

SCREEN SERVICE BROADCASTING TECHNOLOGIES

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1 OPERATIONAL DESCRIPTION

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1.1 PURPOSE **Error! Bookmark not defined.**

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1.1 GENERALITY

Propagation is a critical issue in ATSC / ATSC-MH / Mobile TV broadcasting. In this context, the use of repeaters for digital TV broadcasting becomes a key issue for commercial terrestrial distribution of digital TV. In addition, COFDM signal characteristics avert well known adjacent channel interference problems of analogue TV broadcasting. This leads to the SFN network planning: a single frequency is used all over the coverage territory, increasing spectrum efficiency. Therefore, in digital TV SFN networks iso-frequency repeaters are needed. An On-channel repeater is, basically, a radiofrequency repeater that receives and transmits using the same frequency. Traditional On-channel repeater use is limited by a hard design constraint: coupling between transmitter and receiver antenna limits the allowed maximum gain for the on-channel repeater, leading to a reduction of the coverage area: a traditional on-channel repeater installation is only possible if hard isolation conditions are complied. A on-channel repeater, with coupling echo cancellation system, allows operations at higher power levels under normal tower isolation conditions.

1.2 INTRODUCTION

SDT ARK-1 ECHO is a Multi-standard Television Transposer. Based on Software Defined technology, SDTX ECHO allows the definition of different operative modes on the same hardware platform. At the state of the art SDT ARK-1 ECHO has four working modes:

- Analog Television Heterodyne Transposer (based on NTSC);
- Digital Television Heterodyne Transposer (based on ATSC);
- Digital Television Heterodyne Transposer (based on ATSC) with echo canceller;
- Re-broadcasting ATSC / ATSC-MH Modulator (based on ATSC).

Analog and Digital Television Heterodyne Transposers receive and re-transmit Analog or Digital TV signals allowing the software setting of input and output channels. Re-broadcasting ATSC / ATSC-MH Modulator receives and de-modulates ATSC / ATSC-MH signals and re-modulates them. Auxiliary inputs and outputs allow to import and export TS contents on ASI and GBE interfaces. The single software controller allows the switching between working modes and different settings for each operative mode using the same platform. A brief description of the main features and potentialities of each operative mode follows.

1.3 ANALOG/DIGITAL TELEVISION HETERODYNE TRANSPOSER

Heterodyne Transposer with Digital Filtering at Intermediate Frequency for Analog (NTSC) and Digital (ATSC) Television standards. Capable of:

- Agile UHF input Down-converter (from 470 MHz up to 862 MHz)
- Agile UHF output Up-converter (from 470 MHz up to 862 MHz)
- Input Analog/Digital signal level monitoring with quality measurement for ATSC
- Digital Filtering at Intermediate Frequency
- Echo canceller for Digital signal

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- AM/PM Software Pre-correction power and frequency calibrated for Digital and Analog signal .

1.4 DIGITAL TELEVISION HETERODYNE TRANSPOSER WITH ECHO CANCELLER

Heterodyne Transposer with Digital Filtering at Intermediate Frequency for Analog (NTSC) and Digital (ATSC) Television standards. Capable of:

- Agile UHF input Down-converter (from 470 MHz up to 862 MHz).
- Agile UHF output Up-converter (from 470 MHz up to 862 MHz).
- Input Analog/Digital signal level monitoring with quality measurement for ATSC
- Digital Filtering at Intermediate Frequency.
- Echo canceller for Digital signal.
- AM/PM pre-correction calibrated on channel and power ranges for Digital and Analog signal with manual modeling of the curves on Java GUI.

1.5 RE-BROADCASTING DVB-T/H MODULATOR

ATSC /ATSC-MH Modulator with ATSC de-modulator for Digital (ATSC) Television standard. Capable of:

- Agile UHF input Down-converter (channels 21 to 69)
- Agile UHF output Up-converter (channels 21 to 69)
- Input RF signal level monitoring with quality measurement
- Input ATSC dual de-modulator ATSC / ATSC-MH compliant hierarchical modulation supported
- Auxiliary Transport Stream inputs on ASI (EN-50083/9) or Gigabit Ethernet (Pro-MPEG cop 3)
- Modulus/Group Delay Software Pre-correction
- AM/PM Software Pre-correction