



AUSTRALIAN
DIGITAL
TESTING

**This report has been prepared for
Australian Broadcasting Corporation**

TST1 Audio description transport stream testing

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Issue and Approvals

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Distribution

This test report was prepared for Australian Broadcasting Corporation (ABC).

Location of the Test

The tests were carried out at the Australian Digital Testing Pty Limited (ADT) testing facility at Glendenning. The testing was conducted during March ~ April 2012.

The ambient temperature at the time of the test was $22 \pm 2^{\circ}\text{C}$.

Quality Assurance

ADT has a quality management system accredited to the AS/NZS ISO9001:2008 quality management standard – certificate number 14116. The quality management system is audited by NCSI.

Disclaimer

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This Test Report will always reflect the results obtained at the time of the test and cannot be used to predict or guarantee future developments or changes.

References and links to internet sites may be provided in this report as an information service only and should not be construed as an endorsement. ADT accepts no responsibility for any harm or loss caused by or in connection with access to any internet sites referred to in this report.

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Executive Summary

The summary of the results for the playout of the AD stream to the 165 DVBT receivers in ADT's receiver collection is as follows:

Receivers with AD capability correctly responding to the AD audio	20
Receivers with AD capability not correctly responding to the AD audio	nil
Receivers without AD capability present normal audio in preference to AD audio	129
Receivers without AD capability present AD audio in preference to normal audio	16

The sixteen DVB-T receivers without AD capability that presented AD audio in preference to normal audio exhibited one of three types of anomalies, set out at page 11 of this report.

All but one of these sixteen receivers were able to be reset from AD audio to main audio by pressing the 'audio' button on the remote control. However the Digicrystal DTG-9200 was only able to play the AD audio.

Scope of work

ADT was commissioned by ABC to report on the playout an ABC transport stream with AD audio (ABC AD stream) to the ADT receiver farm to ensure that:

- 1 Receivers with AD capability respond correctly
- 2 Receivers without AD capability do not present the AD audio in favour of the main audio stream.

On 24th February 2012 ABC provided ADT with a CD data disc containing the Audio Description (AD) transport stream.

Initial evaluation of the AD stream showed that ABC had missed the descriptor called Extension descriptor. The descriptor is located in PMT and has a tag value 0x7F. It is used to signal audio description as defined in ETSI EN 300 468(V1.11.1), Appendix J.4.

A fourth disk was provided on 6th March 2012. This disk contained an amended AD transport stream.

The stream was played out to 165 models of DVBT receivers from a total of 52 different manufacturers.

One STB (Samsung DTB-H550F) was supplied by ABC on 4th April 2012. This STB was reported by ABC to be only playing the audio description.

Supplied files

Disk 1

Disk 1 has a hand written label:

‘OFF AIR –
DTV –
Rabs – VAST
Audio Description’

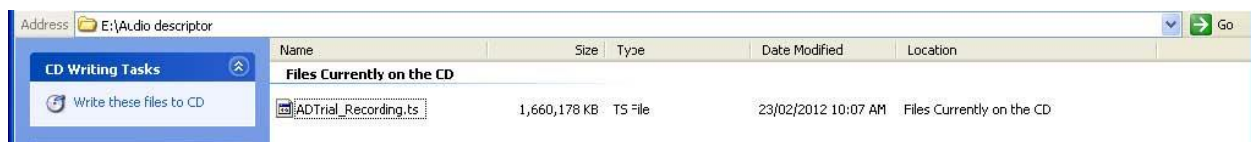
The disk contained the following folders:

Figure 1 – Disk 1 folders



The ‘Audio Description folder’ contained the following file:

Figure 2 – Disk 1 file

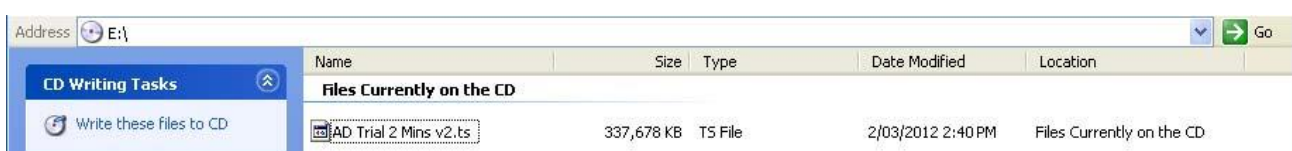


Disk 2

Disk 2 has a hand written label:

‘Audio Description 2 min’ The disk contained the following file:

Figure 3 – Disk 2 file



Test Methods and Analysis

ADT has developed test methodologies to perform the required AD stream testing. These methodologies and ADT quality management procedures were followed.

Methodology

1. Set the DekTec DCT300 StreamXpress Transport Stream Player to the following parameters:
 - DVBT Frequency: 816.5 MHz
 - Bandwidth: 7 MHz
 - Constellation: 64-QAM
 - Hierarchy: Non-hierarchical
 - Interleaver: Native
 - Guard Interval: 1/16
 - Code Rate: 3/4
2. Play the ABC AD stream and tune each DVB-T receiver
3. Play the DR transport streams out to each DVB-T receiver in turn
4. Observe each DVBT receiver to see whether it responds correctly to the stream
5. Record any unexpected receiver response

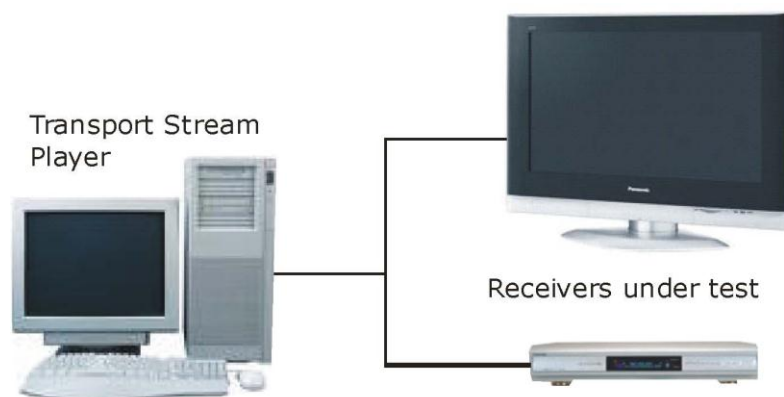
Test equipment required

Table 1 – Test equipment

Description	Example
Multiplexer	DekTec DTA-112
Transport-Stream Player	DekTec DTC-300 StreamXpress

Test set up

Figure 4 – Test setup



Observed Results

Observed effect on receiver farm

Each receiver in the ADT receiver collection was checked and verified that it was tuned to ABC TV.

The ABC AD stream was played out to each receiver in turn.

All receivers within ADT's receiver collection that were known to be AD capable (see Table 6) were able to correctly present the ABC AD stream, with both main and AD audio.

Anomalies

The sixteen DVB-T receivers without AD capability that did not correctly respond to the ABC AD stream exhibited one of three types of anomalies.

Audio description only – no reset

In this case the receiver could only play the AD stream and the normal (or main) audio stream could not be heard. ADT was unable to reset or adjust the receiver to obtain normal audio.

This anomaly affected the following receiver:

Table 2 – Anomaly 1

Digicrystal	HDT-9200	STB
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Audio description only – reset method 1

When the AD channel was selected and AD was turned on the only audio available was the AD stream – the normal stream audio was not available. Changing to another channel and then back again resulted in the normal audio stream being correctly played in preference to the AD stream.

This anomaly affected the following receiver:

Table 3 – Anomaly 2

Pixel Magic	MTV3700	PVR
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Audio description only – reset method 2

When the AD channel was selected and AD was turned on, the only audio available was the AD stream – the normal audio was not available. Using the “Audio” button on the remote control allowed the user to switch between the AD stream and the normal audio stream.

The Samsung STB provided by the ABC could be switched to AD play-out only using the “Audio” button. However it was necessary to change channel and then back again to switch back to normal audio.

This anomaly affected the following receivers:

Table 4 – Anomaly 3

Bush	DTFA10HD	STB
Bush	DTFA14HD	STB
DGTEC	HD-03	STB
DGTEC	HD-0390	STB
DGTEC	HD-3800	STB
Digicrystal	SDT-1000EX	STB
Digitel	HD4000	STB
Grundig	GSTB3105HD	STB
Panasonic	QTR-1004	STB
Panasonic	TU-HD206A	STB
Panasonic	TU-HDT104A	STB
Samsung	DTB-H550F	STB
Soniq	QMD502H	STB
Voxson	HD50	STB

Findings

It was noted that the ADT developed AD transport stream worked on all receivers.

Comparison of the ADT and the ABC transport streams shows that the major difference between the two streams is that the AD in the ADT stream had a lower value PID (33) than the normal audio stream (34).

The ABC stream had the reverse: with the audio description PID having a higher value (141) than the normal audio (131).

AS4933.1 states “Receivers shall not assume any sequenced or ordered numbering of the PID values of various components of a service.”

The receivers in table 4, above, appear to have responded to the higher numbered PID, although the viewer is given the option of changing the audio service.

Appendix A

Receivers / manufacturers represented in the test

Table 5 – List of manufacturers

Aiko	ChangHong	Grundig	NextWave	Samsung	Tevion
Akai	Daewoo	Hills	Olin	Sansui	Thomson
Allure	DGTEC	Hisense	Palsonic	Sanyo	Topfield
Arista	Digicrystal	Hot Chip	Panasonic	Sharp	Toshiba
AWA	DIGITAL	JVC	Pangoo	Soniq	Uniden
Baumann Meyer	Digitalview	Legend	PBI	Sony	Voxson
Bush	Digitel	LG	Philips	Strong	Wintal
Celestial	DVX	MXT	Phoenix	TCL	
Centrex	Electroview	NEC	Pixel Magic	TEAC	

Table 6 – List of receivers with AD capability

Manufacturer	Model	Date	Type	Result
Bush	BHAS03	Jul-11	STB	Correct operation
Hills	HD94003	Jul-11	STB	Correct operation
Samsung	PS50B550T2F	Jun-09	IDTV	Correct operation
Samsung	LA40B650T1FX	Nov-09	IDTV	Correct operation
Samsung	LA37B530P7F	Nov-09	IDTV	Correct operation
Samsung	UA32C4000PD	Apr-10	IDTV	Correct operation
Samsung	UA55C7000WFC	Apr-10	IDTV	Correct operation
Samsung	PS50C451B2D	Feb-11	IDTV	Correct operation
Samsung	LA26D450G1M	Apr-11	IDTV	Correct operation
Samsung	UA46D550RM	Apr-11	IDTV	Correct operation
Samsung	LA46A950D1F	Nov-11	IDTV	Correct operation
Sony	KDL-40Z4500	Oct-08	IDTV	Correct operation
Sony	KDL-46Z4500	Oct-08	IDTV	Correct operation
Sony	KDL-22S5700P	Mar-09	IDTV	Correct operation
Sony	KDL-40ZX1	Mar-09	IDTV	Correct operation
Sony	40E4500	May-09	IDTV	Correct operation
Sony	KDL-46WE5	May-09	IDTV	Correct operation
Sony	KDL-32V4000	Jun-10	IDTV	Correct operation
Sony	KDL-40V4000	Jun-10	IDTV	Correct operation
Sony	KDL-32BX320	Apr-11	IDTV	Correct operation

Table 7 – Receivers by type

Type	Number
LCD	61
PDP	16
PVR	15
STB	73
Total	165