ATSC IS Top Down Process and Results

Introduction

This report documents the efforts of the ATSC Implementation Subcommittee to communicate a clearer understanding of the status of station implementations and the interface standards required for successful transition to digital broadcasting.

As broadcasters develop their plans for the rollout of digital television services, the extraordinary number of choices faced both between and within a given implementation scenario tend to be mind numbing. In an effort to speed the transition to digital television broadcasting, the Implementation Subcommittee of the ATSC undertook an effort to inventory the various systems and their interfaces that could potentially exist in a typical station, regardless of the chosen implementation scenario. This inventory was intended to serve as a guide of sorts to point to the standards that exist for equipment interfaces, identify potential conflicts between those standards, and identify areas where standards and/or technology need further development.

In order to place a reasonable boundary to this effort, it was agreed that the group would not deal with production and post-production suites, nor duplicate the current production of an NTSC studio. There would be direct interfaces to the existing infrastructures and interfaces to and from these existing facilities would be included. The group also agreed to establish an endpoint with the transmitted signal. While the issues of production, post-production and consumer equipment are certainly critical to the successful deployment of the DTV standard, the effort to create an inventory in these areas was identified as potential future work.

Why is This Work Important to the Individual Station?

The following report and attached system maps are generalized blueprints for not only construction of an early DTV facility, but are also a joint informal agreement by a number of industry manufacturers and end-user consultants, all of whom have worked in digital television for some time. For the station engineer this is a basic blueprint for their facilities. No station would build a facility as shown in the main system map, but rather would take portions of the map to meet their local requirements. Thereafter, the station engineer will have a suggested direction for further development over time and as their local needs dictate.

By establishing a single system map where all of the likely system elements and interfaces could exist, a commonality in design and functionality throughout the industry is established which does not only point the way for the early DTV adopters but also establishes a framework upon which to build and expand systems in the future. Setting the direction of expansion is important for station and manufacturer alike in order to have a cohesive, cost-effective, and orderly transition to DTV.

Meeting Overview and Methodology

Under the efforts of the IS-S3 Subcommittee on Station Issues an organization committee was established to plan and direct the meetings of these industry experts to achieve these objectives. To facilitate discussions at the March and June meetings, a drawing was made to identify all potential functional blocks and all potential interconnects that could exist in a station within the scope of our effort See Attachment A). By identifying all potential functions and interconnects, this map can be

confusing at first, given the amount of redundancy that would obviously exist. At the suggestion of several participants, a warning of "Don't Try This at Home" was added to alert those not familiar with the group's methodology that this drawing did not represent a single preferred embodiment.

While this "map" traced the signal flow through the plant, the committee recognized that similar maps for the timing plane, control plane and monitoring plane of a broadcast station needed to be developed. With this top-level map in hand, the gathering of the various industry experts could identify any missing functions and/or interconnects, as well as document the various implementations available for each interface – including relevant standards that existed in draft or final form. This effort of drilling down from the high level map gave birth to the title "Top Down Map Meeting". For the signal plane, the map was subdivided into various sections that could facilitate breakout sessions. Plenary sessions were used to share information between the breakout groups and identify any issues that needed cross-fertilization.

A multi-day industry event was planned to attract participants with relevant knowledge and experience. Participants included manufacturers experienced in digital television, network, group and individual station users, standards bodies representatives, and established industry consultants. The initial Top Down Map meeting was held in New York City on March 17th and 18th. This output of this meeting provided an excellent starting point in the creation of an inventory of interface standards and the issues that surround them. While significant progress was made, it was agreed that further effort was required.

A second Top Down Map Meeting was held, again in New York City, on June 22nd and 23rd. The Implementation Subcommittee requested this group to expand beyond the initial inventory and develop a series of recommendations on preferred embodiments for implementation of the standard. The group accepted as its goal to create one or more strawman approaches for the various elements in our scope of effort.

Findings

The sections that follow describe the efforts of each of the various subgroups that held breakout sessions. The groups are as follows:

Multiple Video Formats
Encoding and Multiplexing
Station Inputs and Outputs
Data Services
Redistribution
Audio
Control Plane
Timing Plane
Monitoring Plane

In each report, objectives and the scope of effort are defined and the methodologies employed are identified. Within each group report, their findings are documented with note of any modification to the reference map, identification of standards, and any other observations the group felt were compelling for those implementing the DTV standard.