

DTV

OPTIONS FOR TRANSITION



A review of DTV transition scenario options

With the clock ticking and a rigorous FCC timetable in place, the fast-track transition to digital broadcasting is upon us.

Unlike previous technology shifts in the television industry, the path to DTV is not a clear one. Broadcasters have unprecedented flexibility - and opportunity - to design new television systems to work with a wide range of business models.

Our role is to offer the best products available to help our customers succeed with their system design.

Many broadcasters are seeking objective information as they make decisions on the best approach for their business. This document covers some of the key DTV transition scenarios and details some of the pros and cons of each.

Snell & Wilcox provides essential solutions in virtually any DTV transition scenario. For this reason this document does not advocate any one approach over another. Each one has its advantages and disadvantages, depending on each broadcaster's situation.

DTV transition scenario 1: NTSC infrastructure

Since many television stations still operate with an NTSC plant, this first scenario is the most cost-effective method of maintaining an existing studio infrastructure while meeting the FCC requirements for digital broadcasting. The trade-off, of course, is a sacrifice of the superior picture quality offered by an all-digital television system.

Incoming high definition feeds and field acquisition materials are down converted to NTSC for use within the plant. At the end of the chain, an upconverter is used to send a digital signal to the DTV encoder. A precision decoder and noise reducer should be employed to provide the best possible video quality to the HD upconverter.

It's important to remember that the HD upconverter can output a signal in one of several ATSC formats. For example, the Snell & Wilcox HD5200 upconverter gives the broadcaster a choice of all available ATSC standards.

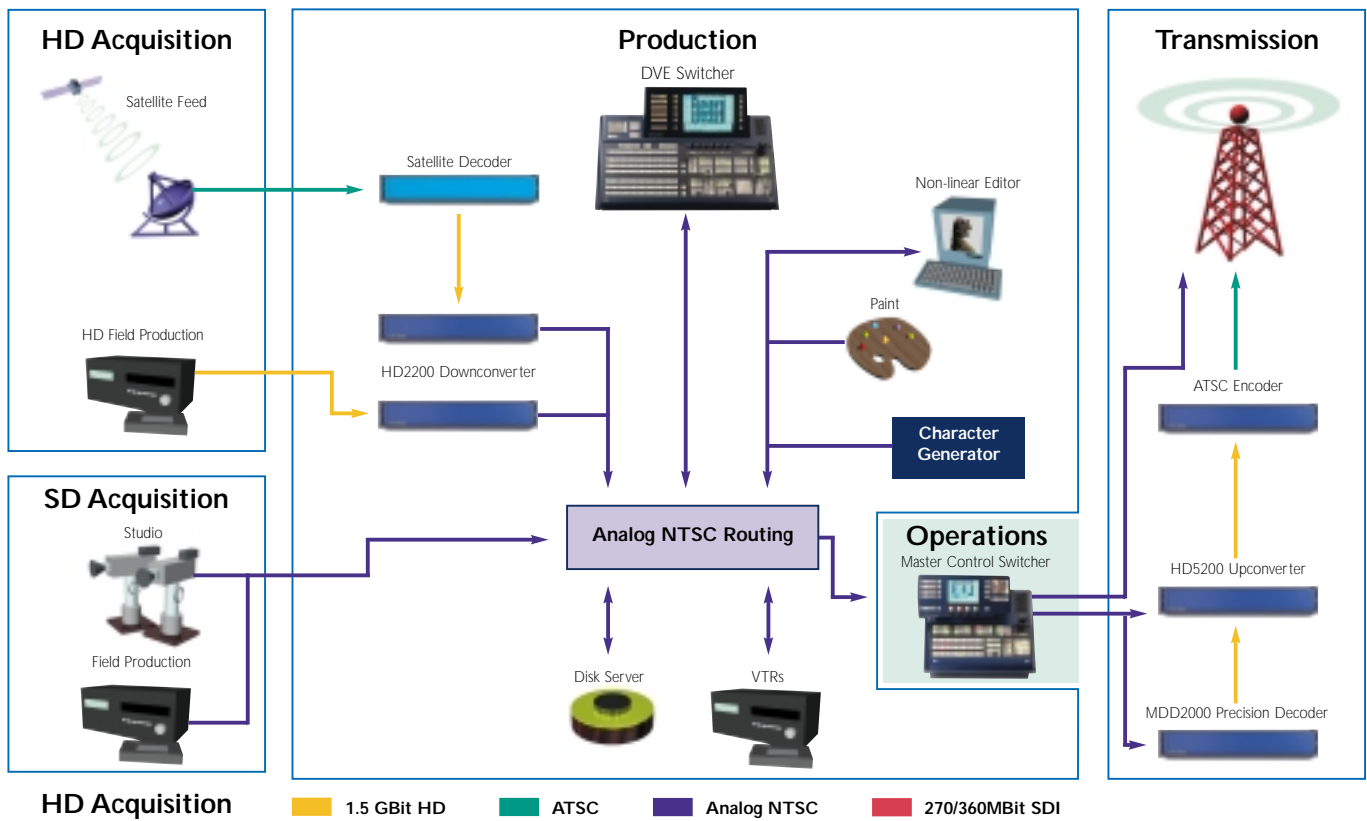
The broadcaster who wants a cost-effective entry route to DTV might consider this basic transition option. It is important to pay close attention to encoding and decoding techniques to obtain satisfactory results.

Pros

- Lowest entry cost to DTV broadcasting
- Leverages existing NTSC plant
- Allows easy insertion of local ID and logos
- Satisfactory image quality with use of good encoding and decoding techniques
- Delivery of all available ATSC standards

Cons

- Upconverted NTSC will not provide the highest quality
- Does not fully exploit HDTV technology



DTV transition scenario 2: Digital 601 infrastructure

For the broadcaster who wants to harness the power of digital technology in a 601 facility, this could be the appropriate option. It offers an excellent approach for broadcasters who want to transmit standard definition television, whether in the 4:3 or widescreen 16:9 aspect ratio. High definition material is downconverted before entering the plant's serial digital routing system. Within the plant, all existing SD digital devices can be used as before.

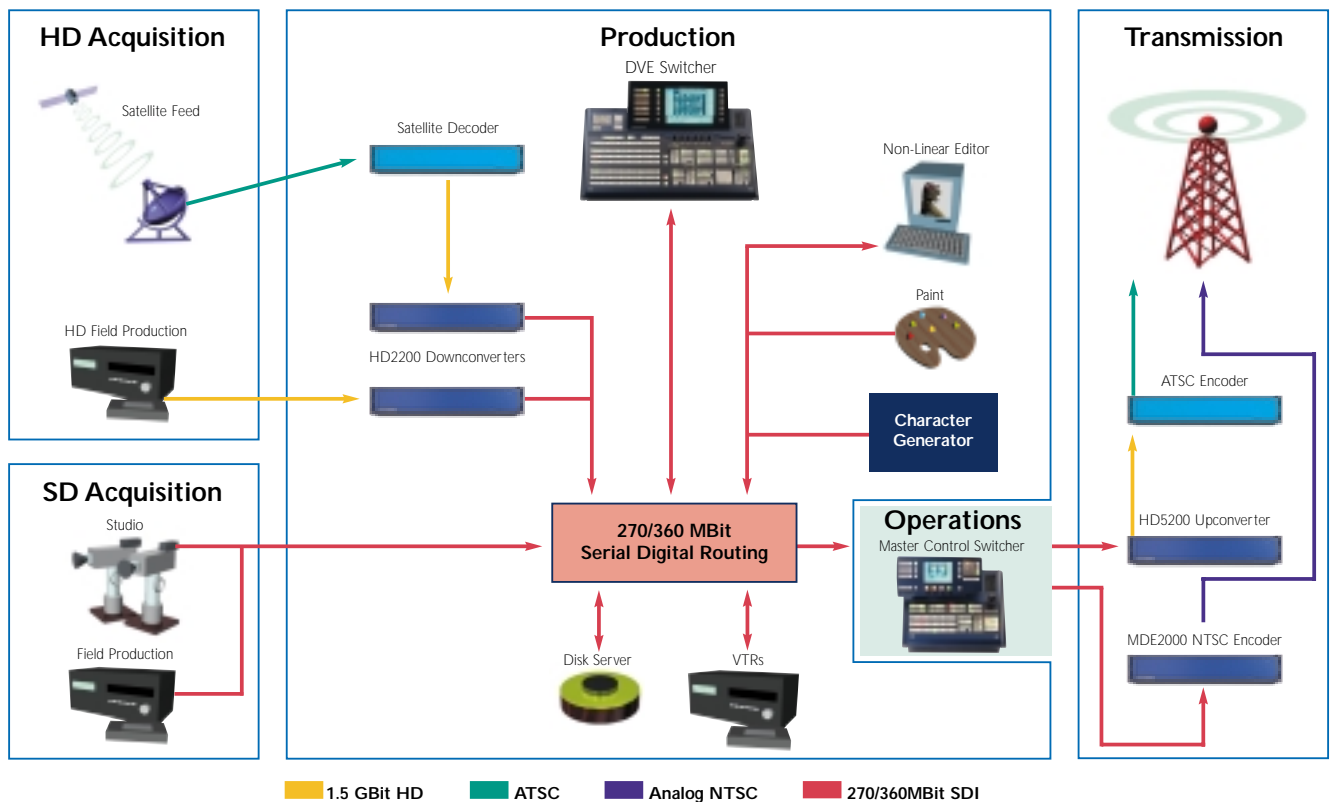
Prior to encoding, an upconverter is used to process the feed to the broadcaster's preferred delivery format.

Pros:

- Cost effective: on air with minimal investment
- Utilizes all of the existing digital 601 infrastructure
- Allows easy insertion of local ID and logos
- Maintains the highest production values
- Upconverted 601 offers excellent picture quality
- Delivery of all available ATSC standards

Cons:

- Does not fully exploit HDTV technology



DTV transition scenario 3: HD in islands

This scenario is for the broadcaster who wants to fully exploit HDTV. In order to fast-track the transition to HD, many broadcasters will choose to operate a dual-mode plant, with HD equipment placed in an island within the existing digital 601 infrastructure. The plant's serial digital router will coexist with a smaller 1.5 gigabit router for HD.

Outside of primetime, these broadcasters will transmit standard definition programming enhanced for video quality with upconversion. During prime time or for special events, the station will switch to HDTV.

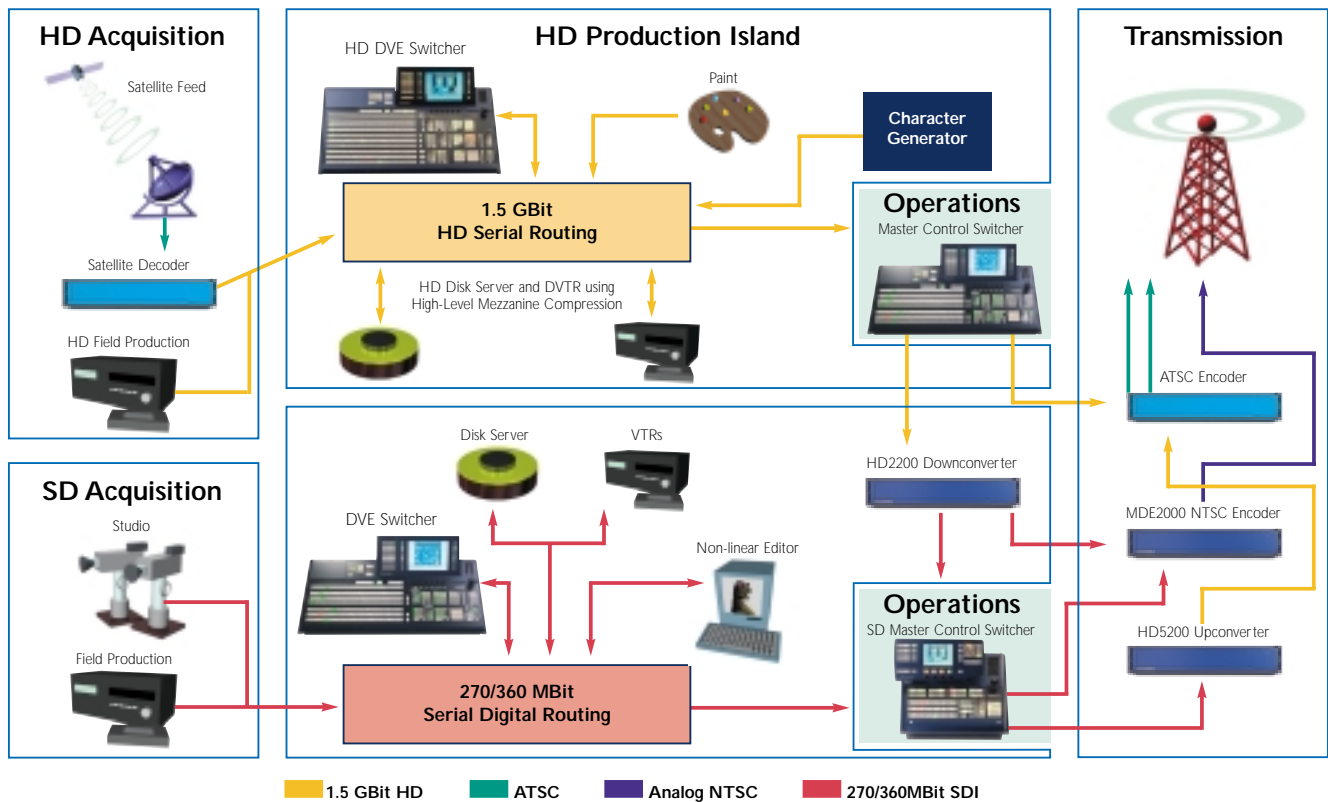
Within the HD island, there may be mezzanine encoding and decoding with VTRs and disk recorders. Up, downconversion, and in some cases, crossconversion will be critical in a transitional HDTV facility.

Pros:

- Offers broadcasters high production values
- Leverages off the existing infrastructure
- Allows stations to start small and build up for full service HDTV
- Offers viewers and advertisers state-of-the-art television services
- Delivery of all available ATSC standards

Cons:

- Higher initial investment (new router, master control, production switcher, etc.)



DTV transition scenario 4: 480p infrastructure

This scenario emphasizes a facility based on 480 progressive. Though 480p can deliver an improvement of image quality over 480i, the wider implications for the plant infrastructure must be considered. All incoming material, including existing 480i archives, must be upconverted for use in a 480p plant.

The 480p signal should be distributed throughout the plant on a 1.5 Gbit router for ease of system integration.

Many common video devices, such as interlaced monitors, must be replaced because they are useless in a 480p facility. The cost to equip a plant for 480p could quickly approach that of upgrading to full 1080i HDTV.

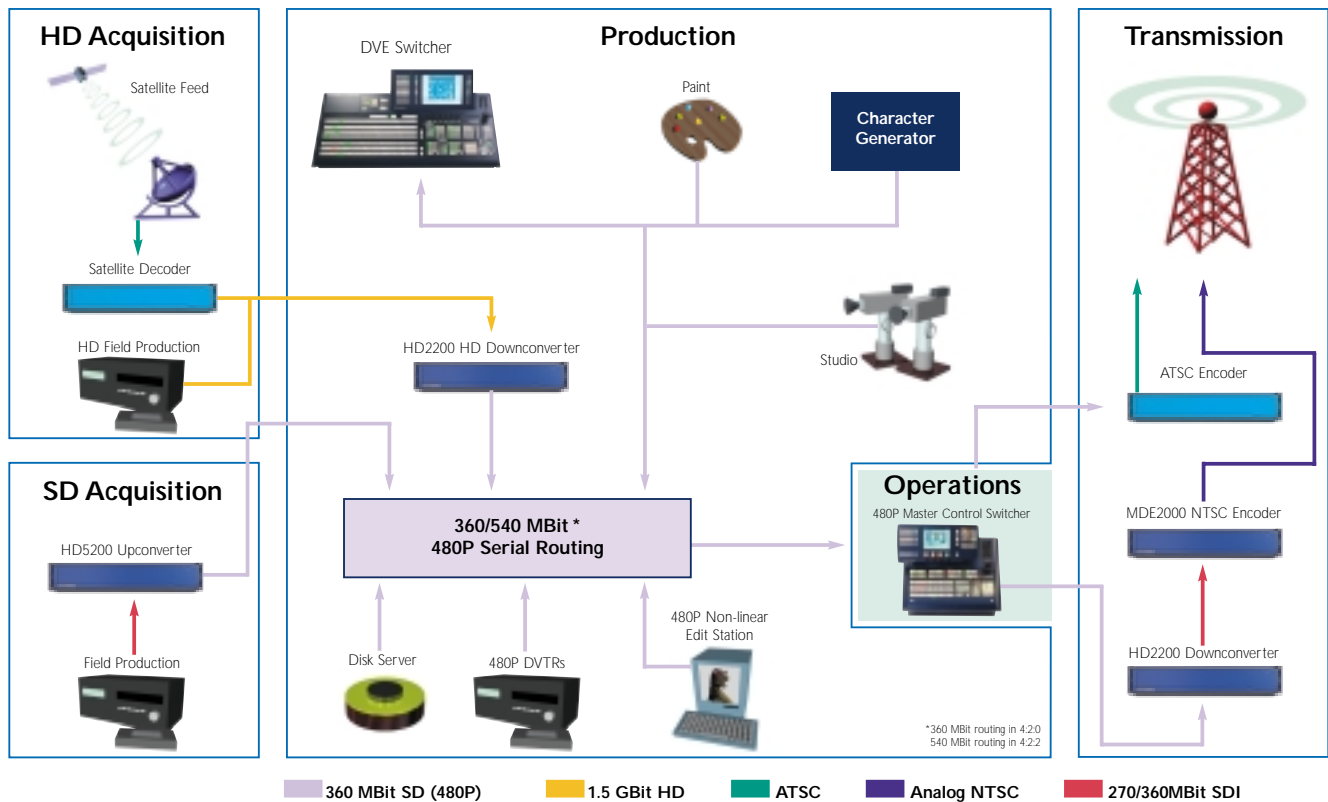
For broadcasters wishing to transmit a 480p signal, a far cheaper solution is to upconvert the plant's output signal to 480p just before encoding. A similar result would be achieved at far less cost.

Pros

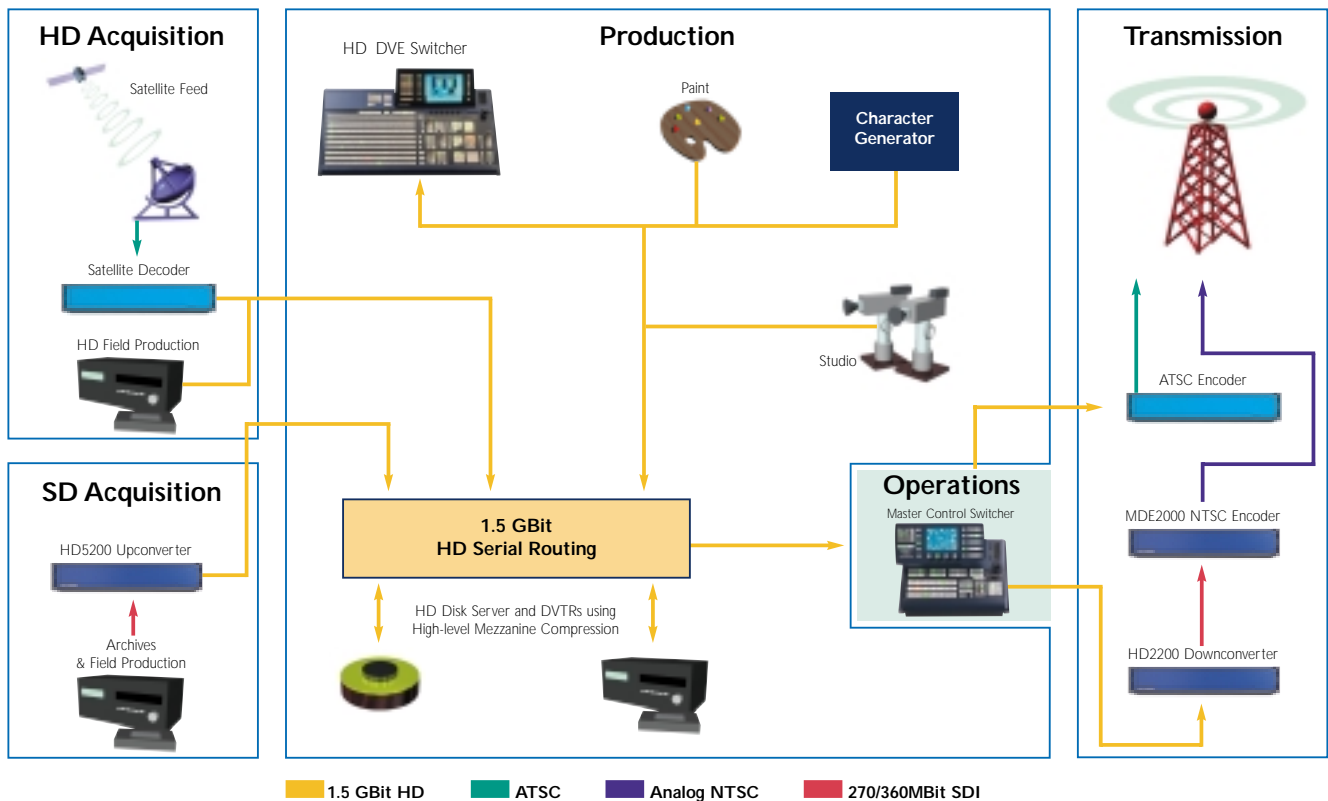
- Offers a visible picture quality improvement over 480i in most situations
- Bandwidth allows multicasting within ATSC transmission environment

Cons

- Requires replacement of master control, production switcher, monitors, etc with 480p equivalent
- Overall cost approaching that of HD infrastructure



Looking further forward: HD infrastructure



Each of these previous scenarios should be considered transitional. Where do we end up when the transition is complete? This illustration shows where we can go with current HDTV technology. A few years from now we might migrate to 1080 progressive, but the basic 1.5 gigabit routing infrastructure will remain the same for many years to come.

www.snellwilcox.com



Snell & Wilcox Inc. 2225-I Martin Avenue, Santa Clara, CA 95050, USA

Tel: +1 408 260 1000, Fax: +1 408 260 2800, E-mail: info@snellamerica.com

Snell & Wilcox Ltd. 6 Old Lodge Place, St Margaret's, Twickenham TW1 1RQ, UK

Tel: +44 (0)20 8917 4300 Fax: +44 (0)20 8607 9466 E-mail: info@snellwilcox.com