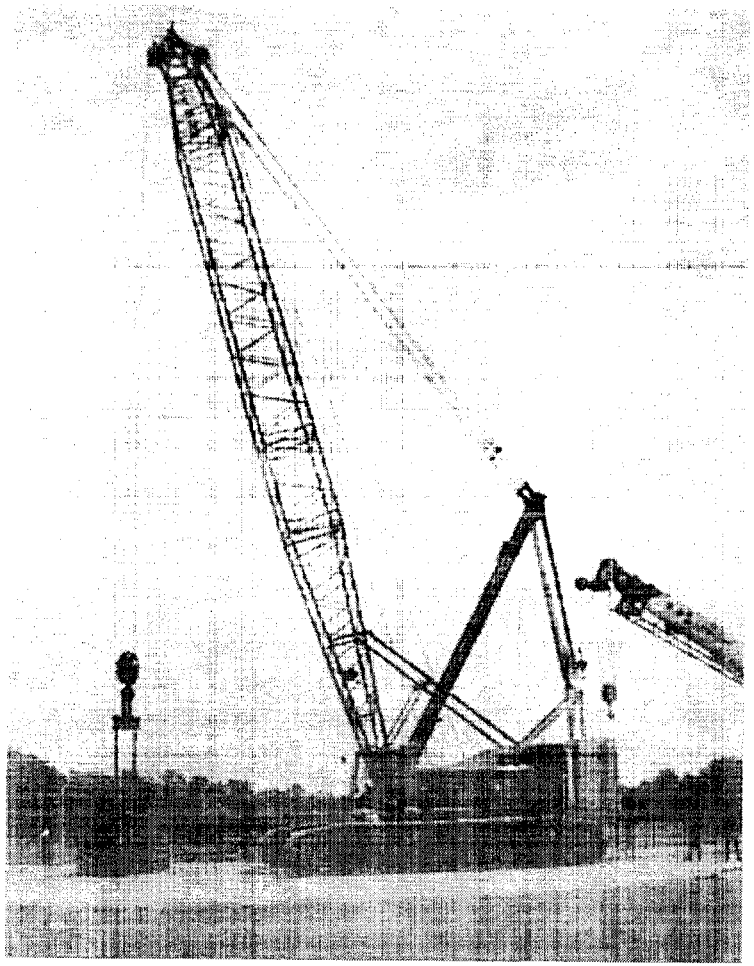
PAT A Division of Hirschmann Electronics

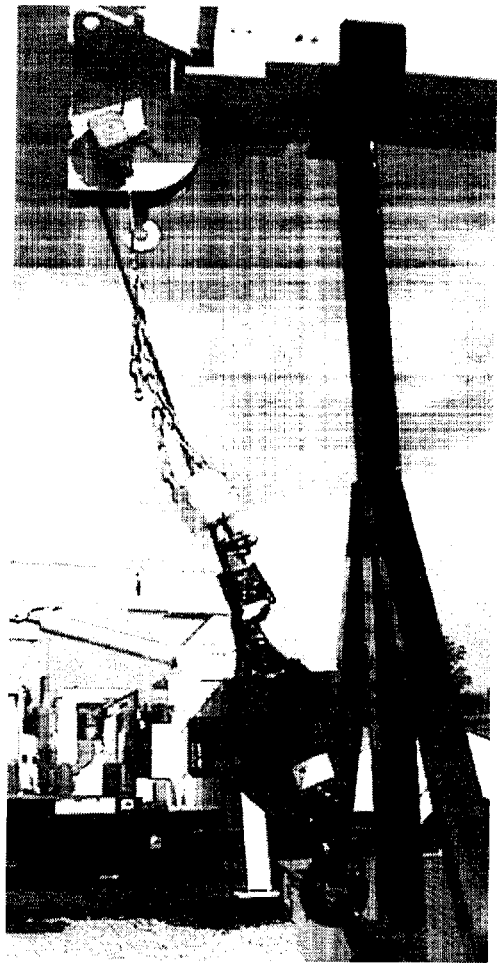
Crane Operator Aids Now and Later



Present

Today, users are offered a broad range of crane operator aids, which include anti two-block systems, load and load moment indicators, outrigger monitoring systems, wind speed sensors, lift and rigging planning software and others.

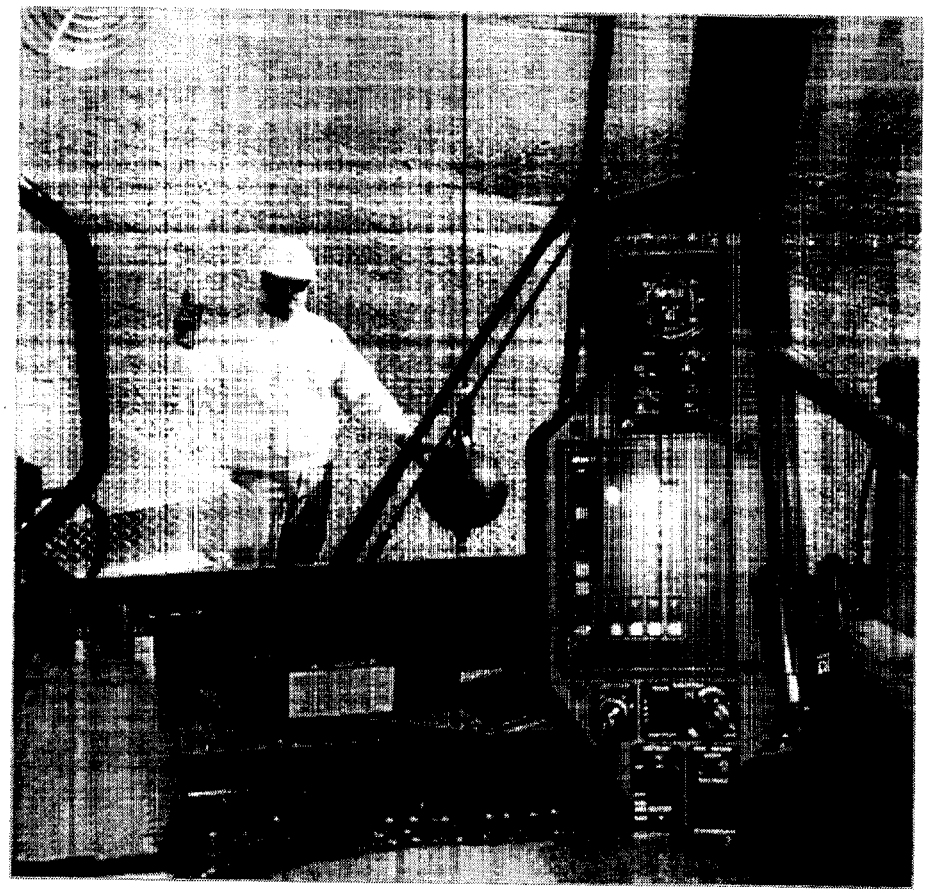
Anti-Two Block



- An Anti-Two Block device is designed to prevent the hook block from touching the boom tip.
  - Typically involves having a weight on a chain that will activate a switch when the hook block lifts the weight

Load Indicators, Rated Capacity Limiters and Load Moment Indicators

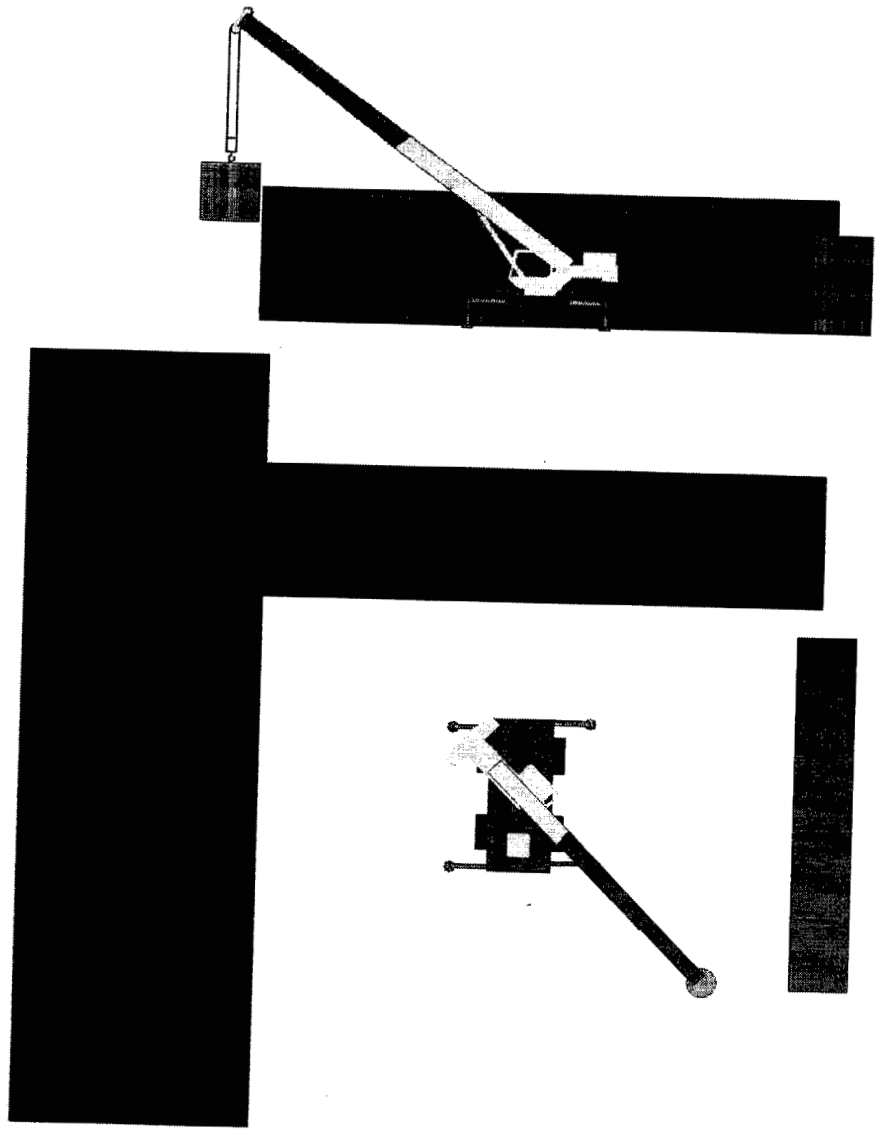
- Basic systems indicate load.
- More advanced systems on bigger cranes provide warnings and lock out as limit is reached.



Working Area Limiters

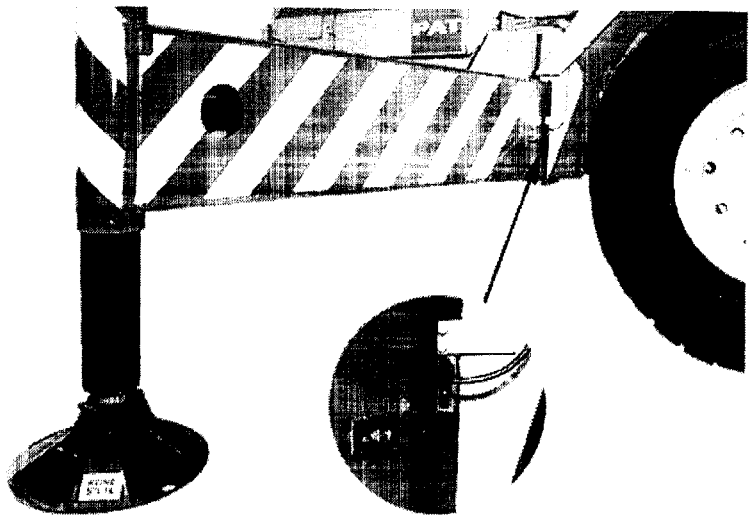
- Allow the operator to set boundaries of the working area.
- System will warn as those limits are approached.
- To prevent collisions with obstacles, such as bridges, buildings, power lines, etc.
- Operator's responsibility to set those limits.

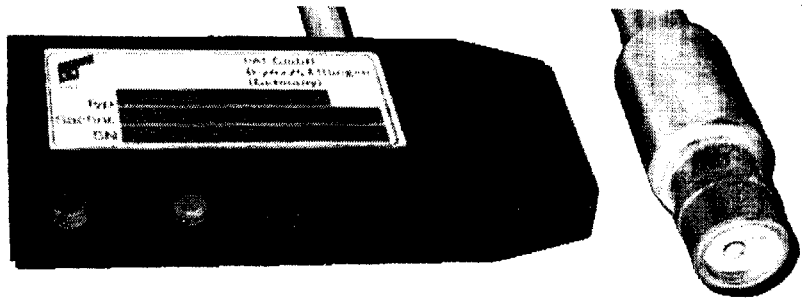
Work Area Limiters, example



Outrigger Monitoring Systems

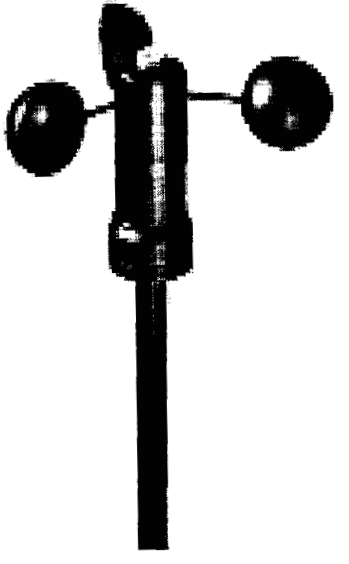
- Basic systems sense if outriggers are extended.
- Other systems add sensing of ground engagement.
- Advanced systems detect outrigger position and select charts accordingly.



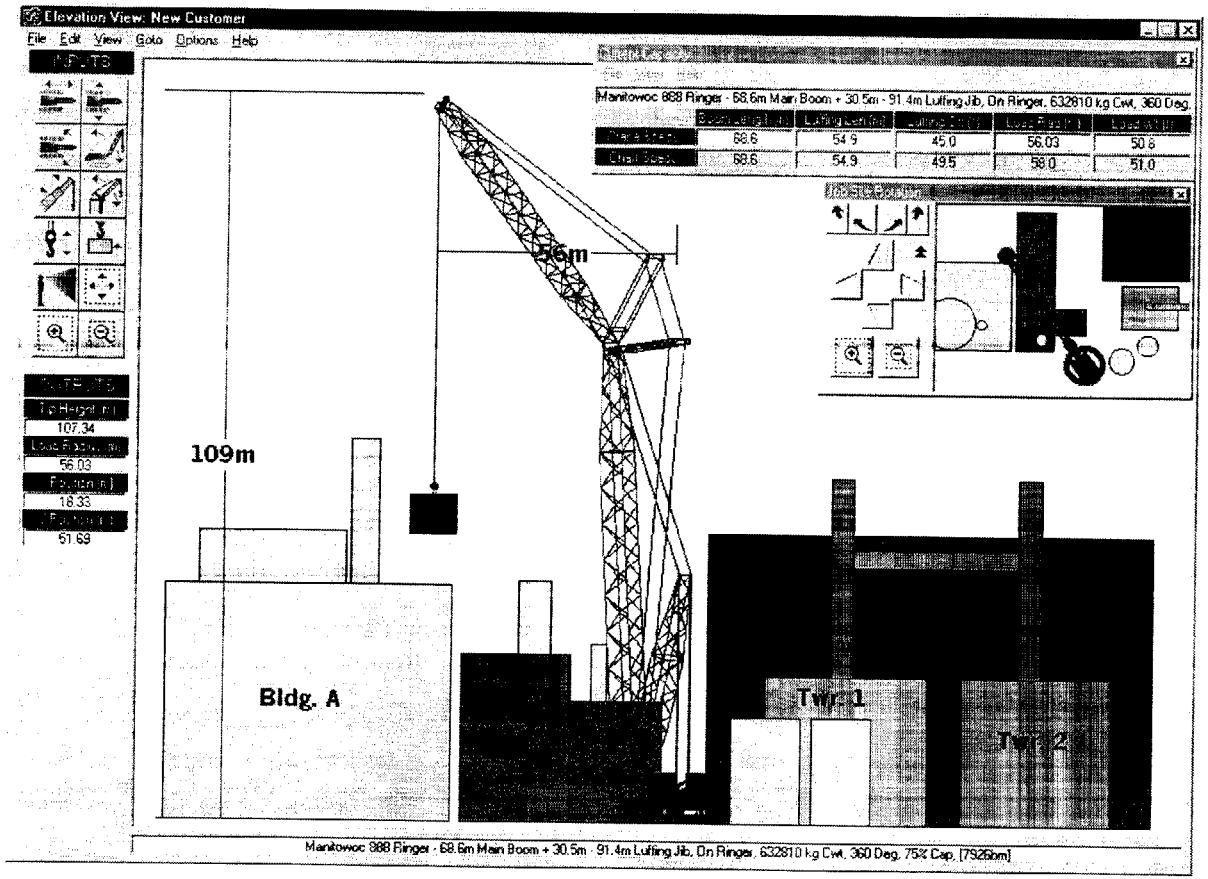


Wind Speed Sensors

- Popular systems for:
  - Tower cranes
  - Lattice Boom cranes
  - Aerial Platforms
  - Telescoping cranes with luffing jibs
- Most manufacturers will recommend shut down above certain speeds



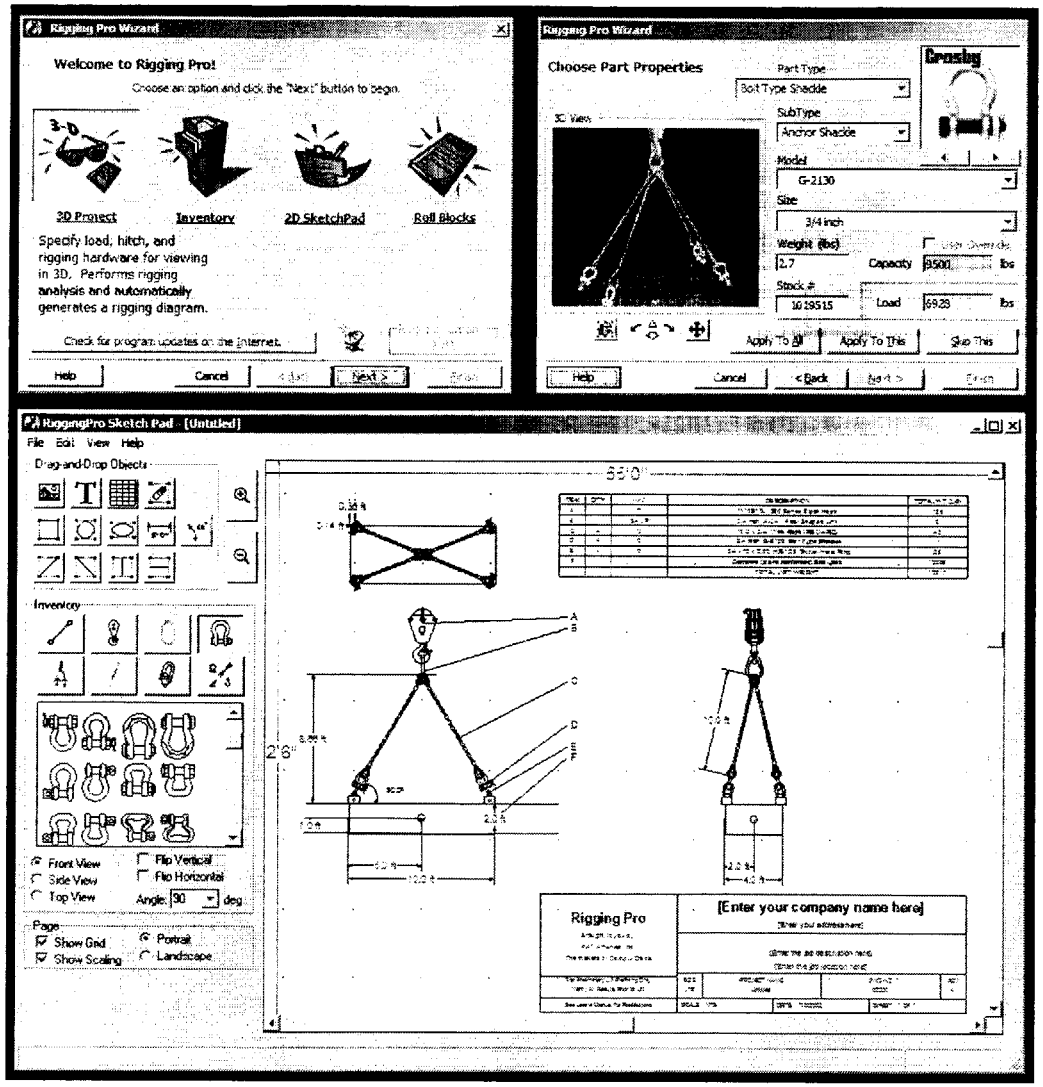
Crane Selection and Planning Software



- Allows the operator or job-site manager to pre-plan lifts in 3D.
- Aids in selecting the ideal crane for the job.

Rigging Planning

- Software that helps calculate and select rigging for any lifting task.
- Tracks inventory and usage.



Other Systems Available Today

- Wireless load, angle & A2B systems
- Slack cable monitoring
- Drum rotation & third wrap indicators
- Anti-collision systems
- Insulated links
- Datalogging & Management information systems
- Power line avoidance aids
- Load movement alert

Future

No one has a crystal ball, but here is our outlook on what the future might bring for crane operator aids and information systems. Computers and communication technology will play a major role in shaping the ways that cranes and other equipment are operated.

Driving Factors For The Future

- Requirements from:

Manufacturers	Owners	Operators & Crew
RoI	Safety	Productivity & Efficiency
Maintenance	Standards & Legislation	

- Advances in Technology:

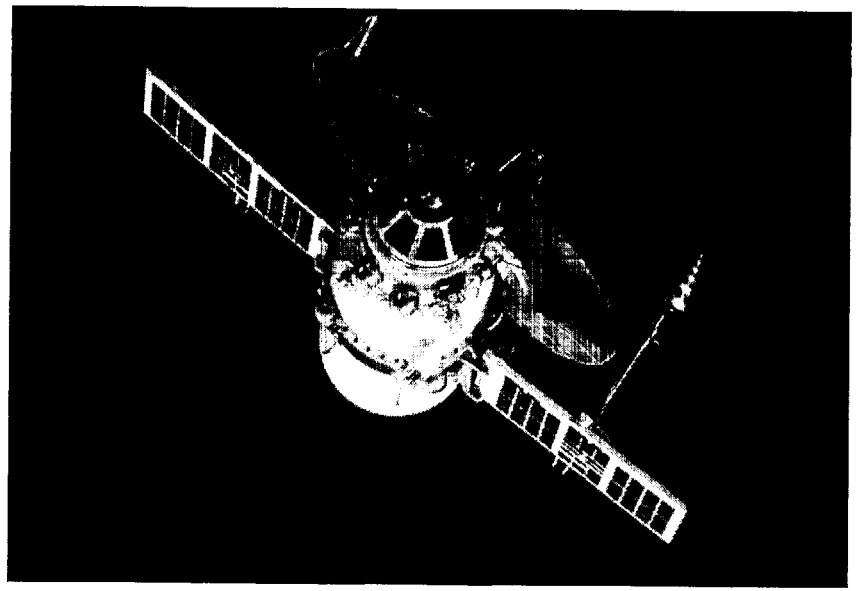
Bus systems	GPS	Wireless Technology
Communications	Displays	Sensors

Bus Technology

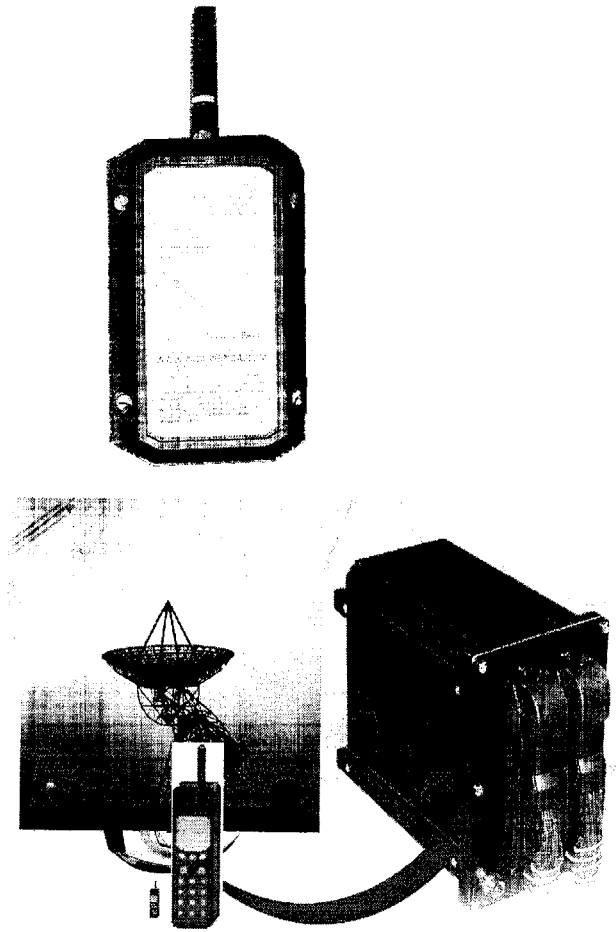
- Bus technology will replace conventional wiring
- CAN-Bus seems to be the favorite technology standard
- The bus will communicate sensor signals and enable information exchange between systems
- A bus-system is less prone to electromagnetic interference

GPS

- GPS will become an integral part of the systems
- It will allow tracking of machines for management information and theft-protection
- It may also be used to exchange information from one machine to the other



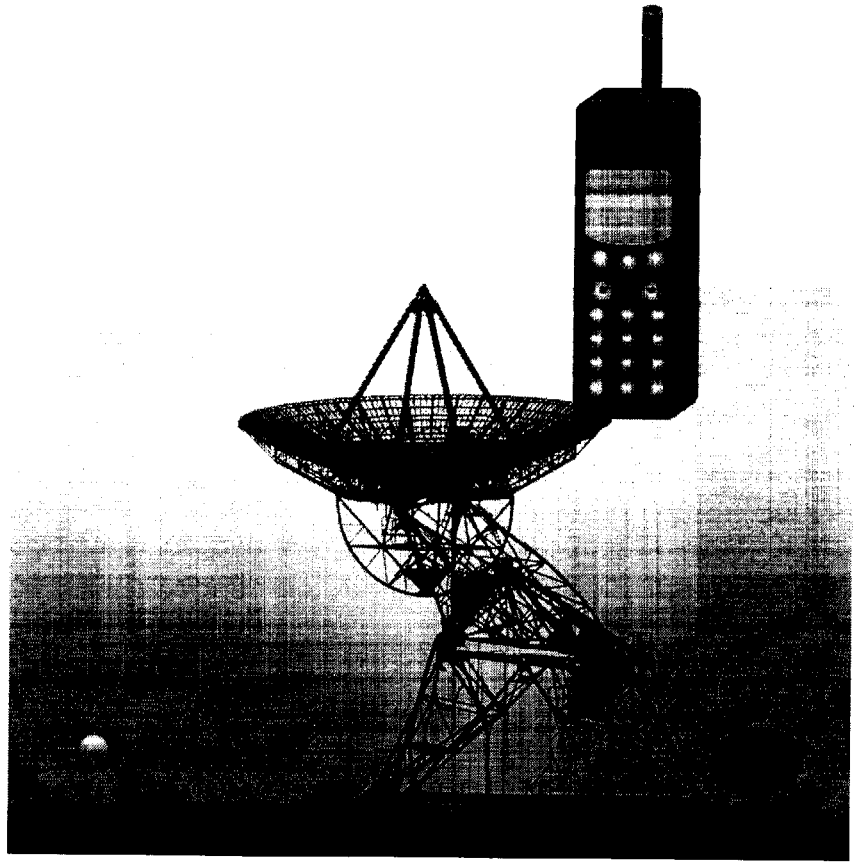
Wireless Technology



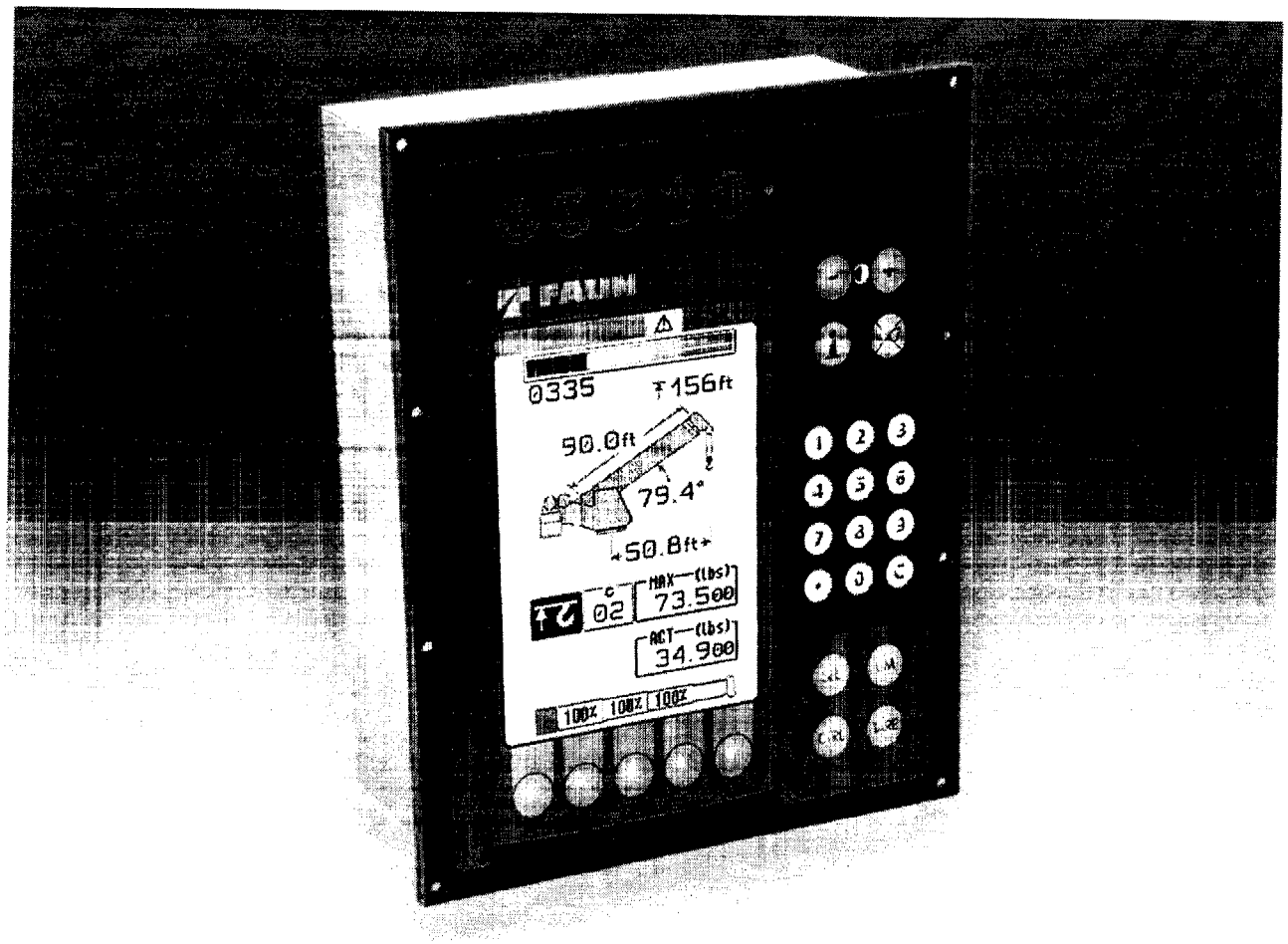
- Some of the wiring on machines will be replaced by wireless connections
- Versatile combinations of sensors, software and communications modules will enable custom solutions for specific applications

Tele Service

- It will be possible to access all relevant machine data in real-time. LMI, Engine data etc.
- Remote trouble-shooting of systems.
- Service technician will arrive with the correct information and spare part in hand.
- This will greatly reduce down time and increase productivity.

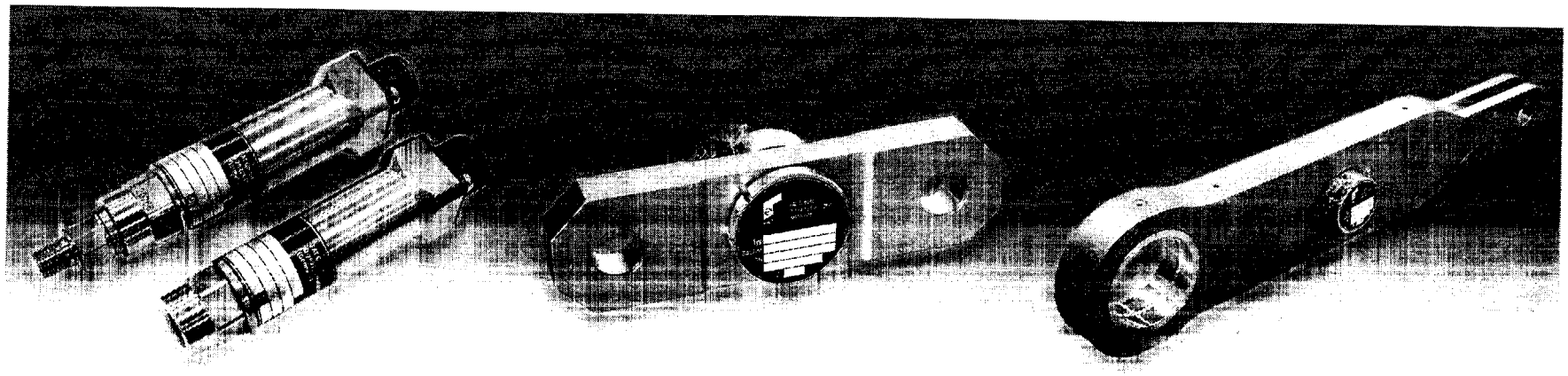


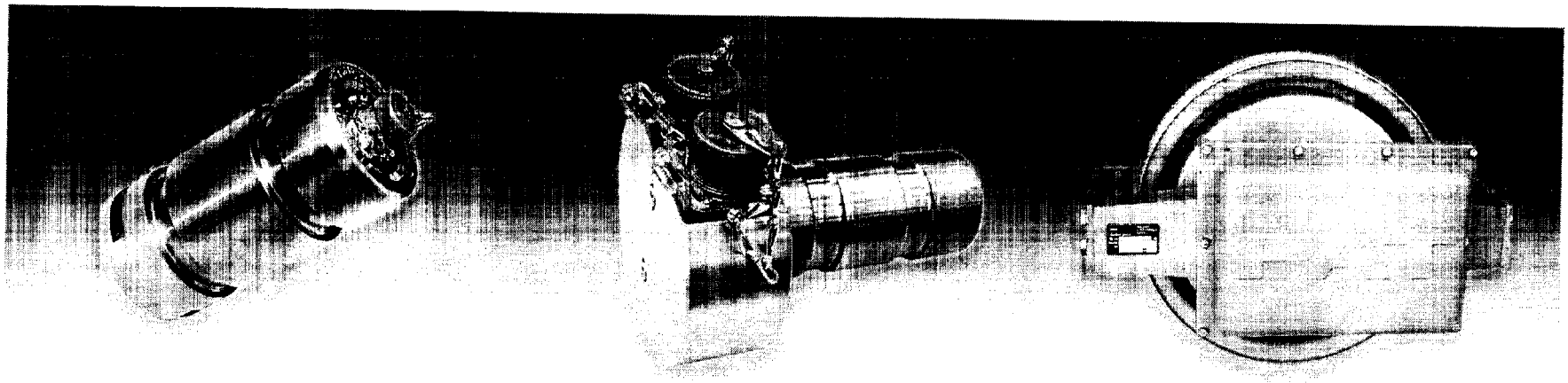
Displays



Graphic & User Friendly
LMI, engine data etc. on one display

Sensors





More sensors

Easier to install & maintain

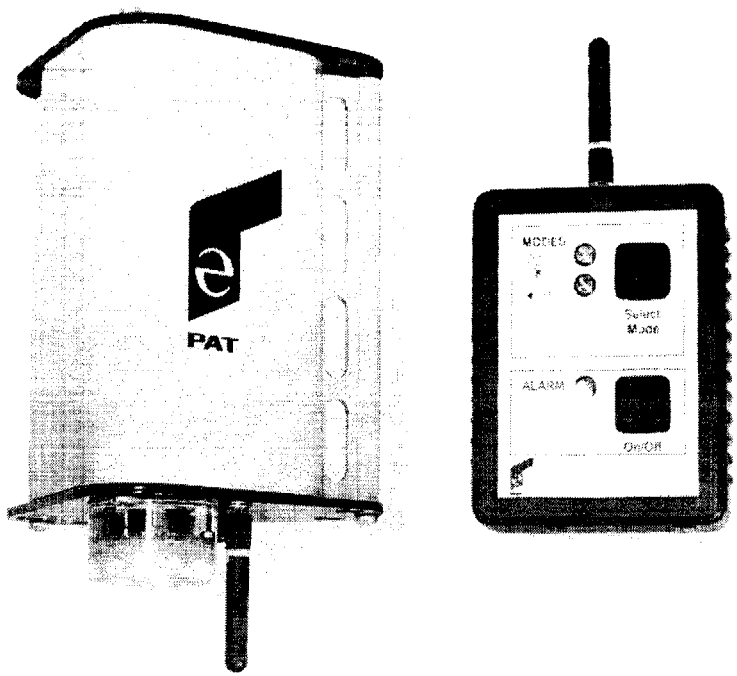
Increased reliability

Standard in the future?

- Load movement warning
- Lift & rigging planning
- Outrigger monitoring
- Level sensing
- Working area limiters
- Power line avoidance aids
- Power line contact warning/ indication
- Insulation of load/ rope from power lines
- Wind speed systems to automatically derate the chart and provide warnings etc.
- Fleet management – GPS, utilization, warnings
- 3D lift planning & remote function control

Load Motion Alert System

- Systems for ground crew and surroundings will become more common
- This system will warn personnel of approaching loads, crane hooks and machine parts, such as counterweights



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