



## **‘must see’ TV – a new flavour of local TV**

Monday 24<sup>th</sup> March was a notable date in the roll-out of Local TV across the UK, as it saw the successful launch of the second of the new channels. Mustard TV, based in Norwich and named in recognition of an historic connection with the local Colman family, followed Estuary TV as a new broadcaster on Freeview Channel 8. Transmitting from the Tacolneston tower and available to around 162,000 homes, Mustard now provides local output for four and a half hours every weekday evening.



### **A strong foundation**

Mustard, as part of the Archant publishing group, is based in the offices of the Eastern Daily Press and Norwich Evening News. Existing areas of the building were adapted to provide new broadcast facilities, including a newsroom, studio, gallery, green room, make-up and technical area. Co-location with the newspaper allows access to the established resources for

print journalism, which provides a strong foundation for the new television news operation.

### **Local TV with a strong Norwich flavour**

Local news, sport and current affairs programming form the backbone of the schedule. A 15 minute news bulletin, including sports and weather, is broadcast live each day at 17:30 and then repeated during the evening. A magazine programme - The Mustard Show - is pre-recorded in three parts, approximately 30 minutes in total, and then uploaded to Comux for playout from their Network Operations Centre (NOC). A



number of sports programmes, including ‘Three Up Front’, which focuses on Norwich City FC, are also produced each week, along with other documentary and local-interest programs.

## Technical infrastructure

Mustard's technical operation was designed around a Tricaster 8000. A green chromakey studio, with 'soft' sofa position for sports and magazine show presenters and a desk for the news presenter, is equipped with three studio cameras – one with an Autocue teleprompter on-camera unit and two smaller PTZ units. There are several edit workstations, using a mixture of Final Cut Pro and Premiere Pro software, and an EditShare storage network for the shared content.



## Workflow challenges

In the weeks leading up to their on-air date, Mustard faced a number of technical challenges in finalising a complete and effective workflow. Without a newsroom system it was proving time-consuming and inefficient to transfer individual scripts to the prompter and difficult to obtain accurate timing for the live and pre-recorded shows, which had to fit slots of pre-defined lengths. Without any automation, caption preparation was difficult in the short periods available between different production teams using the gallery. Access to recorded content, and play out of new material (e.g. breaking news), was awkward because items could not be copied on to or off of the Tricaster during live operation. Transcoding to the particular format required for upload to Comux was difficult, because although an edit suite could be used for conversion, the process took a relatively long time and prevented the edit suite from being used for other purposes whilst underway. Similar issues relating to accessing, converting and uploading content also affected the web-based catch-up service. After reviewing these separate challenges, aQ Broadcast was able to offer solutions for each one, by installing, configuring and, in some areas, developing two systems: the QNews newsroom computer (NRCS) software and AVS video server hardware.



## Direct interface – no MOS required

QNews provided a single point of integration to the prompter, immediately removing the need to send multiple individual files to the standalone prompter PC. It also provided full rundown management facilities, allowing programs to be planned and produced with the benefit of extensive timing information. Caption transfer was addressed by extending the existing QNews export capabilities to allow the CG templates required for a particular program to be loaded and populated automatically within the Tricaster GFX bin. This interface communicates directly with the Tricaster via its SDK protocol and does not require a separate MOS interface to operate.



## Solutions through configuration

The QNews and caption automation utilised existing functionality and only involved configuration, not special development, in order to resolve the technical challenges. By contrast, other elements missing from the workflow were addressed by introducing the AVS into the technical infrastructure and then carrying out five stages of development work to

modify and extend the existing firmware to tackle each aspect.

## Integration into the infrastructure

The architecture of the AVS has been designed to allow content to be transferred in to and out of its media volume while it is running, either remotely via a network connection or by transfer to and from a locally-connected USB flash drive. This makes it ideal for providing network access to media files which have just been recorded and for immediate playback of content which has just been generated or acquired from elsewhere. By making two simple infrastructure changes – connecting one of the AVS SDI video outputs to a spare camera input on the Tricaster, plus the analogue audio outputs of the same AVS port to a spare audio input, and by connecting one of the AVS SDI inputs (including embedded audio) to one of the HD outputs from the Tricaster – this type of immediate access immediately became more widely available to Mustard. The changes meant that it was now possible to record the Tricaster output onto the AVS and then make that content immediately available across the network, and also to copy content onto the AVS and then play it back immediately as part of the current program through the Tricaster – particularly beneficial for urgent material such as breaking news.



## Workflow optimisation through development

The AVS already had the ability to transcode content from one format to another, but this was implemented as an option on the asset menu for items which were already registered with the server's clip database. The first stage of the development work for Mustard was to implement new watch-folder handling, to allow clips in any supported format to be dropped into one folder, accessible across the network, for automatic conversion to the specific MXF OP1a wrapped IMX-30 format required by Comux. Once the conversion was complete, the source clip is deleted and the new clip is placed into another folder for transfer to an appropriate



location. This new functionality means that it is now possible to use the AVS as a utility transcoder for any clip, without needing to first copy content into the server's media directory.

The second stage of development was ostensibly to extend the AVS's existing FTP handling to allow it to actively upload clips to Comux. The original intention was to add this feature to the new watch folder transcode process, so that clips could be transcoded and

then uploaded as part of a single operation. However, as soon as this new handling was tested, it was realised that the approach wasn't viable, at least not directly, as FTP upload to Comux could only be achieved from a machine on their private network. The work around for this network limitation was to develop a new 'agent' process – a small application that would run on the Comux upload machine, act as a receiver for files being transferred from the AVS and then carry out the upload. This indirect, two-hop process meant that it became possible to send a file directly from the AVS to Comux as an automatic process, without having to carry out a manual copy between networks and without having to trigger a manual FTP upload. This new transfer agent has application beyond the Local TV environment, as it will enable transfers to and from non-AVS systems in addition to the internal AVS-to-AVS transfers already supported.

The third stage of development resulted from improvements that Comux made to their upload handling whilst the AVS changes were in progress. Their machine was upgraded to allow files to be uploaded automatically once they had been dropped into a watch folder, rather than requiring an FTP upload to be initiated manually. To accommodate this, the AVS transfer agent was extended so that it had the option to drop files into the Comux upload watch folder, instead of completing the FTP upload. The FTP upload option was proved to operate, and remains available as a backup function, but regular uploads to Comux are now completed through the Comux watch folder process.

The fourth stage of development was to extend the AVS user interface to allow the operator to trigger the transcode and transfer process from a single command. This resulted in a new 'Send to Comux' function, which initiates a transcode of the selected clip – using the in- and out-marks if they are present, so that only the required material is converted – and then transfers it

across to the Comux machine to be uploaded. This led into further GUI development work to extend the information displayed in the AVS record and playback plugins, including more detailed information about the duration of the marked portion of the current clip. This was important for Mustard's operation, as it was vital that the duration of the clip to be transcoded exactly matched the slot that had been created for it. The operation of the AVS GUI was improved further with the addition of a hardware button box and mappings for the new software functions. This meant that the operator could complete the whole record, check, transcode and upload operation by pressing just a few buttons on the customised panel. Specifically they were able to start recording, mark (and remark if necessary) the initial in-point, mark (and remark) the initial out-point, stop the recording (which automatically loads the recorded clip into the associated playout port for review), jump to the in- or out-point, jog back and forth by intervals of one, ten and a hundred frames, remark either point, commit the new marks and then initiate the transcode / transfer operation. This makes it very easy for anyone in the gallery, for instance a producer or PA, to manage the overall process rather than requiring a dedicated operator.



The fifth stage of development was to extend the newly-added handling to make it appropriate for upload to the remote system providing the web catch-up service. This required the configuration of a new encode profile (MPEG-4 at 720p, 15 Mbps, long-GOP) and a new GUI command to enable a single 'Send to Web' operation. The transcode and FTP upload elements for this function used the same handling as implemented for 'Send to Comux', but in this case – without the network restrictions – it is possible to upload to the catch-up system directly from the AVS.

### **Collaboration, configuration and new functionality**

At the point that aQ Broadcast became involved in the Mustard TV launch, the programming aspects of the new channel had been finalized but a number of challenges remained in the technical workflow – it was clear what needed to be done for each day of production, but not clear exactly how it could be achieved. Through effective collaboration, configuration of existing functionality to meet some requirements and development of new functionality to address others, along with sympathetic integration with the infrastructure already in place, each of the technical challenges were progressively overcome. The on-air day went successfully and operation has continued smoothly ever since.

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