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Studio Production and Broadcasting

Introduction

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Course Agenda

- Studio production introduction.
- Studio equipment.
- Control rooms and equipment (video, audio and lighting mixer)
- Lighting techniques in studio conditions.
- Installation of cameras in multi-camera production and lens selection.
- Directing live programs and working with multiple cameras.
- Studio communication and coordination.
- Sound in studio conditions.
- Working with chroma-key technology.
- Integration of graphics and special effects for live programming.
- Recording systems, playout systems and broadcast automation.
- Practical implementation: studio recording.

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Agenda today

- Definitions
- The importance of television
- The influence of television.
- Analog and digital TV
- History of television
- Standards
- Types of TV studios and productions

What is TV production?

• **Studio (TV) production** refers to the creation of television programs within the specialized space of a TV studio.

• It provides controlled conditions: an enclosed space with studio cameras, lighting, sound and set design, where the program is recorded or broadcast live.

•It is most commonly used for news shows, talk shows, entertainment and debate formats.

What is TV broadcasting?

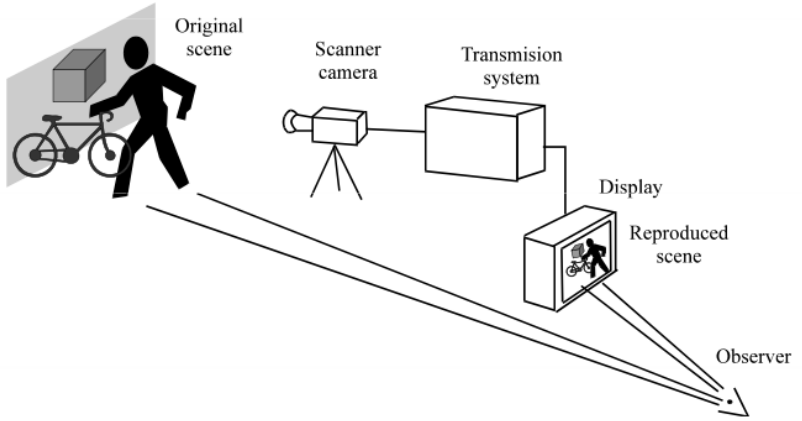
•Broadcasting is the process of distributing audio-visual content to a wide audience through television signals.

•Traditionally, it takes place through a transmitter (terrestrial TV), satellite or cable network

•Today, it also includes digital platforms (broadcasting over the Internet, streaming), but the essence of broadcasting is mass availability and simultaneous monitoring of content by the audience.

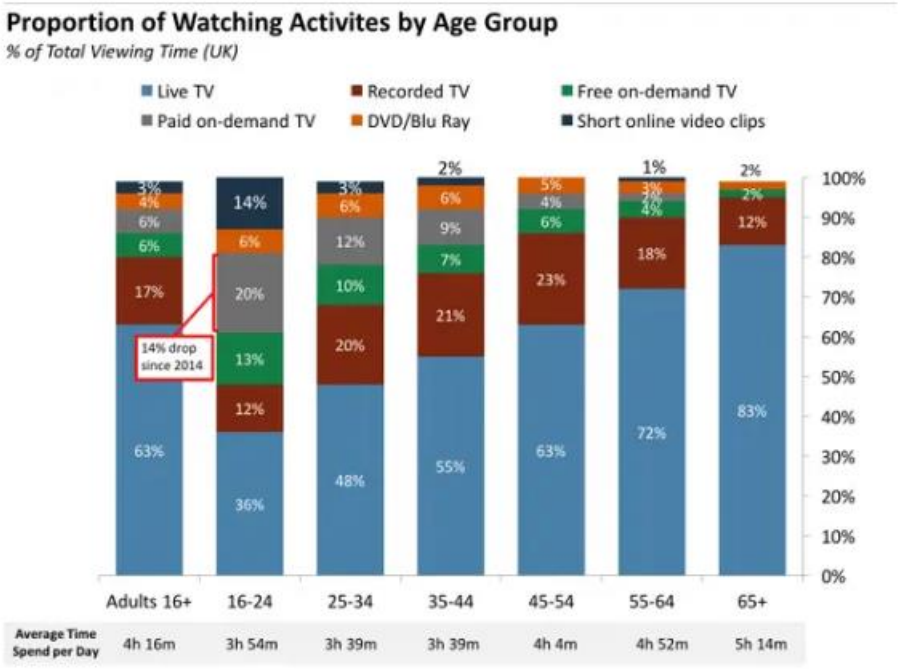
What is television?

- Television is the real-time transmission of an image over a distance trough a telecommunications system.
- In technical terms, television is the conversion of a moving scene, along with its corresponding sound, into an electrical signal, the transmission of that signal over a distance, and its reconversion in a TV receiver into image and sound.
- The basic principle of analog transmission is to continuously change the amplitude (level) of the signal in order to present images and sound.



The importance of television

- Television has been the most influential media of mass communication for decades.
- Emotional impact and social role.
- Television reaches an audience that no other media has had before. It is estimated that over 5 billion people have access to a TV.
- The average viewer in developed countries watches several hours of TV content per day. Older audiences watches more, but most young people still watch at least some TV content.



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The importance of television

- Over 85% of TV viewers use a phone or computer at the same time while watching TV.
- However, it is interesting that only about 24% actually watch something related to TV program (e.g. reading additional information or tweet about it), while the rest simultaneously chat or browse independently.

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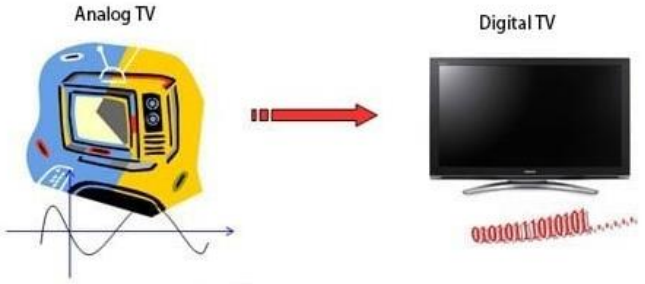
Analog vs Digital TV

- Today, television broadcasting is digital.
- Most of the equipment in television is digital.
- The last decade of the 20th century marked the exceptional development of digital technologies, but also the requirements of users (a number of programs).
- More programs in the same frequency range require reliable signal selection with as little interference as possible.
- With digitalization, the improvement of analog television was abandoned.



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Analog vs Digital TV

- A complete digitalization is being introduced (from production to transmission).
- The era of analogue television was marked by decades-long use of TV signal receivers with traditional screens (cathode ray tubes).

- The electrical signals (electromagnetic waves) carrying image and tone information (TV signal) were broadcast into the air for decades to TV receivers exclusively through a system of transmitters and connections. Such a system is called a terrestrial (land-based) transmitter network.

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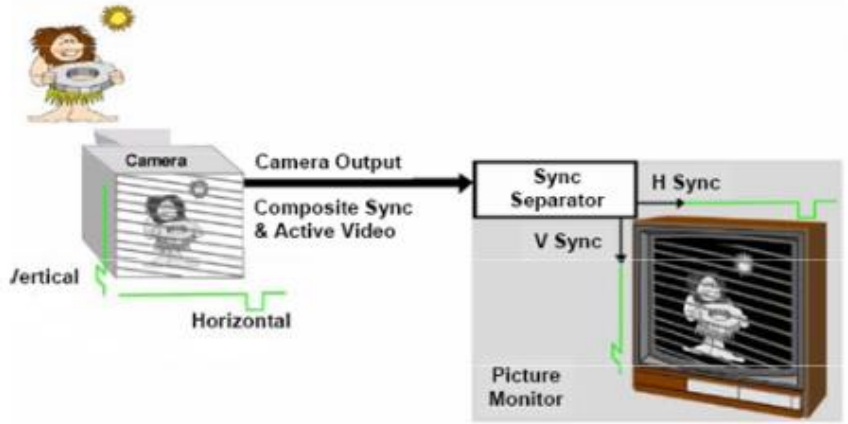
Analog vs Digital TV

- Analog standard: NTSC, SECAM and PAL.
- Before the advent of satellite and cable TV, the only method of transmission was via terrestrial TV.
- The transition from analogue to digital television broadcasting represents one of the most complex procedures in the history of television.
- Receipt and handover equipment had to be replaced or adapted to the needs of digital transmission.



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HISTORICAL DEVELOPMENT

- Mechanical TV – 1884
- Black and White TV (C/B TV) – 1941 in America / 1958 in our country
- Color TV – 1971
- DTV (Digital TV) – 1997
- HDTV (High Definition TV) - 1997
- UHDTV (Ultra High Definition TV) - 2010

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HISTORICAL DEVELOPMENT IN THE WORLD

•January 26, 1926 – the day television began in the world.
- John Berd presented a television image to the members of the British Royal Society.

•Initially, there were few elements in the image, but shades of gray and facial expressions of characters could be distinguished.

•1927 – the first experimental TV program broadcast in the United States (General Electric and RCA).

•1935 – The BBC in England demonstrated the first fully functional TV system.

•Regular TV broadcasting:
- Start in the USA – 1941
- Start in Japan – 1953

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HISTORICAL DEVELOPMENT IN THE WORLD

1958 – Start of experimental TV broadcasting

- **August 23, 1958** – **TV Belgrade** begins experimental television broadcasting.
- The first studio equipment included **tube cameras, telekinics and 16mm and 35mm films**.
- **There was no magnetoscope**, all the shows had to be broadcast live.

1961 – Start of recording and delayed broadcasts

- **June 1961** – TV Belgrade acquires **two magnetoscopes,** enabling the **recording and delayed broadcasting** of shows.
- Prior to that, broadcasts were **exclusively live**, without the possibility of repetition or archiving.

1959 – First live TV broadcast from a greater distance

- **November 23, 1959** – The first live TV broadcast from **Niš**, on the occasion of the opening of the **Niš – Paraćin** highway section.
- This was an important step in the development of **live television broadcasts from different parts of the country**.

1965 – Construction of the Avala Tower

- **Mid-1965** – The construction of the **Avala TV Tower** was completed, enabling **wider coverage of the television signal** and better reception in central Serbia.
- This tower becomes **the main broadcast center for the TV signal in Serbia**.

HISTORICAL DEVELOPMENT IN THE WORLD

1971 – Start of colour TV broadcasting

- **August 1971** – TV Belgrade begins **broadcasting in color**, but only **via outside broadcast vans**.
- This means that not all programs were in color, but only certain events and live broadcasts.

1989 – Digital connection by optical cable

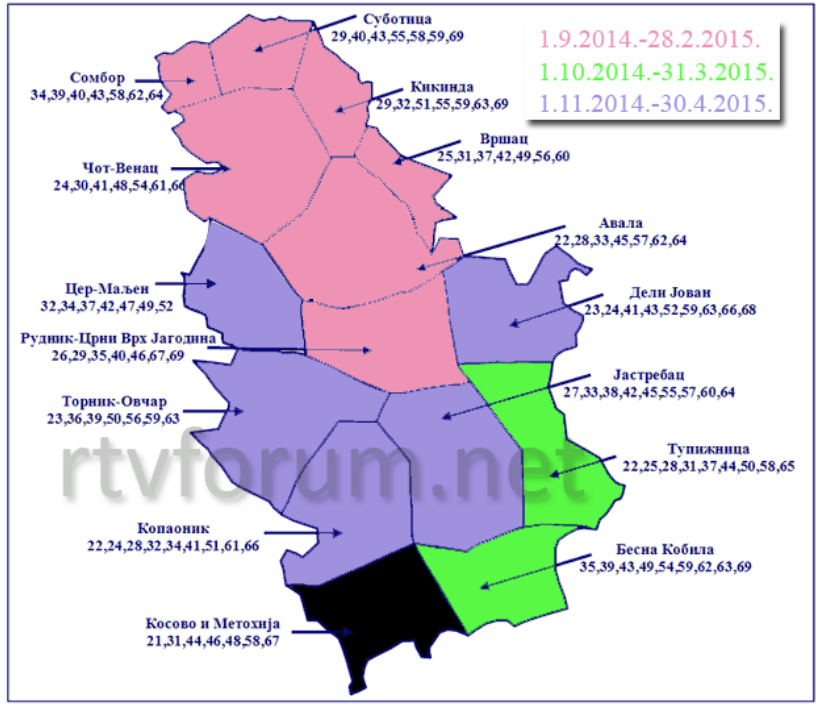
- **A two-way digital connection** was established between **the master station in Aberdareva Street and the Sava Center** in Belgrade.
- This is **the first major digital network** in the television infrastructure in Serbia.

1997 – Beginning of television digitization

- **1997** marks the beginning of the **digitalization era**.
- TV Belgrade acquires **digital ENG cameras and DVC PRO magnetoscopes**.
- **ENG cameras (Electronic News Gathering)** enable **mobile filming and faster content processing**.
- **DVC PRO magnetoscopes** are advanced digital technology for archiving and broadcasting recorded material.

DVB-T2 broadcasting in Serbia

- The territory of Serbia is divided into 10 VHF and 16 UHF allotment zones.
- The first experimental broadcasting of a digital TV signal in Serbia began on April 6, 2005 from the Avala transmitter, by RTS.
- 2009 – 2012- transition to digital broadcasting
- Today, a multiplex is broadcast in this digital network, containing multiple channels.
- The multiplex represents a group of channels transmitted on the same frequency. Part of the frequency spectrum is reserved for allocation (sale) to mobile operators, known as the digital dividend.



Standards

- **The development of DVB (Digital Video Broadcasting) standard** was crucial for the **digitalization of television** and the transition from analogue to digital television worldwide, including in Serbia.
- DVB-S, 1993.
- DVB-C, 1994.
- DVB-T, 1995.
- On 6 April 2005, RTS began broadcasting from Avala on the 27th channel on UHF (518-526) a 1.5 kW DVB-T signal, namely three SDTV RTS programs + 1 SDTV commercial program and 4 radio programs.
- DVB - S2, 2005
- DVB - C/T2 appeared in 2009
- DVB - S2X, 2014

Standards

DVB standards also include:

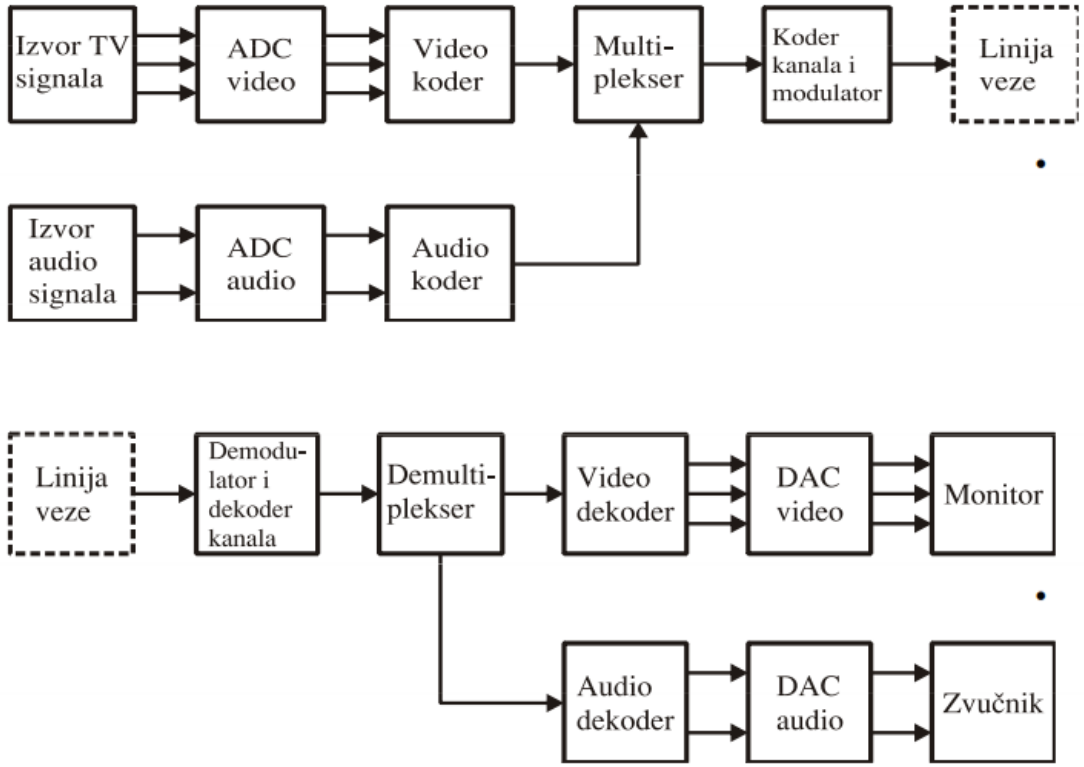
- DVB-MC digital multipoint distribution system based on DVB-C cable system,
- DVB-MS digital multipoint distribution system based on DVB-S satellite system,
- DVB-SI (Digital Video Broadcasting - Service Information), for DVB decoders,
- DVB-TXT - DVB teletext,
- DVB-CI (Digital Video Broadcasting - Common Interface), to access other applications,
- DVB-IPI (Digital Video Broadcasting - Internet Protocol Infrastructure), transport of DVB services over IP

Standards

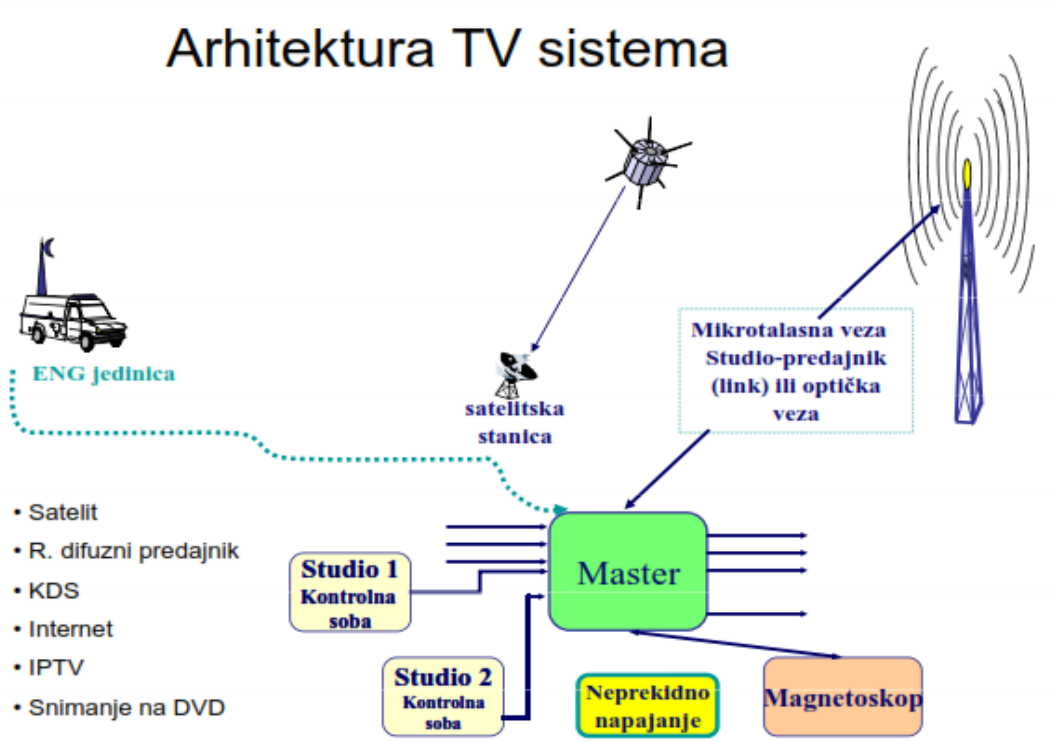
In addition to the DVB standard, which is dominant in most parts of the world, other standards for digital television broadcasting have been developed:

- ATSC (Advanced Television Systems Committee - Terrestrial/Cable),
- ATSC M/H (Advanced Television Systems Committee - Mobile/Handheld),
- ISDB-T (Integrated Services Digital Broadcasting - Terrestrial),
- ISDB-S (Integrated Services Digital Broadcasting - Satellite),
- ISDB-C (Integrated Services Digital Broadcasting - Cable),
- SBTVD (Sistema Brasileiro de Televisão Digital),
- DTMB (Digital Terrestrial Multimedia Broadcast),
- CMMB (China Multimedia Mobile Broadcasting),
- T-DMB (Terrestrial - Digital Multimedia Broadcasting) and
- S-DMB (Satellite - Digital Multimedia Broadcasting).

Structure of digital TV broadcasting



- Blok šema predajnika TV sistema
- Blok šema prijemnika TV sistema



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Types of television studios and productions

- Informative, entertaining, sports, virtual, specialized…
- Studio production, field production, reportage circuits

- Pre-production is the initial phase of production in which detailed planning of the entire project takes place.

- Production is the phase in which the recording of material occurs. Everything that was planned is now executed in front of the cameras.

- Post-production includes all processes that follow the recording, in order to finalize the content before broadcasting.

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Questions & Answers

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Network of centers for regional short study programs in the countries of the Western Balkans

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