

Response to

Media Development Authority (MDA)

and

Info-Communications Development Authority (IDA)

of Singapore

**PUBLIC CONSULTATION ON THE INTEGRATED RECEIVER
DECODER FOR USE WITH THE SECOND GENERATION DIGITAL
TERRESTRIAL AND TECHNICAL SPECIFICATION FOR THE
TELEVISION BROADCASTING SYSTEM**

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1. Introduction

MEDIA BROADCAST appreciates the opportunity provided by the Media Development Authority (MDA) and Info-Communications Development Authority (IDA) of Singapore to give its view on the technical receiver specification IDA TS IRD-T2 Issue 1, September 2012 [Revision: 0], i.e. Technical Specification for Integrated Digital Receiver for use with second generation Digital Terrestrial Television broadcasting system (DVB-T2), for future DVB-T2 reception.

MDA selected MEDIA BROADCAST as technical advisor and project manager for the planning, creation, and operation of a trial network in DVB-T2 standard in 2011/2012.

In the DVB-T2 trial, crucial system parameters for the roll-out of a DVB-T2 transmitter network to provide the island city state with digital television in future – optimised for indoor and portable reception with excellent sound quality and crystal clear pictures in high-definition resolution (HDTV) has been determined.

The core objectives of the trial included:

- Development of recommendations for the creation of technical infrastructure,
- tests of technical components for signal transmission chain,
- compilation of transmitter parameters for the network,
- development of coverage prognoses,
- provision of a detailed cost-benefit analysis, and
- proposal of basic DVB-T2 receiver parameters.

In general, MEDIA BROADCAST considers the draft receiver specification being eminently suited to comply with Singapore's plans to deploy a digital terrestrial television network based on DVB-T2. Therefore, only selected points with direct reference to the outcome of the DVB-T2 trial will be commented.

2. C/N Performance Requirements

DVB-T2 performance requirements in Annex D have been defined for the same reception scenarios and the same DVB-T2 modes that have been tested in the trial for fixed outdoor reception and for portable indoor reception (PLP0 to PLP3), respectively.

Measured C/N figures of both reception scenarios were a major outcome of the DVB-T2 field trial in Singapore. Table 1 summarizes the C/N performance on both, Gaussian channel and 0dB echo channel of Annex D of the receiver specification, and the appropriate mean C/N figures as derived from the trial.

	Fixed Outdoor Reception	Indoor Reception	Indoor Reception	Indoor Reception	Indoor Reception
Identifier According to Receiver Specification	SG1	SG2	SG3	SG4	SG5
PLP in Indoor Field Trial		PLP0	PLP1	PLP2	PLP3
C/N Performance on Gaussian Channel (dB)*	20.4	14.8	16.2	17.7	19.4
C/N Performance on 0dB Echo Channel (dB)*	24.6	18.0	19.7	22.0	23.1
C/N Performance (mean) Measured in Trial (dB)	23.3	17.3	18.1	19.8	21.5

Table 1: Comparison of C/N performance according to receiver specification with C/N performance measured in DVB-T2 fixed outdoor and portable indoor reception tests.

Measured mean C/N values are within the defined parameters, although closer to the “worst case” figures of a 0 dB Echo Channel.

3. Noise Figure

With respect to receiver parameters, i.e. the Receiver Noise Figure (Rx NF) has been discussed with MDA during the trial. Although MEDIA BROADCAST measured receiver Noise Figure of more than 11 dB for professional equipment, commercially available reception devices usually provided a significantly better performance. Taking into account timelines of network deployment and assuming further improvements of consumer equipment, a receiver Noise Figure of 6 dB is considered being appropriate.

Furthermore, the selection of the same Noise Figure by standardization committees in neighbouring markets like Malaysia and also in Europe (Nordic) allows manufacturers to realise economies of scales, thus encourages mass deployment of receivers at affordable cost levels.

4. Overall Receiver Specification Review

DVB-T2 receiver experts of MEDIA BROADCAST have intensively worked through the actual technical receiver specification, IDA TS IRD-T2 Issue 1, September 2012 [Revision: 0].

As a result of this review, MEDIA BROADCAST expresses its overall technical compliance with the abovementioned receiver specification with no further comment or addition needed.