

# Active Autonomous Repeater for Synchronous Networks Broadcasting Standard DVB - T

Gorbylov Yuriy

**Abstract - the work describes the approaches to creating a national network of digital terrestrial television broadcasting standard DVB-T stand-alone repeater with an output power 25 watts.**

**Keywords - repeater, digital broadcasting, photovoltaic module, solar cells.**

## I. INTRODUCTION

System of terrestrial digital broadcasting is using modulation COFDM (Coded Orthogonal Frequency Division Multiplexing) and used guard interval between symbols are transmitted sequentially, as a result is able to take along with primary (useful) signal, also signals that are late (for example, reflected of obstacles on the locality) in the event if the delay doesn't exceed the guard interval. [1 - 3].

Single-frequency network, usually constructed of several smaller-power stations compared to the capacity of a single transmitting station needed to serve the same territory. These stations are placed on antenna supports of small height and they are mostly maintenance-free. Increasing percent of places with sustained signal in single-network compared to the reception signal from a single transmitting station is especially noticeable in the case of rough terrain or urban high-rise buildings.

However, to completely eliminate local areas of uncertain reception and shadow areas in single-frequency areas television cannot. Therefore, to ensure good signal in local areas uncertain reception and in areas of shadow, to serve individual settlements in the model of national DVB-T provides autonomous use active repeaters.

## II. PROBLEM OF DESIGN AUTONOMOUS REPEATER

In single-frequency networks receiving and transmitting signals carried on only one frequency, so the problem of parasitic connections in the repeater is much more complicated.

Repeater must perform the following functions:

- receive content by antenna which transmitted by main station distribution network;
- perform remultiplexing television programs in accordance with the requirements defined for this location;
- modulate the output signal in accordance with the accepted technology;
- enhance power output and direct it through the transmit antenna in service area of repeater.

---

Gorbylov Yuriy – National Technical University of Ukraine, off. 429, Politekhnichna Str. 16, 03056, Kyiv, UKRAINE,  
E-mail: somnieres@gmail.com

One of the main problems in creating active repeater is to provide guaranteed autonomous power supply and the necessary isolation (80 dB) between the transmitter output and input, because may be positive feedback loop, resulting in normal operation of repeater stop.

## III. DESIGN OF AUTONOMOUS TRANSPONDER DIRECT AMPLIFICATION

The active autonomous repeater direct amplification provides the minimum delay signal and contains the following components parts:

- receiving antenna with an input unit of filtration, reinforcement and automatic power adjustment;
- transmit antenna with the input block of finite amplification, filtering and automatic adjustment of its output power;
- connecting lines between the blocks, which provides signal transmission and power;
- autonomous unit of guaranteed power supply.

Autonomous unit of guaranteed power supply composed of the following parts:

- solar photovoltaic modules with automatic orientation to the Sun, consisting of 3 panels in the frame of aluminum;
- device accumulation and transformation of energy with the charge controller;
- rechargeable battery.

## IV. CONCLUSION

Autonomous active repeaters direct amplification using solar photovoltaic modules have undoubted advantages over other types of repeaters, due to their high efficiency during operation and small energy consumption. Scheme of active repeater with GPS synchronization, with compensation of echo signal and the use of distribution networks in microwave link is more complex and uses more energy and taking into account the radio propagation conditions are less attractive to implement than the scheme of active autonomous repeater direct amplification.

## REFERENCES

- [1] Naritnik , Kazimirenko «Some aspects of network deployment DVB T». 2007.
- [2] Narytnik, Volkov «Features of the network deployment of the terrestrial television broadcasting standard DVB-T». 2007.
- [3] Ilchenko, Naritnik, Volkov. «Experience in implementation and modern technology trends in digital broadcasting standard DVB-T». 2010.