

# DIGITAL TELEVISION BROADCASTING

DVB - ATSC - ISDB

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A new era in TV Broadcasting has dawned with the introduction of Digital Television Broadcasting.

Whether via Satellite and Cable or by Terrestrial Transmission to existing antennas, Digital TV is revolutionising TV transmission.

Definitive standards have been carefully considered, debated and optimised through field trials in some cases over several years and the various delivery platforms are the subject of recognised ITU international standards. Satellite digital TV, both DTH (Direct To Home) and via Cable distribution, has started in various countries, both east and west. Digital Terrestrial Television (DTT) is being considered by many national broadcasters around the world its a popular choice as existing domestic receiving antennas can be used and in some countries is already on air.

Digital Television brings many new features, compared with traditional analogue broadcasting:

## **SPECTRUM EFFICIENCY**

A single satellite transponder can beam up to 10 digital TV channels, with high quality stereo sound, to a wide area.

On digital terrestrial transmitters, from 4 to 6 standard definition channels can be multiplexed and broadcast on just a single standard RF channel

## **DATA TRANSMISSION**

Data, some 2 Mb/s, can be transmitted simultaneously with the TV pictures. The data can be picture related (teletext) or it can be software or an Internet channel for home PC use true multimedia. There is plenty of flexibility and scope for future developments.

## **LOWER POWER OPERATION**

Featuring much lower radiated power for the same coverage compared with analogue transmission, DTT offers further enhancements to transmission when using the COFDM standards. The European DVB-T standard and the Japanese ISDB standard are examples of this technology. The American ATSC standard (8-VSB rather than OFDM), also offers significant power economy.

## **SUPERIOR PICTURE QUALITY**

These digital systems can be used for standard (better than analogue) or High Definition TV by appropriate allocation of bit rate capacity.

The COFDM systems (DVB-T and ISDB) virtually eliminate multipath distortion and delayed image problems. This improves significantly reception in mountainous, urban and sea areas. Spectral efficiency is also enhanced, through the use of Single Frequency Networks (SFNs).

ABE a leading manufacturer in this field, is poised to contribute to this technology, offering equipment able to be used on all main platforms.

Technical Note

## TV TRANSMITTERS

ABE has now produced and supplied many thousands of analogue TV transmitters to broadcasters all over the world. The latest in this line of products feature high power solid state amplifier technology which is fully “state of the art” with efficient Class AB operation, MOSFET and LD-MOS technology and comprehensive linearity precorrection.

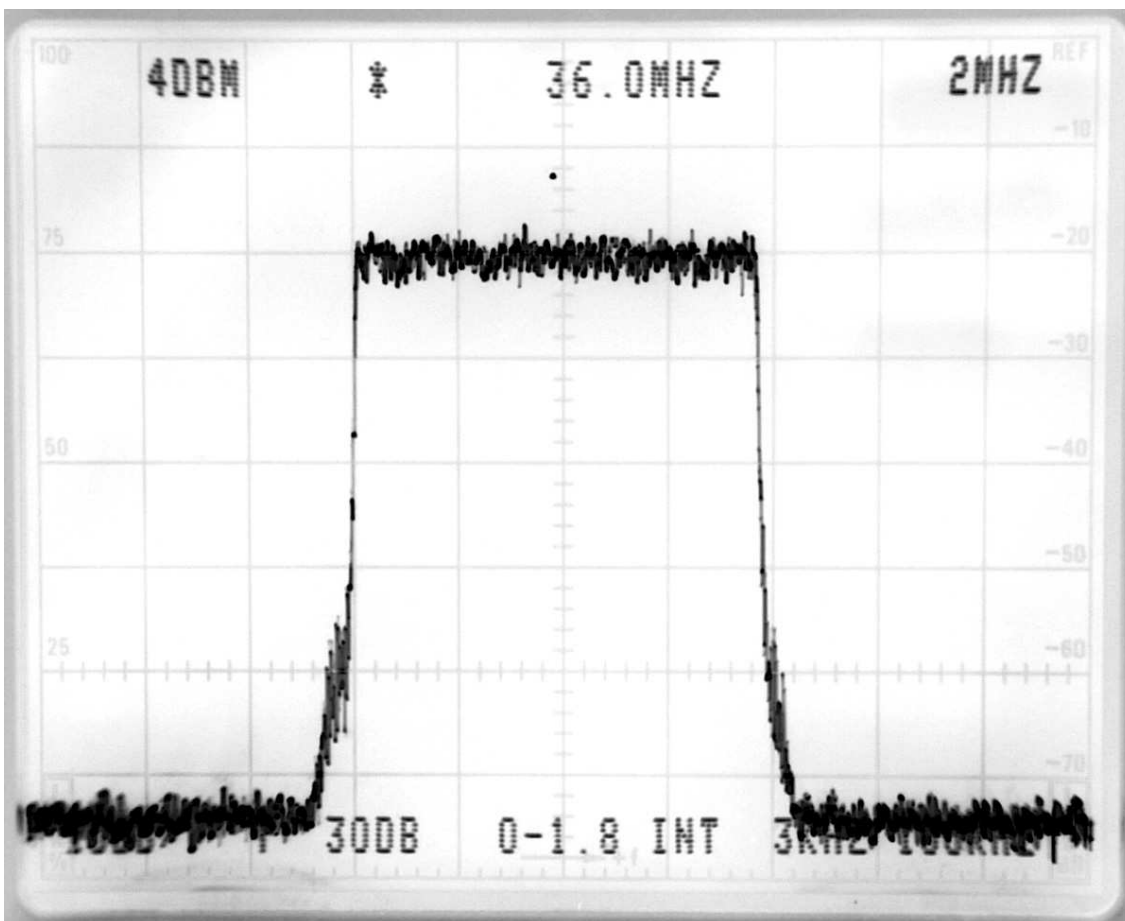
Now, refinements to these features have ensured that ABE transmitters are “digital ready” for the VHF or UHF TV bands, as well as for 2 GHz AM MMDS.

Tests with digitally modulated signals have shown that ABE Transmitters can be easily implemented in versions for either COFDM or 8-VSB operation, as in the European DVB-T or the US ATSC digital TV systems, respectively.

The supply of new digital ABE terrestrial transmitters, and the upgrading of most existing analogue ones for DTT use, will therefore be a straightforward matter, involving the addition of a suitable digital modulator, low phase noise/high stability local oscillators, and the application of the required degree of linearity correction, with output filtering, to comply with MER (Modulation Error Rate) and band spectrum specifications.

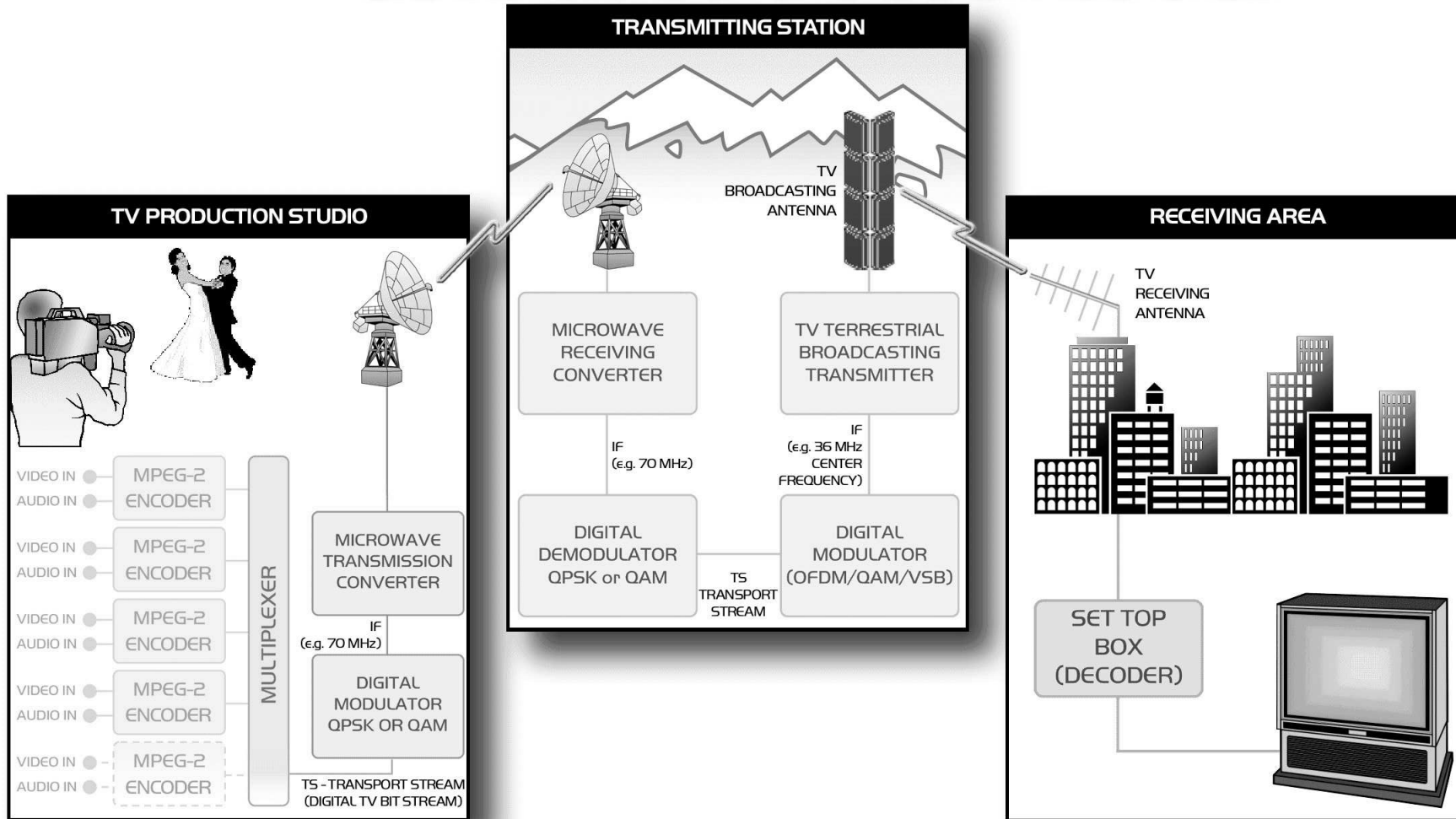
ABE’s precision synthesised local oscillator system is also available, enabling a network of digital transmitters to be locked to the universal GPS standard, using an inexpensive receiver. This is especially suitable for SFN implementation.

ABE policy of continual development ensures a high degree of “future proofing” as well as a large measure of “backward compatibility”.



# Technical Note

## DIGITAL TELEVISION BROADCASTING SYSTEM



## MICROWAVE LINKS

ABE manufactures a very cost effective range of Microwave Links which can be adapted for either fixed or portable use at frequencies which range from 1.5 GHz to 24 GHz.

Digital Links for transporting digitally modulated signals; those using QPSK (Quadrature Phase Shift Keying) or QAM (Quadrature Amplitude Modulation), require a higher order of linearity than do conventional FM links. With QAM modulation particularly, the carrier can assume a potentially large number of phase and amplitude states, so the phase and amplitude linearity of the link transmitter and receiver are required to be of a higher order than for FM analogue links.

Also, excess phase noise prior to demodulation can give rise to an increase in the Bit Error Ratio (BER).

Summarising, the main differences of digital compared with analogue links:

- Digital Modulator and Demodulator are required, suitable for the digital system to be used, to interface at IF (normally 70 MHz);
- A higher degree of phase and amplitude linearity is required in the RF part of the link system;
- Lower phase noise, with better frequency stability, is required in both transmitter and receiver local oscillators;

ABE employs only linear Class A amplifiers in Link transmitters and receiver front ends. New series Links are available without limiters (which would introduce non linearity) and with high local oscillator performance.

Both fixed and portable links can be supplied with either digital or analogue modulators and demodulators. Because both types employ 70 MHz IF interface, customers can upgrade from analogue to digital at a later date, therefore an initial investment in a "new series" ABE analogue Link system may be regarded as a future proof investment.



**ABE ELETTRONICA S.p.A.**  
Via Leonardo da Vinci, 92  
24043 • CARAVAGGIO (BG) • Italy

Tel. +39-0363-351.007 • FAX +39-0363-50.756  
[www.abe.it](http://www.abe.it)