

Challenger TECHNOLOGY SOLUTIONS

Challenger Technology Solutions

We're up to
The Challenge



Challenger



Introduction to Technology



Gathering, monitoring and interpreting information is central to any successful farming enterprise today, enabling greater control of costs, better use of time and more accurate measurement of performance. Advanced technology can now integrate satellites, computers and sophisticated software to gently eliminate the most tedious of repetitive tasks from the hands of the machine operator, ensure precision application of inputs and generate invaluable detail on every metre of every field.

The pace at which automation is being applied to an ever-wider range of functions is quickening in most industrial sectors, and agriculture is no exception. Traceability requirements, the demands of assurance schemes, adherence to input application guidelines and performance measurement are just a few of the aspects of modern-day farming where the ability to record, analyse and interpret information is essential. Likewise, the facility to transfer data from machines in the field to the farm office PC has become a standard feature on most systems.

The technology now exists to carry out these obligations automatically and it's becoming more sophisticated and easier to use all the time. Three distinct areas of farm operations can now be controlled and managed by systems specifically developed to ease the workload and provide invaluable management information. These three areas are Machine Control, Machine Management and Precision Farming.





Challenger®



Machine Control

Controlling all elements of your farm machinery effectively or even automatically is critical to achieving efficient, productive operation. That's why we're constantly working to develop our machines so that your engine, transmission, hydraulics and steering operations such as machine guidance can be optimised with minimum driver input.

With the ISOBUS industry standard, even implements can be connected quickly and easily, with complete control achieved through one simple terminal in the cab.



Machine Management

You need the latest and most advanced planning and monitoring systems for your machines to reduce operating and maintenance costs, so increasing the profitability of your farm business. Remote diagnostics; planning and monitoring logistics to control machine movements and operations; recording and tracking machine data; monitoring machine operations; mapping - all of these elements go together to provide genuine all-round benefits.



Precision Farming

The greater the precision, the bigger the profit. It's as simple as that. The most up-to-date precision farming methods can ensure that you increase returns by varying inputs such as seed, fertiliser and chemicals to match the yield potential for specific parts of each field. They allow collection of the most useful and accurate data, which enables quick and easy analysis and well-informed management decisions.



What can it do for you?



Technology can be costly - although much of it now comes as standard on today's advanced farm machinery. On the other hand, there now exists a host of additional options which could be regarded by some as expensive gimmicks, prompting the question: "where's the payback?"

The fact is that the arguments for making this technology work for you are compelling. More efficient machine control can mean savings on fuel and reductions in costly wear-and-tear, as well as ensuring optimum performance at all times. With reduced operator input for many repetitive tasks, fatigue is much reduced, allowing attention to be focused on other key areas of operation.

Improved fleet management gives you a clearer view of the overall farming operation, allowing closer control of operating costs and more informed business decisions to be made. The opportunities to create savings can be seen everywhere!

Using the most accurate and up-to-date information can help inputs such as chemicals and fertiliser to be applied more efficiently, saving time and money. In turn, full yield potential becomes achievable, taking productivity and profitability to new levels.

Making all these potential benefits available, technology simply has to be an integral part of any successful farming enterprise today.



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Advanced Solutions from Challenger

This brochure aims to provide an overview of technology available from Challenger and AGCO's Advanced Technology Solutions group, showing its capabilities, its many benefits, and how commercial performance can be enhanced in practical, day-to-day terms.

Challenger technology is not just for electronics experts: it may be extremely clever and innovative, but it is also very simple to set up and operate. After all, what you want is to get the most out of it and ensure your business thrives in the new era of world farming.

With a comprehensive offering in the areas of Machine Control, Machine Management and Precision Farming, Challenger is sure to have the solution for your specific machines and requirements.



Look out for these 3 icons throughout this brochure to identify the areas where Challenger Technology can help your business.

In a fast-changing industry, technical advancement is a constant process, but you can be sure that 10 years from now Challenger will still be leading the way.

Tracked and Articulated Tractors



Your search for the most technically advanced agricultural tractors in the world is over. The Challenger MT700B Series, MT800B Series and MT900B Series incorporate a host of computer-controlled features and components designed to deliver exceptional, effortless performance, work of the highest quality and unprecedented levels of operator comfort.

1 Tractor Management Centre

A state-of-the-art, easy-to-read display screen showing vital tractor performance and diagnostic data. This intuitive system allows control of features such as Power Management, while enhancing tractor operations as defined through the Intellitronics™ network.



2 Intellitronics™ Network

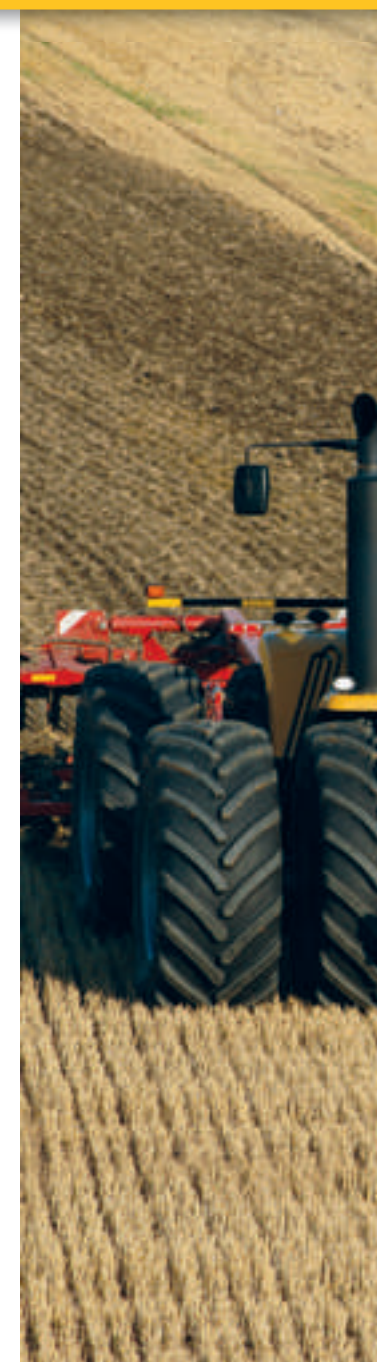
Electronic control modules located on components, such as the engine, transmission, hydraulics and three-point hitch, share performance data through the Intellitronics network. These communications enable the user to monitor performance, automate repetitive tasks and fine-tune tractor operations.

3 One-Touch™

An intuitive management system, One-Touch empowers the operator to initiate several tractor and implement functions simultaneously, with just a single touch of a button. Simple to operate, the One-Touch management system uses the Intellitronics network to record and execute functions such as transmission shifting, throttle, 3-point hitch position, PTO status, implement raising/lowering, and initiate the optional Auto-Guide™ steering system.

4 Machine Guidance Systems

A GPS receiver on the cab roof transfers positioning information to the tractor's guidance system, providing steering guidance with or without operator input. Various systems and levels of accuracy can be selected to suit specific applications, ensuring optimum use of implements and inputs. See page 18 for more information on guidance systems.





Challenger



5 Power Management

A control strategy that varies engine, transmission and hitch settings to optimise tractor efficiency and productivity in a range of applications. Activated through the Intellitronics network, Power Management is controlled using the Tractor Management Centre and the transmission control lever.



6 Engines

ADEM 4 electronic controllers in Challenger's powerful CAT® engines govern fuel delivery, fuel/air ratios, valve timing and other crucial engine processes with high precision. ADEM 4 is part of the Intellitronics system, which ensures that power is delivered smoothly by co-ordinating communication between all of the tractor's electronic modules. The very latest in environmentally sensitive engine technology - known as ACERT™, from Caterpillar® - works on the basis that optimal combustion efficiency produces minimal emissions.

Wheeled Tractors



These exceptional tractor ranges combine impressive power and torque with simplicity of operation and great flexibility. All models utilise advanced technology to enhance both performance and fuel economy.

1 Power Performance III

Enables operators to make precise adjustments and manage complex processes, at the same time as gathering and storing information in multiple memories, all controlled through the clear and logical Console I terminal. The system's features include:

- Comprehensive headland management
- Front and rear implement Dual Control
- Trailed Implement Control (TIC)
- Programmable memories
- Data recording
- Video camera input and display*
- Auto-Guide™ automatic steering*
- Spool valve settings*
- ISOBUS*

* optional features





2 Transmission Controller

Ensures consistently smooth engagement of gears, preventing damage by, for example, blocking inappropriate gear selections. The controller also provides speedmatching by automatically selecting the correct ratio to suit forward and reverse engine speeds when de-clutching.

The system manages much of the operation of the AutoPower and TechStar (CVT) transmissions, including the superb AutoDrive system. No input is needed from the operator to control 4WD mode, differential lock, 4-wheel braking, speed matching; and PTO engagement.

3 Integrated Tractor Control System (ITCS)

The ITCS broadens the number of automated functions beyond those provided by the transmission controller, further simplifying the operator's role and boosting output. The simple controls allow the operator to change and fine-tune settings displayed on the ITCS screen on the instrument panel and will:

- Automate engine speed changes
- Monitor fuel consumption
- Control wheelslip
- Manage spool valve flow and timing
- Prioritise hydraulic flow
- Manage headland turns



4 Machine Guidance Systems

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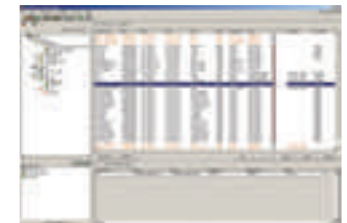
5 ISOBUS

Complying with the latest international standards, the Console I terminal and Power Performance III in Challenger wheeled tractor cabs are capable of controlling a wide range of implements, providing users with the benefit of a single operating system. Just 'plug-in and go' - it's the ultimate in tractor/implement integration. For more information on ISOBUS see page 12.



PC software

Being able to collect, collate and interpret information is absolutely essential if profit growth is to be sustained. Available on many Challenger machines is the powerful GTA software suite, a comprehensive, but very easy-to-use modular package that provides all the key information needed to keep a tight control on costs and record even the smallest detail for traceability purposes. For more information, see page 16.



Combines



Machine Control



Machine Management



Precision Farming

Operational simplicity and unbeatable harvest performance are the hallmarks of Challenger's comprehensive combine range. Numerous standard features and options automate many machine functions to ensure unmatched work quality and timeliness.

1 Datavision II

This invaluable system provides the operator with streams of information and the ability to alter settings. The large, clear, touch-sensitive screen offers:

- Machine monitoring
- Harvesting data
- Machine settings
- Operator's manual
- Diagnostics
- Yield mapping option
- Data transfer via a PCIMCA card



The harvest screen allows up to eight different functions to be viewed simultaneously, monitoring efficiency to ensure output is maximised and losses eliminated.





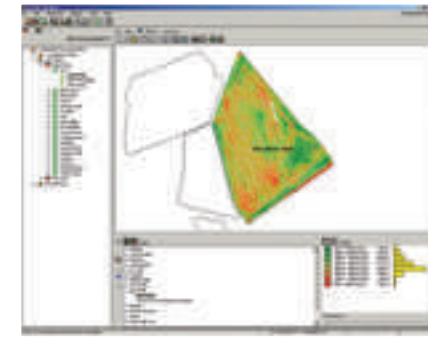
2 Datavision III

Challenger's rotary combines benefit from the Datavision III monitoring and control system, operated through the advanced Console II colour terminal. Based on Datavision II, the new system offers enhanced functionality in many areas to manage:

- Work
- Crop settings
- Combine settings
- Yield settings
- Summary
- Moisture
- Service
- Task Controller

3 Fieldstar

An amazingly accurate, easy-to-use yield monitoring system, Fieldstar Mapping will provide an instant check on actual quantities harvested. Initially simply logging totals from individual fields, the system builds with the help of GPS into a powerful and comprehensive package to create precise records and maps of actual crop yield, highlighting areas of variability.



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Large Balers



Machine
Control



Machine
Management

Solid bales of even density and consistent quality don't happen by accident. Rugged build quality, innovative design and many well-proven features that cannot be bettered have produced a class-leading large square baler with ISOBUS compatibility.



ISOBUS Industry Standard

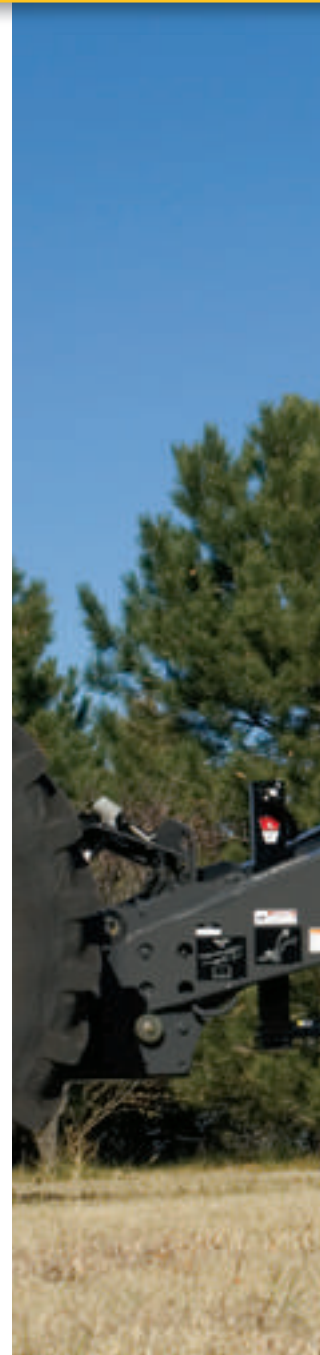
Any implement designed to comply with ISOBUS standard 11783 - from a big baler to a cultivator drill - can be operated through the Console I terminal in Challenger wheeled tractors. It could be described as the 'Windows®' operating system for the world of agricultural electronics, generating savings in time and money by not requiring any additional terminals or extra wiring in the cab.

Plugging a compatible implement lead into the tractor's ISOBUS socket prompts the system to automatically upload the operating menus and display them on the screen.

The information for each implement shown on the Console I terminal, regardless of manufacturer, follows the same routine of scrolling through menus, selection buttons and activation.

Connecting a Challenger baler into the ISOBUS socket utilises the tractor's CAN-BUS network to share information. CAN (Controller Area Network) is a system that transfers information via a data 'bus'.

Large amounts of information are sent around the network, and while all ECUs (Electronic Control Units) on the data 'bus' see the 'messages', they only read those relevant to their operation. This system greatly simplifies the wiring requirement by allowing a large number of ECUs to communicate with each other, without the need for a complicated network.





Challenger®



PC Software

Data gathered from a Challenger baler using the Console I terminal can be transferred simply using an SD card to the farm office PC. There it can be loaded into the GTA200 software package to allow accurate data to be recorded and analysed. A new feature of the software also allows the creation of invoices at the push of a button. To find out more about the GTA software suite, see page 16.



Application Equipment



Highly specialised application machines like the Challenger RoGator, Terra-Gator and Spra-Coupe ranges require specialist control systems, and that's exactly what they have in FalconVT.

FalconVT

FalconVT's principal capabilities are controlling product application equipment in the field and recording data. All information and commands - from application rates to data logging - are shown on a single, easy-to-read touch-screen.

FalconVT is connected to the vehicle's systems via the CAN-BUS wiring network to monitor forward speeds and adjust the flow of material to automatically match pre-set application rates. The console has an SD card slot to enable the transfer of data, application maps etc, to the computer in the farm office, and vice-versa.

The heart of the FalconVT system, the Task Controller, is where all operational data recording for every individual job happens. If an application plan has been attached using the memory card, the Task Controller tells all the relevant operating systems exactly what they should be doing, based on the GPS information being received from the antenna on the cab roof.

The FalconVT system is capable of handling a number of functions simultaneously and can control several fertiliser bins in the same application. It also monitors the machine's tyre pressures (optional), and operates the DogWalk and Auto-Guide™ options.



Challenger®



Airmax

Application control over a range of configurations - FalconVT is the standard controller for Airmax pneumatic fertiliser spreaders and New Leader disc spreaders.

NMS

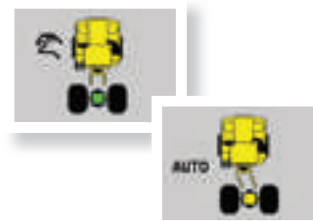
The Nutrient Management System automatically adjusts the rate of product being applied according to the machine's forward speed. FalconVT is the standard controller for both Dry and Liquid NMS systems.

2 Central Tyre Pressure Adjustment

Inflate and deflate tyres with the push of a button to ensure optimum pressures for the ground conditions.

3 Dogwalk

A Terra-Gator option, this offsets the articulated rear axle, left or right, so that only one wheel passes over each track, reducing soil compaction.



4 Machine Guidance Systems

A GPS receiver on the cab roof transfers positioning information to the machine's guidance system, offering steering guidance with or without operator input. Various systems and levels of accuracy can be selected to suit your application and ensure optimum use of implements and inputs. See page 18 for more information on guidance systems.

PC Software

Being able to collect, collate and interpret information is absolutely essential if profit growth is to be sustained. Available on many Challenger machines is the powerful GTA software suite, a comprehensive, but very easy-to-use modular package that provides all the key information needed to keep a tight control on costs and record even the smallest detail for traceability purposes. For more information, see page 16.



Third Party Technology

Challenger application equipment is also compatible with Raven control technologies through either an Envizio or VIPER terminal, assisting operation as follows:

- **Raven Accuboom** - using GPS technology, this feature automatically turns boom sections on and off in the field according to previously recorded applied areas.
- **Raven AutoBoom** - provides automatic boom height control according to the terrain using gauge wheels or ultra sonic sensors.
- **Raven Sidekick Direct Injection System** - simply load chemical into the injection tank, program the rate per acre, and spray.

GTA Software Suite



Machine Control



Machine Management

GTA Farming Software

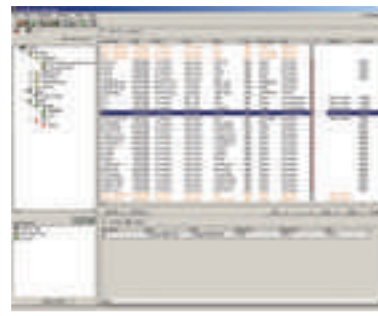
These days, being able to collect, collate and interpret information is absolutely essential if profit growth is to be sustained. Available on many Challenger machines is the powerful GTA software suite, GTA100 through to GTA400, a comprehensive, but very easy-to-use modular package that provides all the key information needed to keep a tight control on costs and record even the smallest detail for traceability purposes.

GTA500 SGIS Agronomy is an advanced software package designed for the agronomist, agri-business and service provider. This package takes information management and crop nutrient planning to the next level providing the ultimate precision farming program.



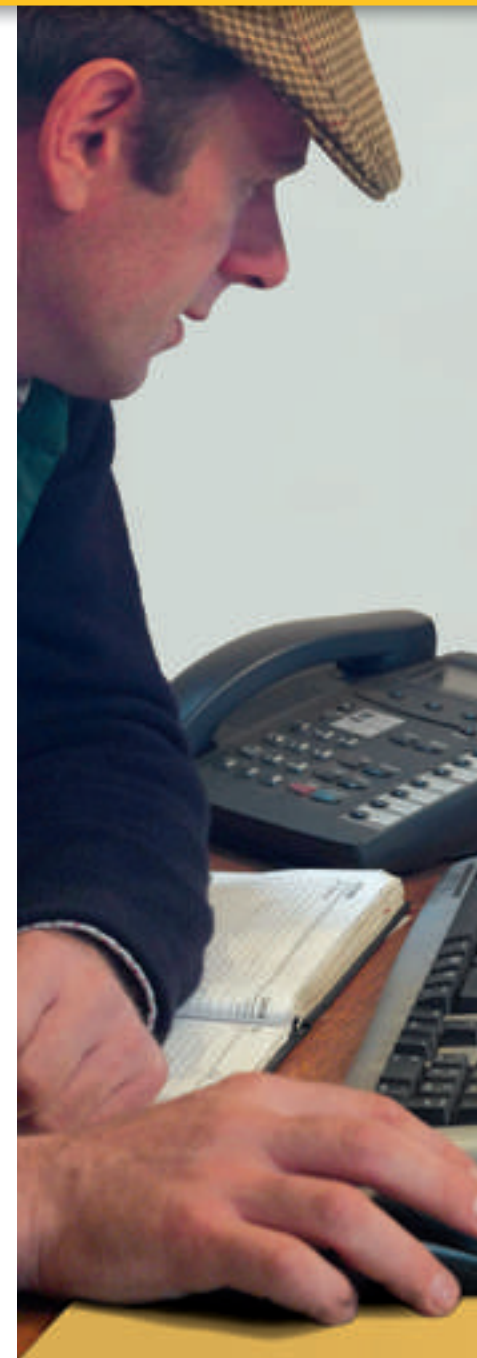
GTA100 Communicator

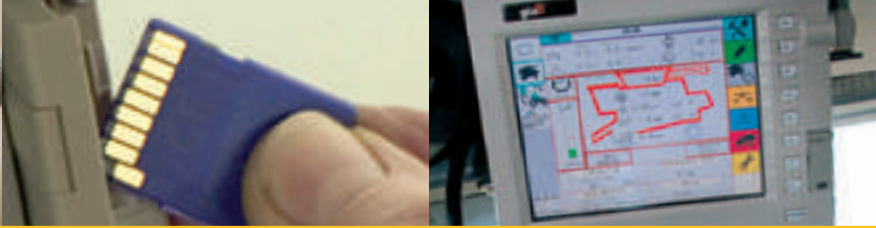
Represents the core of the package, allowing users to quickly and simply download and access key information on machine performance. Valuable information logged on the machine is transferred instantly to a desktop PC using an SD (Secure Digital) card. GTA100 then organises this data into a series of tasks relating to individual farms, operators and machines.



GTA200 Record Keeping

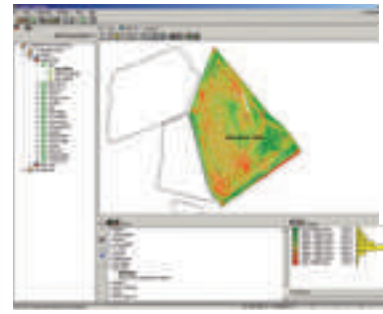
Of great value in keeping track of costs, GTA200 Record Keeping maintains the intuitive format and adds further flexibility, allowing the user to plan, record and create reports on tasks. A 'working group' of machines, people and products can be brought together, then applied to individual fields to create multiple task plans at the same time. A new feature of GTA200 Record Keeping is the facility to quickly and easily generate invoices from completed tasks.





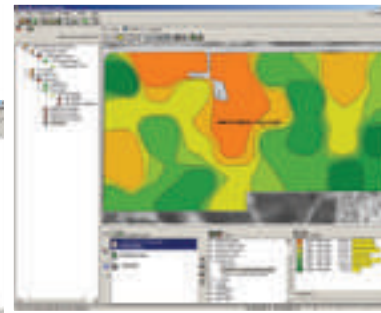
GTA300 Mapping

With even more impressive features and enhanced flexibility, GTA300 Mapping adds the capability to create maps using geo-referenced information gathered on Challenger machines. In the same intuitive file structure, the user can record and measure all operations, inputs and yields. This highly accurate information is easily displayed in the form of a map that can be used to identify areas, plan treatments and provide precise records of treatments and applications.



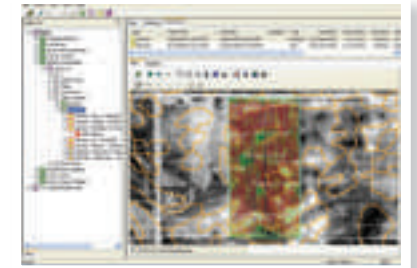
GTA400 Precision Farming

Provides one of the easiest ways to plan, execute and record variable applications. GTA400 Precision Farming expands on the other elements of the suite to offer unrivalled monitoring and control capability. All information gathered on the other modules is available in the same file structures, creating not just an extremely powerful and versatile programme, but one that is quick and easy-to-use.



GTA500 SGIS Agronomy

The ultimate agronomic tool, and the most technically advanced package in the industry. By building a detailed knowledge of an individual field's nutrient status, the grower has much greater control over crop yield and quality. Developed by AGCO Advanced Technology Solutions, GTA500 SGIS Agronomy software enables agronomy service providers and professional agri-businesses to add even more value to arable operations.



Machine Guidance Systems



Machine guidance systems enable the operator to make full use of the optimum working width of their machine to eliminate skips and overlaps.

Visual Guidance

With the simplest system - Raven Lightbar - a receiver on the cab transfers GPS information to the lightbar display, which is installed within the operator's sight line, either in-cab or bonnet mounted. This system enables high output and work quality to be maintained even when working in the dark or in poor visibility.

The more sophisticated Raven Envizio Plus system introduces the unique LastPass Guidance Pattern, which allows the operator to drive to his nearest 'last pass' without the need to set points. Coverage map information can be downloaded via a USB port and viewed in the GTA300 Mapping software (see page 12), providing a record of the areas worked.



Automatic Steering Guidance

Challenger's optional Auto-Guide™ system uses GPS signals to automatically steer machines in parallel tracks, ensuring the optimum and precise use of the implement or cutting table's working width. This saves time, fuel and costs, and, by reducing operator fatigue and tedium, enhances productivity.

With a choice of Auto-Guide accuracy levels, you can tailor the system to meet your specific requirements, and achieve the maximum benefits:

- Eliminating overlaps and underlaps
- Savings in fuel, time and costs
- Improving accuracy of applications
- Reducing implement and machinery wear
- Cutting operator fatigue
- Reducing compaction with fewer tracks



Straightforward consoles in the cab with clear visual displays make Auto-Guide incredibly simple to use and understand.



The TopDock, housing the GPS antenna, is easily transferable between Auto-Guide-ready machines, for maximum flexibility.



Choosing a mobile RTK base station for signal correction can greatly increase accuracy to within centimetres.

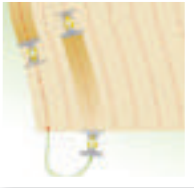


DMU-enhanced accuracy

The 6-axis Dynamic Measuring Unit uses an 'electronic gyroscope' to monitor the vehicle's roll, pitch and yaw on slopes and uneven terrain and correct such movements to maintain pin-point accuracy.

Suits your system

Whatever your farming system, Auto-Guide can effectively steer the tractor in parallel straight lines, around curves or in a centre-pivot pattern to suit.



Accuracy level	Typical operations	Correction service	Pass-to-pass accuracy*
Sub-metre	Tillage	OmniSTAR VBS	+/- 20 cm
Decimetre	Application/seeding	OmniSTAR HP	+/- 5 cm
Centimetre**	Row crop/bed forming	RTK Base station	+/- 2 cm

* Auto-Guide accuracy is dependant on good satellite coverage and the effect of additional errors induced by factors, such as operating conditions and implement setup.

** The manufacturer or supplier cannot guarantee centimetre accuracy in all markets. Import and use of the equipment for centimetre accuracy may require special additional permits in some countries. Obtaining of such permits and any related costs are the direct responsibility of the customer.

Technology	Machine Control											Machine Management		Precision Farming				
	Transmission Control	Integrated Tractor Control System	Power Performance™ III	Tractor Management Centre	One-Touch™ & IntelliTronics™	ISOBUS	Visual Guidance	Auto-Guide™	DataVision II	DataVision III	Falcon VT	GTA100	GTA200	GTA300	GTA400	GTA500 SGIS	Fieldstar	Falcon VT
Challenger Equipment																		

Wheeled Tractors

MT400B	X						0											
MT500B	X	0	0				0	0	0*			0	0	0	0	0		
MT500B TechStar	X	X	0				0	0	0*			0	0	0	0	0		
MT600B	X	X	X				0	0	0			X	0	0	0	0		

Tracked and Articulated Tractors

MT700B				X	X		0	0										
MT800B				X	X		0	0										
MT900B				X	X		0	0										

Harvesting Equipment

648 . 652 combines							0											
654 . 658 combines							0		X			0	0	0	0	0	0	
660 . 670 . 680B combines							0	0		X		0	0	0	0	0	0	
LB34 . 44B balers							X					0						

Application Equipment

Terra-Gator 2244 . 3244							0	0*			X	0	0	0	0	0		X
Terra-Gator 8203 . 9205							0	0*			X	0	0	0	0	0		X
RoGator 1074 . 1274 . 1286C							0	0*			0	0	0	0	0	0		0
Spra-Coupe 4000							0	0*			0	0	0	0	0	0		0
Spra-Coupe 7000							0	0*			0	0	0	0	0	0		0

x = standard o = option *= check with your dealer

Every effort has been made to ensure that the information contained in this publication is as accurate and current as possible. However, inaccuracies, errors or omissions may occur and details of the specifications may be changed at any time without notice. Therefore, all specifications should be confirmed with your Challenger Dealer or Distributor prior to any purchase.

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