DIGITAL CHANNEL INSERTION BY LCOS

If channel viewership figures are closely looked at, the most widely viewed channel is not Star Plus but the local channel run by the Local Cable Operator (LCO)!

The LCO channel often provides the local community with local news and updates of local events that impact the life of cable subscribers in that area.

The popularity of the local cable channel is high & DTH operators have often complained that some homes have not subscribed to DTH, because they do not want to miss the local cable channel.

CURRENT STATUS

Under current law, local channels by any cable operator are permitted and perfectly legal. As per current law applicable to all Analog & Digital cable TV networks, no separate licence is required to be obtained from any authority for starting and operating a local cable channel.

The MSO Is Legally Responsible For Any LCO Channel

Local cable network’s channels are the responsibility of the MSO/Headend from where the channel originates. Even if an LCO inserts a local channel, the MSO is responsible and liable for any violations of the channel such as carrying of pirated content, carrying content that provokes social unrest or carries content that violates the programming code outlined in the Cable Act.

FUTURE RESTRICTIONS

Local cable channels sometimes have carried pirated content and have as a result, incurred the wrath of the Government. Broadcasters and DTH platforms have often approached the Government requesting that local cable channels should not be permitted.

DIGITAL CHANNEL INSERTION

एलसीओ द्वारा डिजिटल चैनल को शामिल करना

यदि चैनल डाटाकस्ट्रीमिंग ऑफर की ध्यान में दर्ज तो सबसे अधिक देखा जाने वाला चैनल नए प्रमाण पत्र नहीं वलिक व्याख्यान केंद्र ऑपरेटर (एलसीओ) द्वारा संचालित व्याख्यान चैनल है।

एलसीओ चैनल प्राप्त व्याख्यान समाचारों व व्याख्यान आयोजकों की जानकारी व्याख्यान समूहों को प्रदान करती है जो कि उस क्षेत्र में केंद्र उपभोक्ताओं के जीवन को प्रभावित करती है।

व्याख्यान केंद्र चैनल वह लोकप्रियता काफी अधिक है और डीटीएच ऑपरेटर पाया वह बात की विकास करते हैं कि कुछ प्रायः डीटीएच को इमारत संकायवाद नहीं करते हैं कि क्योंकि वे व्याख्यान केंद्र चैनल में बंध नहीं रहना चाहते हैं।

बनामन न्याय

मैयूजून नियम के तहत किसी भी केंद्र ऑपरेटर के व्याख्यान चैनल को अनुमति है और यह पूरी तरह से कानूनी है। किसी एलसीओ व डिजिटल केंद्रीय नेटवर्क पर लाए होने वाले मैयूजून कानून के गुलामविहार व्याख्यान केंद्र चैनल के गंवाने व गुजरने के लिए किसी भी अथाहीयता या अलाग लाइसेंस लेने की ज़मानत नहीं होती है।

किसी एलसीओ चैनल के लिए कानूनी तीर पर एलसीओ निम्नमार्गित होता है

व्याख्यान केंद्र नेटवर्क के चैनल की निम्नमार्गियता एलसीओ / डीटीएच की है जहां में चैनल की गुलाम आत्मा है। यहाँ तक कि यदि एलसीओ किसी व्याख्यान चैनल को गुजर करता है तो किसी तरह के उद्देश्य के लिए एलसीओ निम्नमार्गित व उद्देश्य है, जैसे पाइप कार्यक्रम, ऐसे कार्यक्रम जो गामालिक आत्मा फैलाया या ऐसे कार्यक्रम को गियाना जो कि केंद्र एक्ट में उल्लिखित कार्यक्रम को उल्लघन करता है।

भविष्य में प्रतिबंध

व्याख्यान केंद्र चैनल कल्पना-प्रयोग बारे बारे कार्यक्रम प्रयासित करते है निम्नमें वे गर्वकारी आयोजकों के लिए कार्यक्रम वही है। प्रयोग के डीटीएच बेलेकर्म प्रयास: स्वयं वे व्याख्यान चैनल को अनुमति नहीं देने का अनुग्रह करते हैं।
As a result, the TRAI has floated a consultation paper and is currently exploring whether the local cable operators' channel should be banned, or a compulsory license obtained to run the channel.

No final verdict has yet been declared by the TRAI in this matter.

**DAS RESTRICTIONS**

Digital Cable TV networks are currently also permitted to carry local cable channels as long as they do not violate the programming code. Again no special permission from any authority is required for such channels.

However, to increase the control and accountability of the DAS Headend for all local channels, the DAS guidelines dictate that all channels on the DAS cable TV network must be encrypted - including the local cable channels. This ensures that the MSO exerts direct control over the local channel and that the local channel cannot be injected by the LCO without the MSO's active support.

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**TECHNICAL SOLUTIONS**

On a Digital Addressable System (DAS), there are 3 options for inserting a local digital channel.

1. **INSERTION AT HEADEND**

   The DAS Headend houses the Conditional Access System (CAS) as well as encodes/inserts all the satellite broadcast channels. It is therefore easiest for the local cable channel to be inserted at the MSO Headend itself.

   For this solution, the LCO will have to transmit his local channel via return path on optical fiber from the LCO location to the MSO's Headend. WDM (Wavelength Division Multiplexing) technology is easily available & can be used so send 1 or even multiple channels from the LCO to the DAS Headend. WDM provides return path connectivity on the same optical fiber, at a separate wavelength.

   The WDM optical signal is received by the MSO, converted into audio and video baseband signals and then digitally encoded just like any of the other satellite channels encoded by the Headend.

2. **DIGITAL CHANNEL INSERTION**

   As a result, the TRAI has floated a consultation paper and is currently exploring whether the local cable operators' channel should be banned, or a compulsory license obtained to run the channel.

   No final verdict has yet been declared by the TRAI in this matter.
Of course, if a spare optical fibre is available between the LCO and DAS Headend, it can be used with a conventional Optical transmitter to transmit the LCO’s channel to the DAS Headend.

After the LCO’s channel is received, it is digital encoded, and multiplexed along with satellite channels received at the Headend.

The CAS encryption is superimposed on all the channels. Each of the channels including the LCO channel is allotted its own unique channel number and channel id, which ensures that the digital STB recognises each channel separately.

Clearly, the MSO’s active support and involvement is essential for including the LCO’s local channel(s) in the digital bouquet.

2. **LOCALLY INSERTED CAS**

The second option requires the MSO to send out his Conditional Access System (CAS) signal from the Headend to the LCO’s premises.

At the LCO’s premises the MSO CAS is received as ECM and EMM signals. A local encryption system then encrypts the LCO’s channel with the same CAS as what is used by the MSO Headend.
Further the MSO Headend allocates a digital channel number to each of the LCO channels. The LCO needs to buy one digital encoder for each channel, and install them locally. The digitised signals are then multiplexed with the main digital feed from the MSO and retransmitted on the LCO’s network.

For this solution, the cost to the LCO is very high. The LCO is required to purchase encoders as well as the local encryption, which is very expensive. Installing this is usually unviable unless a large number (8 to 16 or more) of LCO channels are to be added from a single LCO location.

3. UN-ENCRYPTED CHANNELS

The law dictates that all digital channels including the local channels must be encrypted on any digital CATV network. However as we have seen above, this is a difficult and expensive requirement.

In practise several MSO’s and local networks have considered inserting the digital LCO channel which is not encrypted/scrambled, even though it does not meet the technical dictate that all channel must be encrypted.
Even though the channel is not scrambled it needs to be configured and accounted for at the MSO Headend so that when it is inserted locally, it will be recognised by the consumers’ STBs.

**TECHNICAL SOLUTION: UNENCRYPTED CHANNEL INSERTION**

The MSO keeps aside one entire "Transport Stream" for the local cable operator. The Transport Stream can accommodate 4 channels, 8 channels or even a larger number of channels. The MSO configures the Transport Stream (TS), allotting channel Id, frequency, QAM and Channel name for each of the LCO channels. Of course these channels do not exist at the MSO’s Headend hence they are effectively blank when the main digital signal leaves the MSO’s Headend.

At the LCO’s location, the LCO needs to install the following:
- Encoders (MPEG-2 or MPEG-4), one for each local digital channel
- QAM modulator operated at either 64 or 250 QAM

**SELECTING QAM MODULATION**

64 QAM modulation provides for a digital data rate of 38 MBPS. One Transport Stream (TS) can carry 8 to 10 MPEG-2 channels and upto 16 MPEG-4 channels in Standard Definition, using 64 QAM modulation.

256 QAM modulation provides a much larger digital data rate of 51 MBPS. As a result it can carry

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**Figure - 3: FTA Local Channel Insertion At LCO**

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DIGITAL CHANNEL INSERTION

12 to 14 MPEG-2 channels and almost 24 MPEG-4 channels.

However MPEG-4 requires an excellent quality distribution network. If the quality of the LCO's network is not good, any channels transmitted on 256 QAM will freeze and pixellise. Hence it is safer to utilise 64 QAM, unless a very large number of local channels are inserted, or if the local channels are in High Definition.

Typically, the same QAM modulator can be set to operate at either 64 QAM or 256 QAM. It is user configurable. Of course, this setting also needs to be correctly programmed at the DAS Headend, where each channel's parameters are defined in the system.

COSTS

Some companies offer a complete package for the LCO consisting of a 4 channel MPEG-2/MPEG-4 encoder + 1 QAM modulator that can be set for either 64 QAM or 256 QAM. This typically is priced at ₹ 1.25 lakhs plus taxes.

Alternatively a package consisting of 8 digital encoders for 8 LCO channels along with the same QAM modulator will cost approximately ₹ 1.8 lakhs.

CAUTION

It must be noted that the above solution does not provide any encoding or CAS for the LCO channels. Since their digital channel Id is pre-allocated by the DAS Headend, they will be received by the STBs in the LCO's network. They will not be received on the network of any other LCO, associated with the same MSO.

These channels are essentially FTA channels and therefore do not meet the Governments directives that all channels must be encrypted.

ALWAYS AVAILABLE TO CONSUMERS

Since the LCO channels are FTA, they can be received even by STBs that have been deauthorised, for non-payment of dues. The consumer gets the benefit of watching these channels, even if he has not paid his monthly Cable TV subscription.

The LCO's FTA digital channels can also be received by any FTA Cable TV STB.

Interesting, the consumer has no way of knowing whether a particular channel on his STB is encrypted or FTA. He can only determine this by using a FTA STB or if his STB is de-authorised, and he stops receiving all other channels, due to non-payment of his Cable TV subscription.