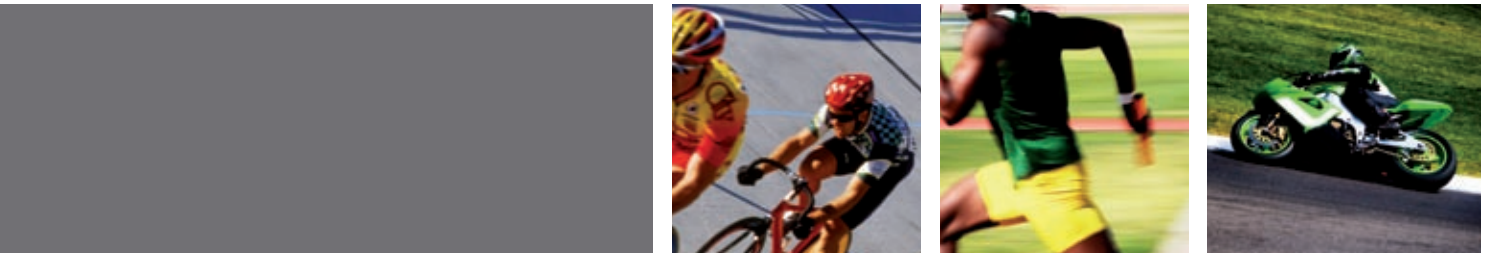


real time choreographed cinematography



- multi camera control
- automated cinematography
- virtual advertising
- patented products



Introducing the Trace X8

The Trace X8 is a revolutionary new camera management system which enables one operator to control the pan, tilt, zoom, and focus of 8 cameras simultaneously. The Trace X8 specialises in tracking dynamic targets while facilitating total control over each camera.

The Trace X8 utilises servo encoded heads and lenses, the Trace X8 Control Interface, its unique software, and an initial venue survey. The Trace X8 can be deployed at any track based event such as Motor Racing, Horse Racing, Track Cycling, Athletics and Winter Sports and it has tremendous applications in small field sports such as Ice Hockey, Basketball or Boxing.

The Trace X8's patented software creates a virtual 3D model that is overlaid and synchronised to each

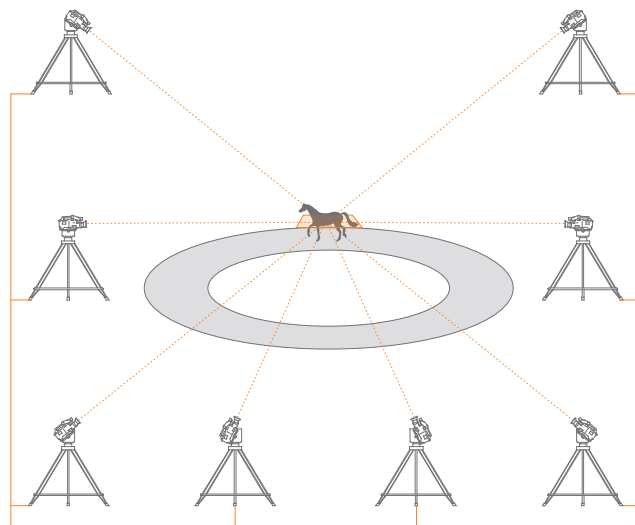
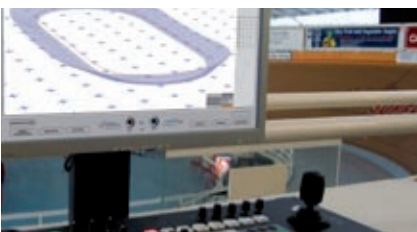
camera's vision. This synchronised 3D model enables a potent array of functional and artistic compositional commands to be executed. The results are unprecedented camera accuracy, agility and an ability to choreograph real time camera sequences that are tracking a dynamic target.

Cost savings generated through the control of multiple cameras by a single operator means the Trace X8 is an excellent investment for many broadcasters. Further benefits include automated

remote cameras that enable a wider range of locations and other reductions in operational and venue infrastructure.

The Trace X8 and its two plug ins, the Trace X8vr and the Trace X8gps, are powerful revolutionary tools for the Broadcaster that will facilitate popular enhancements, reduced costs and additional revenue streams.

System Overview

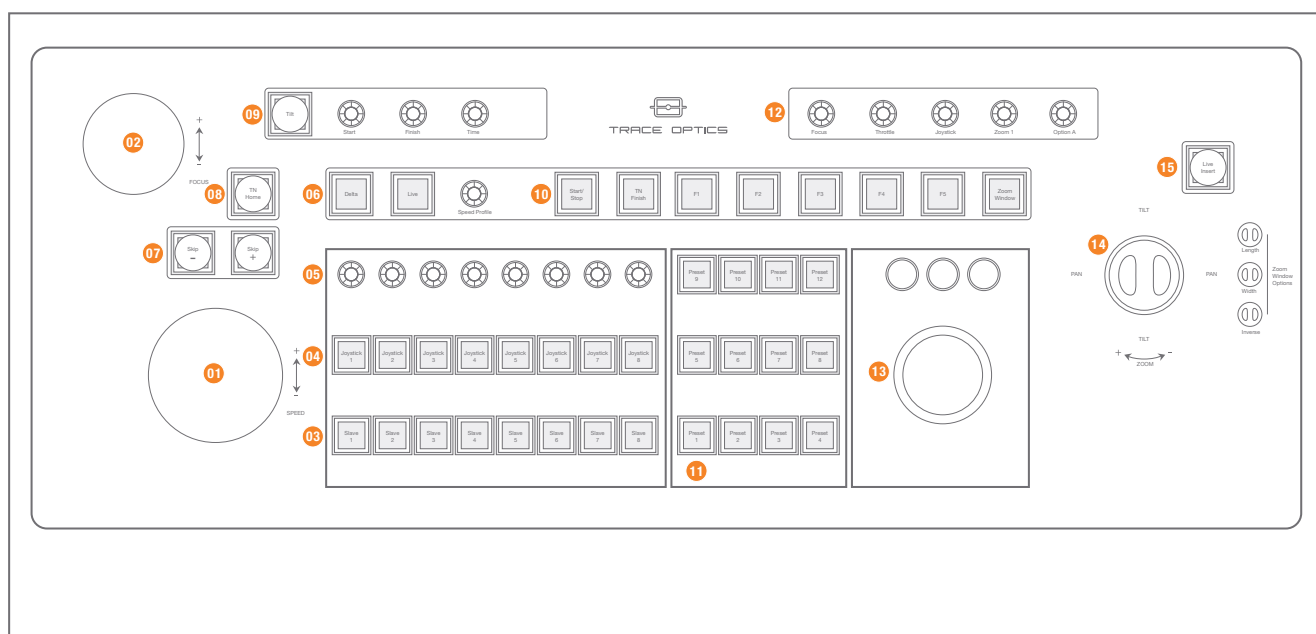


The Trace X8 enables precise framing and focus from any or all of the 8 cameras at any location.





Control Interface



1. **THROTTLE:** Controls the speed of the Track Node (TN) or trims a GPS node.
2. **FOCUS WHEEL:** Governs a camera's focus while in joystick mode.
3. **SLAVE BUTTONS:** Enables camera's to be locked onto the TN.
4. **JOYSTICK BUTTONS:** Controls only one camera at any one time via the Joystick.
5. **ZOOM OFFSETS:** Controls the size of a slaved camera's field of view proportional to the Zoom Window
6. **SPEED PROFILES:** Enables the control of the Track Node via speed profiles.
7. **SKIPPING BUTTONS:** Controls the selected Track Node up and down race order within a GPS environment.
8. **TRACK NODE HOME:** Enables the resetting of the Track Node to the home position.
9. **DYNAMIC TILT:** Enables the start, finish, and duration of a Tilt to be preset and then executed.

10. **FUNCTION COMMANDS:** Numerous commands that include, stopping and starting the Track Node, locating the Track Node at the finish of the Track Path, disabling the Zoom Window function enabling the operator to manual control the zoom via the joystick.
11. **PRESET SHOT:** Enables the logging and retrieval of preset pan, tilt, zoom and focus shots.
12. **SENSITIVITY DIALS:** Controls the sensitivity of the Speed Wheel, Focus and Joystick instruments.
13. **TRACK BALL:** Enables data entry and selection.
14. **JOYSTICK:** When a camera is in Slave mode it controls the offset of the Track Path and the size of the Zoom Window. When a camera is in Joystick Mode is controls the pan, tilt and zoom of that selected camera.
15. **LIVE INSERT:** Enables the centre line of a Joystick mode camera to be slaved to the closest point on the Track Path at a predetermined speed.

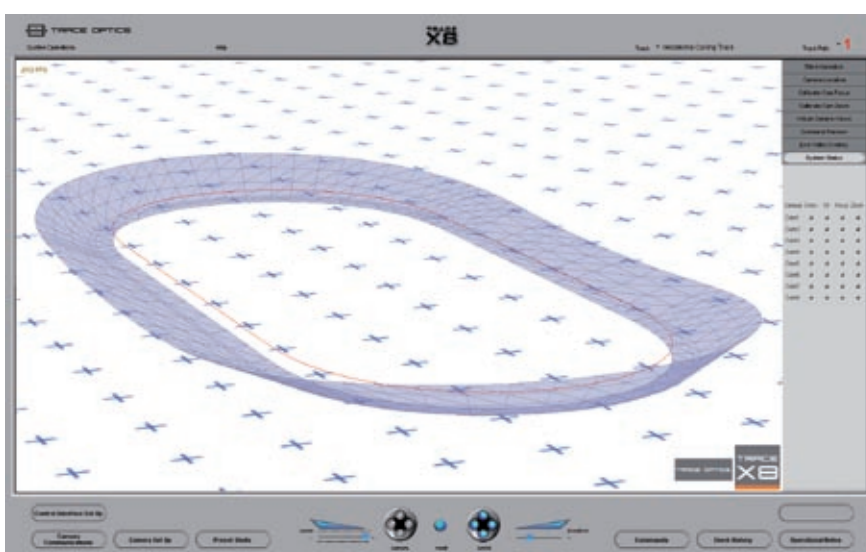




The Graphical User Interface

The Trace X8's GUI enables the synchronisation of the camera's field of view and the venue's 3D model. This precise 3D model of the venue facilitates a powerful and flexible array of patented commands and tools. Directors and Camera Operators now have the ability to model complex choreographed sequences within a dynamic environment then execute that sequence in real time.

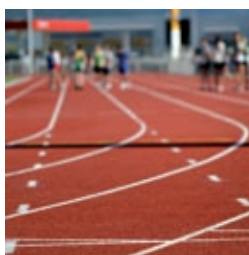
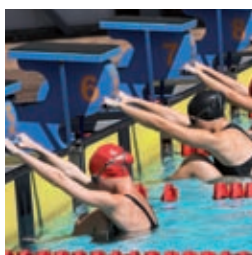
The GUI's logical and intuitive grouping of functions and features makes it very user friendly. Set up functions are located on the top and bottom of the GUI frame, while all calibrations and functions involving live video and real time commands are located in the right panel. Typically the Trace X8 Operator would have the main central area of the GUI showing 4 live feeds from nominated Trace X8 cameras while using the right panel to monitor the general status of the System.



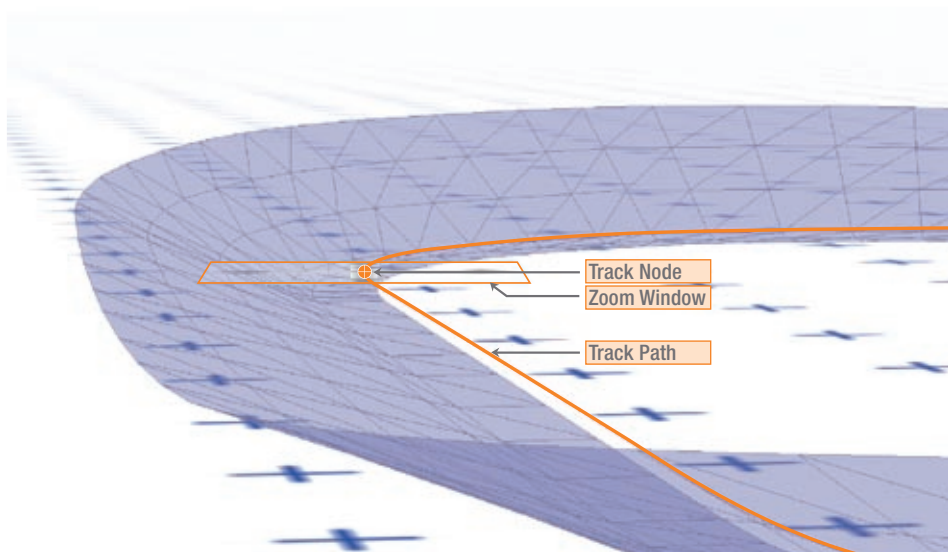
During the system set up, the Trace X8 Operator is guided through the various stages required to calibrate and run the system via pop up screens. To calibrate and integrate a camera is a simple procedure taking less than 6 minutes and primarily involves selecting the venue, nominating system hardware such as the servo encoded heads and lenses, nominating communications, establishing the camera's location using the survey markers, then calibrating the camera's focus and zoom.

It should be noted that once a Trace X8 camera is calibrated it is also immediately ready for use as a Trace X8vr camera. The GUI also enables the customisation of the Control Interface, the allocation of commands to Function Keys and the Operator's personal configurations to be saved and retrieved.





Software fundamentals



The Trace X8's software tools; the Track Node, Track Path and Zoom Window, revolutionise the camera fundamentals of framing, following and focusing. Because all the fundamental camera controls are within the virtual world the Trace X8 Operator has tremendous power to articulate multiple cameras, improve accuracy and choreograph shot sequences.

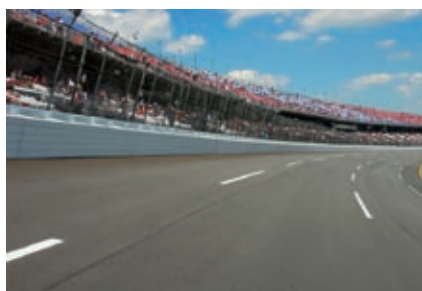
Sports such as motor racing, down hill skiing, speed skating, athletics or thoroughbred racing have a race line or path that competitors must travel. The racing line is entered into the Trace X8 and is known as the Track Path. The camera's centre of vision is the Track Node. The Track Node can travel along the Track Path or the Track Path itself may be offset in real time. The variable speed of the Track Node is easily governed by the throttle on the Control Interface. The Track Node can also travel at predetermined Speed Profiles or use a DGPS tag to update Track Node position at 20hz and with accuracies to within few centimetres.

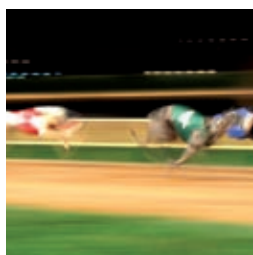
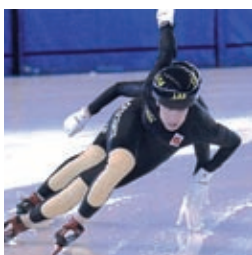
A camera can be used in traditional Joystick mode or it can be Slaved to the Track Node. The Track Node can also be configured to range freely over a ground plane such as a boxing ring or ice hockey arena. Focus is automatic via the initial calibration of the lens and the Trace X8's knowledge of the Track Node's position relative to the camera's location.

The Zoom Window controls the lens's field of view. It is another patented feature that has profound implications for sports cinematography - it enables stable consistent framing around a dynamic target regardless of the target's trajectory.

Individual Zoom Offset dials enable each camera to have a proportionally larger or smaller field of view than the default Zoom Window. This is particularly useful in that a single Trace X8 Operator can generate multiple tight, mid and wide shots from multiple angles.

Command Presets are another patented feature which enables pre composed choreographed camera sequences to be executed in real time. The simplest of these is the Dynamic Tilt which enables the Operator to set the start and finish positions and the tilt duration then execute this command regardless of what is controlling the Track Node. Another versatile feature is the 12 Preset Shots, that can be individually accessed via the Control Interface.





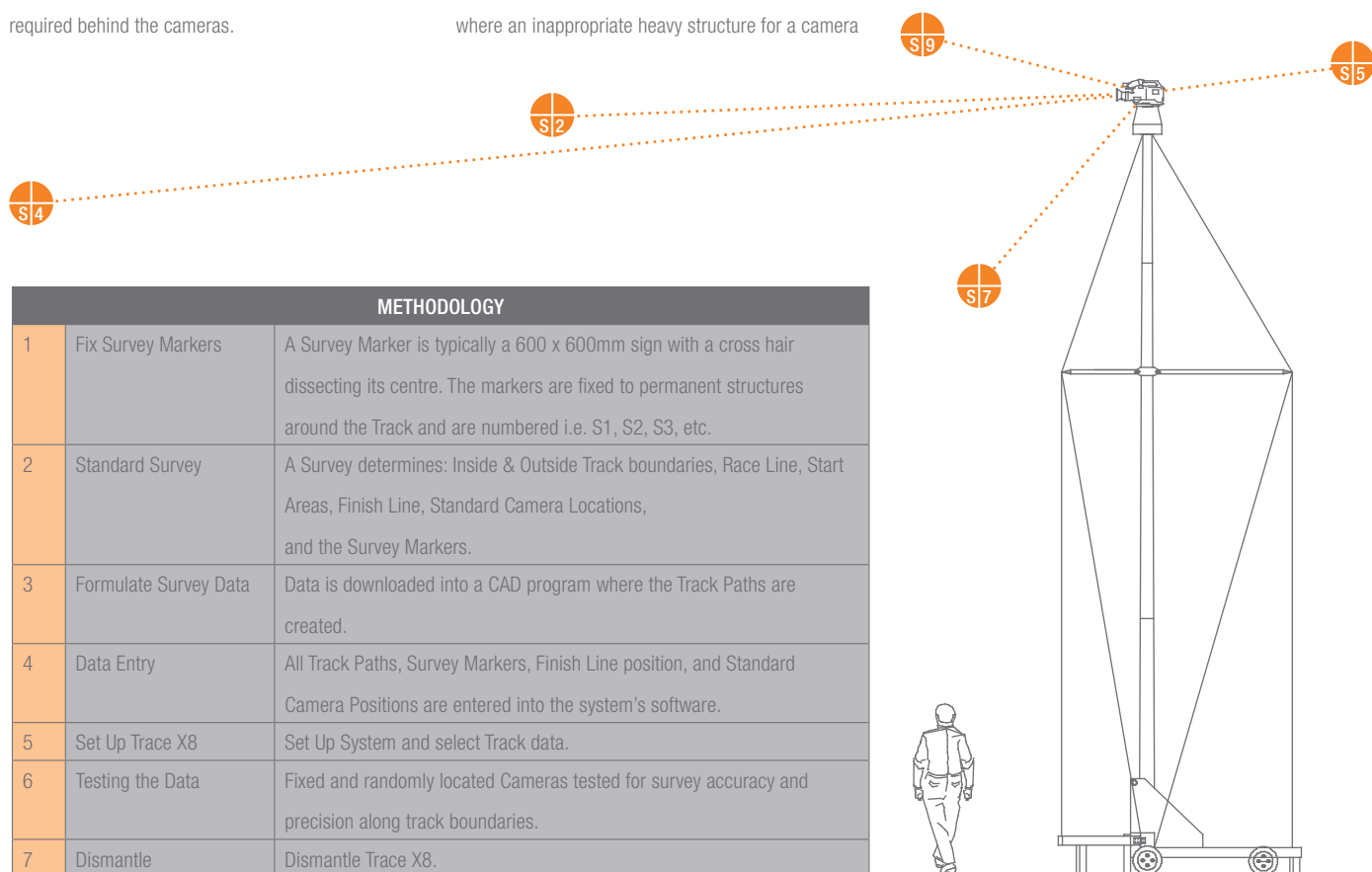
Installation

The Venue Set Up requires a once off installation process that involves the fixing of survey markers to structures that are visible to desired camera locations. The venue and the markers are surveyed and the data entered. Now a Trace X8 camera can be located almost anywhere within the venue and calibrated. Aligning the camera to 5 survey markers enables the encoded lenses and heads to record the pan and tilt alignment and the focus, which results in the Trace X8 calculating the camera's precise location and its pitch and yaw. The lens's field of view also requires a brief calibration. Each camera takes less than 6 minutes to calibrate and enables the synchronisation of the camera's view and the system's 3D model.

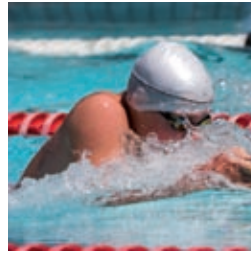
The benefits of this installation method are tremendous: it is quick, highly accurate and permits camera locations almost anywhere. Reductions in infrastructure can also be realized with no Operators required behind the cameras.

For Broadcasters, it means efficient elevated vantage points, or locations previously off limits such as in front of Grandstands, inside the track of a velodrome, beside ski runs or sleigh runs or within any stadium where an inappropriate heavy structure for a camera

operator is unacceptable. This methodology not only saves money - it enables quality new broadcasting locations.



METHODOLOGY		
1	Fix Survey Markers	A Survey Marker is typically a 600 x 600mm sign with a cross hair dissecting its centre. The markers are fixed to permanent structures around the Track and are numbered i.e. S1, S2, S3, etc.
2	Standard Survey	A Survey determines: Inside & Outside Track boundaries, Race Line, Start Areas, Finish Line, Standard Camera Locations, and the Survey Markers.
3	Formulate Survey Data	Data is downloaded into a CAD program where the Track Paths are created.
4	Data Entry	All Track Paths, Survey Markers, Finish Line position, and Standard Camera Positions are entered into the system's software.
5	Set Up Trace X8	Set Up System and select Track data.
6	Testing the Data	Fixed and randomly located Cameras tested for survey accuracy and precision along track boundaries.
7	Dismantle	Dismantle Trace X8.

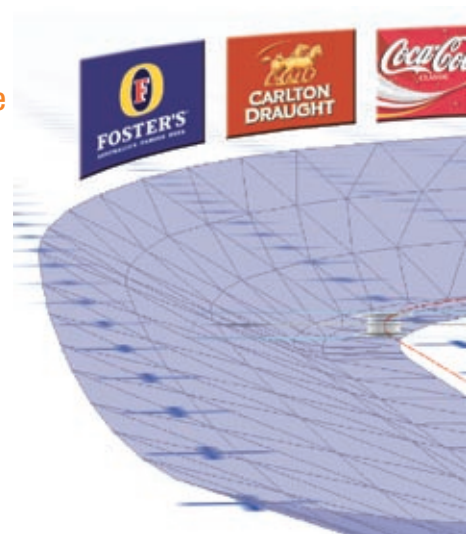


Trace X8VR

The Trace X8VR has exceptional integration and synergy qualities with the Trace X8 regarding the Venue Survey, Installation Set Up, System Hardware and Software and General Operations. These synergies enable the Trace X8VR to be the most affordable Virtual Broadcasting plug in globally.

The Trace X8VR is a plug in or stand alone system which utilises the best system hardware and integration available to ensure quality and leading edge performance is always maintained. The Trace X8 Graphics Engine enables complex 3DS Max or Maya scenes to be loaded and utilised by Trace X8VR.

Choreographed Animations, Live Video rendering on complex surfaces, Virtual Billboards, Live Target Information, and full DGPS integration are just some of the many potent and versatile features of the Trace X8VR.



Trace X8GPS

The Trace X8GPS determines the precise location of a speeding target, trains the camera onto that target, then proceeds to facilitate the most extraordinary sports cinematography. Consistent framing, perfect focus and accurate fluid movement, all previously impossible, are now possible in real time with the Trace X8GPS.

The Trace X8GPS has been designed to work within a normal race environment where a variety of camera functions and conditions are required. The Trace X8GPS easily deals with a multiple target environment where a variety of framing and target selection criteria is required. Automated functions and a series

of commands enable the Operator to achieve the ordinary requirement of racing broadcasting in the most extraordinary fashion. The Trace X8GPS also has an Accident Aware command which identifies crashes before impact and trains the camera onto the situation in a prescribed fashion.



Applications

Motor Racing

The Trace X8 and the Trace X8gps Plug In will dramatically improve accuracy and shot composition and facilitate new camera positions. Excellent VR applications

Thoroughbred & Harness Racing

Substantial labour saving generated through the displacement of camera operators, reduction in infrastructure and excellent VR applications.

Track Cycling

Substantial labour saving generated through the replacement of camera operators and amazing close ups generated. Strong VR applications.

Speed Skating

Exquisite tight shots and strong VR applications

Greyhound Racing

Substantial labour saving generated, good use of presets and strong VR applications.

Athletics

Exquisite tight shots, good multi camera coverage, and strong VR applications

Power Boat Racing

Dramatic improvement in accuracy and shot composition and strong labour saving in some markets. Excellent VR Applications.

Winter Sports

Superb tight shots, good multi camera coverage, utilisation of choreographed commands and strong VR applications

Field Sports

Small field sports such as Ice Hockey, Basketball, Tennis, Boxing and the like could all benefit from discrete automated cameras capturing the action from existing & novel locations. Strong VR applications.

