



SYSTEMS  
INTEGRATION

# Six-Camera OB Truck



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CONCEPT 2 SOLUTION

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## THE BRIEF

With an advanced equipment specification, the truck commissioned by North Star Equipment for Thai National Broadcaster MCOT was to be the first truck of its quality and size in Thailand. The brief detailed a six-camera OB truck with three operation areas separated by sliding doors, enough space for several operators, and air-conditioning to protect equipment from overheating in the tropical Thai climate.

C2S carried out the integration and coachwork, as well as supplying the truck itself, for local broadcast equipment supplier North Star Equipment, who were awarded the SI contract. The system was designed, built and pre-assembled in our workshop, ready for export, with final assembly completed on-site in Thailand.

“The C2S Systems team has the project management expertise and the ability to supply every element of the build to a very high standard rather than outsourcing. We needed this to ensure the highest quality truck was delivered to MCOT at the best possible price,” said Gia Radioas, International Relations Director at North Star Equipment.



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# Six-Camera OB Truck / MCOT, Thailand

## SPECIFICATION

### KEY EQUIPMENT

- Six Panasonic AK-HC3500 HD cameras
- Snell 2ME 40-input Kahuna vision mixer
- Back-up For-A HVS-300HS vision mixer
- Custom emergency changeover
- Two Panasonic AJ-HPD2500 P2 machines
- One Sony MSW-M2000P DigiBeta machine
- Harris Inscrber graphics
- Snell Pyxis 722 AES audio and 362 HD video matrix
- Tektronix 7200 waveform monitoring with engineering analysis
- Snell video and audio processing, distribution, conversion, embedding and de-embedding with RollCall control
- SSL C10HD main audio mixer
- Yamaha DM1000 back-up audio mixer
- DK audio monitoring and loudness measurement
- TC Electronic FX and audio processing
- Telex/RTS 322 communications matrix

### COACHWORK

- Mercedes Axor 1824LLnr chassis
- Height 3.8m Length 8.5m Width 2.5m
- Outer truck body: aluminium-skinned composite frame for acoustic and thermal protection
- Three operating areas, with six-seat production area
- Separate access doors for audio and engineering
- Electronically operated sliding doors between areas
- 63-Amp three-phase input with ISO transformer and AVRs
- Clean, safe power from rack-mounted central distribution unit
- LED interior lighting
- Tropical specification AC units
- Seven on-board automatic cable reels
- Motorised external awnings to shade main doors
- Hydraulic jacks with digital level indication and control





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# 14-Camera OB Truck



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## THE BRIEF

SuperSport wanted to use the equipment from two existing OB trucks to build a new and more capable 14-camera vehicle. They asked WTS' systems integration team to build it for them.

With complex, custom-designed coachwork included in the contract, C2S supplied all elements for the project, from vehicle supply to commission and acceptance. A Mercedes Axor 26T truck was built as a double-expander to provide space, while bodywork was designed to accommodate a large amount of equipment. State-of-the-art mechanics and hydraulics were used, allowing expansion of the OB truck with simple and efficient rigging with the push of a button.

Andre Venter, Head of SuperSport Africa said: "We knew this project could be challenging, especially with such a tight time-scale, but WTS has always been able to meet our needs, so we had every confidence and the result is a very impressive truck. The OB was covering live cricket in Zimbabwe only hours after the team had finished final commissioning on-site. When finalised, the vehicle will be the most powerful OB truck of its kind in eastern Africa, which makes us very proud."

The vehicle is based in Nairobi and is now being used for broadcasting sports events, particularly league football, across eastern Africa.



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# 14-Camera OB Truck / SuperSport, Kenya

## SPECIFICATION

### KEY EQUIPMENT

- Sony DVS-9000 3ME visionmixer
- 12 x Sony BVP-E30 camera channels
- Two LDK SD super slow-motion cameras
- Four robotic/mini-cams
- Three EVS XT2 replay units
- Four DSR-1000 HDD recorder units
- DSR-2000 DVCAM deck
- Yamaha DM2000 audio console
- Sony monitoring
- Tektronix WFM5000 scopes
- Telex communication systems
- CTP Systems DBC-16 camera communication system

### COACH WORK

- Mercedes Axor 2529LLnr chassis
- Double-expanding body
- Outer truck body: aluminium-skinned composite frame for acoustic and thermal protection
- Locker storage and access doors
- Waterproof Air-conditioning compartment with louvres
- 63 amp three-phase input
- Clean safe power from rack-mounted central distribution unit
- LED interior lighting
- Automatic cable reels on-board
- Electrical external awnings to shade main doors
- Hydraulic jacks with digital level indication and control

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# 14-Camera OB Vehicle



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## THE BRIEF

SuperSport Nigeria wanted to strengthen their existing OB fleet. They needed a 14-camera vehicle, that could be upgradeable to 20 cameras, with a double expanding body and state-of-the-art HD equipment and mechanics. SuperSport asked C2S to design the system, coach-build and integrate the truck for them, along with a support vehicle with satellite uplink and on-board generators.



## 14-Camera(+) HD OB Vehicle / SuperSport Nigeria

### SPECIFICATION

#### KEY EQUIPMENT

- Sony HSC-300RT camera channels
- Camera Corp QBall 3 and Meerkat specialist cameras
- Sony MVS-7000X vision mixer
- EVS XT3 replay servers
- EVS 32TB X-File storage system
- Snell Sirius 830 - 288x288 15RU router
- Snell IQ modular conversion and distribution
- Grass Valley KMV-3911 Kaleido multi-viewer systems
- Dual Telex Cronus talkback matrices
- Mercedes Actros 2536 OB vehicle
- Mercedes Actros 2536 support vehicle
- Advent NewSwift 180 uplink
- Ericsson dual AVP3000 encoder and RX8200 decoders
- Sony PVM-A170 & LMD-A240 / LMD-A220 monitors
- Osee rack mount monitors



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# SYSTEM INTEGRATION

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## Dual-Truck OB Units



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- Sony PVM-A170 & LMD-A240 / LMD-A220 monitors
- Osee rack mount monitors



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# 10-Camera DSNG Vehicle



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## THE BRIEF

Built on a 10-tonne MAN chassis with custom coachwork from, Rûdaw needed this production truck to be robust and capable of sustaining operations in Iraq's varying climate.

Operating conditions demanded that the truck be built on a small footprint while still being able to accommodate eight cameras and two wireless cameras, as well as four external feeds. The vehicle also offers two channels of graphics and a six-channel EVS.

C2S provided an end-to-end service, incorporating vehicle acquisition, coach build, electrical design and installation - including roof-mounted domestic air-conditioning units - systems design and integration and on-site user training.

Commissioned to enable the client to expand their outside broadcast news operations, the truck has helped Rûdaw incorporate multiple daily live broadcasts into both their live studio output and pre-recorded programmes.



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## 10-Camera DSNG Production Vehicle / Rûdaw

### SPECIFICATION

#### KEY EQUIPMENT

- Sony PMW400 camcorders with TX70 series Triax adapters
- Boxx Meridian 5 GHz IP based wireless camera system
- Ross Carbonite 2ME vision mixer
- Ross 48x56 video router
- Ross video & audio distribution and card based processing
- Harris X50 multiprocessor units
- Ross Expression Prime graphics
- Sony PMW100 XDCAM recorder
- AJA KI-Pro recorder
- Sony PVM A170 and LMD-2341W monitors
- Osee RMS-HSC range of rack mount video monitors
- Tektronix WFM5000 measurement equipment
- Yamaha LS9-32 audio desk
- Telex Zeus III 32 port comms matrix
- Autoscript 17" prompter systems
- Autoscript 17" prompter systems
- Oyster auto-tracking satellite dish for off-air reception

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# Four-Camera OB & DSNG Land Rovers



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## THE BRIEF

Rudaw needed two off-road DSNG vehicles, each accommodating three triax cameras and one RF camera, for HD news-gathering and small productions on location. The main challenges for the integration project were in fitting a large amount of technology into a very compact space and designing a system that could be manned and used by a single operator and that would function reliably in the extreme climate of Iraq. Equipment choice and system design were important factors in accommodating these requirements.

C2S completed the system design, integration, equipment sourcing, custom fabrication and vehicle-bodywork for the two off-road DSNGs.



## Four-Camera OB & DSNG Land Rovers / Rudaw

### SPECIFICATION

#### KEY EQUIPMENT

- Sony PMW400 camcorders with TX70 Series triax adapters
- Vinten Vision 250 tripod systems
- Ross Crossover 10-input vision mixer
- Ross 32x32 video router
- Ross video and audio distribution and card based processing
- Harris X85 dual-channel multiprocessor units
- Ross Expression Prime GO graphics
- GlenSound MPI0005 dual-channel GSM unit for comms
- Sony PMW100 XDCAM recorder
- AJA KI PRO recorder
- Advent Newswift 1.5m KU uplink
- Boxx Meridian 5 GHz IP-based wireless camera system

#### VEHICLE BODYWORK

- Land Rover Defender 110 vehicles
- Fischer Panda 8KVA on-board generator with custom radiator mounting



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# Government Broadcast Facility



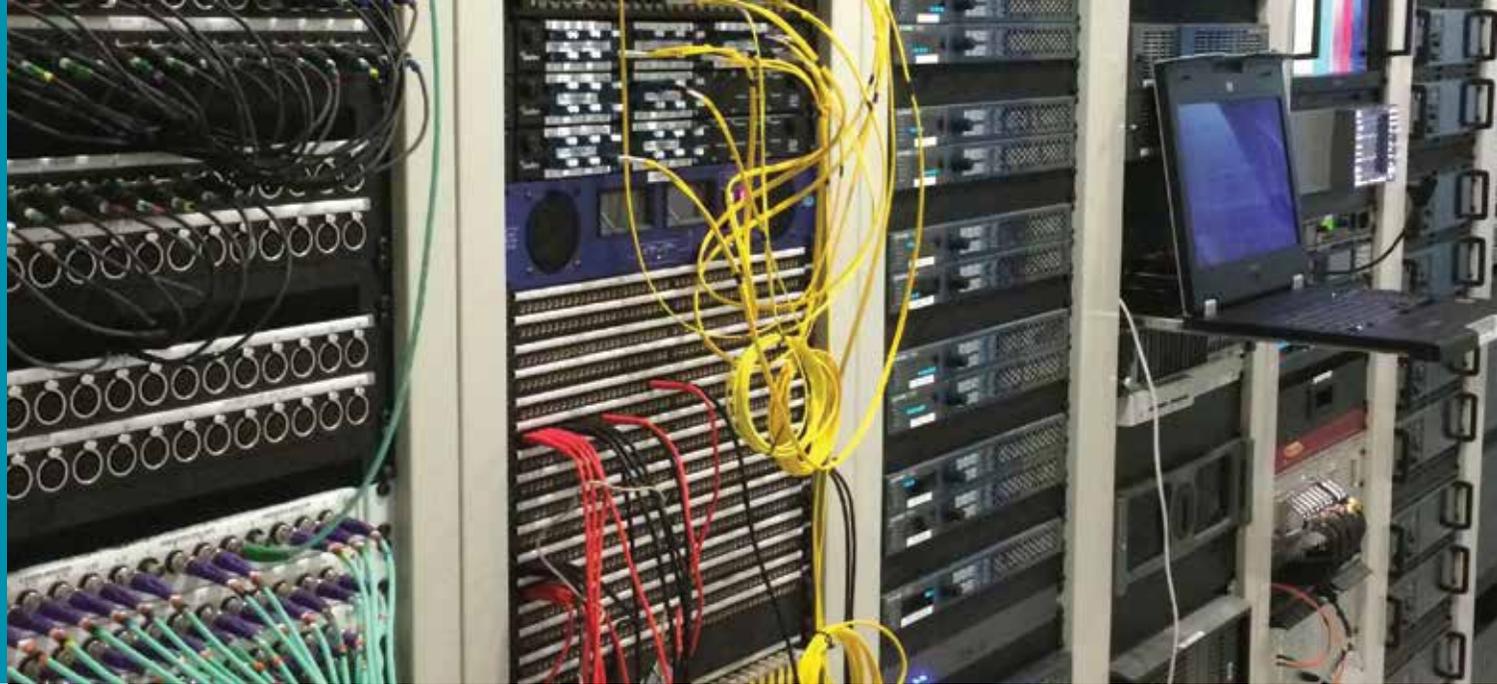
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## THE BRIEF

The new Majlis Building in Oman needed an HD broadcast facility to allow live government broadcasts directly from the location. Contracted by MSE, C2S designed and built the facility in two parts: a multi-area tie-line system for audio, video and fibre; and a 3G HD broadcast control facility for robotic cameras in three halls with an additional single-camera presentation studio.

C2S' systems integration team provided full system design and integration, building consultation, custom-made technical furniture, on-site project-management and operator training. The project, which included 18 Sony HSC-2500 system cameras, was completed in January 2014 and went into use immediately.



## Government Broadcast Facility / Majlis Building, Oman

### SPECIFICATION

#### KEY EQUIPMENT

- 18x Sony HSC-2500 fibre cameras
- Vinten Rademec robotic control system with touch control
- 96x104 3G Harris Platinum router with on board multiviewers
- Telex Adam-M comms matrix with RVON IP panels
- 9x Harris X50 processors
- LAWO MC562 audio mixer
- Harris 6800 series distribution equipment

#### KEY ELEMENTS

- System design
- System integration
- Building consultation
- On-site project management
- Equipment installation
- Custom technical furniture
- Operator training



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# Five-Camera HD 4x4 OB Vehicles



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## THE BRIEF

As part of an upgrade to HD, state broadcaster Kuwait Television (KTV) commissioned WTS to design and build four multi-purpose HD production vehicles capable of providing faster turnarounds than its current 14-22 camera units.

The system integration needed to offer the flexibility to cater for HD productions across multiple regions, and retain compatibility with the existing OB fleet, all within a small vehicle footprint.

WTS' innovative build method of prefabricating furniture and wiring using 3D works models was key to meeting the project's stringent lead time.



## Five-Camera HD 4x4 OB Vehicles / Kuwait TV

### SPECIFICATION

#### KEY EQUIPMENT

- Ikegami HDK-55 Triax HD camera systems
- Ikegami HEM series OLED monitoring
- Ross Carbonite C2M vision mixer
- Yamaha DM1000 audio mixer
- Ross NK routing system (HD video, AES and analogue audio) with NK-Q control panels
- Ross openGear distribution
- EVS XTnano server
- Imagine Communications Inscribe G8 dual-channel graphics
- Auto-deploy satellite antennae customised to receive Middle East-targeted satellites

#### COACH BUILD

- Four Mercedes 5T Sprinter vans with 4x4 running gear
- 3D works models used to prefabricate interior furniture and complete all electrical systems, broadcast wiring, interior panels and equipment configuration prior to receipt of empty vehicles
- Custom three-phase power distribution with 30-minute 6kVA UPS
- Customised roof-mount air-conditioning units to enable higher ambient temperature operation of up to 52°C



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