

- Interview With Jim Mimplitz, President Navionics Research
- Windows95™ Interface Delivers Intuitive, Powerful Interface
- Mobile Laptop To Be Unveiled In Spring 1997

NAVIONICS UPDATE

NCL - Network Control Language - Combines Programmable Control With Wireless Telemetry In Single Integrated Package

ED: 1996 was an exciting year for Navionics. Which particular accomplishments stand out as the most noteworthy?

JM: 1996 was a year of tremendous growth. In the spring, operations were moved from Quincy, Illinois to a larger facility in St. Louis, Missouri. During the summer and fall months, the man-machine interface, which originally ran under UNIX-Motif, was re-targeted to the Microsoft Windows95™ operating system for its increased ease-of-use, stability, and supportability. However, the most significant accomplishment of the year was the completion and winter delivery of the first WiSTAR™ (Wireless System Telemetry And Remote-Control) units which support field-programmable wireless control and telemetry using **NCL** - Network Control Language.



Field-Programming With The Palmtop Interface

ED: Why is field-programmability required?

JM: This capability was the natural solution to the complex control requirements of the Raccoon Water Company in Centralia, Illinois. The hydraulics and inter-station

dynamics (2 towers and 5 pump stations) required a great deal of flexibility. And with 2 new water towers and a large number of new users presently being added to the system, potential for growth was a must... And this ability to handle complex and changing situations will show a cost benefit to all of our customers - present and future.

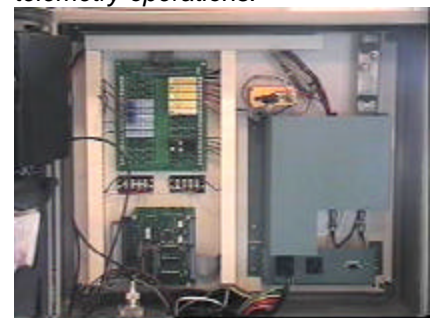
ED: So, as the system evolves, new control logic is programmed into the WiSTAR unit as necessary?

JM: Yes. However, the vast majority of the growth can be anticipated by the customer and handled by a generous group of customer-modifiable setpoints. For example, Mr. Jim Green, Operations Manager at Raccoon Water, has a situation where 2 inline pump stations are now controlled via wireless command from a WiSTAR™ unit at a water tower. In order to reduce potentially damaging water hammers, pump turn-on and turn-off delays are required at each station. Mr. Green specified that we set up these delays so that he would be able to modify and optimize them from the C³ (Communication, Command, & Control) Station at the main office. After a few days of experimenting with different delays, the water hammer was reduced to a very small level. However, as usage patterns change over time, he may continue to optimize the delays. Of course, this is just a small example of how the WiSTAR™ networks are configured for customer-modification. In all, the Raccoon

Water system contains over 150 customer-modifiable setpoints.

ED: When does it make sense for a rural water or wastewater operation to upgrade to a network of WiSTAR units?

JM: There are benefits for both new and older systems. For systems with older control panels which are becoming increasingly more costly to maintain, it is a worthwhile investment. Remember that the WiSTAR™ unit replaces control components such as pressure switches, timers, and alternating relays with NCL programmable logic, practically eliminating the need for these expensive components. For new systems, it is economical to design around it from the start and eliminate unnecessary peripheral electrical hardware. For example, a new 2 pump station will usually only require a WiSTAR™ unit, accompanied by a phase monitor, the two 3phase starter relays, and two "Hand-Off-Auto" switches to perform sophisticated control and telemetry operations.



A WiSTAR™ Field Unit In Operation

ED: As an example, describe the operation of one of the NCL-controlled pump stations.

JM: One of the most interesting pump stations is controlled by **NCL Catalog Program #P4**. This program allows the customer to select one of four operational modes: 1. Water Tower Control (2

Towers) 2. Local Pressure Control 3. Hand Control 4. Timer Control. The customer may select the mode while at the pump station, from any other station, or from the C³ station. For pipe and motor safety, there is a full set of emergency pump cut-outs and cut-ins based upon local suction and discharge pressures

and power status readings. Additionally, the pump station automatically fails over to pressure-mode operation in the case of a radio communication failure. In all, there are a total of 20 customer-modifiable setpoints at this station for specifying the various threshold levels.

WiSTAR C³ Station Features Windows95 Platform

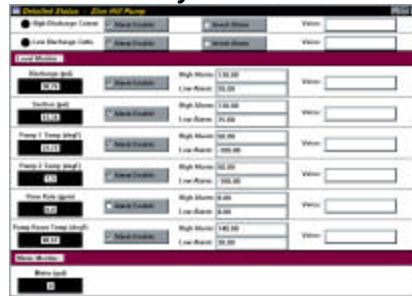
The summer of 1996 saw the introduction of **WiSTAR95™**, Navionics' new Windows95™-based C³ (Communication, Command, & Control) Graphical User Interface. Delivery was made to four customers in Southern Illinois: Walnut Hill, Hoffman, Clinton County, and Raccoon Water Company.



"Executive Summary" Window Conveys System Performance At A Single Glance.

With an eye toward the future, this new software package brings all of

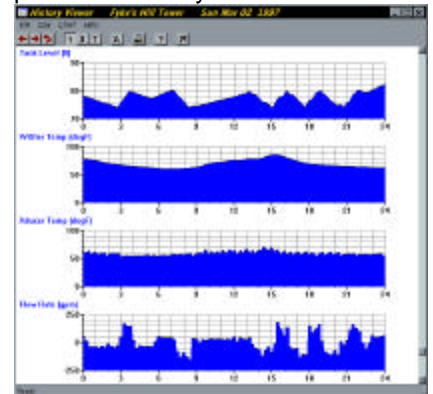
the ease-of-use and reliability of the industry-standard Windows95™ operating system. Through this offering, Navionics demonstrates its unwavering commitment to provide its Rural Water and Wastewater customers with **The Most User-Friendly Graphical User Interface In The Industry!**



"Detailed Status" Windows Display Real Time Status On A Per-Site Basis.

At the C³ (Communication, Command, & Control) Station, all digital states and analog levels can be tagged by the customer for alarm

notification. Windows95™ multimedia techniques are employed for combining visual graphics with audible bells and pre-recorded voice messages in order to alert system management personnel to any alarm states.



"History Viewer" Windows Display 1-Day, 3-Day, or 7-Day History Charts On A Per-Site Basis.

Mobile Laptop To Be Unveiled In Spring 1997

By customer request, Navionics is preparing to unveil a "Mobile Wireless Laptop" interface. This unit will feature a notebook Pentium computer, radio modem, and magnetic roof-mount antenna, all integrated into a briefcase-sized carrying case. It will draw power from a vehicle cigarette lighter or 12V power supply, and will provide all of the monitoring and remote-control capability of the Master C³ Station. The unit is especially designed for use while on the road

or at home for off-hours system vigilance. Sophisticated tracking algorithms will automatically select wireless data communication routes based on vehicle location. Additionally, System Management personnel may use the Notebook Computer to dial in to the Master C³ Station via ordinary or cellular phone from almost anywhere in the country for telemetry and control purposes. The "Mobile Wireless Laptop" is currently undergoing final software and hardware tests.

Need More Information?

Give us a call. Working together, we can configure a Navionics **WiSTAR™** System to solve your Water or Wastewater System's control and telemetry needs.

Navionics Research, Inc.
1353 Baur Boulevard
St. Louis, Missouri 63132
(888)993-3554