

Conductor THE SINGLE/ISOLUTION

WWW.RSTECHSERV.COM



NICE TO MEET YOU



For over thirty years, R.S. Technical Services, Inc. has been an innovative, driving force in the closed circuit televising, or CCTV, pipeline inspection industry and has brought many first time products to the US infrastructure maintenance market.

As the needs of our customers in the pipeline inspection industry have changed, RST has been right there, in step, to provide them with rugged, dependable pipeline inspection equipment that stands up to the challenging environments they're subjected to, data collection software to make sense of inspections and meet reporting requirements, and vehicle installations that tie it all together.

In an industry where real customer service disappears a little more each day, RST takes pride in our commitment to keep you up and running. We know that word of mouth spreads far and fast. We want to make sure that when someone speaks of RST, they're recommending us for our commitment to service and our quality products.

Please take a look at our line of products. Feel free to contact us at any time with any questions that you may have. At RST, we're here to help.

A COMPANY OF FIRSTS

- ✓ First mainline color camera featuring internal lights
- ✓ First U.S. manufacturer to build a true pan & tilt camera with tracking lights
- ✓ First to manufacture cable reels that offers "electrical gear selection" and a true freewheeling cable drum
- First tractor design to provide freewheeling for rapid return
- First to design an electronic circuit to double tractor torque without increasing supply current
- ✓ First to introduce a steerable storm drain tractor or large pipeline tractor
- First U.S. company to design an explosion proof camera and tractor approved for Class I Division I applications
- First to design a universal tap cutting control system for single conductor camera systems
- ✓ First to design Single Conductor Laser
 & Sonar Profiling Systems
- ✓ First manufacturer to produce a Single Conductor Panomorphic Camera System

WHY SINGLE CONDUCTOR?

Single Conductor technology offers more cost advantages than you might think. Interchangeability of components, backwards and forwards compatibility and minimal down time are just some of the benefits that come with owning and operating R.S. Technical Services systems.

RST Single conductor systems have always been considered the cutting edge technology of the pipeline video inspection industry for the following reasons...

- The cable is smaller, normally ¼" in diameter and stronger than any of the reinforced multi-conductor cables currently available.
- The single conductor cable is simple to maintain and the end connectors can be replaced in a matter of minutes.
- The life expectancy of the single conductor cable has been proven to be at least three times that of any multi-conductor cable.

SIMPLY DEFINED...

Single conductor is a term which refers to the cable design used to connect the inspection camera and accessories to the control system. The central core of single conductor cable is constructed by wrapping copper strands around a single stranded insulated wire. A plastic jacket is then extruded over this coaxial cable and two layers of galvanized steel wire are Contra-Helically wrapped for strength and protection of the coaxial cable. These galvanized wires are also used as a safety ground for the system.

This produces a ¼" cable with amazing break strength that is capable of transmitting equipment power, multiple camera video signals and equipment control signals simultaneously.

SIMPLIFY YOUR LIFE AND INSPECTIONS.

- FULLY EXPANDABLE AND UPGRADABLE
- INTERCHANGEABLE COMPONENTS
- EASY MAINTENANCE
- SMALL DIAMETER TO STORM DRAINS
- NO LIMITATIONS

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Cameras

TRAKSTAR LINE

High Res video with total zoom of 40:1 (10X optical and 4X digital) Integrated pan/tilt head with built-in ultra bright, fully adjustable LED's

Remote controlled with full camera head swing/rotation

Programmable pan and rotate limits with on-screen instructions

Internal pressure and humidity sensors and internal clock with startup counter

On-board diagnostics

Home function to return camera head to straight ahead position

LED lights with remote controlled light settings

Sapphire lens window

PAL video format available

TRAKSTAR II

Great things come in small packages, like the TrakSTAR II Camera, RST's shortest Pan & Tilt Zoom camera.

The TrakSTAR II is a micro-processor controlled Single Conductor camera that is well ahead of other cameras in the industry and has many new features.

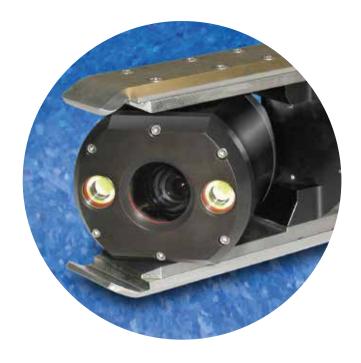
The TrakSTAR II is half the body size of the TrakSTAR Camera and was designed to fit on the all new TranSTAR II Steerable Tractor.



The design of this unit's 2 high intensity bright white LED light arrays produce more lumens than standard LEDs or halogen lights.

These high performance light arrays are guaranteed for the life of the camera.

Capable of operating on up to 2,500' of single conductor cable.



Options include:

- ✓ Inclinometer
- ✓ Laser crack measurement diodes
- ✓ Can be configured for multi-conductor format

Features	OmniEYE 360	TrakSTAR II	TrakSTAR	OmniSTAR Probe
Pipe Sizes	6" and up	6" and up	6" and up	4" to 12"
40:1 Zoom	Software Zoom	✓	✓	
Pan & Tilt	n/a	✓	✓	✓
Auto Iris	✓	✓	✓	✓
Auto Focus		✓	✓	
Adjustable Lighting	✓	✓	✓	✓
Internal Condition Sensors		✓	✓	
Lights Pan with Camera	n/a	✓	✓	✓



OMNISTAR PROBE

Designed to fit in 3" or larger pipelines, the camera will mount on RST Single Conductor Push Rod and the Mighty Mini Tractor.

The camera has a 360° continuous rotate capability and a 270° panning capability!

- ✓ Micro Processor Control featuring a Home function to return camera head to upright and straight ahead position as well as a pre-programmed "Lateral Find"
- Compact, rugged, aluminum and stainless steel housing
- √ 4 High Intensity LEDs
- ✓ Fits in 3" pipes, use as a push camera or mainline camera



Experience the first single conductor panomorphic inspection system available for pipeline inspection.



OMNIEYE 360

The OmniEYE 360 pipeline inspection camera is a state-of-the-art, single conductor inspection tool, compatible with existing RST portable and mainline inspection systems and modifiable for use with most multi-conductor systems.

With its continuous 360° image capture, operators can perform uninterrupted pipeline inspections at speeds up to two times faster than traditional methods (up to 70' per minute). The OmniEYE 360 camera is designed for inspection in lined 6" and larger diameter lines up to 2,500' in length.

The inspection process is greatly simplified when using the OmniEYE 360—crews only need to clean the line and then run a continuous inspection. Post processing and review can be accomplished in the field or back at the office.

The captured images are linked with a powerful software package that allows for identifying defects and features in the pipeline with greater speed and accuracy than traditional inspection methods. Data capture features include: accurate measurements from X and Y axis for precision lateral, joint, and crack measurement, simultaneous view of forward and unwrapped footage, auto measurement and distance recognition for optimal observation and defect coding.

Transporters

TRANSTAR LINE

Single conductor technology

Steerable and freewheel clutch

Most powerful tractor of its size with dual 90 watt motors

Water resistant per ipx7 requirements

Travel up to 70' per minute

Capable of distances of 2,000' in a single run

3 forward speeds, reverse and freewheel

Numerous options to extend inspection capabilities in a wide array of environments

Optional 512Hz pigtail sonde available for all units

Features	TranSTAR II	TranSTAR	ProTRAK	Storm Drain	Mighty Mini	
Pipe Sizes	6"to 24"	6"to 30"	6" to 30" 24" and up		4" to 12"	
Pull Distance	2000′	2000′	2000′	3000′	750′	
Steerable	✓	✓		✓		
Elevator	✓ optional	✓ optional		✓	✓ manual	
Length	14"	19"	27"	36″	11"	
Speeds Forward / Reverse	3 / 1 / freewheel	3 / 1 / freewheel	3 / 1 / freewheel	3 / 1 / freewheel	3 / 1 / freewheel	
Motor / Power	2-90W Rare Earth	2-90W Rare Earth	150W Rare Earth	125W Rare Earth	25W Rare Earth	

TRANSTAR

This robust, six-wheeled, steerable, all gear driven transporter is equipped with two 90W Rare Earth permanent magnet motors, making it the industry's highest power tractor of its size. This allows the tractor to inspect larger lines without the need for additional gear trains or transmissions.

The clutch allows rapid freewheel retrieval once the inspection is complete so production capability is greatly optimized. The TranSTAR, at 19" in length, offers tremendous versatility through its many standard features like its tilt up connector and rear color view camera and options that include manual and motorized elevator systems and multiple tire configurations.



COMPACT POWERFUL[®] VERSATILE

0 0 0 0 0 0 0 0 0 0



TRANSTAR II

The TranSTAR II uses the same innovative technology as its larger counterpart—the TranSTAR. Dual 90 watt motors lets the TranSTAR II achieve speeds up to 70' per minute. The clutch allows rapid freewheel retrieval once the inspection is complete. At just 14" in length, the TranSTAR II features a tilt up connector, rear view color camera and options such as manual and motorized elevator systems and multiple tire configurations, making it an extremely versatile addition to your inspection toolbox in a robust, compact size.





MIGHTY MINI

This unit's easily adjustable cantilevered camera mount and optional tire combinations allow for superior performance in small pipelines. The Mighty Mini Tractor can be configured to transport the RST 1306 camera or OmniSTAR Probe camera. Travel speeds up to 40' per minute with plenty of power generated by a 25W Rare-Earth permanent magnet motor, high efficiency planetary gear train and four-wheel drive.

PROTRAK CRAWLER

Available in single or multi-conductor configurations, the ProTRAK operates in line sizes from 6" to 30".

Three forward speeds, reverse and a freewheel mode for easy retrieval with travel speeds up to 55' per minute at full power. Specially designed, contoured pads, attached with dual stainless steel rivets on #40 stainless steel chain, provide a large contact surface for maximum traction and extreme durability.

Transporters

Large Diameter

Supports all RST Mainline Cameras

Remote controlled camera lift can center the camera in up to 60" pipe

For pipelines 24" and larger

Dual 26W (2600 lumens) adjustable LED array lights

Four-wheel drive with high efficiency gear train

Speeds up to 80-85' per minute

Large 11" tires (optional 13" tires available)

*Options include:*Color back up camera



PONTOON SHOWN WITH TrakSTAR CAMERA



Gen2 Zoom Mainline and Lateral

Inspection System

The Gen2 Zoom System performs mainline and lateral pipeline inspections from a single, fully integrated unit.

The system utilizes picture-in-picture or dual video monitors allowing operators to view the mainline and lateral lines simultaneously.

- ✓ Inspect mainlines from 6" to 24" and 4" to 8" lateral lines
- ✓ 40:1 zoom pan and rotate mainline camera with auto iris and auto focus
- ✓ High resolution 1545 lateral camera with auto-uprighting picture, retracts at the rate of up to 30' per minute and features an integrated 512Hz sonde for locating
- ✓ Capable of mainline inspections up to 500' in length with lateral inspections of up to 150'
- ✓ Color backup camera and tilt up connector







- Electronically synchronized mainline and lateral launch cable reels for ease of retrieval during and after inspection
- ✓ Picture-in-Picture format or dual video monitor view format
- ✓ View mainline and lateral simultaneously
- √ 6-Wheel drive tractor features three forward speeds, reverse and freewheel
- ✓ Optional locating receiver available



Cables, Reels + Controllers

Two types of single conductor cable are now available.

Our traditional .25" OD double steel armored cable with 5,400 pound break strength and RST's new .34" OD Hytrel jacketed cable.

The new cable incorporates a braided Aramid strength member with 2,000 pound break strength.



PORTABLE REEL

A small maneuverable portable reel with up to 1,500' cable capacity designed for use in restricted access areas. Ideal for mainline pipe inspections when large vehicle mounted systems are not required.

The reel operates from either a portable generator or Shore Power cord.

Offers maximum tractor footage by free-wheeling during cable pay-out, while the ½ horsepower motor provides quick, effortless retrieval of the camera system.



MAINLINE REEL

This powerful reel offers a capacity of up to 2,500' of double-armored single conductor cable with automatic level wind and footage counter. Unit features a variable speed motor and dual gear ratios.

- ✓ State-of-the-art micro-processor control electronics allows local and remote operation
- Gear driven cable drum eliminates excessive drag typically found in chain drive units which provides tractors the ability to travel greater distances
- Extreme-duty automatic cable level wind with heavy-duty, self aligning sealed bearings



- ✓ Chain drive connects the level wind shaft to the cable drum shaft for accurate timing of the rewind operation
- ✓ An electronic/mechanical footage counter is mounted on the level wind shaft to indicate cable travel in feet and tenths of feet at the reel and on the data display at the operator's station
- ✓ Cable measurement accuracy adjustable via software to within .10 foot

CAMERA | TRANSPORTER CONTROLLERS



Joystick Aux Unit*

Ergonomically designed dual joystick controller allows for easy operation of all camera and tractor functions with dedicated controls. Multiple mode selector enables operator to select component (i.e. standard tractor, storm tractor or other) and controller will self-adjust to the selected unit's features.





Desktop Aux Unit

Simple, push-button control of mainline cameras and transporters in a compact, desktop configuration.

*Wireless option available



Handheld Aux Unit

Designed for remote use with portable and vehicle mounted mainline inspection systems. Compact and convenient, it performs all the functions of the desktop controller.

MAINLINE CONTROLLER AND CPU

The Mainline Controller provides all the necessary power to operate and monitor the television inspection system. All circuits are solid state with built-in protection circuitry.

The back plate of the Mainline Controller contains all the required plug-ins for the various locking cable connectors, each of which are separately indexed and labeled.

The faceplate is permanently labeled designating the function or purpose of the various switches, meters and controls divided by POWER, CAMERA and REEL.

Systems

THE CUBE

This is the perfect pipeline inspection system for easements, off road manholes or any hard to get to situation.

This little workhorse of a system is ideal for easement work or those organizations who want the power of a full mainline system in a freestanding, highly mobile format.

Housed in quarter-inch powder coated, glare resistant aluminum, The CUBE has forklift access both front and rear along with stainless steel lift and tie-down hooks for easy handling and storage.

Other outstanding features:

Rack mount or laptop data collection system

Two 500 lb. capacity storage drawers

Front access 9-gallon pressurized wash-down system









JET PROPELLED INSPECTION SYSTEM

Adaptable to any jetter system, the JPIS is powered by the jetter's 12-volt DC battery system and allows the operator to see the condition of the pipe to be cleaned and the results of the cleaning. Features 600' of light-weight armored single conductor cable on motorized reel with torque control, high resolution color camera with high-intensity ultra bright white LED lights and TFT LCD monitor. Can record video to flash drive. Optional on-screen footage counter available.

THE PRIVATE EYE 2

The PE2 command center is enclosed in a Pelican® waterproof and crush proof case that measures 18.43" x 14.43" x 7.62" and weighs just 30 lbs, giving the user extreme portability without sacrificing field durability.

The PE2 is compatible with all RST cameras and tractors (shown here with the TranSTAR 6-wheel drive tractor and TrakSTAR dual LED camera) and when combined with a Compact Portable Reel (CPR) loaded with single conductor cable, is capable of inspecting 4" to 200" diameter pipelines up to 1,500' in length.



Specialty Applications



WELL CAM

The RST Well Camera is designed to inspect water wells from 4" to 30" in diameter. It provides a 360° radial view of the walls and works with up to 2,000' of RST single conductor cable when connected to an RST mainline controller. The camera is designed to withstand an applied pressure of 450 psi or be submerged in 984' (300m) of water.

SONAR PIPE PROFILER

The RST single conductor Sonar Profiling system includes a underwater scanning transducer which may be mounted on a skid or flotation device, a sonar processor unit and the RST single conductor interface components.

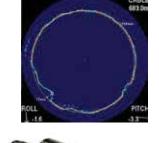
The underwater scanning unit is housed in a stainless steel pressure vessel and works on up to 2,000' of armored single conductor cable.

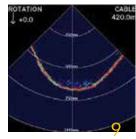
As the scanner is moved through the pipe, an indication of the distance traveled is shown on the screen allowing for accurate determination of the location of defects in the pipe.

Internal sensors monitor and display Pitch and Roll indicators in analogue and digital form on the screen to show the orientation of the transducer unit.

- ✓ Real time continuous scanning over a full 360° in 1 second
- ✓ Windows® user-friendly software with USB hardware minimizes training time
- ✓ Direct capture to hard disk for high resolution image save and restore
- ✓ Dual tracking cursor for accurate on-screen measurements
- ✓ Internal pitch and roll sensors
- ✓ Quadrature and compatible cable counter interfaces are built in
- √ 1500 feet cable drive as standard, fibre-optic system optional
- ✓ Automatic profile detection and output in ASCII format for import into third-party 3D modelling software







INVESTIGATOR CAMERA

The RST Investigator Camera (shown left) is a fully self-contained portable, 12V rechargeable battery powered inspection system ideally suited for inspection of vertical assets such as manholes, access shafts, conduits and similar structures 4' and larger in diameter up to a depth of 21'. Fully submersible to 5', 10x Optical, 4X Digital Zoom Camera has 2 High Intensity White LED lights and digital video recording capacity.

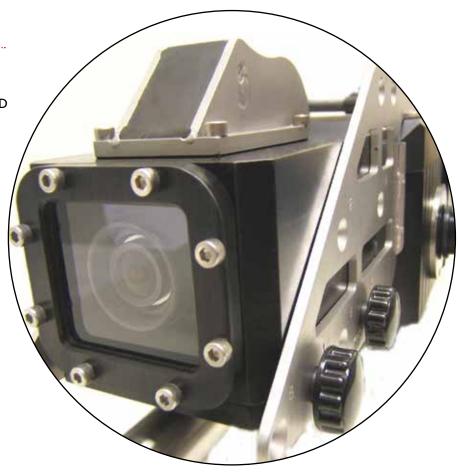
Optional Mainline System Video Interface and Data Capture capability available.

Laser Profiler

The Laser Profiler accurately measures pipeline ovality. The profile data captured by the unit is analyzed by a professional data analysis center which produces detailed reports that include: Inspection Overview, Laser and Camera View and 3-D Color Visualization renderings of the asset with any problem areas highlighted.

- ✓ Fixed optical and laser triangulation for +/- 0.25% accuracy
- √ 99.9% repeatability for inspection comparison
- √ 60,000 measurements taken per second
- ✓ Able to profile pipes that contain up to 45% water
- ✓ 2000 radial measurement points per profile
- ✓ Data analyzed by user on site or by data analysis center
- ✓ Capable of profiling 8" to 48" pipe
- ✓ Only requires a single pass through the pipeline to complete profile

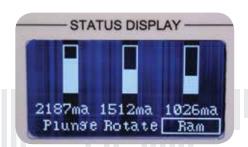




TAP CUTTER CONTROLLER

This single conductor tap cutter module is compatible with all RST single conductor mainline systems and operates all industry standard multi-conductor cutters or other robotics.

- ✓ Control and monitor up to 10 different functions
- ✓ Proportional joystick control
- ✓ Programmable current limits to the motors to protect them from being damaged
- On screen status display of settings, test modes and equipment operations



Accessories

We offer a wide variety of accessories to extend the capabilities of your inspection equipment.

We have developed specialized accessories such as skids, flotation devices and winches where motorized transporters are not feasible or practical.











WHEELS (pictured left to right)

Standard and Balloon Knobby Tires and **High Traction Caster Wheels** are designed for use on the TranSTAR line. The studded style (*shown upper left*) is recommended for special applications such as PVC pipe and heavy grease.

MegaTRAK is a high performance wheel set for use on the TranSTAR line and the Mighty Mini tractor. This style is recommended for special applications such as PVC pipe and heavy grease.

Pneumatic Tires are designed for the TranSTAR line and are available in two sizes and are required for large (12" and larger) pipe diameter inspections



Shown here is just a small sampling of what is available to complete your inspection "toolbox".

Tire/Wheel Type	TranSTAR II	TranSTAR	Storm Drain	Mighty Mini	Gen2 Zoom
Knobby Tire	✓	✓		✓	✓
Studded Knobby Tire	✓	✓		✓	✓
Hi-Traction Caster Wheel	✓	✓		✓	✓
Studded Hi-Traction Caster Wheel	✓	✓		✓	✓
Knobby Balloon Wheel	✓	✓			✓
6" Pneumatic Wheel	✓	✓			✓
8" Pneumatic Wheel		✓			✓
13" Hi-Traction Wheel			√		_
MegaTRAK Wheels	✓	√		√	✓

Installs

Let us build your inspection dream machine. We offer build-to-suit configurations to meet your budget, applications and ergonomic requirements.

















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Software

DATA COLLECTION SOLUTIONS

Our industry is constantly evolving and during the last decade, software has grown into an indispensable tool to assist asset owners in making key decisions about their vital underground assets.

RST is here to help you integrate the best fit data capture technology into your pipeline inspection toolbox.

After-Sales Support

Since 1984, we've been a family owned and operated company. Our company repair and support policies have been and always will be based upon our customer's needs.

At RST, the sale is the beginning of the business relationship with all of our customers.







R.S. Technical Services, Inc. supplies the industry's best asset management tools, from field data collection software to GIS database integration.

Whether you are new to computerized pipe survey data collection or if you are already committed to a particular software package, RST inspection systems provide all the necessary components to work with the software tools of your choice.

KEEPING YOU PRODUCTIVE AND PROFITABLE

In an industry where time is money, RST is committed to keeping your inspection investment running in optimum condition. Our outstanding after-sales support program features:

- ✓ Lifetime free loaner program*
- ✓ We strive for a 48-Hour turnaround on repairs
- ✓ Fully stocked parts and supplies facility
- ✓ Two factory owned and operated repair locations
- ✓ Free telephone tech support weekdays from 7:00 AM to 7:00 PM FST

E-mail Support: techsupport@rstechserv.com

Repair service for your CCTV equipment is available from our factory owned service facilities located in California and Kentucky.

West Coast 1327 Clegg Street Petaluma CA 94954 tel 800.767.1974

East Coast 292 Midland Trail Mt. Sterling KY 40353 tel 866.769.8264

^{*}Based on Equipment Availability at Time of Service Request

COMPONENT COMPATIBILITY

	OmniEYE 360 Camera	TrakSTAR II Camera	TrakSTAR Camera	OmniSTAR Probe Camera	Well Camera	TranSTAR II Tractor	TranSTAR Tractor	ProTRAK Crawler	Storm Drain Tractor	Might Mini Tractor	Gen2 Zoom Lateral Launch
Private Eye 2 System	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1375 Controller System	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1315 Controller	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Mainline Controller	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
OmniEYE 360 Camera							✓	✓	✓		
TrakSTAR II Camera						✓	✓	✓	✓		
TrakSTAR Camera							✓	✓	✓		
OmniSTAR Probe Camera										✓	
Laser Profiler System	✓	✓	✓			✓	✓	✓	✓		✓
Sonar Profiler System	✓	✓	✓								
Tap Cutter Control System	✓	✓	✓	✓							

WARRANTY

R.S. Technical Services, Inc. (RST) warrants all items of our manufacture for defects in materials and/or workmanship from the date of receipt by the Customer.

Controllers, Reels & Cable	Duration	Transporters	Duration	Cameras	Duration
Mainline Controller	5 Years	TranSTAR Transporters	2 Years	TrakSTAR Cameras	2 Years
Joystick Aux Box	5 Years	ProTRAK Crawler	2 Years	OmniSTAR Probe	2 Years
Desktop Aux Box	5 Years	Mighty Mini Tractor	2 Years	Well Camera	2 Years
Handheld Aux Box	5 Years	Steerable Storm Drain	2 Years		
Tap Cutter Controller	2 Years	Gen2 Zoom Lateral Launch	2 Years	Camera Lighting	Duration
Mainline Cable Reel	5 Years			Dual LED Light Arrays	Lifetime
Compact Portable Reel	5 Years				
Double Armored Sincon Cable	5 Years				

Your Authorized Dealer is:

Municipal Equipment Sales, Inc.

Mailing Address: PO Box 1233 Location: 208 Bell Place Woodstock, GA 30188

Local: 770-928-0424 Fax: 770-928-7512

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