

HDTV

— ready for take-off in Europe?

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Last year, the Belgian facilities company, Alfacam, placed their faith in HDTV by designing and constructing two state-of-the-art OB vehicles, one of which was recently demonstrated at IBC in Amsterdam.

This article gives an overview of the facilities offered by this new design of HDTV OB vehicle, which is also equipped to provide standard-definition pictures, simultaneously.

HDTV – it rings a bell in many European ears. About ten years ago, a few companies embarked on the first careful steps towards high-definition TV. It was new and stood for *extremely high quality*; it promised to have a bright future. But the equipment was extremely large and heavy, the investments were extremely high and, last but not least, who could profit from HDTV? There was no platform to distribute this new technology, there were no clients, there was nothing but pioneering.

In Europe, the HDTV story faded out silently. In America and Asia, on the other hand, the new technology grew beyond the experimental stage. The national TV station of Japan, NHK, beats everybody when it comes to HDTV. They have been studying this subject since the 1970s. Their investigations have led to the situation where they have been broadcasting in HD for about 10 years now. At the beginning, it was just a few hours a day; since a year ago, they have been broadcasting a 24-hour schedule in *Hi-Vision*, as they call their HD technology. Also in the USA, Central and South America, China and Australia, the HDTV broadcasters are making their way forward.



Figure 1
General view of Alfacam's OB10HD.

It was surely high time to prepare for HDTV in Europe!

And that is exactly what Alfacam thought when it conceived its two most recent OB vehicles – OB10HD and OB11HD, referred to as OB10-11HD in this article.

(To meet the needs of HD production in smaller or niche projects, Alfacam has also recently completed a smaller multipurpose OB vehicle, OB8, which – in one of its possible configurations – can have up to two HD cameras.)

What is so special about OB10-11HD?

First of all, these two OB vehicles are extremely large: thirty cameras can be connected! But what is more important is that they are the first fully-switchable digital **SDTV** (625/50, 525/60) / **HDTV** vehicles in Europe, if not in the world. They allow the recording and transmission of two completely different programmes simultaneously – even live. This of course is a very strong asset: they are not dedicated HDTV trucks, but vehicles that can record in exactly the format the customer wants, and deliver exactly the output the customer needs, on an extremely large and highly professional scale.

And last but not least, we are talking of twin vehicles: they have been designed and developed in exactly the same way. As such, they are completely interchangeable: one can serve perfectly as a backup for the other.

Thanks to the extreme user friendliness of the equipment installed in OB10-11HD, and the extensive format-conversion possibilities they offer, we feel that we can now call an end to the experimental period and consider that HDTV is now operational in Europe!

Inside the OB10-11HD vehicles

OB10HD and OB11HD, as their names suggest, are not the first OB vehicles in the Alfacam fleet. The team has built up quite some experience in the concept, design and construction of such vehicles. In 1999, their first extra-large TV truck – OB7 – was finished: it could take 22 cameras.

The concept and design of that truck was unique, and proved so effective that the same philosophy has been used for the new HDTV vehicles, OB10HD and OB11HD.

As shown in *Fig. 2*, OB10HD (and its sister, OB11HD) are based on a coach chassis, supplied and fitted out by the Belgian coach builder, Van Hool. Alfacam is very much in favour of the coach architecture, because it is the only way to introduce two levels in an OB vehicle. With this design, you can separate the technical area from the production area, and this concept has been greatly acclaimed by all the people working in Alfacam's OB vehicles.

All the technical equipment – mainframes, routers, Camera Control Units (CCUs), up to ten VTRs and hard-disk recorders, and other machines – is located downstairs, in racks mounted along both the longitudinal sides of the vehicle. This leaves a very spacious area upstairs for the “real work”. All the machines downstairs can be remotely controlled from upstairs.

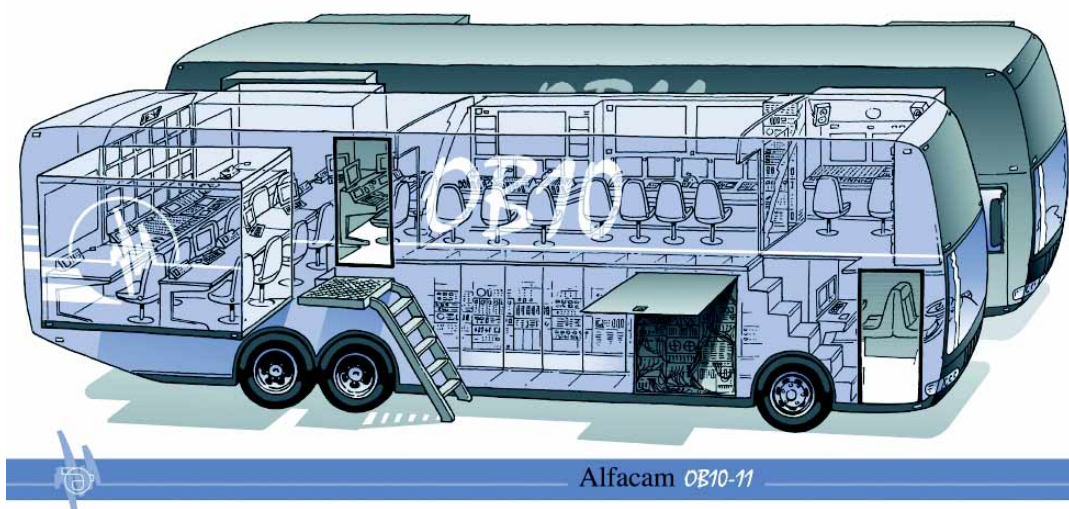


Figure 2
Drawing showing the interior layout of OB10-11HD.

As you can see on the drawing above, there are two expanding modules on the side walls at the rear of the coach, creating a comfortable and attractive production area which contains two long desks (4.5m) and a shorter one for the chief technician. The second and third of these desks are mounted, respectively, one step higher – so the staff always have an optimal undisturbed view facing the monitor wall (*see Fig. 3*), which is located against the inner rear side of the coach. The back walls of the expanding modules are used for large plasma screens that can be configured any way the director wants.

This spacious production area can hold up to 16 people comfortably. Of course it can be separated from the rest of the working area by a transparent door. The production area also provides a direct way out of the vehicle.



Figure 3
The spacious production area with the monitor wall.



Figure 4
The camera-control area.

The camera-control area is situated in the middle of the vehicle, in the longitudinal direction. In order to connect 30 cameras, you must be able to house enough people to control them! The vision-control desk in OB10-11HD can accommodate up to seven people. Each person has a high-quality monitor available directly in front of them. All the camera inputs can be monitored on three huge plasma screens, which can be configured completely according to the wishes of the customer.

The plasma screens are of an extremely high quality and of large size (50-inch screens). They offer major benefits by saving a lot of space and producing much less heat when compared with 30 separate monitors.

The camera-control desk is designed in such a way that it can meet any requirement: all the camera and master control panels can be added or removed as needed. If there are less than 30 cameras connected, the desk even grants space for an additional small mixing unit. At the right-hand end of the camera-control desk is a rack which provides space for an extra five VTRs if required. This brings the total of available VTRs to fifteen.

The sound-control area is situated in the front of the OB vehicle. Above the driver's seat, a third module can be expanded sideways. This module contains the fully-digital audio console and thus creates a comfortable location for the audio staff.

An effective intercom system connects all personnel permanently.

The OB vehicle has six cooling units. The fact that the technical area is separated from the production area, allows the creation of two different climates: a personnel-friendly climate upstairs and a cooler climate in the downstairs area, which accommodates all the heat and noise producing equipment.



Figure 5
The sound-control area.

A lot of difficult choices

OB10HD has been operational since April 2001; OB11HD since May 2001.

In the period between the conception and completion of both vehicles, a lot of difficult choices had to be made. For some of these, inspiration could be found in the experience the team had built up through constructing and operating the previous OB vehicles of the Alfacam fleet. However, in order to build two innovative, high-tech, extremely flexible and multi-customer-oriented OB vehicles – incorporating the latest technology, and which



Figure 6
The Thomson DD35 2S
vision mixer for SDTV.

would need to be very reliable – meant that more than a few heavy decisions had to be taken.

First we had to decide what kind of vision mixers we would use. On the HDTV side, we chose the Thomson Multimedia HD35 production switcher: on the SDTV side, the Thomson Multimedia DD35 2S (see Fig. 6). We already had experience with a lot of Thomson (previously Philips) mixing and switching equipment. In our studios and smaller TV vehicles, we use DD10 and DD20 mixers; in the larger vehicles, we have turned to the DD35 series. Throughout the years, these mixers have always proven to be very reliable and stable, so why change a winning team? The fact that the HD35 production switcher can be used with any DD35 control panel, enhances the accessibility and ensures that the operators are familiar with it from the very beginning.

As far as the HD cameras are concerned, we chose the Thomson LDK 6000 HD. Most of our existing non-HD cameras also come from Thomson: LDK 100/200/23/10/ ...

The LDK 6000 HD is an extremely powerful camera. It can record in SD and HD simultaneously, processing both the signals independently without conversion. This independent processing allows us to have 16:9 HDTV and 4:3 SDTV at the same time. The LDK 6000 HD is believed to be the only camera in the world that can switch between 625/50 and 525/60! As such, it fitted perfectly within the concept of OB10HD and OB11HD. Today, we own twenty LDK 6000 HD cameras.

Together with the cameras, the question arose – which recorders to use? Most of the available recorders compress the enormous amount of incoming data. That was an option we clearly did not want. It would be a pity to lose any of the 1.5 Gbit/s signal. Moreover, most of our clients were using the HDD5 format. Therefore we chose the AJ-HD3700 recorder from Panasonic.



Figure 7
The LDK 6000 HD camera.

The plasma screens form a fundamental element in the design of the two vehicles: their space-saving and low heat-producing features enable us to provide an attractive and comfortable working area of over 68m²; this is much more than in most existing TV trucks!

The screens must be of an outstanding quality, otherwise no customer would like to work with them. Two years ago, we tried out this concept in our first large-size van, OB7 (22 cameras), and chose Panasonic plasmas. OB7 has been heavily used ever since, and has made numerous trips throughout and even beyond Europe. We have never had any problems with these screens, so we obviously again chose Panasonic for the displays. We even installed the very first Panasonic 50-inch HD plasma screens in our OB10-11HD!

Abbreviations

| | | | |
|--------------|--|-------------|--------------------------------|
| 1080i | 1080 lines, interlaced scan | OB | Outside Broadcast |
| 1080p | 1080 lines, progressive scan | PAL | Phase Alternation Line |
| HD | High-Definition | SDI | Serial Digital Interface |
| HDTV | High-Definition Television | SDTV | Standard-Definition Television |
| NTSC | National Television System Committee (USA) | VTR | Video Tape Recorder |

The use of plasma screens calls for a reliable and very flexible splitting system. Here we chose Barco's i-Studio. This system can organize up to twenty-eight different inputs on the screen, exactly as the customer wants it. You can draw boxes as small or big as you like, place them on the screen wherever you like, and choose whatever input (one of twenty-eight) that you want to appear within each box. The output of the i-Studio feeds the plasma screens in SXVGA (with a resolution of more than 1000 lines!).

The monitor wall consists of BarcoNet monitors: twelve ADVM 14 and ten CBM 5049 units. The latter are SXVGA monitors which can display either HD signals or the output of 10 Barco Vivaldis. Thanks to the Vivaldi system, you can have either one or four high-resolution signals on the screen. When used in 4-split mode, each of the four signals is displayed with the same high resolution of over 1000 lines.

The sound console was another big issue. We absolutely needed an audio desk that was capable of surround sound mixing, since OB10-11HD are high-definition vehicles. This already narrowed down the choice. A digital console was preferred because of the possibility of remote wiring. The Soundtracs DPC-II is a console with great ergonomics and is very user friendly. This is an important factor, knowing that many different technicians will be operating the desks. Also, the Soundtracs DPC-II has great accessibility, which is crucial during live broadcasts.

The real strength of the design concept is that all the equipment is interconnected by a network. An outline of the mixing part of the network will clarify this (see Fig. 8). Each desk is equipped with an elaborate patch panel that allows you to control virtually anything from anywhere in the working area. Add to this the large number of output formats that the HD sources of the vehicle can deliver – 625/50 and 1080i/50, 525/60 and 1080i/60, as well as 1080p 24/25 – and you get a very fine example of utmost flexibility.

It is an incredible advantage if you can both *build* and *operate* the vehicles, yourself!

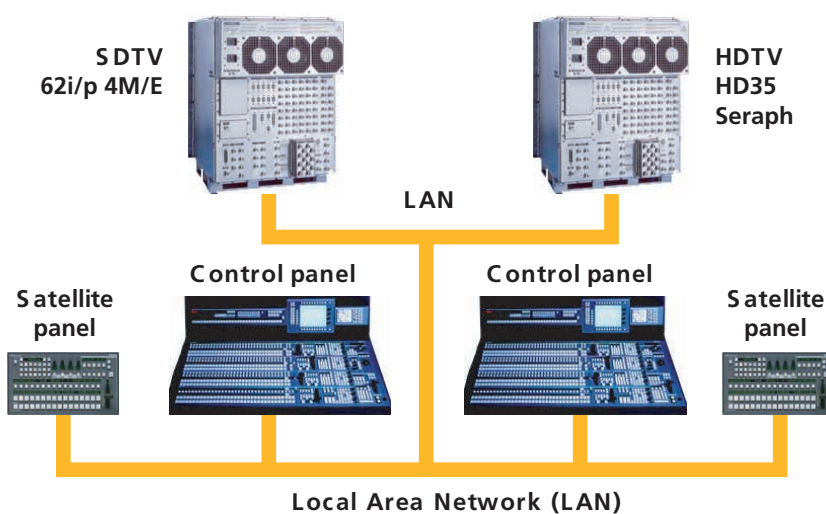


Figure 8
Simple schematic of part of the LAN which interconnects the vision-mixing equipment in OB10-11HD.

Outstanding quality of HDTV

A high-definition image consists of 1080 lines, almost twice as much information as a normal television image – 625 lines in Europe, or 525 lines in the USA and Japan. Together with some other refinement parameters



Gabriel Fehervari, general manager of Alfacam, was born in 1960. He studied law at the university of Louvain, in Belgium. After his graduation, he took a postgraduate course in audiovisual communication at the same university.

Since 1985, Mr Fehervari has been very active in the broadcast business, in very many different ways – as director, producer and technical coordinator – but also in the field of development and innovation. His broad range of practical experience “in the field” keeps his creativity going and permanently inspires him to develop new, efficient, flexible customer-oriented facilities and equipment.

within the HDTV technology, the total digital information of the image is increased by a factor of ten over SDTV. This results in a much higher product quality – to an extent that is comparable with the transition from black & white to colour television some 30 years ago. HDTV allows people to watch television like they would watch a 35mm movie in the cinema, including outstanding audio quality.

There is also the great archiving advantages of HDTV: because all the information is digital, you have the ultimate instrument for live recordings of very important historical events – such as royal marriages, unique cultural happenings, and so on.

And in the film industry, HDTV could cause a great change: it ensures a quality that is comparable to 35mm film, and allows a very flexible way of distributing and, again, archiving your productions.

Mega events, mega customers

OB10-11HD allow you to produce two different programmes at the same time, even live. That is exactly what Alfacam did for the Belgian Queen Elisabeth Competition for Violin in May 2001: we transmitted the concert live for VRT/RTBF in “Standard Definition” and recorded it simultaneously in “High Definition” for NHK, the

HDTV in Europe

Who will take up the challenge to get HDTV into the living room?!

When Alfacam planned two new HDTV trucks, our first and obvious concern was: who will watch HDTV in Europe? Families at home do not own an HD television today. Neither will they buy one as long as there is no HD signal available on satellite or cable.

In order to broadcast HD signals, you need a broadcaster who is keen to provide an HD platform. And in order to produce HD programmes, you need producers who can make HD programmes – but only if the facilities and equipment are available.

It is like a road – each part of it is equally important in order to reach your destination.

Alfacam has started to build the HD road in Europe and we will do even more. In 2002, we will build four new HD vehicles, with a capacity of up to twelve cameras each, based on the same concept as OB10HD & OB11HD but slightly smaller (OBs 12-13-14-15).

From Belgium, and from three new strategically-placed bases in Madrid, Monaco and Salzburg, we will be able to reach all the major European cities within four hours. At the end of 2002, Alfacam will then have seven HDTV vehicles and more than sixty HD cameras.

The first part of this long road – to get HDTV into the living room – is ready!

During the past few months, since OB10-11HD became operational, we have noticed that more and more producers want to make the step towards HD. They have noticed that producing in HD, in most cases, adds only 5 to 10% to their budgets. These producers make up the second part of the HD road.

But the road has to be finished by means of distribution and broadcasting. We believe that it is possible – within a reasonably short period of time – to develop a European HDTV Platform, maybe in an EBU-Eurovision context? We can think of plenty (language-independent) sports or cultural events which are very well suited to be broadcast in HD: The Eurovision Song Contest, New Year’s Concert, Euro2004, Olympic Games 2004 in Athens, ...

With some help from the European Union, this platform could start even next year!

Once the distribution and broadcasting part of the HD road has been completed, we believe that people at home will start to buy HD equipment. The new plasma technology should help them to fully equip themselves for HDTV at home. All new plasma models are HDTV-ready.

So the question I want to ask is: **“Which European broadcaster is prepared to take up the challenge to complete the HD road – right into the living room – within the next few years?”**

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Japanese television broadcaster – much to the satisfaction of the many Japanese participants in this international competition.

The opportunities are there. The market seems to have been waiting for a solution like this, as appears from the many requests for our services that come from all over the world. We have been working in HD for ORF (Austria) on several classical music events (e.g. Seefestspiele / Mörbisch), and for the BBC (Night of the Proms / London). We will shortly be doing quite a few jobs for several European production houses, such as R.M. Associates and EuroArts. Then, in February 2002, OB10HD will cross the Atlantic to Salt Lake City to provide HD coverage of the Figure Skating championships.

The existing or growing HDTV networks in Japan and America need original HD material – including material produced in Europe. With these two OB vehicles, we can provide the HD and SD material simultaneously. It is a smooth way to start up HDTV in Europe.

So, even though HDTV seems very far away from the common user right now, there will come a day when HD equipment is affordable – within the budget of many homes in Europe. We at Alfacam are ready to help make this happen!

