

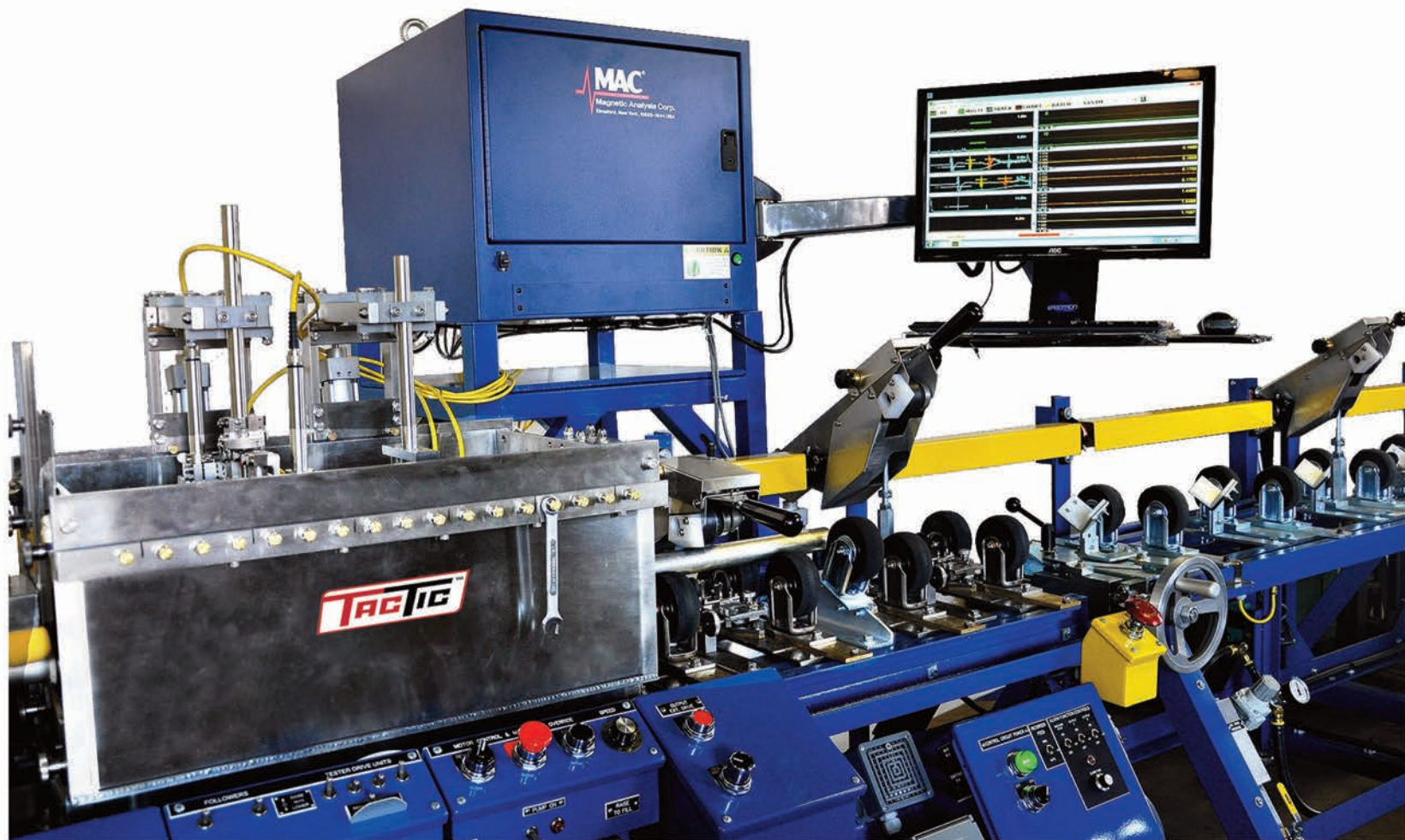


A Product of Magnetic Analysis Corp.

BULLETIN 1000

MAGNETIC ANALYSIS CORP.

# Ultrasonic Inspection Systems for Tubes and Bars



TacTic™ Model 76 EX-24 "spin the tube" immersion style system



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TacTic™ Bulletin 1000 - 3/2022

## Decades of Experience

TACTIC specializes in the science of testing tubing and bar stock. Since its inception in 1962, TACTIC has consistently developed and delivered state of the art inspection equipment for cylindrical products. Nuclear coolant and fuel cladding tubes, chemical reactor and heat exchanger tubing, turbine blade forging stock, screw machine bar stock and bearing race tubing are just a few of the products that TACTIC systems are used to inspect every day.

The utilization of ultrasonics for inspection is an exacting process that requires precise positioning of both search units and test material. TACTIC mechanical transport systems and transducer positioning accessories have been engineered around the laws and theories of ultrasound. What has evolved is a product line that is efficient, economical and scientifically accurate.

TACTIC has decades of experience and a talented team of designers, machinists and technicians who build ultrasonic test systems to meet our customers' needs.



Precision Parts Manufacturing

## TACTIC™ is now a product of Magnetic Analysis Corp.

TACTIC™ has been acquired by Magnetic Analysis Corp. (MAC®), of Elmsford, NY, effective February 28th, 2022. TACTIC™'s operations in Treose, PA have been moved to MAC's Elmsford NY headquarters and manufacturing plant.

Magnetic Analysis Corp. has been designing and producing nondestructive test instruments and systems since 1928 and now provides ultrasonic, phased array ultrasonic, eddy current, and flux leakage nondestructive test technologies.

Many of TACTIC™'s customers are also customers of MAC. Both companies have a long history of helping metal producers achieve reliable, high-quality inspection that meets their specific needs. Support, service, upgrades and calibrations for TacTic™ customers are being handled through MAC's existing worldwide field network of Engineers and experienced Representatives.

Working together, TACTIC™ and MAC are prepared to meet all your ultrasonic testing needs.



Commercial Testing Facility

## Model 76 Series Ultrasonic Tube & Bar Testers

The Model 76 family of testers employs continuous rotary feed of round material through a glanded, water-filled test tank in which ultrasonic transducers are positioned to make as many simultaneous inspections as are desired. A number of models of testers are available in this series to provide a full range of test capability from the lightest to heaviest duty applications. A wide choice of accessories is available to equip these machines for special testing jobs and various degrees of automatic operation.

TACTIC test systems are available in standard duty, heavy duty and extra heavy duty configurations for applications from the most sensitive to the most rugged.

### STANDARD FEATURES

- Precision idler wheels for smooth material flow and accurate pitch control
- Anti-vibration mounts on motor for smooth operation
- Pre-wetting sponge to reduce air bubbles in immersion tank
- Large flush and drain valve for fast clean-out
- Leg lagging plates to secure and level the Tester

### OPTIONAL ACCESSORIES

- Alarm and motor control functions for specific applications
- Air-actuation of drive units
- Immersion tanks available in many sizes
- Pump and filter for recirculating coupling water
- Highly calibrated wheel angle adjustments for precise pitch control
- Support pedestals for guiding and supporting rotating test material



Model 76N - Test unconnected and randomly spaced lengths with the 76N

The tank in the Model 76N Tester has internal overflow sections, special glands and a high flow recirculation system. These features permit one-at-a-time feeding of small diameter tubes and bars with any desired spacing between their ends.

## Model 45 Series Transducer Positioners

These versatile transducer positioning devices for flaw detection systems are provided in a number of useful adjustment and mounting arrangements. They are employed in TACTIC Model 76 Tube and Bar Testing Systems, on scanning bridges and in other special purpose installations.

Model 45 Series positioners have independent, lockable rotation in two or more planes. They are furnished to fit standard search tube diameters.

Many of these positioners have micrometer dial adjustments. In addition, highly calibrated directions of motion are available in various models to meet a wide range of alignment requirements.

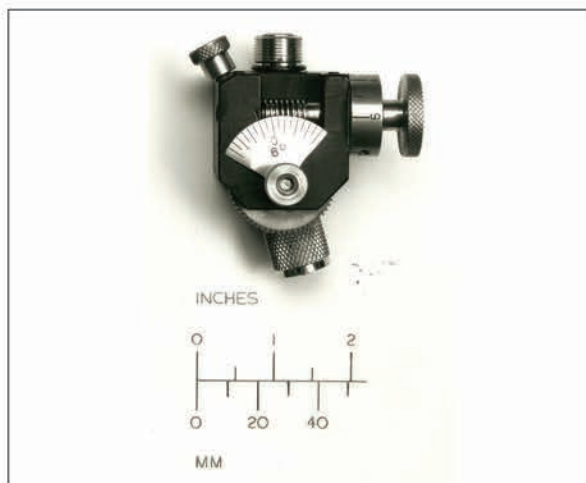


Model 45-9 Precision Multi-Axis Transducer Positioner with micrometer control

## Model 140 Manipulator

The Model 140 Manipulator mounts on the end of a standard 3/4 inch "search tube" for ultrasonic immersion transducers. Its bottom connector receives a standard UHF-threaded transducer which may then be adjusted over a wide range of highly calibrated angles in one plane.

The top and bottom connectors are rotatable to allow compensation to be made for "off-axis" beams or to provide proper focal direction for cylindrically focused transducers.



Model 140 miniature 1-axis Transducer Manipulator



Model 45-9 with a Model 140 Manipulator

## Followers

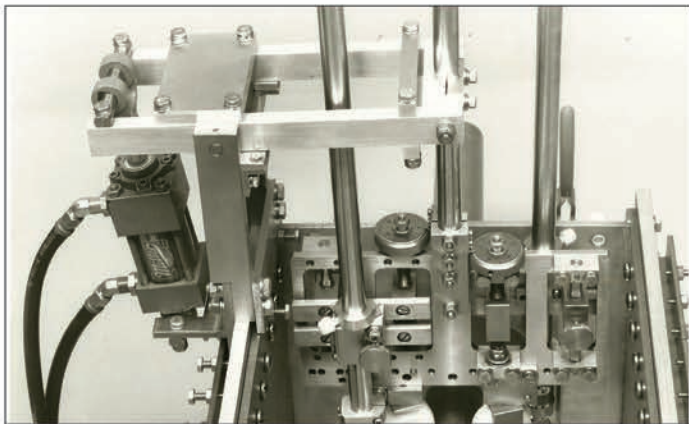
Material which is not exactly straight will constantly change its orientation with respect to a fixed transducer as it is fed through an inspection tank. For small diameter, flexible material, various types of in-tank supports can be used to stabilize the material position. However, for reliable inspection of larger, out-of-straight material, it is necessary to use a device which allows the transducer to "ride" the material in order to maintain consistent focus and angular orientation of the transducer beams on the test piece. The ability to do this is a principal advantage of rotating tube systems over rotary probe systems which only yield reliable results on perfectly straight material.

Models 47, 48 and 49 Followers are all gravity-loaded to provide a downward pressure on the test piece. Various models can accommodate from one to three transducers. Each follower is equipped with calibrated dials for accurate transducer positioning.

In the Model 411 Followers, additional hold-down force on the follower mechanism is obtained from a pneumatic cylinder. This "air loading" technique allows the follower to "track" the test material at higher speeds than would be possible with gravity loading alone. In addition, transducer positioning controls have been mounted to permit easier operator access.

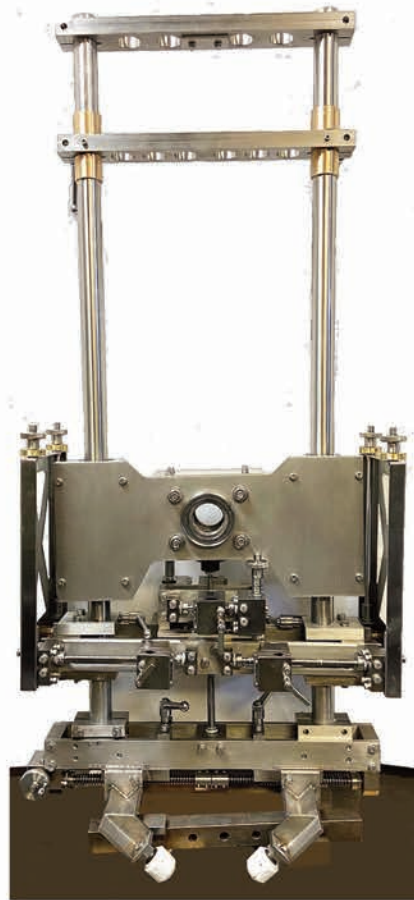
### Model 411 Standard Features

- Air cylinder loading
- Easily accessible position controls
- Transducer angle reflectors to conserve tank space  
Right angle adapters also furnished
- Wheel or ball "riders"



Model 411 Follower

The TACTIC Model 444 Follower provides for mounting and adjustment of four ultrasonic transducers (probes) to be used for the inspection of cylindrical material such as pipe, tubes, bars and billets. The Model 446 Follower accommodates six transducers. Both models are intended to be supported from a traversing bridge or carriage on a fairly large inspection tank. An air cylinder raises the scanner plate a small distance above the test material when it is desired to move the bridge rapidly along the length of the tank. Vertical positioning of the entire follower assembly to accommodate materials of different sizes is accomplished by an electrical motor drive. A positive stop is provided so that, once positioned for a given size of material, the follower plate will not drop further should it be traversed beyond the end of the test piece. The diameter range for standard models is 3-20 inches (75-510 mm). Other ranges may be obtained on special order.



Model 446 Follower

## Idler Sections & Accessories

Series 600 Idler Sections are rugged, low friction stands used to support rotating material feeding into and out of TACTIC Ultrasonic Tube and Bar Stock Testers. They can also be converted for “straight-through” feed of rectangular and hexagonal stock to and from TACTIC Model 78 Combination Testers. Other uses include material feeding to eddy current testers, grinders and grit blasters. All Idler Sections incorporate welded and bolted structural steel elements, adjustable leg levelers (or shock isolators on the heavy duty models) and matched pairs of neoprene or polyurethane idler wheels. Coordinated and calibrated wheel angulation from 0 to 30° is provided on all units for accurate pitch control and to provide minimum friction. Idler Sections are available in lengths from 6 to 30 feet (1.8-9.1M). This modular design permits a “building block” approach to customer handling systems.

Optional features for Idler Sections include:

- Extended drive units
- Guide pads for guiding flexible material onto the idler wheels
- Air-actuated hold-downs to reduce vibration and material wobble
- Loaders, unloaders, sorters and other system accessories



Model 620H Heavy-Duty Input Idler Section with load guides and extended drives

## Loaders

Material is placed on forward-sloping, plastic-covered storage arms of the loader and is restrained from rolling off by means of adjustable stops at the front of the loader modules. When loading is desired, lifting arms raise the first piece from the storage arms and allow it to roll onto the input conveyor while holding back the remaining material. Manual or optional automatic operation of the loader is controlled from a console located at the front of the tester. Model 219 Loaders are available with any number of arms to handle a wide range of material lengths and weights.



Model 219K Heavy-Duty Loader

## Unloaders

Models 187 and 188 Unloaders unload each piece after it has passed through the Tester to the output Idler Sections. They are available with various numbers of lifting arms to suit material length and weight requirements. Even unloading is assured through the use of exclusive hydraulic synchronization design. Selectable manual or automatic operation is standard.

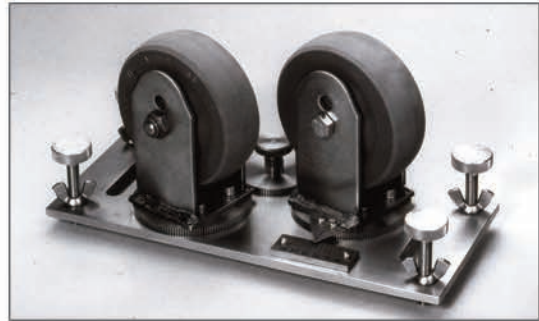


Model 188 Unloader in mid-cycle on heavy-duty output idler section with storage rails

## Model 190 Series Defect Sorters

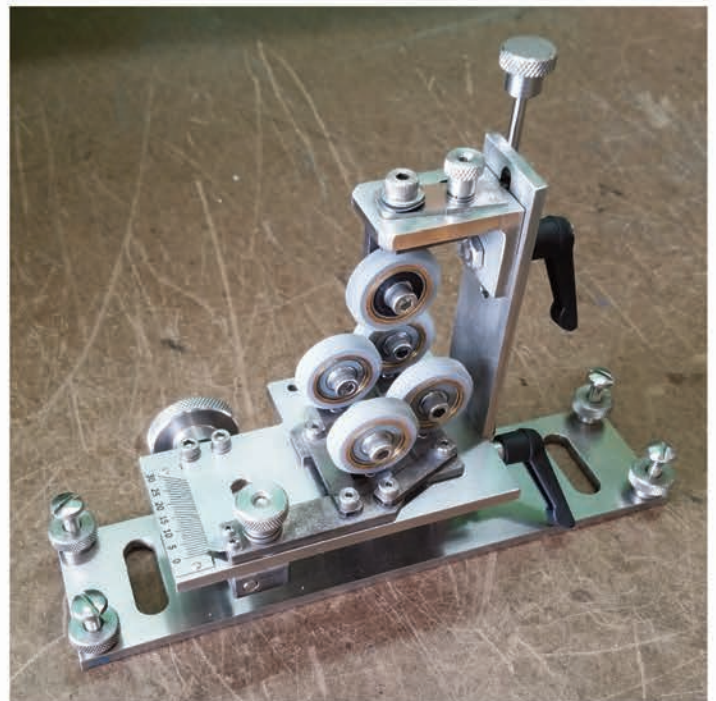
These sorters are available for manual or automatic operation. After material is inspected, it is unloaded and ready for sorting. Pneumatic cylinders on the sorter open gates to allow the material to enter the appropriate bin as determined by its quality status. The modular design of this sorter permits any number of stations to be utilized to handle a wide range of material lengths. The unloading and sorting operations can be push-button controlled or automatically actuated from one or more TACTIC Model 23 defect memories. As many reject bins as desired can be incorporated to provide for a variety of flaw classifications.

## Support Pedestals



Model 265 Large Wheel In-tank Support Pedestal for use with followers

This wheeled support is used to provide a firm foundation for material in the tank under a follower.

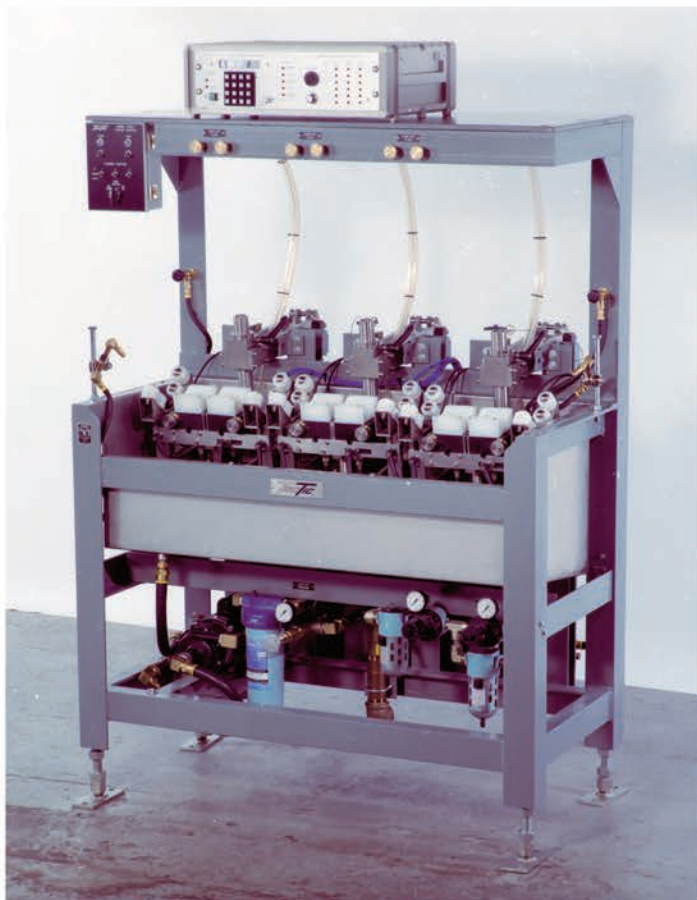


Model 259A In-Tank Support Pedestal for small diameter, flexible material

This support pedestal, with coordinated wheel angulation, keeps small diameter tubes and bars oriented properly under fixed transducers when the use of a follower is unnecessary or impractical. Other wheeled pedestals are available for use under drive units and hold-downs.

## Model 57 Flow-Coupled, Multi-Probe Ultrasonic Tube & Bar Tester

TACTIC Model 57 Ultrasonic Tube and Bar Testers provide all the advantages of 100% immersion inspection of rotating cylindrical material without requiring either a full immersion tank or a glanded pass-through ("stuffing box") tank. The Model 57 Testers utilize patented "flow coupler" transducer shoes, proven effective by many years of use in our Model 55 On-Mill Tube Weld Testers. In Model 57 Testers, each pair of upward-facing coupling shoes is in an air-actuated "carrier" assembly that rises to engage and "follow" the underside of a rotating bar or tube passing over it. Coupling water flows without turbulence from the shoes to the material surface and then to a "drip-tank" reservoir from which it is filtered and recirculated. Ask for Bulletin 570 for a complete description of these systems and accessories.



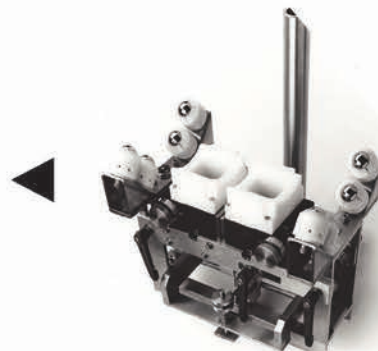
Model 57B-6 Six-Probe Bar Tester with Model 1088 Indicator/Controller

## Ultrasonic Inspection Systems for Flat-Sided Material - Squares, Rectangles, Hexes & Strip

TACTIC Model 77 Testers and Model 700 Series Loaders, sorters and followers provide a no-compromise approach to high production inspection of flat-sided material. Ask for Bulletin 770 for a complete description of these systems and accessories.



Model 77 Straight Through Tester with automatic loader and unloader shown with hex bar



Model 57 Carrier Assembly with two coupling shoes and Model 900 Ball Transfers