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laboratories



Leading the way in multimedia quality assurance

Faults With Digital Television Equipment In The Home

**Common faults, compatibility faults, how to find them,
and how to correct them.**

A White Paper from Testronic Labs

1. Problems your viewer sees... but you don't

Broadcasters, and manufacturers of set top boxes for television reception, conditional access, subscriber management and related functions in hardware and software all have their testing procedures to check new products and services. But Testronic Labs, as a result of their experience with some of the world's most influential companies in games, DVDs, movies, TV and distribution technologies, can find compatibility and functionality issues which are often only manifested on the end user's TV set.

2. Why do the operator's staff not see the faults?

Individual elements of the distribution chain all work fine in isolation. They are subject to service level agreements and other guarantees, so both the vendor and the operator are keen to check they work, and they do so. But what happens in the home when the equipment is connected up together and normal human beings are pressing the buttons? In the real world, compatibility issues between receiver and TV create significant usability problems. Neither the vendor nor the broadcaster is at fault. The elements in the distribution chain work fine on the bench, but not in the home. And no-one knows about the problems until consumers start phoning up... disaster.

3. Standards, chip set quality, incompatibility

Testronic Labs has found that the individual application of a transmission or connectivity standard is often at the core of the problem; our experience in certification in many areas of video and home technology gives us insight into these issues which individual manufacturers might overlook.

Components which work fine in the pre-production samples are often different in the final versions or perform to lower quality standards. And when items of equipment are connected up, the problems start. Let's look at 7 real live examples to illustrate the problems and how they can be solved.

Fault 1) HDMI Incompatibility

In a major European digital TV cable network, Testronic Labs found a major problem of HDMI compatibility between the set top box (receiver) and the TV set, both from highly respected manufacturers. HDMI (High-Definition Multimedia Interface) is a licensable compact audio/video connector interface for transmitting uncompressed digital streams. It's the digital manifestation of analog standards such as composite video, S-Video, SCART, component video and VGA. Symptom; After switching channels in certain combinations and sequences the audio disappeared. No more sound! We found that the pre-production version of the chipset, also from a major manufacturer, did not address the HDCP signals to spec and the receiver, which worked fine with some TV sets, failed with others. Solution; Inform the call centre, verify a practical workaround for the installed base, inform consumers and proceed to replacement of the chip set.

Fault 2) Unsupported Resolution in High Definition TV

HD Television sets have to be backward compatible with standard TV, so the set top box has to be able to support TV sets in the high def picture standards 720P, 1020i but also the standard def 567P. Symptom; we detected major problems in the roll-out of a cable operators set top box when using SD resolutions on many common HD TV sets, to the extent that the picture often got completely distorted. Solution; it was impractical in this case to change the equipment immediately but at least the operator was able to inform consumers of the problem and with which combinations of TV set and receiver it was likely to occur.



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Fault 3) Conditional access failure; wrong tiering

Symptom; in the case of a cable operator running a variety of pay TV packages, we noticed that viewers paying for certain tiers had access to the wrong package of channels. Solution; we identified the software glitches in the CA (conditional access) and in the SMS (subscriber management service) back office and helped the operator correct the problem.

Fault 4) Breakdown of Parental Control and VOD

In 21st century we are getting used to parents losing "control" of their children, but not often in a technical sense! Symptom; Testronic Labs' suite of tests identified for a cable operator that even when the parents of the home had switched on the Parental Control to barr their children from watching certain channels, the children could still get access to them without a password. In the same homes a movie ordered by one home (Video on Demand) could be viewed by the neighbouring home! Disaster. The problems were diagnosed to a simple fault triggering a more complex one; firstly the receiver had lost its return path to the head end (often by something as banal as cable getting pulled out if its socket for a short period of time) and secondly this caused the regional VOD servers to adopt an incorrect allocation of modem frequencies... the wrong home was subsequently addressed with parental control or VOD instructions. Solution: we supported the operator in correcting server and STB software and middleware compatibility issues. This was typical of the problems involved when different systems in SD, HD, SMS, CA, VOD are glued together. Each on its own works fine, but not together.

Fault 5) Too much spin

And you thought it was Tony Blair's government which was accused of too much spin! Symptom; in the case of a digital cable PVR (personal video recorder) deployed in a large cable network, we detected that in certain sequences of commands given through the remote to the PVR, the hard disk memory device would subsequently "spin up" unnecessarily and stay spinning. This caused heat and noise and would, if left unchecked, vastly shorten the life of the HD. Solution; Testronic Labs checked all possible usage scenarios and advised the operator and their technical services how to change the HD controller instruction set to prevent the unwanted spin.

Fault 6) Inferior components when mass produced

Broadcasters, operators and manufacturers are used to testing equipment prior to consumer introduction and "signing them off", i.e. accepting them. Vendor contract payments are often predicated on this sign-off. However, Testronic Labs insists on the need for repeat testing of samples after product introduction, when connected up in real situations. In some cases the chipsets and other components in the prototype are of the very highest quality. Performance is demonstrated as being acceptable, or better, and the operator is satisfied. We keep track of the timing of the development of components and the system to ensure the system continues to work as the operator specifies. Symptom; a small example demonstrates the point. Production models of a STB were causing blocking of the video. We found that the aerial connector of the production STB was of inferior quality and was not carrying some RF frequencies in the signal properly to the TV. Solution; the operator recalled the boxes and fitted a quality connector.

Fault 7: Channel set-up problems

Symptom; on a certain cable operator's set top box, the auto-install process failed to identify and tune the regional TV channels available from the regional server. Given that the consumer might not know that these channels were available it is unlikely that the fault would have been reported. This would not have been a massive disaster but it would have been a shame that the viewers could not see these channels. The problem was attributed to the specific format in which the viewer's geographical location with post code had to be entered at start. Solution; Testronic Labs helped the operator change the STB software to prompt for correct entry of the viewer's location.

All these examples show that small glitches, undetected in the normal course of events by the operator and their vendors, have quite negative effects at the consumer level. No picture, the wrong picture, no sound, the wrong channel... customer dis-satisfaction. We have the people and the skills to solve these problems. Check out our web site or call now to set a meeting. Please contact initially Eric Wilkinson, at Testronic Labs' London office below.

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