

# INVENTION DISCLOSURE

**Invention Title:** Building a Better Wave for Surfing Digital Channels

**Invention Summary:**

Solutions for QAM and IP Video that enable rapid changes between channels, enabling customers to channel surf at speeds comparable to analog TV.

QAM Solution: Dynamically assign multiple tuners Current Channel, Channel Up, and Channel Down. When the Current Channel is selected on the active tuner, the unused tuners would automatically be set to up and down from that channel.

IP Video Solution: Actively stream a limited number of channels - Current Channel, Channel Up, and Channel Down. The Current Channel would be streamed at full resolution; Up and Down would be streamed/buffered at a significantly lower resolution.

**Invention Description:**

Background: Since the days of analog TV, users have been accustomed to channel surfing. The switch to digital TV has caused delays as channels buffer and load, negatively impacting the customer experience. The change from broadcasting in SD to HD has greatly increased bandwidth consumption. Higher video resolution will increase bandwidth needs and the associated delays with changing channels, even with IP-based video delivery.

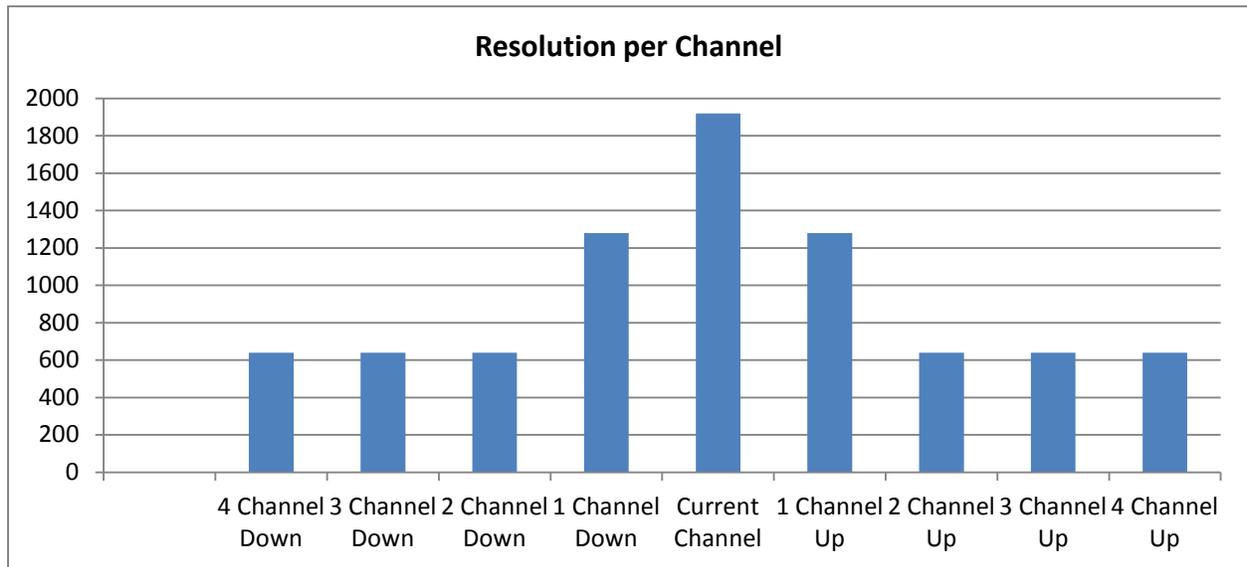
QAM Solution: Most cable set top boxes contain multiple tuners so that customers can record alternate channels while viewing live TV. When those additional tuners are not in use for recording, they can be made available for channel surfing by dynamically assigning them to Current Channel, Channel Up, and Channel Down. When the Current Channel is selected on the active tuner, the unused tuners would automatically be set to up and down from that channel. As the customer changes channels, the set top box would switch to the appropriate tuner and the unused tuners would update and be available for the new Channel Up and Channel Down.

The optimum solution will find a balance between total tuners available (not actively in use for recording), the number of channels in the Up/Down wave, and time required to change channels. Because this is a software solution that requires no storage space, it requires no change to the current hardware infrastructure and could have a very short time-to-market implementation.

IP Video Solution: IP video uses less bandwidth than QAM video through a unicast/multicast solution rather than a broadcast approach. However, IP video still requires buffering time when switching between channels. To permit channel surfing, actively stream a limited number of channels - Current Channel, Channel Up, and Channel Down. The Current Channel would be streamed at full resolution; Up and Down would be streamed/buffered at a significantly lower resolution until it is selected, then the selected channel would switch to high resolution after a certain amount of time. Changing channels would also alter the values for Current, Up, and Down.

The optimum solution will find a balance between total bandwidth usage, the number of channels in the Up/Down wave, time required to change channels, and the resolution of each channel within the wave. Because most markets have not (yet) changed from QAM to IP video delivery, this solution could be available when IP video is deployed.

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## **Invention Commercial value/customers:**

The commercial value is a quality enhancement for existing cable TV service consumers.

## **Invention differences:**

United States Patent 8,532,459 - Heath, et al. (September 10, 2013) is for a channel surfing solution for QAM using second tuner to predict next channel and record that predicted channel in a storage buffer, which is displayed when the predicted channel is selected.

Significant differences for our QAM solution include use of multiple tuners iteratively selected based on current channel value, changing active tuner viewed live rather than pre-recording content, and requiring no change to the current hardware infrastructure.

Significant differences for our IP Video solution include IP video unicast/multicast instead of QAM broadcast, decreased streaming resolution to save bandwidth during transmission, and time component for increasing video stream to high-resolution.