

90 YEARS
OF ENSURING A SAFER AND
CONNECTED WORLD

UNCOVERING ATSC 3.0 REVENUE

A look at new services and associated revenue opportunities

ROHDE & SCHWARZ

Make ideas real



Our vision

TO ENSURE A SAFER AND CONNECTED WORLD.

Our mission

MAKE IDEAS REAL.

Our values

RELIABLE. ENTREPRENEURIAL. IMPACTFUL.

ROHDE & SCHWARZ

Make ideas real



EXECUTIVE SUMMARY

ATSC 3.0, the next-generation television standard, unlocks the chains that bind broadcasters to decades of old technology, freeing them to compete effectively with digital media. The standard brings broadcasters in line with how data is transported via the internet, equips them with a transmission method that approaches the theoretical limit of how much data can be transmitted on their channels, makes it possible for them to augment traditional broadcasts with advanced features and enables them to pursue numerous opportunities to distribute data wirelessly from a position of strength.

This eBook examines the opportunities ATSC 3.0, also known as NextGen TV, offers broadcasters to enhance monetization of their spectrum and content. It also discusses the challenges they face and strategies they can employ to surmount them. In doing so, the eBook's primary focus is on U.S. broadcasters and their market realities.

It is not an in-depth technical discussion of the ATSC 3.0 standard. However, due to the nature of the subject, the technology involved in finding new ATSC 3.0-based revenue streams and overcoming challenges will be discussed.

TABLE OF CONTENTS

What is ATSC 3.0?.....	04
The state of ATSC 3.0 in the United States.....	07
New TV-related monetization opportunities.....	10
Datacasting and monetization.....	14
Public broadcasters and ATSC 3.0.....	20
LPTV and ATSC 3.0.....	22
ATSC 3.0-based Broadcast Positioning System (BPS).....	24
Challenges, solutions, and the future.....	26
The new R&S®TE1: Building a path to ATSC 3.0 paved with Energy Savings, Efficiency, and Sustainability.....	29

WHAT IS ATSC 3.0?

ATSC 3.0 is a suite of technical standards that enables broadcasters to deliver the next generation of digital terrestrial television, complementary internet streaming content and a wide range of new services.

The Advanced Television Systems Committee (ATSC) first asked for proposals for the foundational technology for a next-generation digital television system in spring 2013. The selected technology, OFDM or Orthogonal Frequency Division Multiplexing, had established a proven track record in television transmission outside the United States as well as in wireless network service. Its hallmark attributes were efficient use of spectrum and the ability to hold up to interference.

In the years following the call for proposals, various components of the ATSC 3.0 standards suite were developed, tested and accepted. Under Special Temporary Authority from the Federal Communications Commission, WRAL-TV in Raleigh-Durham, N.C., launched the first full-time ATSC 3.0 simulcast of a regularly scheduled DTV channel in June 2016.

The ATSC 3.0 standard offers many improvements over the existing digital TV system, known today as ATSC 1. Equally important, the standards suite was designed to give television broadcasters the ability to update their service offerings as new technologies are developed, thereby giving them a way to remain competitive with other digital media and avoid premature technical obsolescence.

Unlike ATSC 1, the NextGen TV standard distributes digital data packets that are formatted in the same manner as those distributed across the internet, in other words as IP packets. Content can be transmitted over the air, via the internet or both.

Using IP packets is significant because it places TV on the same development trajectory as the internet and enables broadcasters to offer many advanced features, such as interactivity, content personalization and video on demand. It also exposes television broadcasters to a variety of new opportunities to deliver IP packets wirelessly for businesses and other organizations at a price.

When it comes to television, ATSC 3.0 can be used to improve the quality and quantity of content. With regard to the former, it supports 4K (3,840 x 2,160 pixels) video, High Dynamic Range (HDR), immersive audio and advanced sound features like personalized audio as well as advanced emergency alerting.

In terms of quantity, the standard can transmit many HD and even more SD channels than can be transmitted with ATSC 1. Due to its flexibility and channel efficiency, the standard even gives broadcasters a way to allocate their over-the-air bits to deliver multiple Full HD (1080p) channels with HDR and simultaneously deliver other bits via the internet to augment those channels to create a 4K experience for viewers.

With ATSC 3.0, broadcasters also have the flexibility to strike different balances between how much digital data they wish to transmit and how robust they want their signals to be based on the business models they wish to pursue.

Depending on how broadcasters choose to deploy ATSC 3.0, they can even target different content over the air to different geographical regions within their market, or they can simply target audience members who opt in with customized content via the internet.



THE STATE OF 3.0 IN THE UNITED STATES

As of this writing over 80 markets, covering more than 80% of the population, are on air with ATSC 3.0 in the United States. A dozen more markets are either preparing to launch or have broadcasters that have announced they are working together with an eye towards launch.

The Consumer Technology Association (CTA) pegged the cumulative U.S. installed base of NextGen TVs in the United States at more than 10.3 million as of the end of 2023. It forecasts sales of the sets to increase 24% this year. Models from Sony, Samsung, Hisense and TCL are available, and multiple NextGen TV logo-certified plug-in ATSC 3.0 receivers for legacy DTV sets are available.

BIA Advisory Services released an outlook for “non-core” revenue, i.e. non-advertising and non-must carry-related NextGen TV revenue, in December 2021. It forecast the additional revenue through 2030 based on three spectrum allocations to data transport: devoting 3 Mbps 24/7, or 12%, of total spectrum capacity to non-core datacasting; 5 Mbps, or 20%; and 7 Mbps, or 27%.

While it saw no revenue on the low-end for 2024, the outlook forecast an additional \$300 million with a 5 Mbps allocation and \$500 million with 7 Mbps assigned to datacasting this year. By 2030, it forecasts ATSC 3.0 datacasting revenue growing to \$6.4 billion on the low end, \$10.7 billion with the middle allocation and \$15 billion on the high end.

One World Trade Center, also known as One World Trade, One WTC is the main building of the rebuilt World Trade Center complex in Lower Manhattan, New York City, USA.



Rick Ducey, Managing Director at BIA Advisory Services. (Photo: BIA Advisory Services.)

“Optimistically, we are seeing some early commercial deployments [of ATSC 3.0 non-core datacasting services], so I would push out the 2030 forecast to 2035,” says Rick Ducey, Managing Director at BIA Advisory Services.

The FCC authorized U.S. broadcasters to transition to ATSC 3.0 on a voluntary basis in November 2017. Unlike the analog-to-DTV transition, in which the regulator temporarily assigned an additional TV channel to broadcasters for DTV simulcasts with the goal of an eventual analog shutoff, no second channel was assigned for the ongoing ATSC 3.0 transition.

Instead, the agency authorized rule changes allowing multiple broadcast competitors in the same market to share a single 6 MHz channel to transmit NextGen TV—on a so-called ATSC 3.0 lighthouse—as well as to share remaining channels in the market to maintain existing ATSC 1 service for viewers.

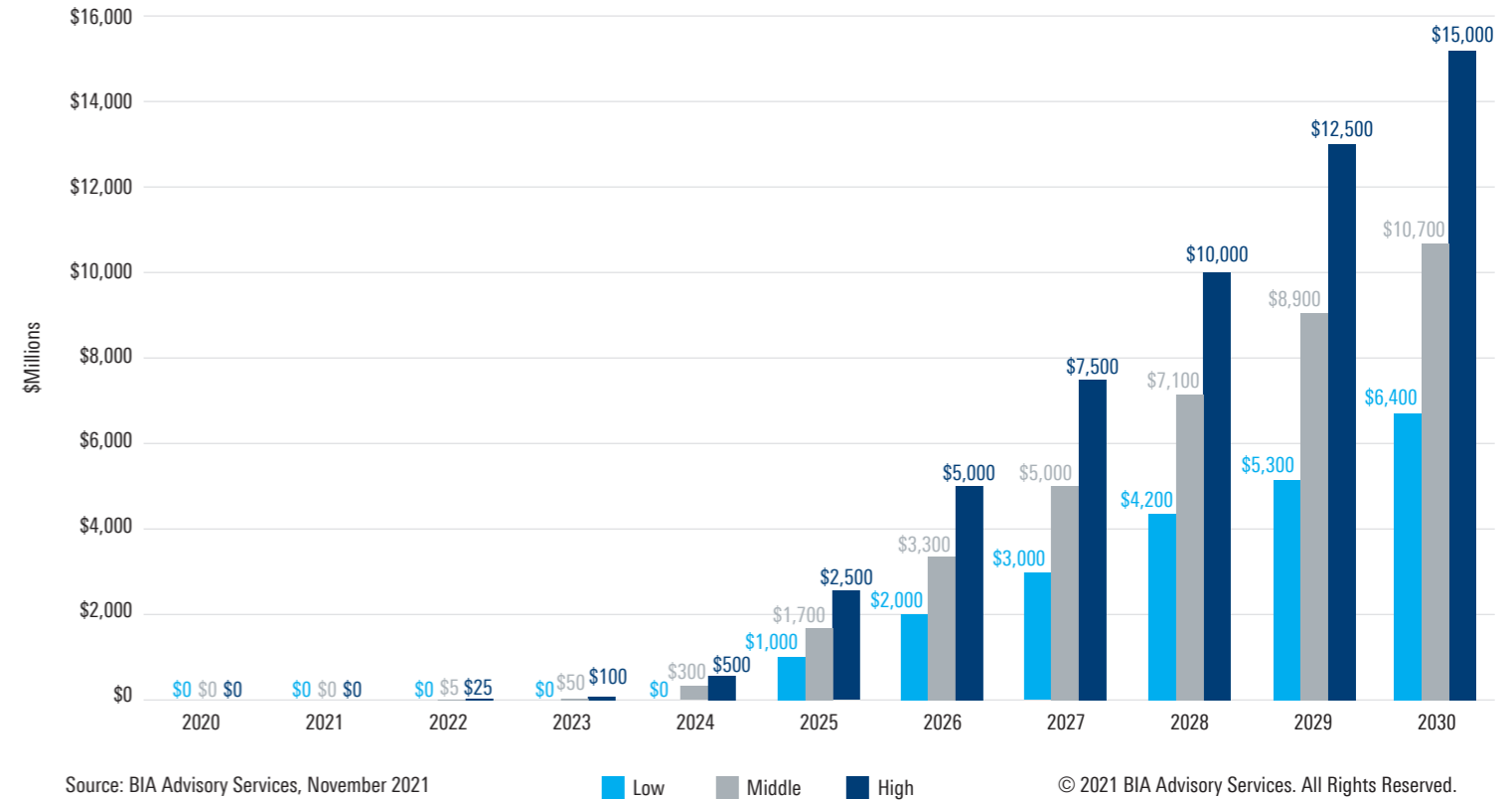
While effective at enabling broadcasters to put ATSC 3.0 on air, this approach has hampered them in fully taking advantage of the standard’s potential as there is little to no remaining bandwidth left on the lighthouse to deploy additional ATSC 3.0-services.

Initially, the agency authorized broadcasters to sunset legacy DTV service after five years, which would have allowed them to return to their own sticks and channel assignments with NextGen TV transmissions and new ATSC 3.0 services.

However, an ATSC 1 shutoff for the moment has been delayed indefinitely as broadcasters wait for consumers to replace their ATSC 1 sets with NextGen TVs so large portions of their over-the-air audiences are not obsoleted and forced to buy new sets or converters.

NEXTGEN TV DATACASTING REVENUE SCENARIOS—UP TO \$15B/YEAR

Non-Core Datacasting Revenue Based on Anticipated Data Capacity Utilization



High Case

Average utilization of 7 Mbps (27% of total spectrum capacity).

Middle Case

Average utilization of 5 Mbps (20% of total spectrum capacity).

Low Case

Average utilization of 3 Mbps (12% of total spectrum capacity).

BIA Advisory Services projects significant non-core datacasting revenue growth. (Image: BIA Advisory Services.)

NEW TV-RELATED MONETIZATION OPPORTUNITIES

Besides the improvements ATSC 3.0 brings to the quality of the video and audio broadcasters deliver, the standard also offers other important enhancements to help them better monetize their core service.

“The most immediate monetization benefits of ATSC 3.0 will come from the television service itself,” says Anne Schelle, Managing Director of Pearl TV, a business organization made up of eight of the largest broadcast groups in the United States.

“This will come from finally being able to mine TV’s over-the-air service capabilities. So, first and foremost, we have 500% more capacity with NextGen TV, and ultimately in the long run, that capacity allows us to not only provide more TV services but also future datacasting services.”

Better audience measurement is a prime example of how ATSC 3.0 can benefit traditional TV service. “The first area that you’re going to be able to see value is around audience viewing data and measurement,” says Schelle. “Today, over-the-air services go largely unmeasured.”

However, the standard enables a hybrid broadcast-internet environment, which makes it possible to launch applications that access the internet for two-way communications and gives broadcasters a more accurate way to measure audiences.

“TV broadcasters can leverage ATSC 3.0’s internet connectivity to improve the measurement accuracy of the over-the-air audience rather than solely depend upon the audience panel-based model companies like Nielsen use to determine ratings,” says Schelle.



*Anne Schelle, Managing Director of Pearl TV.
(Photo: Pearl TV.)*

“In 2025, broadcasters will be able to enable a data service for measurement partners [like Nielsen] that will finally fill the gap in measurement,” she says. “What’s important about that is it will place broadcasters on a more level playing field with digital competitors in terms of having viewership data that augments existing panels to provide better visibility for advertisers into the over-the-air service. That’s huge, and you don’t need to have the full scale for that because aggregated data sets become de minimis at about one million connected sets.”

Pearl TV’s Run3TV, a middleware abstraction layer that simplifies the development of NextGen TV applications across five operating systems used by different television and device vendors, enables this level of measurement.

“Our goal here is to make the application environment ubiquitous, scalable and easy for broadcasters, and then the benefits accrue from there on behalf of all broadcasters, such as advanced advertising,” she says.

An even more immediate benefit with monetization implications is what Schelle calls Broadcast IP and app-based services like Roxi as well as Sinclair Broadcast Group have dubbed virtual channels.

“Broadcast IP and app-based services allow broadcasters to create virtual over-the-air channels that address spectrum constraints and bring exciting new streaming channels to OTA viewers,” says Schelle. This enables NextGen TV broadcasters to insert data into their over-the-air Electronic Program Guide (EPG), giving OTA viewers watching on connected TVs access to additional channels.”

“We are calling them broadcast-enabled virtual channels,” says Mark Aitken, Senior Vice President of Advanced Technology at Sinclair Broadcast Group and President of ONE Media Technologies. “They are signaled within the NextGen Broadcast channel and IP-delivered via the internet-connected smart TV environment. We are adding these and other services in many of our markets to provide additional content that is enabled only through ATSC 3.0.”

In mid-March, Sinclair and America’s Public Television Stations (APTS) announced that the commercial broadcaster will at no charge host in its markets virtual channels for public television stations not yet transmitting in ATSC 3.0.

Sinclair also recently announced Tennis Channel 2 (T2) is being carried as a free broadcast-enabled virtual channel on all of its stations nationwide that have deployed using NextGen Broadcast. They are providing a more realistic and immersive visual experience using Advanced HDR by Technicolor©. The channel is Tennis Channel’s first free ad-supported TV (FAST) channel.



Mark Aitken, Senior Vice President of Advanced Technology at Sinclair Broadcast Group and President of ONE Media Technologies. (Photo: ONE Media Technologies.)



Sinclair Broadcast Group serves viewers in Beaumont, Texas, from KFDM with a Rohde & Schwarz R&S®THU9evo UHF transmitter. (Photo: Sinclair Broadcast Group.)

DATACASTING AND MONETIZATION

Many new opportunities to earn additional revenue by exploiting the benefits of ATSC 3.0 leverage datacasting. While datacasting is possible and has been deployed with existing ATSC 1—most notably to augment some public broadcasters’ on-air educational programming, ATSC 3.0-based datacasting is far better suited to a wider range of commercial applications because of many inherent strengths of the standard.

Among them are a far more robust signal that can be dependably received, even in an RF environment that’s noisy; support for IP packet transport commonly used to move internet data; and, of course, the one-to-many nature of broadcasting, which NextGen TV shares with ATSC 1. When paired with a wireless network for remote backchannel communications, ATSC 3.0 becomes even more powerful for commercial applications.

“Nothing will move the market faster than if broadcasters see a way to monetize their excess capacity for real money,” said Jerald Fritz, Executive Vice President for Strategic and Legal Affairs at ONE Media Technologies. “There are multiple datacasting use cases being tested so stay tuned. “Once broadcasters see that there’s money to be made with datacasting, that’s going to move the needle.”

To date, several ATSC 3.0 datacasting use cases have been proposed, many of which have undergone successful trials. Some include:



Jerald Fritz, Executive Vice President for Strategic and Legal Affairs at ONE Media Technologies. (Photo: ONE Media Technologies.)



Synthesia.io | 50 Video Statistics You Can't Ignore in 2024

CDN Offload

Video traffic surpassed 80% of all consumer internet traffic in 2022, and nearly 89% of internet users watched online video that year, according to Synthesia. Millions upon millions of individual streams to deliver video of a live event can put a strain on the unicast networks upon which Content Delivery Networks rely.

Offloading that delivery to an ATSC 3.0-based one-to-many broadcast alternative is an attractive option. “What could broadcast bring in terms of offload to a content delivery network?” asks ONE Media Technologies’ and Sinclair’s Aitken, rhetorically. “Reliable, repeatable high-quality video, low latency and broadcast’s one-to-many delivery with tremendous efficiency.”

Before the 2024 NAB Show, Sinclair plans to announce an agreement with a CDN — “a paying, contractual customer,” in Aitken’s words — to provide an ATSC 3.0 offload for some video data delivery, he says. “That’ll sort of be the beginnings of ‘show me the money.’”

There are a couple of key components to enabling nationwide or regional ATSC 3.0-based CDN offload as well as other datacasting use cases of ATSC 3.0. One is aggregating available TV spectrum from broadcasters willing to contribute a portion of their channel assignment for a price to maximize available data capacity to sell to businesses. Another is effective management of this resource via a Broadcast Core Network. Progress is being made on both fronts.



In-Vehicle Entertainment

In June 2022, the eyes of those interested in the future of ATSC 3.0 for delivery of video entertainment and data to moving vehicles were on the state of Michigan. A trial of transmitting ATSC 3.0 to a moving vehicle traveling between four transmitters proved to be successful.

The trial demonstrated that a broadcast core network, in this case from Alchemedia 5G, could manage successful ATSC 3.0 delivery of IP data, media files and an HD video stream. It also showed how the use of advanced forward error correction technology could improve performance even more.

The “Michigan Coast-to-Coast Data Delivery Drive Tests” joined other successful trials conducted in South Korea by CAST.ERA, a joint venture of Sinclair and SK Telecom, on Jeju Island, and a separate test in the Phoenix market by Sony Electronics with the assistance of Pearl TV and News Press & Gazette.

Navigation

ATSC 3.0 can deliver the navigation data required to enable self-driving vehicles (vehicle telematics) and precise drone delivery of consumer goods as well as precision surveying and farming, distribution control, marine navigation and smart construction.

South Korean broadcaster MBC (Munhwa Broadcasting Corp.) along with partner CAST.ERA has successfully trialed the MBC Real-Time Kinematic (RTK) service at the ATSC 3.0 testbed on Jeju Island. The system currently is deployed nationwide in South Korea using LTE and DMB networks for precision within 2 to 3cm. In RTK applications, ATSC 3.0 can offer a lower cost and higher capacity.

Separately, the U.S. Department of Transportation is seeking a complementary positioning, navigation and timing (PNT) technology to serve as a backup for the existing Global Positioning System (GPS). An ATSC 3.0-based Broadcast Positioning System (BPS) has been proposed. (To be continued on page 24).

Sinclair Broadcast Group has traveled the country with its transmitter on wheels. The climate-controlled trailer contains a one-rack Rohde & Schwarz liquid-cooled R&S THU9evo UHF 19kW transmitter with 12 power amplifiers as well as a tunable mask filter from Dielectric, test load, pumps and separate heat exchangers for the transmitter and test load.

Enhanced Telematics

In addition to vehicle telematics, ATSC 3.0 can be used to transmit data used to control a wide variety of devices, an important capability as Internet of Things (IoT) devices become more prevalent. A spring 2023 report from IoT Analytics estimated the number of IoT device end points worldwide that year would reach 16.7 billion.



IoT-Analytics.com | State of IoT 2023: Number of connected IoT devices growing 16% to 16.7 billion globally



StraitsResearch.com | Digital Signage Market Size, Share & Trends Analysis Report

Digital Signage

In April 2023, Sinclair and USSI Global announced a digital signage pilot program to deliver content via ATSC 3.0 transmission to Electric Vehicle (EV) charging station kiosks in West Palm Beach, Fla. Nationally, the Department of Transportation has set a goal of having 500,000 EV charging stations by 2030.

The North American digital signage market is on an upward trajectory. Straits Research estimates market value will grow from \$24.3 billion in 2022 to nearly \$40.5 billion by 2031.

Mobile and Home Audio Delivery

An ATSC 3.0 hybrid service using both over-the-air and the internet offers the ability to deliver a multiplex of audio channels. In early 2021, Sinclair launched its STIRR XT audio service with 15 digital audio channels and simulcasts of its KVI, KOMO-FM and KPLZ-FM stations in Seattle.

Initially aimed at offering automakers an alternative to satellite radio, the service can also be accessed via the company's STIRR XT broadcast app on NextGen TV sets. Launching the app lets consumers access over-the-air and streaming audio content. More broadly, mobile and home audio delivery via ATSC 3.0 offers broadcasters another avenue to monetize their content and spectrum.

Mobile Phone

The path to ATSC 3.0 reception in mobile phones in the United States may be a bit circuitous, but there is a strategy in place aimed at making it a reality. While domestic wireless carriers have resisted adding ATSC 3.0, an effort is underway in India to advance ATSC 3.0 as an integral part of that nation's Direct-to-Mobile (D2M) video policy, which would allow the public to watch TV directly on their phones without an internet connection.

Adoption of ATSC 3.0 to meet that goal in India would create a mass market for NextGen Broadcast-enabled wireless phones, which in theory could one day become available in the United States. "When the question is how do you get ATSC 3.0 chips into the phone, the answer is you have to have a mass market adopt the technology," says ONE Media Technologies' and Sinclair's Aitken.

Sinclair has invested in India's Saankhya Labs, which has designed and produced a software-defined receiver chip with low power consumption to enable ATSC 3.0 mobile reception. Two prototype phone models using the chip have been built and tested.

"In the U.S., there is in fact a bring your own device mentality for the wireless networks," says Aitken. "As long as those devices work in all of the bands [frequencies] and technologies, such as GSM, CDMA, LTE and 5G, of a given carrier, by law you can bring your own device and attach it to their network via a proper SIM card."

Extensions to the ATSC 3.0 standard that would add various mobile network operators' features, such as Packet Data Convergence Protocol (PDCP), which they use for customer plane and control plane data, are currently being considered by ATSC. Adding the extensions would bring ATSC 3.0 mobile phone support one step closer, "meeting in the middle," says Aitken.

PUBLIC BROADCASTERS AND ATSC 3.0

ATSC 3.0 offers public broadcasters several avenues to enhance revenue. “One big area has the dual function of underpinning the mission of public broadcasting but also opening the door to generating new sources of revenue,” says Marc Hand, Founder and CEO of Public Media Venture Group (PMVG).

Specifically, while ATSC 3.0 can enable public broadcasters to offer education, telehealth and emergency alerting services in “a substantial and substantive way,” there may be revenue components associated with delivering some of these services, he says.

Another path to higher revenue is offering many of the same sorts of data distribution services commercial broadcasters look to tap but “doing so in a way that doesn’t impact their core services and mission as public broadcasters,” says Hand. “Public stations hadn’t been able to do that in the past with the FCC rules for use of reserve-band channels. But, with the [FCC’s] ancillary and supplementary rules [with regards to ATSC 3.0] public stations can use at least a portion of their spectrum to generate commercial revenue.”

As NextGen TVs become fixtures in the homes of viewers, more avenues to added revenue will open. The personalization and interactive capabilities of ATSC 3.0 will enable public broadcasters to build deeper relationships with members and viewers and derive additional funding, he says.



Marc Hand, Founder and CEO of Public Media Venture Group (PMVG). (Photo: PMVG.)

“Public broadcasters will be able to target households they know are not already donors,” says Hand. “When they are watching a program, a ‘Donate Now’ button can appear, whereas if a station knows the viewer is a donor, there can be no button or one asking the viewer to consider increasing their donation to access other unique programming of interest based upon their viewing habits.”

Similarly, offering access to premium content on a video-on-demand basis for an additional subscription is possible by tapping these same NextGen TV capabilities, says Hand.

“Obviously, underwriting is another opportunity,” he says. “ATSC 3.0 offers the ability to target underwriting in a way that reaches more specific audiences just as commercial broadcasters look to do with targeted commercial advertising.”

LPTV AND ATSC 3.0

Low-power television (LPTV) broadcasters stand to benefit greatly from ATSC 3.0 due to the robust nature of its signals, which are easier to receive at lower power levels relative to RF noise. Better market coverage not only will bring additional viewers to their television programming, potentially enhancing ad revenue, but it also opens up LPTV operators to many of the same data distribution service opportunities full-power broadcasters look to offer on a commercial basis via ATSC 3.0. LPTV operators have the added opportunity to offer a portion of their ATSC 3.0 bandwidth at a price to full-power broadcasters wishing to fill coverage gaps in their communities, regions or nationally.

HC2 Broadcasting is an example of an LPTV operator preparing to cash in on new ATSC 3.0 revenue opportunities. The broadcaster, which owns and operates 195 LPTV stations and 53 Class A stations around the country, sees the ability of the NextGen TV standard to overcome the reception challenges of ATSC 1 as a “huge benefit to the LPTV business model,” in the words of Michael Voge, Director of Engineering Operations at HC2 Broadcasting.

“Particularly when combined with amplifying signal coverage with translators and repeaters in local markets, ATSC 3.0 will help to extend the reach that all of our LPTVs have today and make LPTV operators more competitive with some full-power players in our markets,” says Voge.

Data distribution services also are high on the list of new revenue opportunities for the broadcaster. “Delivery of ATSC 3.0 broadcast signals will be very conducive to data transmissions—another application that will be transformative to the data delivery market,” he says.

HC2 Broadcasting owns and operates 195 LPTV and 53 Class A stations. The broadcaster has deployed the R&S®TMU9evo UHF transmitter, like the one shown, at many. (Photo: HC2 Broadcasting.)



Michael Voge, Director of Engineering Operations at HC2 Broadcasting. (Photo: Michael Voge.)

Forming partnerships with full-power stations wishing to enhance their own services is also on the company’s radar. “We’re looking to partner and currently are in the stages of partnering with public broadcaster stations, some full-power broadcasters, for light-housing opportunities of ATSC 3.0,” he says.

“Additionally, we are working on developing commercial applications that we are allowed to pursue on our sticks where we have redundancy in markets where we continue to run our ATSC 1 broadcast service,” says Voge.

In these cases, HC2 Broadcasting could partner with full-power broadcasters, which for a fee would use the LPTV operator’s capacity to launch over-the-air ATSC 3.0 service while maintaining their own ATSC 1 service as required by the FCC. “We’re certainly looking to fill that void,” he says.

ATSC 3.0-BASED BROADCAST POSITIONING SYSTEM

Precise positioning, navigation and timing (PNT) go hand-in-hand-in-hand, driving critical infrastructure, thanks to the Global Positioning System (GPS). Energy and power grids, communications, financial, transportation, health care, defense and other economic sectors depend on GPS to deliver this critical data.

However, unlike other major powers, the United States currently has no GPS backup. In 2021, the White House issued a policy to improve existing GPS and search for an alternative. Congress responded with funding and authorized the Department of Transportation to find a complementary system.

Mark Corl, Senior Vice President of Emergent Technology development at Triveni Digital, is a leader in the development of a PNT solution based on ATSC 3.0.

Called the Broadcast Positioning System (BPS), the solution revolves around a small amount of highly precise timing information being inserted in the ATSC 3.0 waveform transmitted from multiple nearby towers.

“If you know where the tower is because it’s broadcasting its position, you know exactly how long it took for that waveform to get to you from the tower, and you know what time it is with a fairly high precision, and you can see three towers, you can triangulate and you know where you are,” says Corl.

While positioning and navigation are important, the focus of the search for a system that complements GPS is time. “Time is the key driver for infrastructure, and that’s really their [the government’s] concern right now.”

Newly developed technology from Triveni Digital and Avateq looks at the timing data being transmitted, compares it to the known time and determines any variance. That data is sent back to the transmitter’s exciter and the time variance is corrected, thereby creating a control loop. “That control loop is required to make sure that the time signal being emitted is correct,” says Corl.

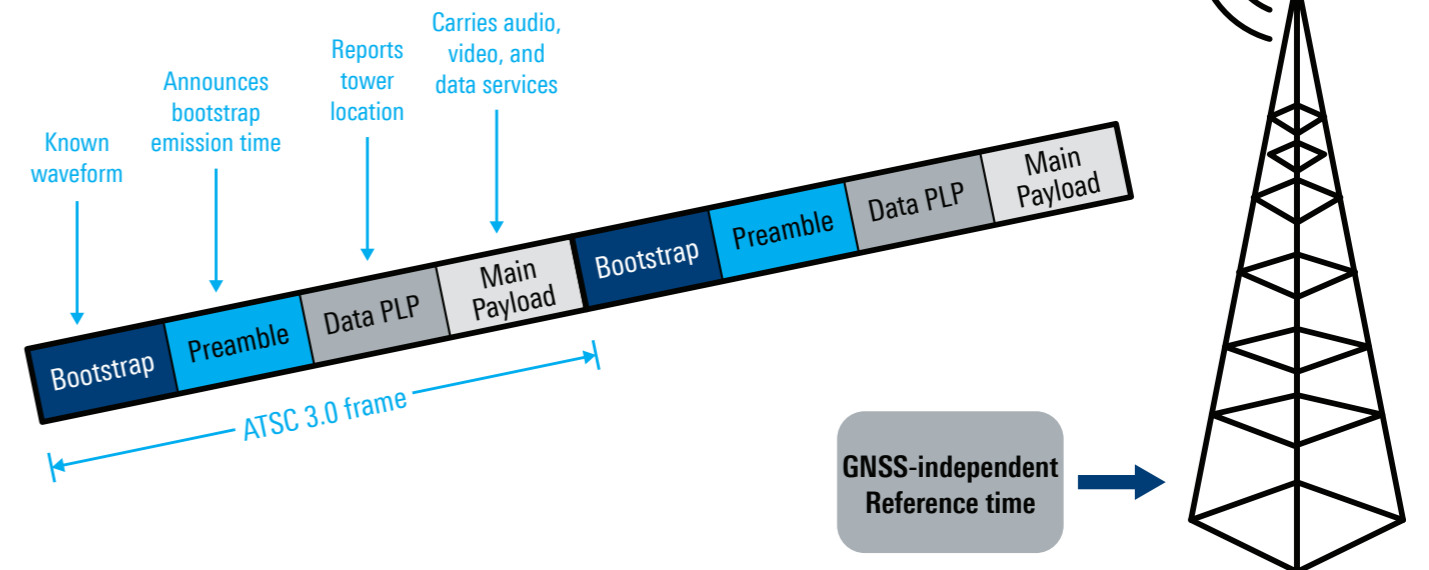


Mark Corl, Senior Vice President of Emergent Technology Development at Triveni Digital. (Photo: Triveni Digital.)

“Our whole goal is to make this system precise to the NIST [National Institute of Standards and Technology] clock for every transmitter in the United States,” he says.

Selection of this ATSC 3.0-based solution by the government as the complementary system to backup GPS could possibly come with government funds to transition remaining legacy DTV transmitters to NextGen TV and perhaps even annual funding, he says.

In a possible future Broadcast Positioning System (BPS) deployment, a small number of bits is inserted into the ATSC 3.0 signal preamble to enable delivery of precise time data. (Image: Triveni Digital.)



CHALLENGES, SOLUTIONS, AND THE FUTURE

Before broadcasters can begin to benefit fully from additional ATSC 3.0 revenue streams, the logjam created by the voluntary transition model and channel sharing must be addressed.

Currently, only a handful of markets are on-air with more than one ATSC 3.0 stick, meaning in most markets many competitors share limited spectrum to simulcast their main channel as NextGen TV to viewers. At the same time, they also share the other channels and sticks in the market to maintain their ATSC 1 channels—main and multiple diginets. As a consequence, there is not enough bandwidth for broadcasters to offer new revenue generating ATSC 3.0 services.

“One of the most important things to goose 3.0 deployment is a firm, articulated sunset date for 1.0,” says ONE Media Technologies’ Fritz. “There are so many monetization applications for 3.0 that we can’t pursue now because we don’t have access to 100% of our 3.0 capacity. It’s virtually all being used up for other stations or diginets.

“We need the Commission, we need the government, to say this is the date when 1.0 is going to shut down.”

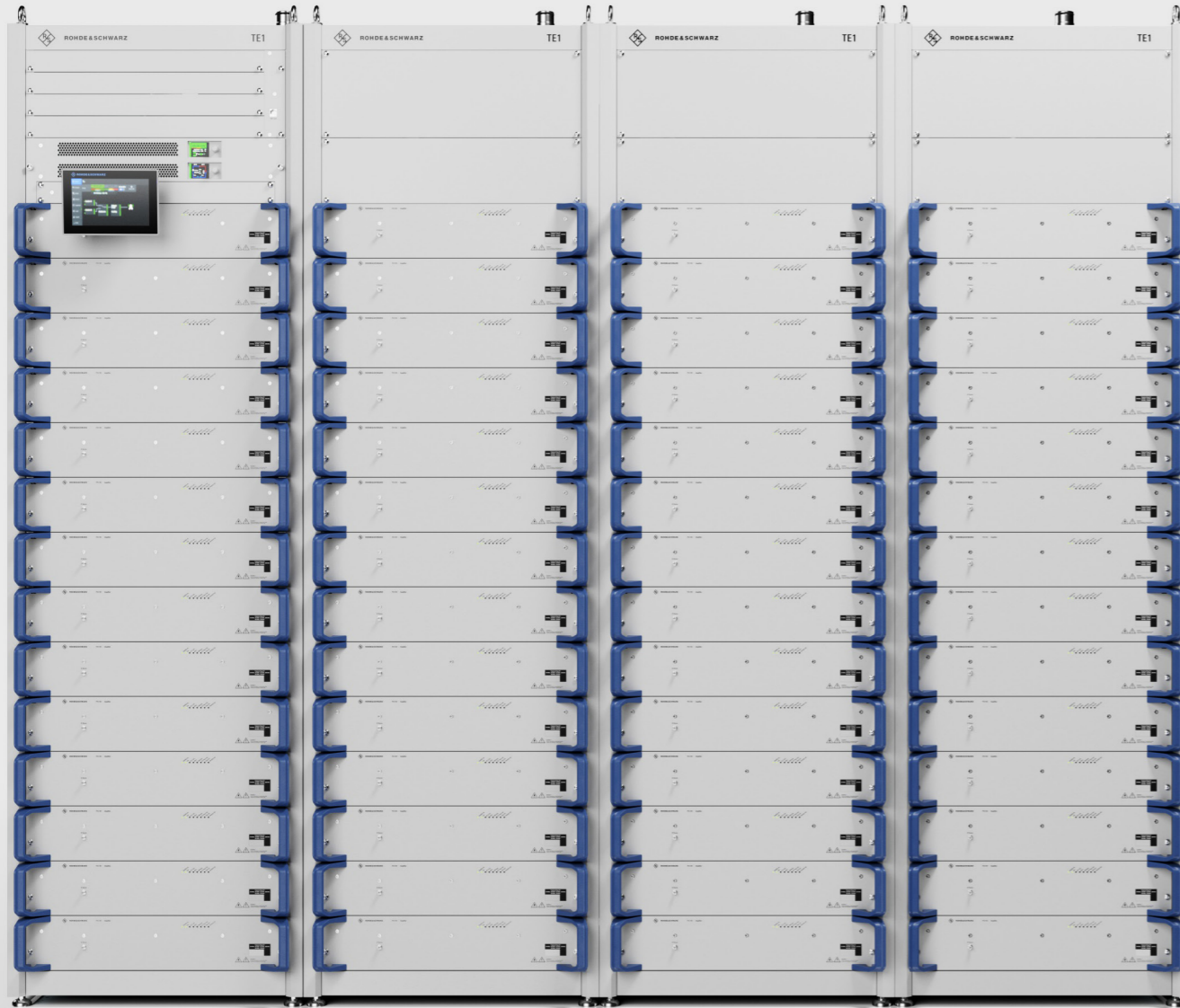
In April 2023, NAB launched the Future of Television Initiative, a public-private partnership to work on the transition with the goal of making it smooth for broadcasters, associated industries and the public.

While that effort progresses, broadcasters are addressing the challenge as well. Development of the Broadcast IP/broadcast-enabled virtual channel solution may provide some relief. Partnering with LPTV operators may also prove to be an effective way to reduce the logjam.

Perhaps the fastest way to solve the problem comes from out of leftfield—a solution to the congestion that designers of the ATSC 3.0 standards suite never envisioned more than a decade ago when this journey began. If the U.S. government were to select ATSC 3.0-based BPS as a complementary backup for GPS, a sequence of predictable regulatory and funding eventualities could sunset ATSC 1 on a date certain, and one that’s sooner than later.

“The thing I find most shocking about all of this is that about 62 bits in the ATSC 3.0 preamble may prove to be the killer app,” says Triveni Digital’s Corl, referring to the timing information that would be inserted into a NextGen TV signal if BPS were to become a reality.

One day in the future when broadcasters have full access to their own channel assignments for ATSC 3.0 transmission, the doors will open to an abundance of new services—many of which are ready for launch today—and the billions of dollars in added revenue they promise.



THE NEW R&S®TE1

Building a path to ATSC 3.0 paved with Energy Savings, Efficiency, and Sustainability

With completion of the Federal Communications Commission's UHF TV spectrum repack in 2020, many of the nearly 1,000 full-power stations were relocated to new UHF channel assignments. Most received a new DTV transmitter to transmit ATSC 1 today and are capable of being upgraded to ATSC 3.0 in the future.

While good news for those broadcasters, hundreds upon hundreds of full-power and Class A stations were left unaffected and continue to transmit with their old, inefficient ATSC 1 transmitter. However, there's good news for those stations, too, when it comes to a future NextGen TV launch.

The new R&S®TE1 transmitter from Rohde & Schwarz reduces cost of ownership, simplifies maintenance and operation and reduces carbon footprint, placing broadcasters on the path to an ATSC 3.0 future that's more economically efficient and environmentally sustainable.

The new ATSC 3.0-native transmitter is designed from the ground up for affordable, energy efficient operation—qualities particularly important to broadcasters looking to minimize total cost of ownership as they pursue new NextGen TV business models and revenue sources.

The liquid-cooled R&S®TE1 employs an optimized wideband design and leverages proven Doherty high-power PA (power amplifier) performance. As a result, the transmitter is extremely energy efficient. With liquid cooling that disperses 90% of excess heat outside, the transmitter also reduces required AC cooling and associated energy costs.

The new R&S®TE1.

To illustrate power efficiency and associated cooling savings, consider two different TV stations, each using a different pair of ATSC 3.0 34kw transmitters. One operates a pair of the average 34kw transmitters installed today, while the other operates two new R&S®TE1 transmitters at the same power level. Over 10 years, the station using the R&S®TE1 units will pay \$1.2 million less for electricity than the station relying on today's average transmitter, based on today's electricity prices.

For broadcasters deploying the R&S®TE1 in ATSC 1 mode until they're ready for NextGen TV, efficiencies exceed 50%.

Maintenance and operation of the R&S®TE1 are significantly simpler as well, further reducing operating costs. Troubleshooting is easy with built-in diagnostics, and support directly from Rohde & Schwarz ensures rapid response to any issue that arises.

The new transmitter supports broadcasters today and when they begin their NextGen TV journey, fully enabling them to maintain existing linear TV service with all the added benefits of ATSC 3.0 while devoting a portion of their channel capacity to new datacasting opportunities, whether those are CDN Offload, in-vehicle entertainment and Internet of Things applications or digital signage, TV to mobile phone and broadcast positioning services.

The R&S®TE1 is also future-ready and scalable. Relying on a native software-based exciter means the unit is extremely flexible, capable of handling potential new broadcast applications. Software-based modulation also futureproofs the R&S®TE1, ensuring it is natively ready for new applications with ATSC 3.0 extensions or 5G Broadcast.



R&S®TE1 Liquid-Cooled Transmitter

The new R&S®TE1.



Rohde & Schwarz

Rohde & Schwarz is striving for a safer and connected world with its Test & Measurement, Technology Systems and Networks & Cybersecurity Divisions. For 90 years, the global technology group has pushed technical boundaries with developments in cutting-edge technologies. The company's leading-edge products and solutions empower industrial, regulatory and government customers to attain technological and digital sovereignty. The privately owned, Munich based company can act independently, long-term and sustainably. Rohde & Schwarz generated a net revenue of EUR 2.78 billion in the 2022/2023 fiscal year (July to June). On June 30, 2023, Rohde & Schwarz had around 13,800 employees worldwide. Regional hubs in Singapore and Columbia, Maryland coordinate business activities in Asia and North America.

Broadcast & Media

For decades, Rohde & Schwarz has been a leading technology innovator in broadcast distribution and a trusted partner in media production. Broadcast solutions from Rohde & Schwarz deliver the latest generation of energy-efficient, software-defined transmitters and enable network operators to leverage new broadcast technologies. Providing solutions for live and studio production, post-production, multiviewing and playout, Rohde & Schwarz helps media professionals produce and deliver great content.

Regional contact

Europe, Africa, Middle East
+49 89 4129 12345

customersupport@rohde-schwarz.com

North America

1 888 TEST RSA (1 888 837 8772)

customer.support@rsa.rohde-schwarz.com

Latin America

+1 410 910 79 88

customersupport.la@rohde-schwarz.com

Asia Pacific

+65 65 13 04 88

customersupport.asia@rohde-schwarz.com

China

+86 800 810 82 28 | +86 400 650 58 96

customersupport.china@rohde-schwarz.com

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG; Trade names are trademarks of the owners.

ROHDE & SCHWARZ

Make ideas real

