

# COMMAND

FOR EXCAVATING



# CAT<sup>®</sup> COMMAND REMOTE CONTROL

SAFE. EFFICIENT. PRODUCTIVE.

Digging near cliff faces. Working on unstable surfaces or steep slopes. Moving hazardous materials. Any of these situations can put excavator operators at risk. Even traveling to a remote jobsite poses its own safety issues. Cat<sup>®</sup> Command for Excavating helps address all of these challenges by enabling the operator to work outside the machine.



## IN THE FIELD OR OFF SITE

### COMMAND HELPS OPERATORS WORK SAFELY

It's a sophisticated remote control system that takes operators off the machine and away from potential dangers when working with hazardous materials or in unsafe conditions. Plus, it maintains the option to utilize other advanced control technologies such as Cat Grade and 2D E-Fence for excavators.

Once operators become familiar with the feel of the remote control system, they can operate as efficiently, accurately, and confidently as in the cab. In fact, because they experience dramatically less noise and no vibration, operators can work efficiently for longer periods of time with less fatigue.

# TWO SYSTEMS TO MATCH JOB NEEDS

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## CAT® COMMAND CONSOLE

Portable, lightweight system allows the user to work outside of the cab while remaining on site and in direct visual contact with the machine.

- + Ideal for short-term and emergency use.
- + Requires no on-site communications infrastructure.



## CAT COMMAND STATION

Enables the operator to work remotely in a seated indoor “virtual cab” located on site or many miles away.

- + Helps reduce operator fatigue with a comfortable working environment.
- + High quality video delivers a clear view of the work area.



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## SAFETY COMES FIRST

Allows operators to work away from hazardous conditions, dust, noise, and vibration. Eliminates risk of an operator being injured climbing on or off the machine.

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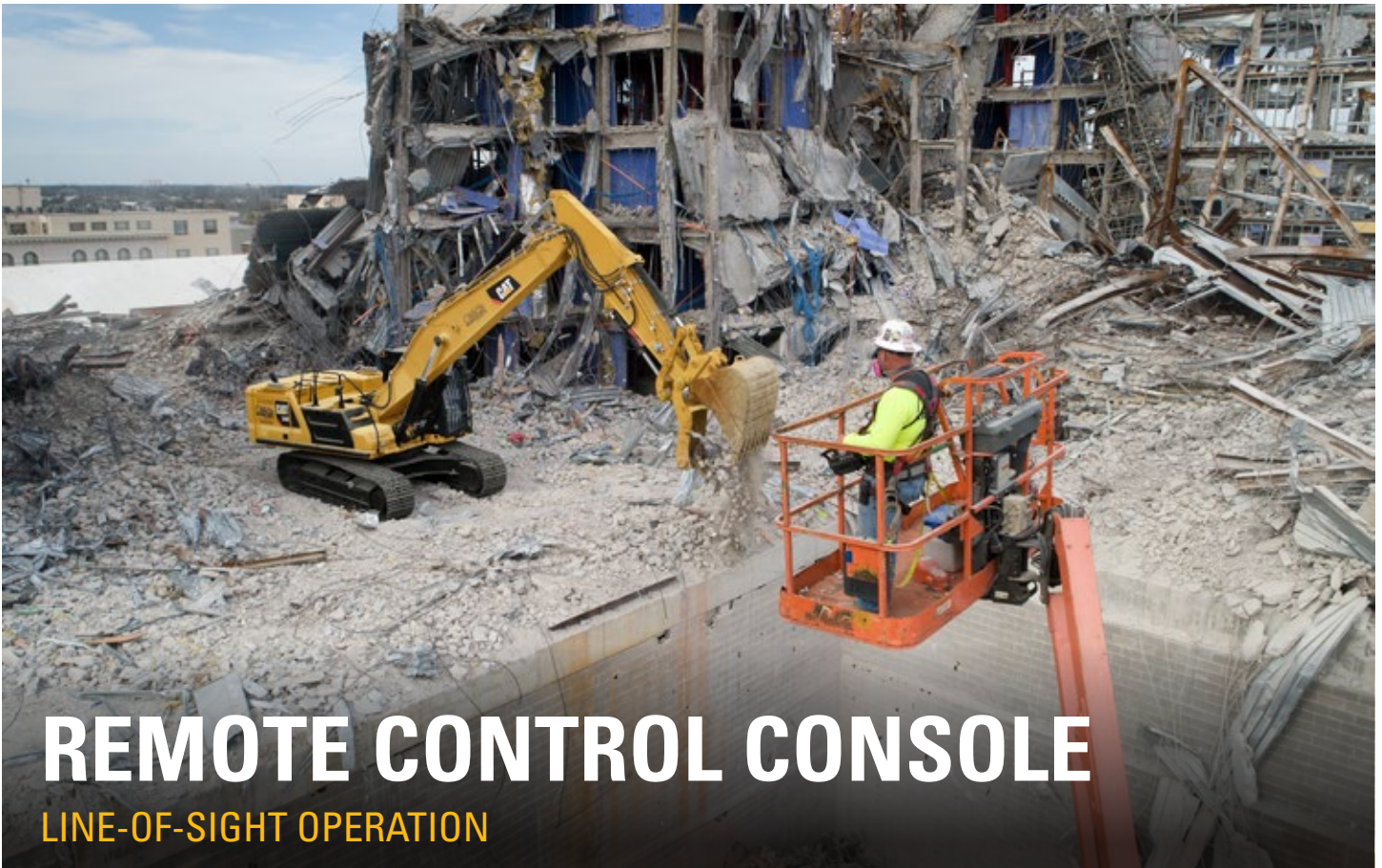
## OPERATION IS SIMPLE AND FAMILIAR

Easy to learn and use. Common jobs like trenching and foundation work in hazardous areas become safer for operators – without sacrificing control or accuracy.

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## FLEET INTEGRATION IS EASY

Your Cat dealer can install Command on a wide range of new Cat dozers, wheel loaders, and excavators.



# REMOTE CONTROL CONSOLE

## LINE-OF-SIGHT OPERATION

### LINE-OF-SIGHT

- + Remote control functions deliver smooth, precise boom, stick, bucket, and tramming control.
- + Provides line-of-sight operation from up to 400 meters (1,312 ft) away.
- + Operator inputs are sent to the machine via a dedicated radio transmitter/receiver link for real-time implement control.
- + The machine will shut down if the controller is tipped more than 45 degrees; this feature was designed in the case of the operator tripping or falling.



### CAT COMMAND CONSOLE

- + Ergonomic controls provide complete access to all excavator functions.
- + Integrated electronics provide nearly the same response as if operating from the cab.
- + Console LED display delivers comprehensive excavator status information.
- + Console comes with batteries, charger, and shoulder harness.

# REMOTE OPERATING STATION

## NON-LINE-OF-SIGHT OPERATION



- + Provides a comfortable, indoor environment with familiar controls.
- + Operators can switch between machines, changing jobsites with no downtime.
- + Controls deliver virtually the same response time as in the cab, maintaining precise control for all dozer applications.
- + Enables trainers to stand beside an operator without noise or movement.

**CAT COMMAND STATION** includes universal controls and an ergonomic design for long-term operation.

## DISPLAY OPTIONS



### STANDARD

- + Television Size: 43-50" (110 cm-130 cm)
  - Not Included
- + Television Interface: TV Wall Mount
  - Not Included
- + Touch Screen Size: 22" (56 cm)
  - Not Included
- + Touch Screen Mount: Dynamic Arm
  - Included



### OPTIONAL

- + Secondary Site Television Size: 43-50" (110 cm-130 cm)
  - Not Included
  - Optional Dual Interface Bracket
- + Secondary Touch Screen Size 22" (56 cm)
  - Not Included
- + Touch Screen Size: 22" (56 cm)
  - Not Included
  - Optional Dynamic Arm



### CONFIGURABLE

- + Remove Mounting Mast
- + Wall Mount Any Size TV

## STATION CONTROLS



### PEDALS

- + Adjustment Range: 3" (7.5 cm)

### JOYSTICKS

- + Adjustment Range: 7" (17.5 cm)
- + ISO/SAE Pattern Configurable

### SEAT

- + Adjustment Range: 9" (23 cm)
- + Recline Adjustment Range: 35°
- + Lumbar Adjustments: Five Positions
- + Headrest: Adjustable
- + Seat Material: Cloth
- + Operator Presence Switch

### SWITCHES

- + Station Power
- + Park Lock
- + Implement Lock
- + Remote Shutdown Switch

### STORAGE

- + Mouse Pad Area
- + Keyboard Shelf
- + Two Cup Holders
- + Storage Tray
- + Cell Phone/Tablet Holder

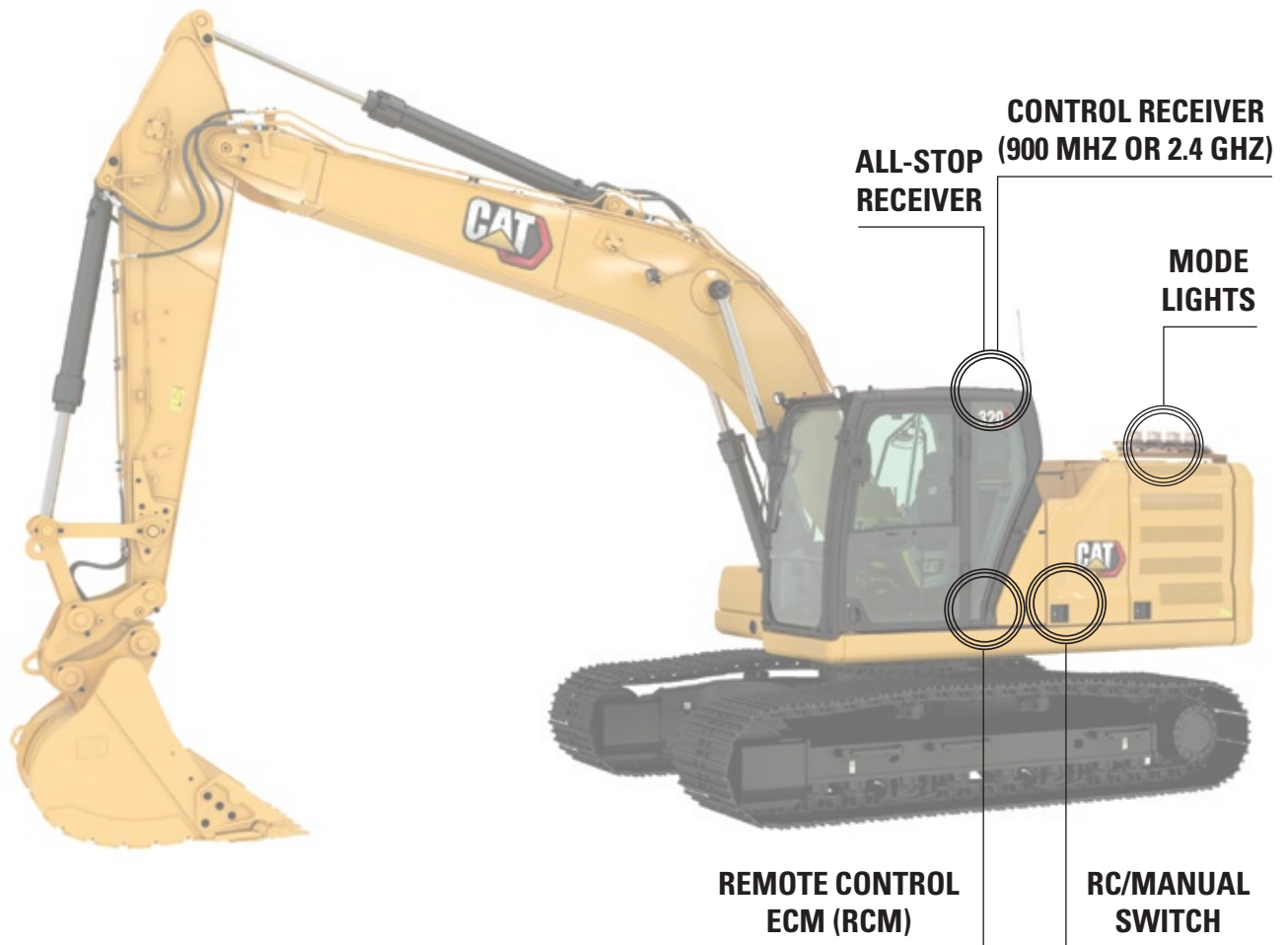
# FULLY INTEGRATED REMOTE CONTROL SOLUTION



- Cat Command Console and Cat Command Station controls are fully integrated with the excavator's electronic and hydraulic systems.
- + Ground-level switch toggles between manual and remote operation.
  - + Can be retro-installed on many existing Cat excavators, dozers, and wheel loaders.

# ONBOARD EXCAVATOR COMPONENTS

Most components that make Command for Excavating possible are already integrated into next generation machines. Getting the operator started is fast and easy with only a few additional parts needed.



**CAT COMMAND CONSOLE**

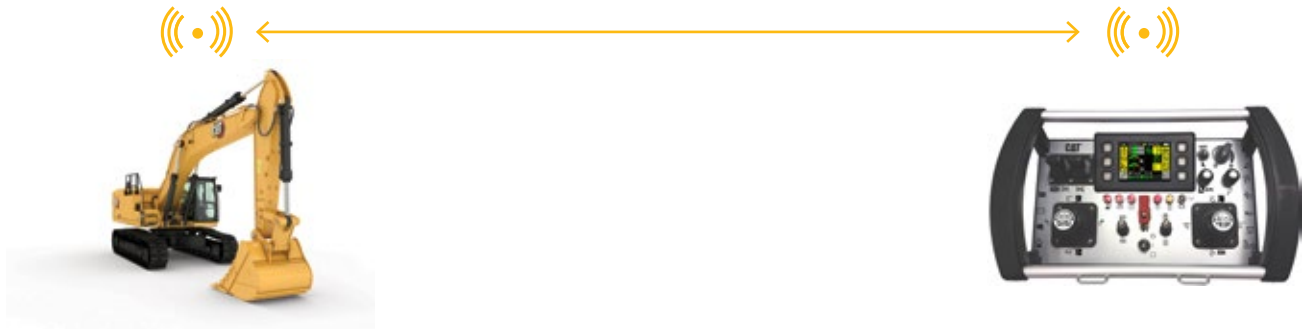


**CAT COMMAND STATION**

# COMMAND FOR EXCAVATING

## HOW IT WORKS

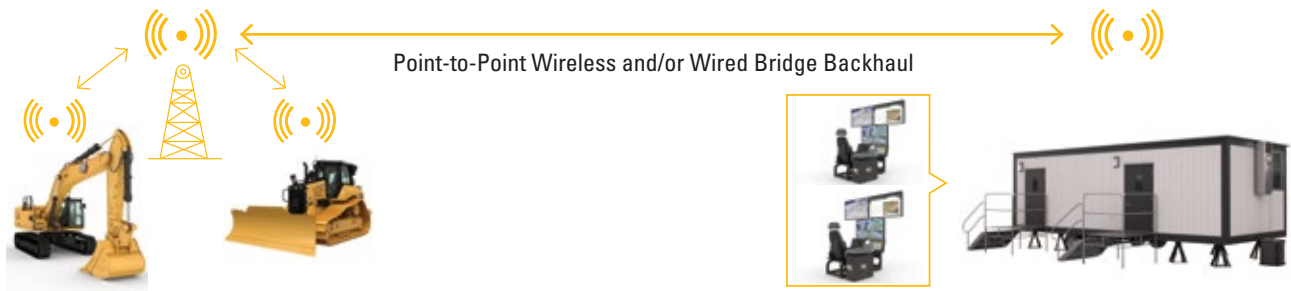
### LINE-OF-SIGHT



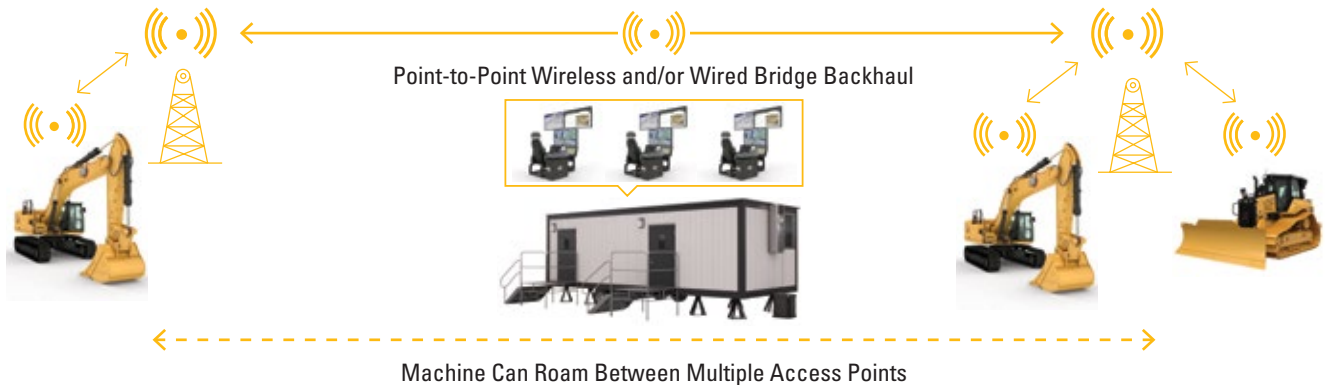
### POINT-TO-POINT COMMUNICATION



### SINGLE ACCESS POINT



### MULTIPLE ACCESS POINT/MACHINE ROAMING





## COMMAND STATION OPERATION IS INTUITIVE AND PRECISE

Operating from the Command Station is remarkably similar to running an excavator from the cab. Multiple monitor views show everything the operator needs to see, including additional views that they can't get from the cab.

## SMOOTH BOOM, STICK, AND IMPLEMENT CONTROL

The control layout of the Command Station mirrors what operators will find in most Cat excavators. Controls are familiar and precise, reflecting what is happening on the machine in the field.



## REAL-TIME MACHINE STATUS INFORMATION

Along with the exterior camera views, the Command Station monitors provide essential machine status information in real time, such as fuel usage engine speed, travel mode and more, plus information from other Cat excavator technologies such as Cat Grade.

# COMMAND FOR EXCAVATING

EASY-TO-LEARN CONTROLS



## COMMAND CONSOLE OVERVIEW

Experienced operators will quickly pick up how to use the Command Console. Joystick control is intuitive and designed to allow operators to work efficiently and comfortably.\*

- |   |  |    |   |
|---|--|----|---|
| 1 | CONTROL LEVERS - LEFT AND RIGHT TRACKS   | 10 | IMPLEMENT LOCKOUT SWITCH                      |
| 2 | MACHINE STATUS DISPLAY                   | 11 | RIGHT JOYSTICK - BUCKET AND BOOM CONTROLS     |
| 3 | CAT GRADE CONTROL/GRADE ASSIST SWITCH    | 12 | STRAIGHT TRAVEL MODE BUTTON (SIDE OF CONSOLE) |
| 4 | ENGINE THROTTLE DIAL                     | 13 | DISPLAY SELECT BUTTON (SIDE OF CONSOLE)       |
| 5 | FIRE SUPPRESSION SWITCH (OPTIONAL)       | 14 | ENGINE SPEED MODE BUTTON (SIDE OF CONSOLE)    |
| 6 | ASSIST ACTIVATE BUTTON                   | 15 | MACHINE WORK LIGHT BUTTON (SIDE OF CONSOLE)   |
| 7 | LEFT JOYSTICK - STICK AND SWING CONTROLS | 16 | HORN BUTTON (SIDE OF CONSOLE)                 |
| 8 | PARK BRAKE SWITCH                        | 17 | CONSOLE POWER BUTTON (SIDE OF CONSOLE)        |
| 9 | ENGINE START SWITCH                      |    |   |

Systems are shipped with a console and onboard receiver that share either a 900 MHz or 2.4 GHz frequency communications protocol.

\* Partial list only. Consult the operation and maintenance manual for a detailed description of available controls.

# COMMAND STATION OVERVIEW

- 1 SITE CAMERA DISPLAY (DEALER/CUSTOMER SUPPLIED)
- 2 REMOTE VISION DISPLAY (DEALER/CUSTOMER SUPPLIED)
- 3 REMOTE OPERATOR INTERFACE DISPLAY AND GRADE CONTROL OPTIONAL DISPLAY (DEALER/CUSTOMER SUPPLIED)
- 4 RIGHT-HAND SIDE CONSOLE
- 5 PARK BRAKE SWITCH
- 6 IMPLEMENT LOCKOUT SWITCH
- 7 FIRE SUPPRESSION SWITCH (OPTIONAL)
- 8 COMMAND STATION REMOTE SHUTDOWN
- 9 RIGHT CONTROL
- 10 OPERATOR NOT PRESENT SENSOR (WITHIN SEAT BOTTOM CUSHION)
- 11 LEFT CONTROL





# SUPPORTED OPERATOR FEATURES

The operator can select a wide range of excavator and technology features using the touch screens on both the Command Station and Console.\* Some features are not available on all excavator models or configurations. Consult your Cat dealer for details.

- Grade with 2D** - Delivers real-time guidance for accurate vertical and horizontal control and helps to ensure that cuts and fills are made to exact specifications – without under or overcutting.
- Work Tool Recognition** - The Cat PL161 is a Bluetooth device that provides attachment location and enables work tool identity to recognize the tool and set attachment parameters automatically.
- Grade with 3D** - Adds GNSS and RTK positioning guidance to simplify the grading process of complex designs often found on large commercial projects.
- E-Fence** - Automatically stops excavator motion using predefined boundaries to avoid hazards – above, below, front, left & right swing.
- Grade with Assist** - Automates boom, stick, and bucket movements to help improve operator efficiency - works with Grade 2D and 3D.
- Cab Avoidance** - A safety feature within E-Fence that helps to eliminate the chance of an attachment striking the cab.
- Payload** - Provides on-the-go weighing to help operators hit exact targets every time and avoid overloading, underloading, or misloading materials.
- Auto Dig Boost** - Improves bucket penetration and cycle times when cutting through tough materials by automatically increasing hydraulic pressure by 8%.
- Lift Assist** - A safety feature that helps operators avoid tipping. Visual and auditory alerts warn operators when a load is over the excavator's safe working range limit.
- Auto Heavy Lift** - Detects when a heavy load is present and automatically increases hydraulic lifting pressure by 8%.
- Smart Mode** - Automatically adjusts engine and hydraulic power to meet work demand with maximum fuel efficiency.

*\* Not all technology features are available on the Command Console.*

**“WE HAD A VISION OF BEING ABLE TO MAKE A SAFER, MORE EFFICIENT, AND MORE COST-EFFECTIVE ENVIRONMENT.”**

– JEFF MORTON, VICE PRESIDENT OF FINANCIAL PLANNING AND ANALYSIS, ASSOCIATED TERMINALS



## REMOTE CONTROL IN ACTION

**Associated Terminals, a cargo handling and logistics company with facilities along the Gulf Coast,** is using Cat Command Stations to run small wheel loaders and excavators.

Eliminating the need for people to work in potentially dangerous situations – such as running a machine in the cargo hold of a barge – operators now work from the company’s headquarters. They can switch between multiple machines in different locations from the same Command Station, in some cases hundreds of miles apart.



**“CAT COMMAND HAS ALLOWED US TO REMOVE THE OPERATOR FROM HAZARDOUS ACTIVITIES.”**

– FRANK MONTGOMERY, PRESIDENT, SAIIA

**SAIIA, an industrial/heavy civil contractor in northern Alabama,** is using three Cat Command Stations and a Command Console around an ash pond site. The materials around these ponds can be unpredictable, especially during rainy conditions.

Operators control Cat excavators from inside a heated office trailer. Along with the comfortable work space, they appreciate not having to walk through muddy conditions or risk getting their vehicles stuck on the way to their machines.

# STANDARD & OPTIONAL EQUIPMENT

Standard and optional equipment may vary. Consult your Cat dealer for details.

## COMMAND STATION (NON-LINE OF SIGHT)

MACHINE BASE KIT	STANDARD	OPTIONAL
Mode Indicator Lights	●	
RC/Manual Mode Switch	●	
Electronic Control Modules, Harnesses, Brackets, Fuses, Relays	●	

MACHINE VISION AND COMMUNICATIONS	STANDARD	OPTIONAL
HD Cameras	●	
Microphone	●	
ECMs, Harnesses, Brackets	●	
Machine Radio Installation Kit	●	
Machine Radio, Antennas	○	

STATION DISPLAY SETUP	STANDARD	OPTIONAL
Machine Vision Television	○	
– Tilt Mount and Cables	○	
Operation Info Touch Screen	○	
– Dynamic Mount Arm	●	
– Cables	○	
Site Camera Television	○	
– Tilt Mount and Cables	○	
Secondary Touch Screen (Ex. Cat Payload)		○
– Dynamic Mount Arm		●
– Cables		○
Configurable 3rd Television		○
– 3rd Television Bracket		●
– Television Tilt Mount and Cables		○
Configurable	●	
– Remove Mounting Mast		
– Wall Mount Any Size TV		

STATION CONTROLS AND ERGONOMICS	STANDARD	OPTIONAL
Pedals	●	
– Adjustment Range: 3" (7.5 cm)	●	
Joysticks	●	
– Adjustment Range: 7" (17.5 cm)	●	
Seat	●	
– Adjustment Range: 9" (23 cm)	●	
– Recline Adjustment Range: 35°	●	
– 5 Lumbar Positions	●	
– Adjustable Headrest	●	
– Cloth Seat	●	
– Operator Presence Sensor	●	
Switches	●	
– Station Power Switch (Lockable)	●	
– Park Brake Switch	●	
– Implement Lock Switch	●	
– Fire Suppression Enable Switch	●	
– Remote Shutdown Switch	●	
Storage	●	
– Mouse Pad Area	●	
– Keyboard Shelf	●	
– Two Cup Holders	●	
– Storage Tray	●	
– Phone/Tablet Holder	●	

● – Caterpillar supplied equipment  
○ – Cat dealer or customer supplied equipment

(Continued on next page)

# STANDARD & OPTIONAL EQUIPMENT

Standard and optional equipment may vary. Consult your Cat dealer for details.

## COMMAND STATION (NON-LINE OF SIGHT)

STATION MODULAR STRUCTURE	STANDARD	OPTIONAL
Detachable Display Mounting Mast	●	
Two-Piece Rigid Frame	●	
Detachable Cat Electronics Enclosure	●	

STATION POWER AND CONNECTIVITY	STANDARD	OPTIONAL
Personal Computers	○	
– Personal Computer for Machine Vision and Interface	○	
– Personal Computer for Site Camera and Cat Productivity	○	
– Wireless Keyboard/Mouse	○	
AC-to-DC Power Supply (24VDC, 10A)	○	
AC Power Strip Extension	○	
Caterpillar Validated Ethernet Switch	○	
4 × Ethernet Cables	○	
2 × Power Cables	○	

SITE COMMUNICATIONS	STANDARD	OPTIONAL
Site Access Point – Manages wireless communication with the machine	○	
Site Backhaul – Manages communication between the Station and Access Point		○
Site Camera – Operator can monitor site-level hazards	○	

A-STOP	STANDARD	OPTIONAL
Handheld Transmitter		●
Machine Receiver		●
– Harness, Brackets, Hardware		●

## COMMAND CONSOLE (LINE OF SIGHT)

STATION CONTROLS AND ERGONOMICS	STANDARD	OPTIONAL
Mode Indicator Lights	●	
RC/Manual Mode Switch	●	
Electronic Control Modules, Harnesses, Brackets, Fuses, Relays	●	
Console Control	●	
– Batteries, Charger, Shoulder Harness, RFID Chip	●	
Machine Receiver	●	
– Harness, Brackets, Hardware	●	

● – Caterpillar supplied equipment  
○ – Cat dealer or customer supplied equipment

Cat Command availability may vary by region and model. Consult your Cat dealer for details.

For more complete information on Cat products, dealer services and industry solutions, visit us on the web at [www.cat.com](http://www.cat.com)

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Materials and specifications are subject to change without notice. Featured machines in photos may include additional equipment. See your Cat dealer for available options.

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