



ASSOCIATION OF RADIO INDUSTRIES AND BUSINESSES

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**THE COMMENTS FOR THE SPECIFICATIONS AND PROTOCOL
FOR FIELD TESTS OF THE STANDARDS OF
TERRESTRIAL DIGITAL TELEVISION IN CHILE**

Tokio, Japan, July 11th, 2007

ARIB

(ASSOCIATION OF RADIO INDUSTRIES AND BUSINESSES)

DiBEG

(Digital Broadcasting Experts Group)

We highly appreciate to compare the transmission characteristic of the three Terrestrial Digital Broadcasting terrestrial television broadcasting system candidates (ATSC, DVB-T, ISDB-T) by the field test. We are expecting that the comparative test should be fairly and impartially implemented and tested. We hope that an excellent system would be chosen, which has the best transmission performance for the Chilean people.

On behalf of DiBEG/ARIB, we will give the following comments for your proposed specifications and Protocol.

1. The general aspects

First of all, concerning comparison test for system selection, we would recommend to take into account the function of the systems. There are many service possibilities by Terrestrial Digital Broadcasting, i.e. HDTV or SDTV, Multi-Channel Services, Data Broadcasting, Interactive Services, Mobile Reception and/or Handheld reception. It is very important to give priority to the user's requirements, as mentioned above for the selection of the digital TV system in Chile.

We believe it is important to take into account the portable/handheld reception as well as the fixed reception. As you know, ISDB-T is the only one transmission system in the world, which is capable for both services of HDTV (or Multi-SDTV) and portable reception simultaneously using one segment of a broadcast channel. In the comparison test, we believe



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that the portable reception should be implemented for comparing the performance in addition to the fixed reception. We understand the Chilean audience would require TV program & Information at outside too, i.e. beach, street, cafeteria and resort as well as in house.

We understand SUBTEL prepared the comparative test for fixed reception. Therefore we believe the fixed reception test should be the first priority and we proposed an Advanced Test on Mobile/Handheld Reception of “One-Seg” (One Segment) service and Mobile Reception of HDTV for supplemental purpose.

2. The individual items

Hereinafter, we will comment the Protocol for the field test of the three Terrestrial Digital Broadcasting Systems comparison, section by section.

2.1.1 The test signal

We agree to be compared in the same conditions as possible, because ATSC system only has a single transmission parameter and not flexible for the HDTV fixed reception. Therefore, we agree to choose the test signal near 19.39Mbps.

On encoding scheme of the image, the Protocol should specify MPEG2 for all systems, not MP@ML but MP@HL for HDTV, because we believe MP@ML should apply to SDTV Protocol.

Also, we believe that the comparative test in this time is the comparison of the Transmission System Performance and not Quality of Image. Therefore, we think that it is desirable to use a common encoder for all systems to avoid the difference of the encoder.

We recommend using the zone-plate for the transmission test to easily detect the defect on the image of HDTV for objective test.

As for the Audio Test, the Protocol specifies to evaluate the Sound System as Image System. We think it is enough to evaluate merely the image, because the data of sound are only to about 1/100 than the transmission rate of the image.

For sound system, we believe it is more important how it is compatible with Digital Radio System and how flexible is.

Further more, the Compression-Encoding scheme of the Sound is different from three



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systems. Among those three systems, we believe the best compression efficiency is AAC, which is adopted only in ISDB-T.

2.1.2 Modulator

We agree your Protocol to not use experimental modular, but Commercial Modulator for comparison test.

For transmission parameter set of ISDB-T system, except “Time Interleave”, we agree to your proposed parameter set. For “Time Interleave”, we proposed alternatives, that is I=2 (0.2 sec), because of the reasons written in (note-1).

8k(mode 3), modulation= 64QAM, FEC=3/4, GI=1/16, Time interleave, I=2(note)

(note-1) In your Protocol, I=1 is proposed, but we recommend I=2 for time interleaving; because in case of 8k mode (mode 3), delay time of I=1 and I=2 is same, so now in Japan, I=2 is used for commercial broadcast service.

2.1.3 Selector in low power stage

We basically agree your Protocol that signals should be switched at the input of Power Amplifier stage (Low Power Stage).

But, it is not confirmed that your proposed operation, instantaneous switching at low power stage, works well. Generally, Power Amplifier operates with AGC mode by feedback loop, therefore, at signal switching, signal level might extremely change, and it may cause some unusual and unstable effect.

We ask you to show detail diagram of Signal Switching Part, and recommend you to check such procedure and prove that this works without any problem before comparison test.

2.1.4 Power amplifier

We agree your Protocol that comparison test should be done with the same level of



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R.M.S., root mean square power and that you describe the definite value in the Protocol.

For set up of the output power, level should be decided within specific range to satisfy the good Performance of each system.

2.1.5 Transmitting antenna

We agree your Protocol to use the same antenna and to transmit with the same ERP for three systems in test.

We request you to add following information, as a reference, which three proponents should agree before testing:

- (a) Polarization of transmitting signal (vertical or horizontal),
- (b) Feeder loss from transmitter to transmitting antenna,
- (c) Transmitter antenna gain,
- (d) ERP of maximum radiation direction,
- (e) Transmitting antenna height,
- (f) other specifications

2.2 Selection of measurement points

2.2.1 Selection of location

2.2.1.1 Outdoor location

We recommend that three Terrestrial Digital Broadcasting Systems be measured at the same point (exactly same antenna point), and not to measure at different point within 50m circles.

We propose to select measuring points, not only “Good Receiving Condition” points, but also “Not so Good Receiving Condition” points, because, for Terrestrial Broadcasting Service, there are many critical points suffering from several interference, such as, Multi-path (signals bounces), Urban-Noise, etc. In other words, it is very important to know “Not so Good Receiving Condition” points in Chile, because there are lots of audiences in “Not so Good Receiving Condition” points than in “Good Receiving Condition” points.

In an urban area, such as the city of Santiago, many cases written in the followings



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should be taken under consideration:

(1) Under the multi-path condition:

In city area, there are many tall buildings and some mountains and hills; it is difficult to see through transmitting antenna directly. It causes the degradation of receiving quality in case of analog service; therefore, it is necessary that following areas must be chosen to prove the robustness with Multi-path condition;

- (a) Behind the tall buildings,
- (b) Under the highways,
- (c) Behind the hills or mountains, etc.

(2) Urban noise:

Car engine noise and electronic switching noise cause serious degradation against reception, these are called Urban-Noise. It is impossible to neglect these degradation factors for the urban area broadcasting service. Therefore, to prove the robustness against urban noise, following area should be chosen;

- (a) Near the heavy traffic roads,
- (b) At downtown,
- (c) Near the factories,

In addition, to rural areas, WE DO NOT FRGET that there is many audience in the areas where is the fringe of the border of reception. They would require the social information by Terrestrial TV.

2.2.1.2 Indoor location

As for the same reasons described in 2.2.1.1, similar kinds of locations should be chosen.



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In addition to the mentioned above, the lower floor of buildings should be chosen especially in urban areas to verify critical receiving points.

2.3 Reception

2.3.1 Receiving Antenna

We agree with using the same receiving antenna for three TERRESTRIAL DIGITAL BROADCASTING transmission tests. But, the antenna gain of 9 dBi seems to be low. We recommend using more elements with Yagi type Antenna of high gain.

In the ITU-R "DTTB handbook (Ver. 1.01)"(**note-2**), receiving antenna height of 10 meters from the ground level is recommended. In order to compare the result measured in Japan and measured by the Mackenzie University in Sao Paulo, we propose that you measure the performance at the receiving antenna height of 10meters.

(**note-2**): "ITU-R recommendation P.1546: Part2, Planning Part, Chapter 4 - Coverage, 4.1.1.1 Fixed, antenna reception (Page 163)" describe it as follows:

4.1.1.1 Fixed antenna reception

Fixed antenna reception is defined as reception where a directional receiving antenna mounted at roof level is used. It is assumed that near-optimal reception conditions (within a relatively small volume on the roof) are found when the antenna is installed. In calculating the field strength for fixed antenna reception a receiving antenna height of 10 m above ground level is considered to be representative.

2.3.2 STBs (Set Top Box or adapter)

Although we respect the STB selection methodology, described in your document, we request that you should reconsider including the use of the receiver recommended by each standard too.

From already, STBs price do not depends of the standard, but of functions and features of each of them, such as quality of Image (HDTV or SDTV), Data Broadcastings, LAN Connection, number of Tuners integrated, etc. To avoid possible confusions, we want to clarify



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that there will always be available the right suitable products to the constituted market. If really ISDB-T receiver's market are constituted in the Chile, and if there is an economical priority, then it will be provided with the proper devices, according the choice of your country.

It is remarkable that several STB models were launched recently in Japan, pointing to satisfy the demand to enlarge the useful life of the existing analog televisions, even though after the "Switch Off" of the analogue terrestrial transmissions expected by July of 2011. The same STBs might be sent not only to Chile, but to the entire ISDBT markets in South America.

We do consider that the priority must be the selection of the technologically best standard, looking its stable and long-lasting implementation for beyond 30 years, which will determine the Digital Life Quality for All the Chilean citizens. Therefore tests must not be limited, to cause of the selected STBs, just because of its present price, but using the best performance receivers which each transmission system potentially has.

2.3.3 Measuring vehicle

We recommend you should measure the performance at the receiving antenna height of 10m. Therefore, the antenna mast needs to exceed 10meters high from the ground level.

A high-resolution HDTV monitor should be used for the assessment test. You should specify cable's connection and interface between the STB and the monitor. We recommend the HDMI interface as the best performance.

2.4 Measurement

2.4.1 Measurement items

ITU-R subjective assessment methods for image quality described in your Protocol are assessment methods for Analog TV Broadcasting. We believe that it is not suitable to evaluate the transmission error for Terrestrial Digital Broadcasting. In Terrestrial Digital Broadcasting, the "Block Error" occurs on the screen if the transmission error occurs. For example, it is a general method evaluation to count how many times "Block Errors" or "Block Noise" occurs in some observation time duration (for example, time duration is two minutes). Concretely, we think that it is suitable for you to adopt a Five-Grade Scale assessment method that no error on screen is evaluated as 5, a little error on screen is evaluated as 4, some errors on screen are



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evaluated as 3, many errors on screen are evaluated as 2 and freezing on screen is evaluated as 1.

In Terrestrial Digital Broadcasting, if the “Block Error” or “Block-Noise” occurs even a little, it is supposed that the receiving site is the border of the Terrestrial Digital Broadcasting service area by cliff effects.

Moreover, we propose to measure the MER value as an objective evaluation by using the measuring equipment besides the above-mentioned subjective assessment. If you measure the MER value, you will objectively verify the result of subjective assessment and reception threshold by adding white noise.

2.4.2 Measurements documentation

The Image of spectrum waveform for the received signals is necessary, as one of the recording data. We propose that these data should be attached to final report, so it will be visually easier to understand.

3. Test certificate

3.3 Test duration

We believe that the time of total observation of five minutes is enough to determine the subjective level of quality of the signal for each standard at each point.

We believe the measurements at many different locations are more important than the time of total observation. We request you to reconsider the duration of the test.

3.5 Measurement Procedures

3.5.1. Positioning of the antenna at outdoors

For the measurements In/Out-doors, we recommend the measurement points to be fixed not only in optimal reception points, but also in critical points, including downtown areas affected with traffic automobile noise, in valley between tall buildings or mountains affected by reflected waves, because, as we have appointed in 2.2.1.1 “Outdoor location”, there are many



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critical receiving points in actual environments than good receiving points. We believe that robustness is the most important factor to decide the digital system selection.

3.5.2. Positioning of the antenna at indoors

According to 3.5.3 “Measurements of each standard”, b) of item 2 “To fit the receiving antenna”, it is defined that one should avoid as much as possible the movement of people in the proximity of the antenna, as well as connection and disconnection of household-electric apparatuses.

We agree to these methods, because it is useful to maintain equal conditions to obtain the reception data for fair comparison

However, in actual viewing environment, it is impossible to eliminate any affection such as the movement of people, noise of household-electric apparatuses.

We recommend that indoor measurement should be obtained not only under the static environment but also in actual environments, for practical service confirmation of the performance. You can understand what happens in actual receiving on screen.

3.5.3. Measurements of each standard

We would like to recommend how to determine the antenna direction adjustment. We believe that to save measuring time that merely reception signal-strength and spectrum waveform capture data are sufficient to determine the satisfactory reception points. Those objective data should be recorded for verification.

3.5.4. Specific aspects of each standard

According to the ISDB-T parameters defined here, they are different from 2.1.2 modulator parameter defined the ISDB-T. It seems a typographical error.

We propose that ISDB-T parameters should be 8k as well as Mode 3 in Japan, 64QAM, GI=1/16,I=2 as well as 0.2Sec for the consistency in the Protocol.



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Our comments are the above mentioned. If you have any questions or requirements, Please do not hesitate to contact me and/or to ARIB / DIBEG for any additional comments regarding this document.

ARIB /DiBEG appreciate the evaluation test to be conducted by SUBTEL. We therefore expect to be a successful, fair and impartial Protocol for the field test to all system candidates.

From now on we compromise ourselves to give priority to contribute to Chilean People upcoming Digital Life, considered “Amigos of the Pacific”.

Sincerely yours,

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