Қазақстан Республикасының Бірінші Президенті күніне арналған **«Сейфуллин оқулары – 9:** жоғарғы білім және ғылым дамуындағы жаңа бағыт» атты Республикалық ғылыми-теориялық конференция материалдары = Материалы Республиканской научно- теоретической конференции **«Сейфуллинские чтения – 9:** новый вектор развития высшего образования и науки**»** посвященная дню Первого Президента Республики Казахстан. – 2013. – Т.2, ч.1. – С. 247-248

SATELLITE COMMUNICATIONS SYSTEM

Utemissov A.

Satellite Communications System (SSC) has long been known and is used to transmit different signals over an extended distance. Since its inception, satellite communication has evolved rapidly, and with experience, improvement of equipment, methods of signaling the transition from individual satellite links to local and global systems.

These growth rates are explained by SSC number of advantages they possess. These include, in particular, high bandwidth, unlimited overlapped space, high quality and reliability of the communication channels. These advantages, which confer a power of satellite communications, make it a unique and effective means of communication. Satellite currently is the main international and national context of long and medium distances. The use of satellites for communication continues to grow with the development of existing networks. Many countries have their own national satellite network.

All systems can be divided into two types of systems: working through satellites in non-geostationary and geostationary orbits.

Geostationary satellites are used primarily for military, scientific and meteorological research. Their main feature - the inability to maintain the clock communication with the AP. However, moving from a given orbit relative to the Earth’s surface, they can collect data from a large surface area.

Geostationary satellites appear on such an orbit in the plane of the equator, where their angular velocity equal to the velocity of rotation of the Earth on its axis. Height above the surface of the Earth, where the conditions of constant velocity and equality of centrifugal and gravitational forces is 36 thousand kilometers. Theoretically, one positioned so the satellite can provide high-quality connection for a third of the earth’s surface. To the actual area is much smaller. Feature satellite in geostationary orbit is a significant time delay (about 240 ms) in the satellite channel, which led to double cover the distance of 36 thousand kilometers from the AP to the satellite.

We will consider a system where applicable satellites circulating in orbit in sync with the Earth’s rotation. This allows simplifying the communication system. In this case, each earth station operates continuously with the same satellite. Previously, when using no synchronous satellites, there was a need periodic switching antenna system each earth station from one satellite to another, which naturally led to interruptions. In addition, a significant portion of the value of AP was not very reliable tracking equipment. The use of fixed satellite communication provides seamless communication, but requires additional working fluid supply for

multiple satellite orbit correction. It is believed that this additional supply of working fluid for orbit correction is a relatively small price to pay for the ease of use of the system and the lack of interruptions. Earth stations using stationary satellites simplified by eliminating the complicated and expensive tracking system.

Satellite systems can also differ and the type of the transmitted signal, which can be digital or analog. Transmission of information in digital form has several advantages over other methods of transmission. They are:

1. Simplicity and efficiency of integrating multiple independent signals and convert digital messages into "packages" for the convenience of switching;

2. Less power than the analog transmission signal;

3. Relative insensitivity of digital channels to the effect of accumulation of distortions in retransmissions, which is usually a serious problem in analog communication systems;

4. Potential to produce very low probability of transmission errors and to achieve high fidelity of transmitted data by detecting and correcting errors;

5. Confidentiality of communications;

6. Flexible implementation of digital equipment, allows the use of microprocessors, digital switching and the use of chips with greater integration of components.