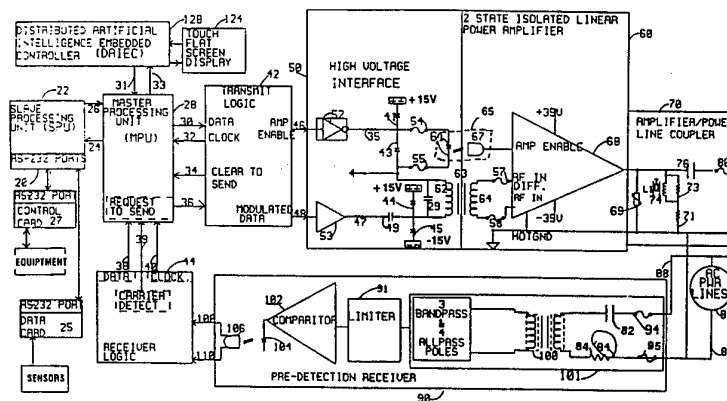




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification 5 : G06F 13/00</p>	<p>A3</p>	<p>(11) International Publication Number: WO 94/01949 (43) International Publication Date: 20 January 1994 (20.01.94)</p>
<p>(21) International Application Number: PCT/US93/06017 (22) International Filing Date: 22 June 1993 (22.06.93) (30) Priority data: 906,309 30 June 1992 (30.06.92) US (71) Applicant: ELECTRONIC INNOVATORS, INC. [US/US]; 11902 Parkland Court, Fairfax, VA 22033 (US). (72) Inventors: MASSEY, John ; 11902 Parkland Court, Fairfax, VA 22033 (US). GRANZOW, Garland, R. ; 235 Meadows Lane, Leesburg, VA 22075 (US). (74) Agent: NUSBAUM, Mark, E.; Nixon & Vanderhye, 1100 North Glebe Road, 8th Floor, Arlington, VA 22201-4714 (US).</p>	<p>(81) Designated States: AT, AU, BB, BG, BR, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i> (88) Date of publication of the international search report: 3 March 1994 (03.03.94)</p>	

(54) Title: DISTRIBUTED INTELLIGENCE ENGINEERING CASUALTY AND DAMAGE CONTROL MANAGEMENT SYSTEM USING AN AC POWER LINE CARRIER-CURRENT LAN



A distributed artificial intelligence data acquisition and equipment control system forms a local area network (LAN) over the AC power lines (83) of a vessel for communicating shipboard engineering casualty and damage control information. Each node (10E, 12E, etc.) in the (LAN) includes a power line carrier current (PLCC) transceiver, a slave processing unit (22) for interfacing with local sensors or equipment, and master processing unit (28) for controlling the formation, transmission and reception of OQPSK LAN messages. Nodes in the LAN are strategically positioned at various locations throughout the ship and configured to function either as a terminal unit or as a data and control unit. Terminal units are equipped with a touch screen display (124) and intelligent controller (128) that provides a user-friendly display interactive operator interface through a series of display screen prompts and includes a database of ship casualty and damage control information stored in local non-volatile random access memory.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/06017

<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(5) :GO6F 13/00 US CL :395/200 According to International Patent Classification (IPC) or to both national classification and IPC</p>																				
<p>B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. : 395/200, 575, 700; 340/310R, 310A, 538, 825.06, 825.16; 364/138 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) APS- PLC, PLCC, CARRIER CURRENT, LAN, LOCAL AREA NETWORK, CONDITION, EQUIPMENT, CASUALTIES, DAMAGE CONTROL, SHIP, VESSEL, BOAT, SUBMARINE, SHIPBOARD, MONITOR, POWER LINE, DAMAGE</p>																				
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>US, A, 4,446,458 (COOK) 01 MAY 1984, SEE ABSTRACT.</td> <td>1-50, 74-93, 147</td> </tr> <tr> <td>A</td> <td>US, A, 4,731,810 (WATKINS) 15 MARCH 1988, SEE COL. 3 LINES 19-44, COL. 4 LINES 14-28.</td> <td>1-50, 74-93, 147</td> </tr> <tr> <td>A</td> <td>US, A, 4,785,195 (ROCHELLE ET AL) 15 NOVEMBER 1988, SEE COL. 1 LINES 12-33.</td> <td>1-50, 74-93, 147</td> </tr> <tr> <td>A</td> <td>US, A 4,885,563 (JOHNSON ET AL) 5 DECEMBER 1989, SEE COL. 1 LINES 48-58.</td> <td>1-50, 74-93, 147</td> </tr> <tr> <td>A</td> <td>US, A, 4,903,006 (BOOMGAARD) 20 FEBRUARY 1990, SEE COL. 1 LINES 10-31</td> <td>1-50, 74-93, 147</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	A	US, A, 4,446,458 (COOK) 01 MAY 1984, SEE ABSTRACT.	1-50, 74-93, 147	A	US, A, 4,731,810 (WATKINS) 15 MARCH 1988, SEE COL. 3 LINES 19-44, COL. 4 LINES 14-28.	1-50, 74-93, 147	A	US, A, 4,785,195 (ROCHELLE ET AL) 15 NOVEMBER 1988, SEE COL. 1 LINES 12-33.	1-50, 74-93, 147	A	US, A 4,885,563 (JOHNSON ET AL) 5 DECEMBER 1989, SEE COL. 1 LINES 48-58.	1-50, 74-93, 147	A	US, A, 4,903,006 (BOOMGAARD) 20 FEBRUARY 1990, SEE COL. 1 LINES 10-31	1-50, 74-93, 147
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<p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.</p>																				
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<p>Date of the actual completion of the international search 09 December 1993</p>		<p>Date of mailing of the international search report 18 JAN 1994</p>																		
<p>Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. NOT APPLICABLE</p>		<p>Authorized officer ROBERT L. RICHARDSON <i>B. Richardson</i> Telephone No. (703) 305-9657 <i>501</i></p>																		

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/06017**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-50, 74-93, 147

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US93/06017

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

GROUP I, CLAIMS 1-50, 74-93, AND 147 DRAWN TO DATA ACQUISITION AND EQUIPMENT CONTROL.

GROUP II, CLAIMS 51-73, 108-120, 148, AND 149 DRAWN TO A CONDITION MONITORING SYSTEM.

GROUP III, CLAIMS 94-107, 145, 146, AND 150 DRAWN TO A VESSEL DAMAGE CONTROL MANAGEMENT SYSTEM.

GROUP IV, CLAIMS 121-129 DRAWN TO A CARRIER CURRENT CURRENT TRANSCEIVER CIRCUIT.

GROUP V, CLAIMS 130-142 DRAWN TO A POWER LINE COMMUNICATION SYSTEM.

GROUP VI. CLAIMS 143, 144 DRAWN TO VCO CIRCUITRY.