BATC ATV repeater controller

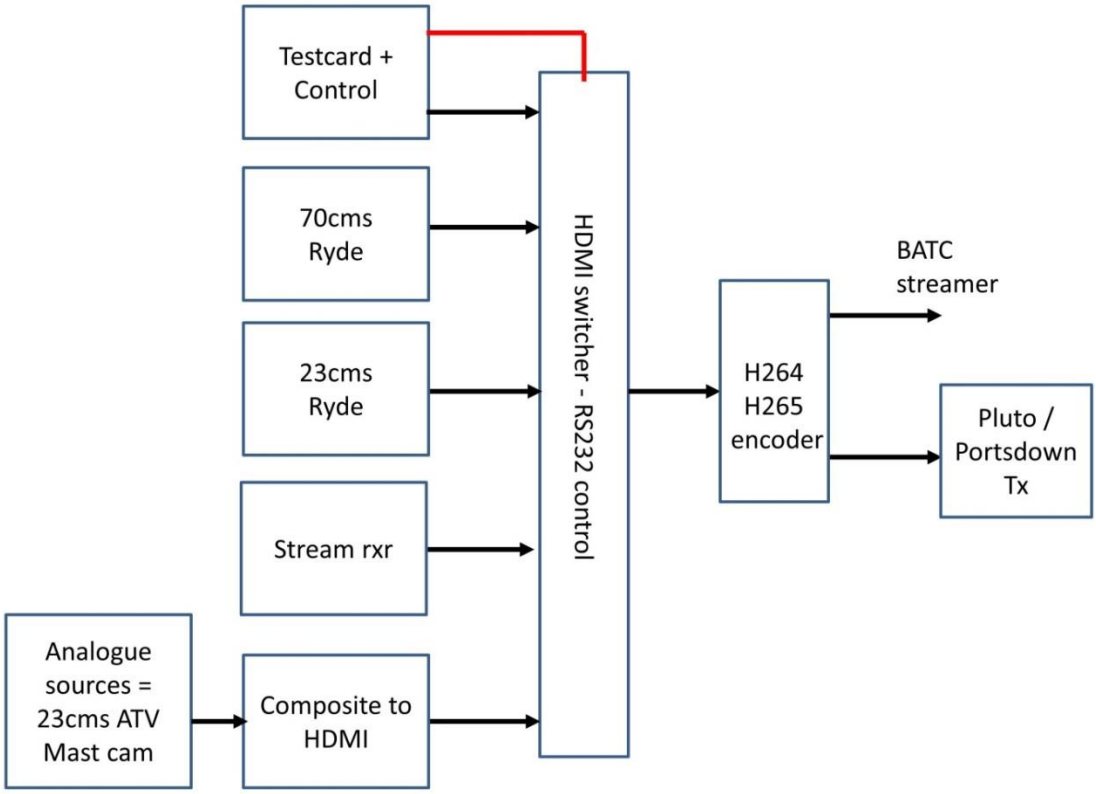
Version 1 – Jan 2022

Over the last 10 years, the ATV community has successfully migrated to digital transmission standards which have enabled transmission of greater resolutions than the 720 * 576 PAL standard.

However most ATV repeater systems are still using PAL based video switching and logic systems. In order to encourage repeater groups to upgrade their systems it is proposed that BATC develops a simple repeater controller enabling the use of consumer HDMI switches.

In order to provide some backwards compatibility it is possible that an analogue switcher could be controlled using the GPIO outputs and the potential for the caption generator to use the RPi composite video output is included as an option.

Overview



The core of the proposed system is a consumer IR controlled HDMI switch – these are readily available of Multimedia home systems from the normal sources and come in 2 / 4 / 6 / 8 input configurations.

The switch will be fed with HDMI outputs from Ryde receivers, BATC streaming receiver, Analogue to HDMI converters and graphics generator.

The switched HDMI output is fed to a video encoder / modulator which is not part of this requirement.

Functional description

In idle mode the controller will play out via the HDMI output (or potentially via the analogue AV output - selected via the SSH config menu) a carousel of still images, video files or potentially an input on the video switch.

The carousel files will be user configurable with parameters such as play length, repetition and sequence. One of these files can be configured as the ident test card / audio callsign which will be played out every 14 minutes irrespective of the controller state.

The controller should monitor up to 6 GPIO pins which will change state when a valid signal is received on any of the input devices.

When a valid signal is received, the controller should toggle a GPIO pin to enable Tx control and play a specific image selected by port number for up to 5 seconds.

It should then send a command to the HDMI switch to select the active input – it is envisaged this command will be sent via IR or optionally via a GPIO output sequence.

When the GPIO pin changes state back to idle mode, the controller should play a specific image / video file known as the “K” image, dekey the Tx GPIO pin and return to the carousel.

If more than one input is triggered simultaneously then the highest port number has priority (port 1 is highest priority) – if a port is currently active is should be kept open until it closes before switching to more recent input. An exception to this is if port 1 is triggered, then this should override the current input.

A status screen should be available to be displayed on the video output showing the status of all GPIO inputs enabling the monitoring of other repeater functions.

Manual selection of all inputs and the status screen can be selected via GPIO pins (allowing remote DTMF control) and SSH control menu is desirable.

SSH menu (essential)

It is envisaged that most parameters will set via an SSH control menu.

DTMF control (nice to have)

An on board DTMF decoder would allow remote users to select video sources, including the status screen, and potentially control external equipment via a GPIO interface.

For example, to select video sources a sequence such as *11# to select source 1 and *21# to deselect. *12# to select source 2 and *22# to deselect etc. A timeout of 10 minutes and a valid signal on another GPIO input overrides the remote selection.