

Move up to the next level!

The future of digital broadcasting is in your hands!

Final round exercises

Introduction

- I DVB-T2 field trials are already underway in some countries. Regular DVB-T2 operation is starting up in the UK, Finland and Italy. And it will soon be launched in Sweden as well.
- I Transmission and reception equipment is already available. But development of T&M equipment is incomplete or is just getting started.



Exercises

- I Define the requirements for DVB-T2 T&M equipment. This equipment should serve to "harass" and test DVB-T2 receivers with the required receive scenarios, to measure the quality of transmitters and to measure the real reception situation at a specific location in the field.
- I The following tasks are related to questions that T&M developers and product managers must ask when defining T&M equipment for the DVB-T2 environment.
- I Based on these questions, create an appealing presentation that will convince your customer to give you the budget needed to develop the various products. Your presentation should impart the complexity of DVB-T2 and similar standards.



Exercise 1 (11 points)

- I Describe which customer groups need what T&M equipment for DVB-T2. This can also be in the form of a diagram.



Exercise 2 (9 points in total)

- I Define the test requirements for a DVB-T2 receiver in consumer devices. → 6 points
- I Describe the test setup. → 3 points



Exercise 3 (3 points in total)

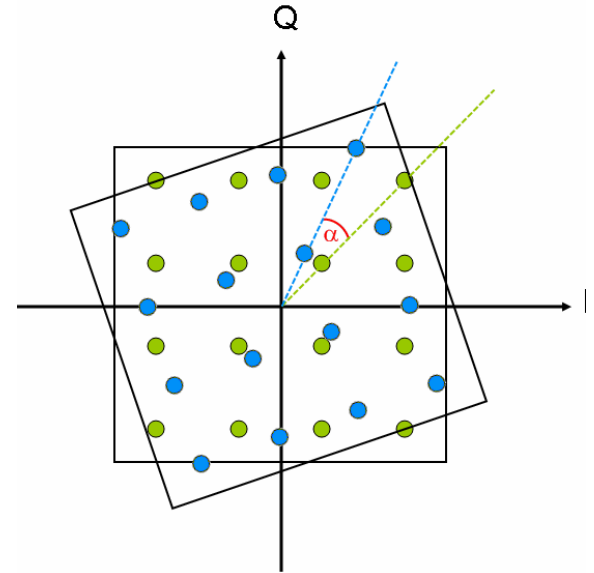
- I What special advantages does MISO have in DVB-T2 compared with DVB-T networks? Explain your answer. → 2 points
- I How does the MISO principle used in DVB-T2 differ from the standard MISO principle? → 1 point



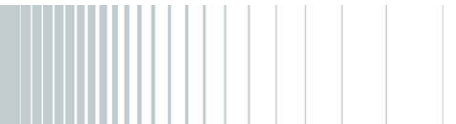
Exercise 4 (11 points in total)

DVB-T2 lets you use rotated and Q-delayed constellation diagrams.

- I Derive the optimal tilt angle α for 4QAM, 16QAM, 64QAM and 256QAM. → 9 points



- I Why do the angles deviate from the tilt angles defined in the standard? → 1 point
- I Explain the advantages of this new process. → 1 point



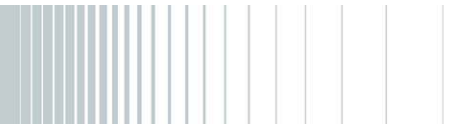
Exercise 5 (4 points)

- I Describe what test parameters are used for checking and acceptance testing of DVB-T2 transmitters.



Exercise 6 (2 points)

- I What special circumstances are to be expected during DVB-T2 network planning (MISO, guard)?



Exercise 7 (3 points in total)

A customer (network operator) wants to set up a DVB-T2 network that should include services for portable indoor and high-data-rate roof antenna reception in one channel in a large SFN.

- I What transmission parameters would you select? → 1 point
- I What transmission parameters would you select to simultaneously use mobile and indoor capability in one channel? → 1 point
- I What is the conflict between large SFNs with high data rates and mobile reception? → 1 point



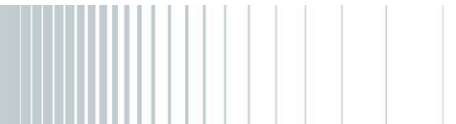
Exercise 8 (5 points)

- I Define the coverage measurement requirements (test parameters) placed on a DVB-T2 test receiver.



Exercise 9 (3 points)

- I Find out what DVB-T2 receivers and receiver chips are already available on the market or have been announced.

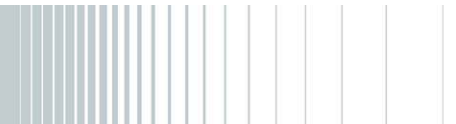


Exercise 10 (4 points in total)

Compare DVB-C2 with DVB-C and DVB-T2.

- I What do you notice in particular? → 2 points

- I What is new or different compared with the other two standards?
→ 2 points



Exercise 11 (7 points in total)

Around the world, there are still many countries that only have analog TV operation.

I Which countries? → 1 point

Many of these countries are looking into currently existing digital terrestrial TV standards.

I Which standards? → 1 point

I Compare these standards by clearly stating their weaknesses and advantages. → 2 points

Analog TV standards vary worldwide.

I What are the main differences? → 1 point

I Which difference still affects digital TV today and where does it originate? → 1 point

I How does this affect T&M technology? → 1 point



Exercise 12 (6 points in total)

Ever since "Avatar" came out, everyone is talking about 3D. For this reason, a network operator wants to use DVB-T2 to broadcast 3D HD TV.

- I Does this inevitably lead to a higher data rate? In this context, explain the possible 3D image formats that can be used today for TV transmissions. → 1 point
- I What coding methods are used (today / in the future)? → 1 point
- I What are the various technologies used to simulate 3D in the cinema and in TV? Briefly explain the principles and list the main advantages and disadvantages of these technologies. → 4 points



Now get going – and good luck!

Each of the twelve exercises can normally be solved independently of the previous ones.

Most of the exercises do not require complex calculations.

We hope you enjoy solving these exercises and wish you the best of luck.

