



Figure 8.2 Almost as soon as the television camera made it out of the laboratory it hit the street. One of the compelling features of television was its ability to take the viewer to interesting places. Equipment and image quality were crude, but the fact that the new appliance in the living room could present black-and-white pictures, and tinny audio, from all over the world was amazing at the time. Here David Sarnoff, the president of RCA, which owned NBC, talks about the new technology at the 1939 World's Fair in New York City to a very limited television audience. The U.S. entry into World War II put the commercial rollout of television on hold.

The Business and the Future

"The Whole World's a Stage"

Today every NFL game is covered, and CBS and FOX have a slew of control rooms back at their respective network operations centers (NOCs) to insert commercials, and an equal number of satellite transponders in use so that each local affiliate can select the game of most interest locally. An interesting dance takes place as the half-time show's producers try to organize the half-time show with some semblance of continuity as each game and its associated control room switch to the show and back out at different times based on a particular game's progress.

When the satellite first became a tool for broadcasters to use in the late 1970s, along with the emergence of Vyxx, the number of sporting events that could be simultaneously backhauled from venue to network or station and the coverage of televised sports exploded. Up until that time Ma Bell was the only viable long haul transporter of video, and it did that by carving bandwidth out of existing telephone capacity. Today the amount of sports coverage would have eaten up almost the entire capacity of the long lines available in the '60s. Another impediment was Sports Network, the original multitruck fleet. They early on had made a long-term deal to lease capacity for



Figure 8.3 In the 1960s, television stations started to separate into stations that did lots of productions outside the station, and those that did not. The stations that did a fair number of remotes often had their own truck; the others didn't. Even the stations that had their own trucks often only had a couple of cameras in them. This created an opportunity for enterprising individuals to go into the remote production business to serve the stations that occasionally needed outside production facilities, and occasions where a station that had a truck needed a unit with more cameras than theirs had. These "individuals" sometimes started their companies or, just as often, worked for a broadcaster or production company and convinced their employers that a truck would generate positive cash flow in increased capability or in service to others. Many educational stations built trucks (a few still do) with the intent of using them to help fund the station. The truck shown here would have been considered a big one in the late '60s. This trailer carried two RCA two-inch "quad" VTRs and up to six cameras, which enabled it to handle the "large" remotes of the day.

video across the entire long lines system, before the phone company realized the true value of the bandwidth they were giving up. That left a pinch on capacity for everyone else. Often Sports Network would sublease their leased capacity to others. In fact, some claimed that was Sports Network's real business and the trucks were only to help use the bandwidth — kind of like Vyvx with a fleet of trucks.

Although remote production has always included a fair number of entertainment shows and news, and some of the largest concentrations of remote units have been at the political conventions, sports has always dominated this niche of the television industry. The sports tail has actually become so large as to wag the dog. In other words, sport has transformed the television industry. Let's see why.

First, a little background. The networks historically have paid their affiliates to carry their programs, with stations in the larger markets being paid more per hour than stations in smaller markets. The onslaught of competitors that sprang to

life in the 1980s, namely the cable networks, meant that the networks ended up with less of the pie. Plus, the terrestrial broadcast networks more than doubled their ranks, from three to seven in the last couple of decades. This squeeze on revenue prompted the networks to try and scale back the payments, or "comp," to their affiliates.

Sports had become big business by the start of the nineties. Sleepy sports franchises in the major sports that were worth a few million in the '60s and '70s had in many cases branded themselves into large empires that were looking to wring maximum worth out of their "assets," from the sport itself to venue seating and merchandising. Team ownership was no longer a rich man's game, but one for the mega-rich or for large corporate entities, as teams often only changed hands after hundreds of millions of dollars were swapped. The major players in these sports also went from financially well off to major economic centers in their own right, via the astronomical salaries they were able to command. The major sports transformation from a grown man's game to major industry was funded by television.

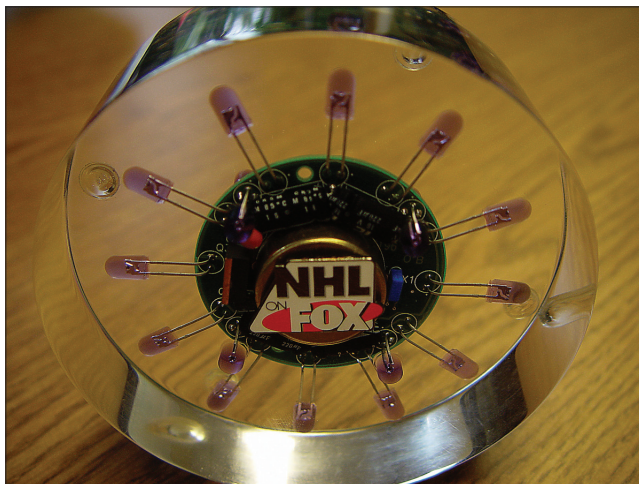


Figure 8.4 Soon the networks found that they could not do all, or even most of the remotes they were committed to. The networks would handle the A game stuff and hire others to facilitate the rest. The above the line production stayed in house; the hardware was outsourced. In the late '60s and early '70s individual events such as the Olympics had grown large in scope and many outside vendors had to be hired to generate a single feed back to the NOC. The photo here is what today would be called the IBC master control, during the tragic 1972 Games in Munich.



Figure 8.5 The three big networks usually had production requirements that most local trucks could not match. The big three also had much more money to spend as, unlike today, the network itself was a much larger cash cow than the local stations. So the networks all had several large, and a few smaller remote units. The photo here shows the video operator's station in ABC's Phase 8 unit during the early 1980s. Up until the early '80s, the amount of sports coverage done by the networks didn't require a lot of outside help. Even though the big three aired all of the marquee sporting events, the coverage was quite sparse by today's standards. CBS would cover only a couple NFL games each week, as would NBC with the AFL. (Source: A.F. Associates)

Figure 8.6 FOX had originally started in 1986, and up until the mid-90s was usually a distant fourth in the ratings. What FOX decided they needed was the credibility that sports would bring. When the NFL rights contracts came up in 1993, FOX wrestled the NFC contract away from CBS, which had a 28-year relationship with the NFL at the time, by agreeing to pay over \$350 million a year. FOX had no trucks. All their games would be produced using outside vendors. In fact, besides hiring a lot of the CBS talent and production staff, for the first couple of years FOX actually hired CBS's units to cover some of the games. In 1998 CBS sold off their units, as they were getting a bit long in the tooth and were not technically competitive with the facilities FOX had been getting with vendors. The actual beginning of the end for large network production units came when NBC sold off their units to NEP in January 1995, citing cost savings as a major factor. FOX also obtained the NHL contract and proceeded to generate buzz about their coverage of the game, which included use of graphical enhancements, like the glowing "Fox puck." An example of its innards potted in resin is shown below.



As the cable networks nibbled away at the major networks' viewership, no other television programming could deliver a concentrated audience like sports. Plus not all audiences are deemed equal by the advertisers. Young adult males are considered the hardest to reach because they don't watch a broad spectrum of television, but they do watch a lot of sports, and they are considered good consumers, spending wise.

So in the early 1990s, all the stars lined up for a monumental shift in television, and its impact on the remote production industry was huge. The networks were looking to reduce affiliate comps, sports had become a big and expensive business and central to many a network's business plan and identity, and an upstart network wanted in on the action.



Figure 8.7 When FOX got into sports it branded the sports in the FOX image — louder, bolder, brighter, flashier. FOX coined a motto describing their coverage: "Same Game — New Attitude." The FOX coverage also placed additional emphasis on the audio, so the audio folks appended the motto to include "Better Audio." Graphics also took center stage. As we have seen earlier, whole separate production trailers are found at many venues now to support the graphics effort. As the photo here shows, graphics are not just layered, or keyed, over the video anymore, but embedded into the background, as the pattern on the soccer field exists nowhere but inside a graphics engine. The graphics requirements have greatly impacted the truck vendor's workloads, as the graphical package from network to network and sport to sport is usually different. This means reconfiguration of remote units for each new sports season, which for the networks can be comprised of two tractor trailers in addition to the graphics trailer.

The Game Changes

Even though FOX wasn't making money on sports, it wrote down the value of its sports contracts later in the tune of a few hundred million dollars: The exposure garnered by its sports programming drove viewers to other shows on the network and generated lots of conversation about FOX around water coolers. Sports, especially NFL, had one other profound effect on the television landscape in the United States. A number of CBS affiliates jumped ship and became FOX affiliates. The resulting game of musical chairs left CBS with less desirable UHF stations in some markets, along with the reality that many of these new CBS affiliates had no news operations for the network news organizations to count on to help feed the national news engine of the network. This churning of affiliates, which affected even ABC as some of their stations sought better deals with rivals, also stopped talk of lowering or elimination of comps, at least for a few years. All this because of football!

Rights costs today for the big tickets sports are staggering. For NFL



Figure 8.8 A couple dozen vendors today provide the remote production backbone for the television industry. The largest fleet, NMT's, has nearly 50 trucks. One of their digital units, DX-4, is shown here alongside another vendor's unit at Anaheim stadium for a baseball game. One unit provides home team television coverage, the other the visitor's coverage. Often some cameras will be shared between the two but, in this case, these units each used their own equipment. NMT, which started in Seattle as an arm of King Broadcasting, grew both organically and through acquisitions, acquiring such venerable names as VTE and John Crowe along the way. NMT is not the only large fleet; as NEP has a couple dozen production units. Its roots also go back to a broadcaster, as a television station in Wilkes-Barre, WNEP, built a production truck which quickly gained favor with the networks. That led to more trucks, and a couple of acquisitions, notably Untel, an early pioneer of remote entertainment productions. There are a number of other truck companies running fleets of four to eight trucks, noticeably Core Digital Technologies/SWTV out of Phoenix; Lone Star/Mountain Mobile alliance out of Dallas and Denver respectively; All Mobile Video, which is based on the East Coast and the West Coast; and Trio from Chicago. There is also a group of a dozen companies that have banded together into "The Alliance," which represents over 30 trucks. Companies represented include NCP (another company that got its start from a broadcaster) out of Philadelphia, Corplex based near Chicago, Crosscreek based in Alabama, Mira in Portland, OR, YES New Orleans, and Soljiv in Dallas. There are also two to three dozen independents spread across the country running one or two trucks. Most of these independents built their truck(s) to serve a particular client or niche.

Figure 8.9 There are approximately 160 large remote trucks plying the interstates of the United States and Canada today. Most are used to cover the 10,000 or so sporting events televised yearly on the continent north of the Rio Grande. It's a tough business for all concerned. With the exception of professional football, and a few baseball and basketball franchises in large markets (such as the Yankees, Dodgers, Lakers and the Nicks), most sports teams are marginally profitable, if at all. The networks and other broadcasters in many cases pay dearly for the rights to air the games, hoping that enough advertisers can be found that will in turn pay handsomely enough to reach the viewing demographic that at the end of the day the broadcaster ends up with positive cash flow for the whole endeavor. That often doesn't happen, and networks have lost as much as \$100 million a year on some sports contracts. In fact in another form of reduced affiliate compensation, networks have gone back to their affiliates asking for them to kick in to cover some of the losses, in amounts pushing \$50 million.

alone, FOX and ABC pay \$550 million a year, CBS \$500 million, and ESPN \$600 million. When CBS took the AFC from NBC, it ended up paying more than twice what NBC had been paying. ABC, CBS and FOX are paying the NFL over 10 percent of what the big four networks bring in totally in ad revenue for the whole year. NBC, which bought the rights to the Olympic Games through 2008, gave the International Olympic Committee over \$500 million for the Winter Games in Salt Lake. The networks have been able to push down the rights fees in a couple of sports, namely baseball and basketball. In 1998 ABC paid \$23 million to broadcast soccer's World Cup. In 2002 ABC and ESPN exchanged airtime for the events. A production company formed by the U.S. men's pro soccer league produced the coverage and split the commercial inventory with ABC/ESPN. The huge fees for sports rights explain, in part, the earnings difference between the big four networks. The spread in earnings is over \$1 billion, with a couple of networks losing hundreds of millions of dollars, and a couple on the plus side by similar amounts.

The economics of sports is bringing back a business situation that started in television's infancy — the "time buy." In a time buy, an outside producer buys airtime from a broadcast or cable network. The network provides a coordinating producer so that the show doesn't end up looking like an infomercial. The networks often provide the talent also. Going rates are \$200,000 an hour and up. Some packagers, notably TWI (Trans World International), a unit of sports talent agency IMG (International Management Group), which initially represented tennis and golf stars such as Jack Nicholas, Bobby Riggs, Billy Jean King and Arthur Ashe) have been purchasing airtime from the networks for a couple of decades. TWI bought the rights to an event, produced the coverage, sold the commercials and essentially handed off the program to the network. The non-major sports can usually line up sponsors for their sporting events in advance, whereas the networks would have a tougher time lining sponsors up for niche sports. Sports where this is being done include tennis, golf, skiing, college basketball, horse racing, woman's pro basketball, bull riding, gymnastics and auto racing. Ten years ago the networks would have paid for a lot of these





sports, but not today. Some of the biggest profits for the networks in terms of sports programming is generated by time buys.

In 2000, the last of the big three networks, ABC, opted to get out of the truck business, selling their fleet to NMT. ESPN sold off four of their units in 2000, keeping a single unit on the West Coast for an ESPN Zone show. Turner Networks has two analog expando units used for baseball, hockey and basketball in Atlanta and the Southeast. The production of large and sophisticated productions on location had reached a point where companies that specialized and concentrated in this area were required to run these fleets profitably.

There are a couple paths to survival that truck companies have found. One path they go is to find a niche, be it high-end network productions, corporate productions or entertainment; small-scale productions; small-footprint vehicles, such as combination Ku/production units; or a truck built to the specifications of a client that will provide enough work to keep it afloat. The second path is heft, or economy of scale, which means lots of trucks. With one truck, a vendor that wants to handle 14 camera remotes might have to buy 14 cameras, even though they seldom do remotes of that size. Multiple-truck fleets can spread cameras across the fleet and gather them in large numbers in a particular unit only when needed.

Many remotes done on a daily basis have almost reached commodity status, specifically many baseball and basketball shoots. The prices that truck vendors can command for those events haven't dramatically increased in 20 years, while the costs of the trucks have. In the 1960s the lament was that someday it would take a million dollars to put a truck on the road. Twenty years ago the worry was raised to \$3 million, 10 years ago it was \$5 million, today the figure of \$8 million is seen on the horizon. Whereas a truck a generation ago stuck doing these S's (set, shoot, strike) remotes might have taken five years to pay for itself, now the time required can often be over 10 years. That's a long time to pay off technology that is continually moving toward obsolescence, and at a very fast pace.

Now the financial burden of high definition (HD) has arrived on the scene. Three types of HD truck infrastructures are distilling out to handle the dual HD/SD requirements on an ever-increasing percentage of remotes. The first is the single mode truck. Almost all trucks today are of this type. At the heart of this truck, the switcher can only handle HD. Any SD sources are upconverted upstream of the switcher, and the SD feed is downconverted downstream of the switcher. In the dual mode unit, the switcher can be



Figure 8.10 The remote truck industry has always been a tough business. Over the years many have put trucks on the road because it is one of the most interesting applications of television technology. Many liked being outdoors (well, maybe not in Minnesota in January), traveling to different venues and the raw challenge of fighting the elements to do television. A lot of trucks that came and went made no sense from an economic standpoint. At least one single truck operator has slept in his truck at times because cash flow from the truck didn't provide enough for the rental of an apartment. At many times there were simply too many trucks chasing the business.

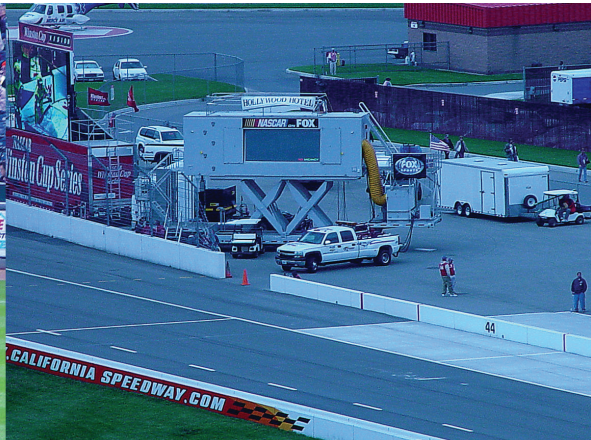


Figure 8.11 Left: In a number of instances the networks have decided that the deficit funding of sports, at least by the terrestrial networks, has to stop. The cable networks have an advantage that the traditional ones don't — besides selling ad time, the cable networks also collect fees from the cable company for each subscriber. This gives them an additional stream of cash to help pay for the rights.



Figure 8.12 Concentrating on entertainment is a way to get out of the sports grind for some operators. But trucks are often configured and laid out differently to cater to this clientele, and thus might not work well if pressed into sports work. But with the double- and triple-expando trailers available today, often enough space can be had in the truck to provide a good compromise between the needs of the two.

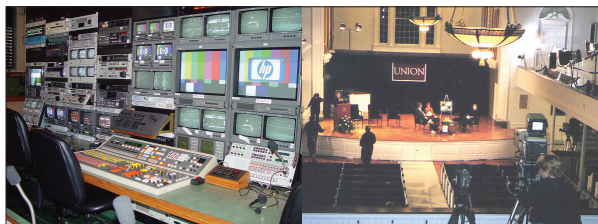


Figure 8.13 Catering to corporate television needs is profitable for a number of trucks. Corporate productions often don't require the high-end graphics and effects that high-end broadcasts require. Thus these trucks can concentrate on providing a good basic professional quality video and audio infrastructure. Many corporate clients also budget for one or more setup days. While not expecting the graphics and effects wizardry, they usually are concerned with basic production values. Vendors serving this niche claim that this situation results in less wear and tear on equipment, as you don't have the rush factor that can come with S's.

configured to operate in either SD or HD modes depending on the need. The most elaborate is the dual path. Here, one switcher control panel controls two switcher matrices, one SD and another HD. This eliminates the problem of upconverting an SD source, say the RF blimp camera, for passage through an HD switcher, and then having to convert it back down to SD as part of the SD program stream. This approach also allows separate

CGs and DVEs sized for SD's 4:3 and HD's 16:9 aspect ratios. This approach can use two units: one with the HD infrastructure, the other the slaved SD equipment. Or all could be combined into a single unit, and voila — the \$10 million truck is here!

With compression technology able to move high quality video and audio using less and less bandwidth every year, and the convergence of video and computer networking technology, some are pondering what the truck of the future might look like. In the future it will be possible to just have on location what is absolutely necessary — that is, just the sources, such as cameras and microphones. These sources could all be compressed and multiplexed in a small satellite or support truck and sent on a single feed back to the NOC, where in the comfort of a production control room the rest of the production staff would switch, add graphics and mix the show. Whether the cost saving will outweigh any potential loss of production flexibility remains to be seen.

Taking the previous idea a step farther, LAN-ready sources could plug directly into high-speed "production" networks that snake through the country and venues. Using LAN and telco transport protocols, the

A Separate HD Format for Everyone

One other aspect of HD production has muddled the direction that HD trucks will take. The major players can't agree on what constitutes an HD signal. Technology used to dictate that we interlace two video fields together to make a single video frame, but this is not true anymore. The approach taken so far in trucks to date is to use HD labeled 1080i. The 1080 refers to the active, or visible, horizontal lines in the picture, while the "i" indicates that the video is interlaced. That means it takes two fields to create a single 1080 frame. NBC and CBS have settled on this standard. But in our current age of choice, there are a number of other possible standards. ABC and ESPN like one called 720p. Again the 720 is the active horizontal line count, but the "p" stands for progressive scanning, which means the entire 720 line video frame is created each scan. Interlace vs. progressive attributes rest on temporal (read change over time) updating of the video frame. Which is better? Well 720p gives you more complete frames per second, but less horizontal lines, which results in lower vertical resolution (yes, it's confusing). In addition 1080i has 1920 active pixels per horizontal line, while 720p has only 1280 pixels per line. Which attributes are the compelling ones for HD format selection? The number of arguments supporting one or another usually is a function of the number of engineers in the room. And, by the way, FOX likes 480p. The end result of all this could very well mean different trucks for different clients, as cameras and VTRs are today generally not interchangeable between formats. But that fact has started to change as cameras are on the horizon that will be able to provide multiple HD formats out.



Figure 8.14 High-end trucks continue to push the limits of technology. The truck on the left was state of the art in the 1980s; the one on the right is on technology's edge today. The new truck is All Mobile Video's truck named "Resolution." This is a high-definition (HD) truck that can handle up to 16 cameras and 20 VTRs. This truck is a hybrid, in that it can produce both HD and SD outputs at the same time. Up until recently shows that were offered in both SD and HD used two separate production units and crews. Panasonic built a truck and lent it to ABC for a year of Monday Night Football, and CBS has hired SWTV and others to cover a few NFL and college football games, most separately from the SD feed. Other early HD trucks have been put into service by NMT, AESM and HD Vision. Airing simultaneous SD and HD productions presents problems other than the technical ones. The production techniques used for HD are often different. The increased resolution that HD offers allows for wider shots, capturing more of the overall spectacle, and HD has a wider aspect ratio, 16:9 vs. SD's 4:3. The HD cameraman has to keep in mind that he must keep the entire pertinent scene in a narrower 4:3 box for SD viewers, but at the same time keep unwanted people and things out of the HD viewer's picture.

source signals would make their way back to the intended NOC. Cameras programmed for a FOX remote would know that their video needs to find its way to Los Angeles in a timely and deterministic way, and cameras in the employ of CBS would know that New York City was their destination. Pushing the scenario out to something approaching ideas advanced in movies like *The Matrix*, a few cameras might someday be placed at strategic angles to the playing field, allowing virtual reality rendering engines to create camera angles selected by the director, or in the ultimate in user interactivity, by the viewer at home.



Figure 8.15 The demands placed on the high-end production makes for large compounds and complicated logistics. (Source: Core Digital Technologies/SWTV)

This book has looked at a very unique aspect of the television industry. The television industry in general has always tended to combine diverse technologies and disciplines. Television remote production takes that foundation, adds weather variations of over 100 degrees, monsoons, squalls, more studio cameras for single productions than many television stations have owned in their entire existence, and production locations that can be on the beach, or in a basement. The remote production industry is not for the person who wants a fixed routine and does not handle surprise well. On the road very few shows are ever the same, as equipment, crews, location and the weather combine to produce a different set of obstacles and challenges, and the satisfaction of prevailing over them. Hopefully we have painted a picture of the turmoil, the cacophony of often conflicting requirements, the technology, determination, dedication and the pure adrenaline rush that define the industry. ■



Figure 8.16 This is a business where the hats that people wear often change in the course of a shoot. On a moment's notice engineers become operators, and vice versa. At times, any of the crew can find themselves as assistant lighting directors or simply gophers. A remote is definitely a team sport. We know of at least one person who had two seemingly incompatible desires as occupations: He wanted to drive big rigs, and be a television camera operator. Luckily he discovered the remote truck biz. (Source: A.F. Associates)