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To: Whom this may concern
Cleereman Carriage/PTJ Vision Scanning Carriage Control System

From: Jerry Johnson, Paw-Taw-John Services, Inc.

Subject: Scanning Carriage Features

Overview

PTJ 3D scanning carriage system utilizes the flexibility of a Programmable Logic Controller (PLC) for machine control, an industrial computer for data acquisition, Servo Sensors® for knee motion control, Time of Flight (TOF) laser technology for carriage position, and Joe Scan 3D scanner heads for log analysis .

FEATURES/NOTES

- Eight Board and Eight Cant Sets
- Four Species size tables
- MOF, BOF, and manual log breakdown methods.
- Cancel taper/Cancel Cant and motion over-ride buttons
- 2 programmable hot set sizes-1/4" and 1/8"
- Split hot button- moves knees to the center of whatever wood is left on carriage.
- Log Counter
- Memory
- Joe Scan 3D scanner heads with 100base T connection speed
- Joe Scan scanner heads have a 5 year warranty.
- Scans at 12" or 6" centers with accumulated 1" resolution
- Simple mounting and adjustments of scanner heads.
- Easy scanner calibration.
- If scanner fails, system can still run with the PLC control.
- Enclosures are smaller and less hardware used due to the module integration of the control.
- Motor Control Start/Stop function for Hydraulic Power Unit.
- Proven in industry, the MTS Servo Sensor® motion controller.
- LT7 carriage position laser have a high MTBF (Mean Time Between Failure) rating and are readily available from the factory.
- Since we use a laser for position of the carriage, no mechanical items are needed and nothing can wear out
- Since a PLC is used, customer specified machine control is possible. An example, saw guide up and down, gate control, log deck interface, and/or log loader control.
- DC power requirements for all components are +24 VDC. Thus no special power supplies are needed

LOG BREAKDOWN METHODS

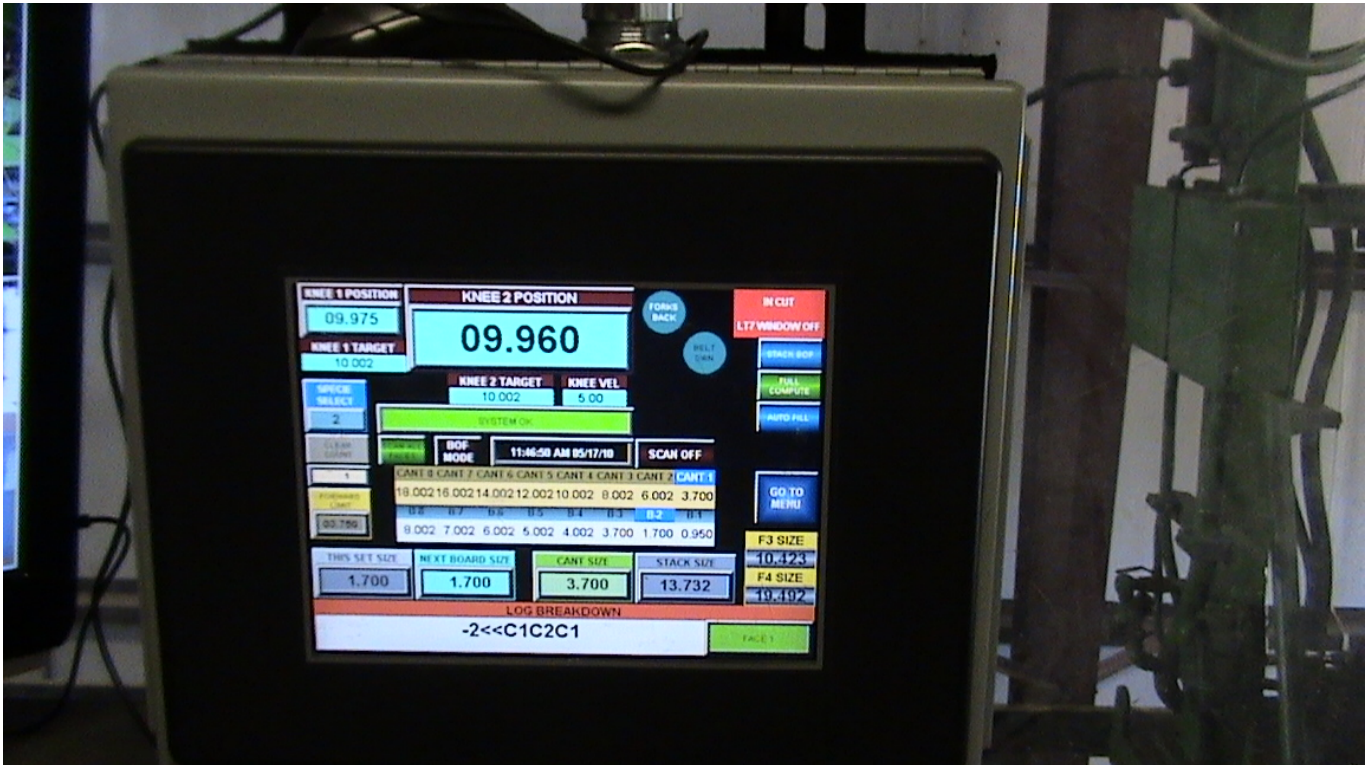
- Standard techniques used throughout the industry.
- MOF (Minimum Opening Face) programmed
 - Selectable None, Split, or Full Taper sawing on all four sides
 - Four selectable face widths and lengths for all four sides
- BOF (Best Opening Face) programmed

- Selectable None, Split, or Full Taper sawing.
- Adjustable minimum opening face value.
- Manual Breakdown if wanted.
 - Sawyer depresses a board button the knees move that amount. The sawyer depresses a cant button and depresses set; the knees will move to that amount from the saw line.
- Cant optimized in solutions.
- Grade saw at any time

CARRIAGE KNEE CONTROLS

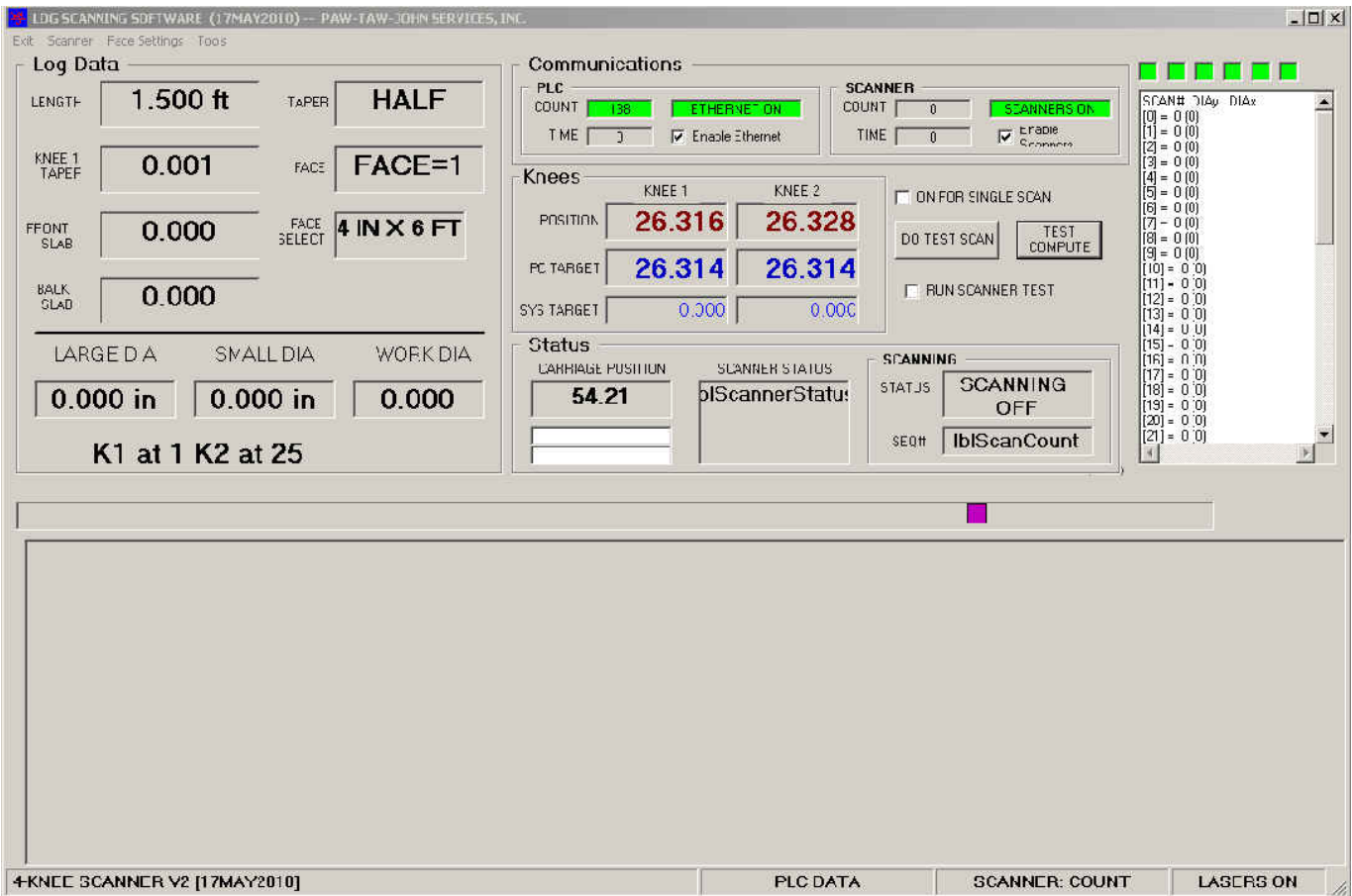
- Auto knee tracking.
- Infinite taper for knees 1, and 3.
- Independent taper for knees 1, and 3
- Taper cancels when dogs go up.
- Dogging controls including cinch back if used.
- Separate dogs up/down control for each knee
- Independent knee 1, and 3 disable.
- Hammer dog control.
- Brownsville turner control
- Hydraulic lockup valve and Safety valve control.
- Timed oiler control. Comes on when Hydraulics are turned on.
- Auto null for each knee axis.
- Programmable independent Jog speeds for Forward and Reverse.
- Programmable independent Set speeds.
- Mechanical functions controlled by Automation Direct PLC controller.
- Adjustable software limits for Dogs Retract, Dogs Extend, Hammer Dog/Scissors Dog Extend/Retract and Up/Down.
- Servo Sensor® Motion Controllers mounted in knee hydraulic cylinders.

TOUCHSCREEN FEATURES



- Run screen displays status of Knees, real time position, target position, trouble messages, log breakdown, cant selected, amount of wood left on carriage and many other features.
- Board sizes, Cant sizes, Operational limits, Servo dynamic values, servo limits, etc. are entered through the Touch Screen Display and saved in the PLC battery backup ram.
- Help menus for trouble shooting if necessary are on the Touch Screen.
- Some operational features are displayed on the help screens.
- Input/output status is displayed on the I/O screen.
- Servo Sensor® status is displayed on screen.
- Timer entries for oiler, log turner, or Brownsville turners, and/or cinch back delay time
- The Run screen will also show a trouble message if a problem occurs with the system.
- Graphs of each cylinder movement and error.
- Actual loaded board and cant values are displayed on screen.

INDUSTRIAL PC LCD MONITOR SCREENS



Displays the following:

- Log opening graph
- Knee status when scanning
- Individual laser status-blocked, unblocked, or disabled
- Data entered for scanner calibration
- Knee 2 positions in relation to the carriage track.
- Scan parameter entry screens
- Scan history screens
- Individual laser heads can be disabled using the mouse and keyboard.
- LT7 carriage position laser setup

SYSTEM HARDWARE

- The system control cabinets, operator panel, and j-boxes are pre-wired at the factory.
- All cables are labeled and cut pigtails are left at the terminal blocks of each enclosure. Rewiring of the enclosures is expedited because the colored wires and pairs are left as they were when tested at the factory.
- Each enclosure has an identifying placard on the front of it.
- The operator console overlay is reverse engraved, to prevent wear and tear over the years of operation.
- An interconnect cable diagram is provided as well as an installation/operation manual. The manual is written to cover most operational procedures and installation requirements.
- PTJ uses “off the shelf parts”. No black box technology.
- All parts used in the system are available directly from the manufacturer. This gives the user some independence.

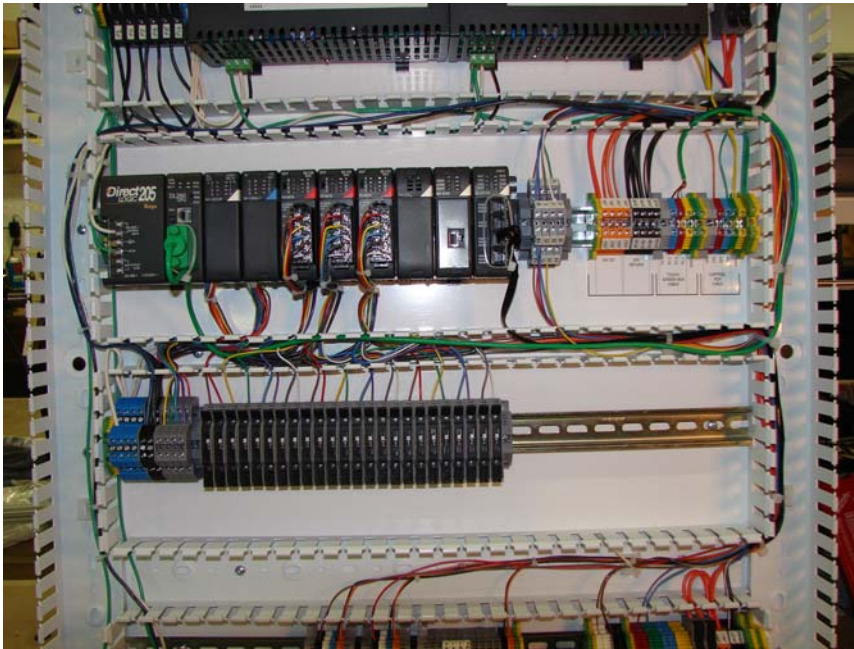
Carriage Control Hardware



Operator Panel

- Hoffman 16x16 Slope front enclosure with reverse engraved overlay.
- Control handles terminated within enclosure.
- All inputs and outputs within panel are +24VDC.
- LED lamps used within the lighted push buttons for longer MBF.
- Ethernet linked Input/Output rack to main control cabinet.
- Lamps, pushbuttons, handle controls wired to remote plc rack.
- Lighted Start/Stop button for HPU
- Lighted E-Stop mushroom button
- Control Power Start/Stop button.

Control Cabinet



- 30"x36"x10" Hoffman Enclosure with back Panel
- Two 12 Amp Switching +24 VDC Power Supplies
- Indicating fuse blocks are used on all AC outputs to carriage dogging, etc., DC outputs, and all power sources.
- Pantograph AC power cable terminated on bottom of box.
- Clearly marked input and output terminals.
- Utilizes Automation Direct PLC
- Garrett 8 port hub

Industrial PC (Personal Computer)

- PC handles the data gathering from the scanner bar.
- If the PC should go down, the carriage system can still be run with the PLC.
- PC communicates to the scanner bar and PLC.
- Uses 17" LCD monitor, wireless mouse, and wireless keyboard.
- Program nested in ram.

PLC

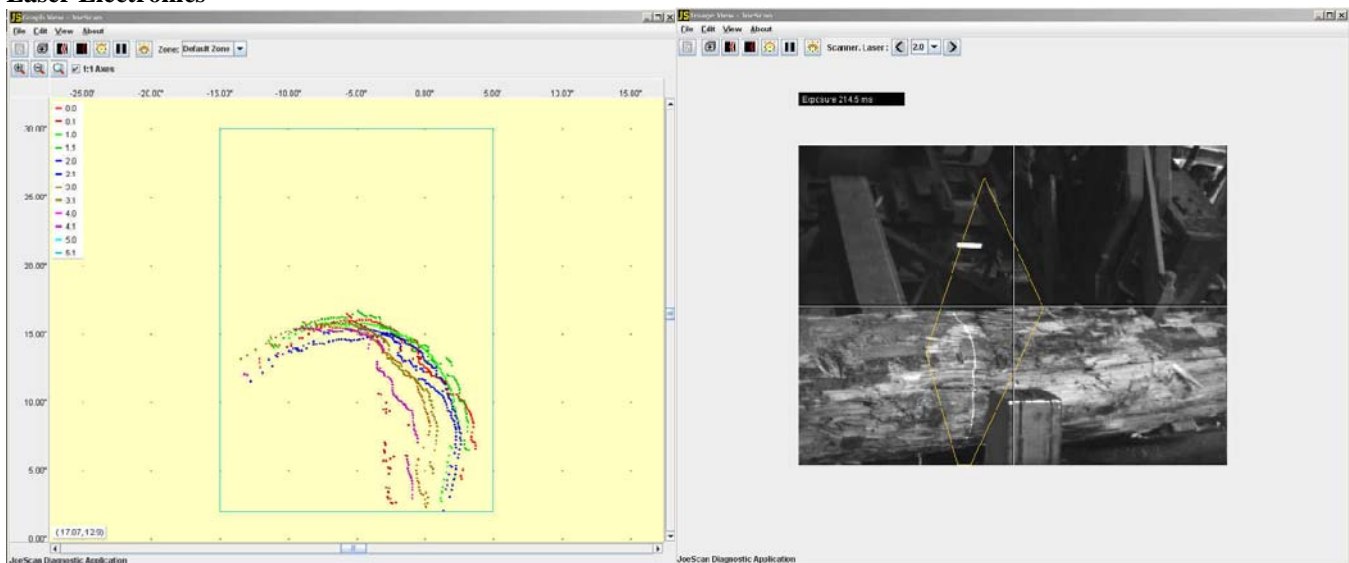
- 260 CPU
 - 2nd communication port connected to touch Screen
- 1-Combination DC Input/Output module
- 1-AC Input module for start/stop circuits
- 3-High Current AC Output modules
- 1-ERM (Ethernet Remote Master Module) for communication to operator panel
- 1-ECOM (Ethernet Communication Module) for PC communications to PLC.
- The PLC controls all carriage functions and others specified by the customer.
- Adjustable timers for turner control.
- Uses a 10" touch screen display for HMI interface.

Scan Curtain



- Top bar only
- Simple scan bar (mounting to floor supplied by customer)
- Easy Scan Head mounting
- 12 to 24 Ft scan area (dependant on the number of scan heads).
- Uses 6 to 12 JS-20 scan heads for a scan area of 12 to 24 ft.
- Connectors to laser heads are screw on for easy replacement.
- Scan bar not affected by log turner position.
- Scanner not affected by fiber residue falling below carriage
- No special blowing system required

Laser Electronics



- Lasers are turned on/off by computer software.

- Lasers are readily available from Manufacturer.
- Application software used to align lasers.
- Quick and easy alignment.
- Programmable scanning window for each head.

Carriage Position Control



- Resolution to .010”.
- Actual position returned to computer. No data manipulation required.
- Easy setup
- No encoder and reference proxy required.
- No Mechanical Linkage
- Uses Time of Flight laser in retro-reflective mode.
- A reflective panel is attached to the end of the carriage.

Any questions, please call Jerry at Paw-Taw-John Services, Inc. at 208-687-1478

Some Scanner System User Contacts

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For more information, please contact Paw-Taw-John Services, Inc. at 208-687-1478.

Respectfully,

Jerry Johnson, President
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