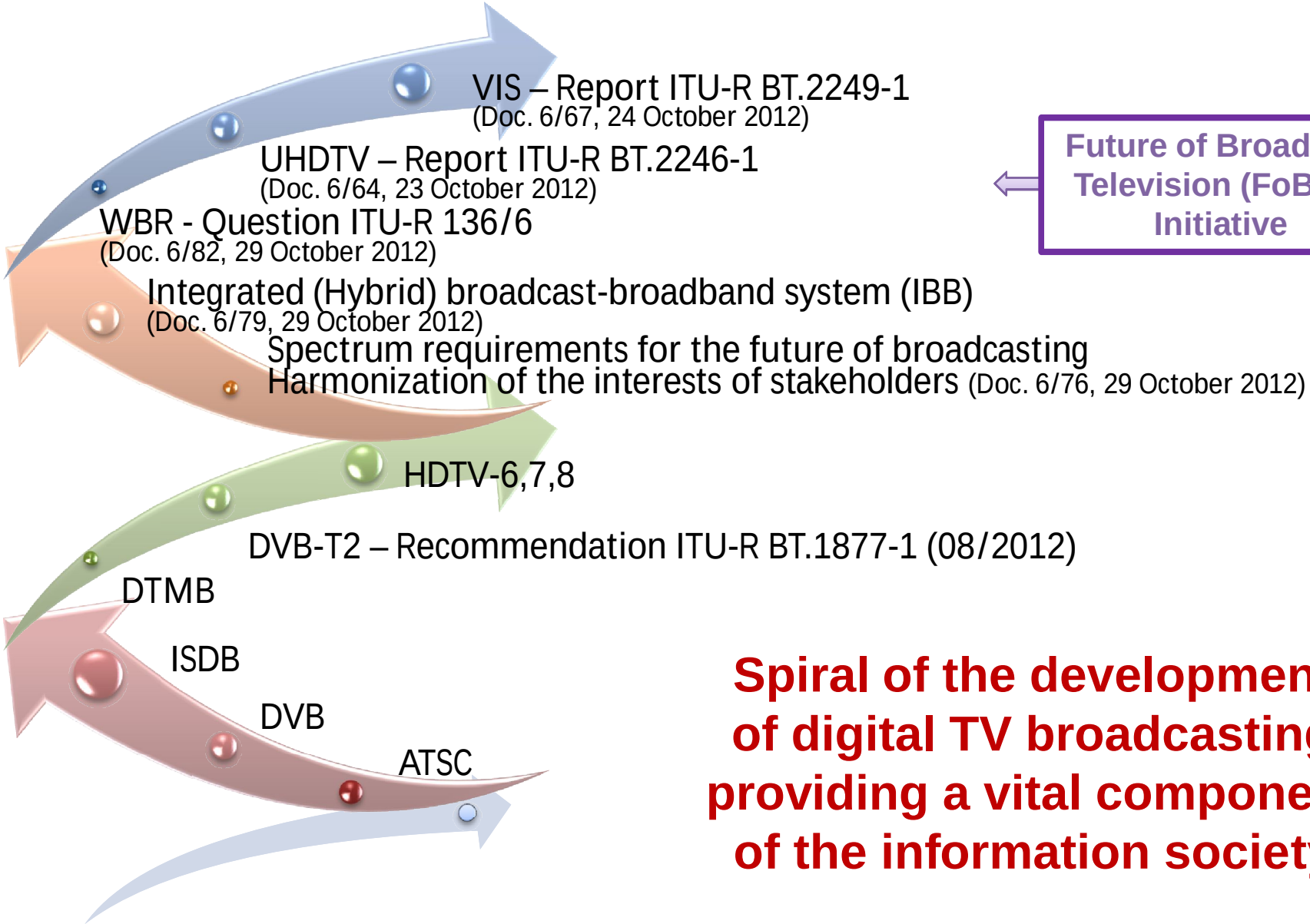
1) fixed conditions – individual choice of content;

2) mobile conditions – individual choice of content;

3) videoinformation system conditions – target content.

6. It is difficult to find out any other field of study where there is such an original, mass and significant contribution of the ITU, considering as well significant amount of time and cost saved. This outstanding contribution of the ITU is highly appreciated. In particular, it is confirmed by the Boards of Honor in the ITU premises.

7. Celebrating the fortieth anniversary marks a start to new approaches and development strategies of digital broadcasting taking into account the realities and prospects.



Spiral of the development of digital TV broadcasting providing a vital component of the information society

CONCLUSION

On the Opening Ceremony of the ITU TELECOM'12 (Dubai, 14 October 2012) ITU Secretary-General Dr Hamadoun Touré said "Voice is no longer cool, the decline of the voice model which has served well for the past hundred years means a new model must be created, a new mechanism of communication and an industry structure serving that mechanism for the next one hundred year. Now is the time for leadership in creating that model for the future."

In support of this issue it is proposed to begin developing a long-term model of the global information society, taking into account convergence of technologies as the creation of various content, and so many means of its delivery to consumers.

It is proposed not only to put forward such model, but also celebrating the fortieth anniversary marks the foundation of one new key component in the development of the information society - a mass implementation of interactive 2D/3D visual screens, including TV broadcasting, VIS and other video and audio means, together with the mobile communications and worldwide information roaming.

This component will remain forever because more than 80% of the information obtained by a person is acquired through the eyesight. Video information is demanded by our life activity and the functioning of the human body.