Current Status: 2275MUX PEP # H0146A
                  2275MUXE PEP # H0146B

First Customer Ship: Q3 FY87

Logistics:
There will be three FRU's associated with this product:
  210-8824 Multiplexer (MUX)      MTBF: 104,436 hrs
  210-8825 Multiplexer Extender (MUXE)  MTBF: 163,577 hrs
  220-3588 Interconnection Cable    MTBF: TBD

Technical Documentation:
Documentation class code is TBD.
This product will be used in the MicroVP, LVP and MVP systems.
First draft of the PUB is being reviewed.

TEE/FSC:
Repair Plan will be required for the MUX and MUXE. Hardware Specifications
and Schematics have been provided.

Diagnostic Support:
Existing 2200 Disk Diagnostics will support this product. The 2275MUX/MUXE
has been tested using the 2200 Multiple Disk Exerciser (Rev. 6547). The
diagnostic was obtained from Wang Direct by ordering diagnostic package
number 195-2956-0.

Technical Training Center:
This product should be included in the 2200 System Class. The Product
Maintenance Manual and TSB will provide necessary information for Customer
Engineers previously trained on the 2200 system.
CUSTOMER ENGINEERING

(Preliminary)

MAINTENANCE PLAN

227SMUX/MUXE DISK MULTIPLEXER

4/3/86

Periph # 023

Product Line Engineer

New Products Manager

Product Line Manager

Maintenance Planning Manager

Product Line Director

COMPANY PROPRIETARY
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A3 P.M. Parts
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I. PRODUCT DESCRIPTION

A. OVERVIEW OF THE PRODUCT

The 2275MUX is a board that resides in a 2200 CPU. It provides a link to any Wang disk product with a 22C03 interface and up to four 2200 CPU's. The 2275MUX provides the disk interface to for the CPU it resides in and replaces the 22C80 board. Three additional 2200CPU's can be connected to the 2275MUX via the existing 22C80 Disk Controller and cable. The 2275MUXE will allow an additional four 2200 CPU's to access the disk drive. Up to three 2275MUXE multiplexer expanders can be connected to one 2275MUX multiplexer.

B. SIMILARITIES/DIFFERENCES with other WANG products.

1) Software

   Standard Wang BASIC II for the 2200 systems will be the software for the 2275MUX/MUXE.

2) Hardware, including PCBs

   The multiplexer will no longer have to be housed in it's own chassis as in the 2280MUX. The 22C80 Disk Controller will be used for the 2275MUX/MUXE.

C. ANNOUNCE/FIRST CUSTOMER SHIPMENT DATE


D. SERVICE OFFERINGS/WARRANTY

   On-site maintenance will be the only service offering. Unit will have normal Wang warranty.

E. MAJOR COMPONENTS

   The 2275MUX will be a single board unit and have an internal 22C03 disk controller and interface with up to 3 more 2200 CPU's. The 2275MUXE will also be a single board unit cabled to the 2275MUX via ribbon cable.
F. CONFIGURATION REQUIREMENTS

The 2275MUX will interface with the 2270A, 2275, 2275F/R/S and 2280 disk drives. The single unit will include the 2275MUX card, the disk drive and the drive interface cable. Up to three more CPU's can be connected to the multiplexer and each additional CPU will need a 22C80 Disk Controller and interface cable.

II. MAINTENANCE PHILOSOPHY

A. Maintenance Objectives
   1) C.E. Level
   2) Maintenance Procedures
      C.E. will replace Field Replaceable Unit found to be defective.

B. Types of contract to be offered
   Only on-site maintenance contracts will be offered.

C. P.M. requirements
   No preventive maintenance will need to be performed on this product.

D. Diagnostics required
   1) diagnostic name(s)

III. TRAINING

A. CUSTOMER ENGINEER COURSE

   1) COURSE OBJECTIVE
      Will be included with 2200 course.

   2) TIMETABLE and FORMAT
      TBD

   3) PREREQUISITES

IV. SPECIAL TOOLS/TEST EQUIPMENT

   No special tools will be needed with this product.
V. OPERATING ENVIRONMENT

A. TEMPERATURE RANGE
   operating 60°-80°F  15°-28°C

B. VOLTAGE RANGE for each model
   DC voltage only.
   +12volts DC +- 1%
   -12volts DC +- 1%
   +5volts DC +- 1%
   -5volts DC +- 1%

C. HUMIDITY RANGE
   operating 35% - 65% (non-condensing)

D. PHYSICAL SPECIFICATIONS

2275MUX
   Height  8 inches (centimeters)
   Width  16 inches (centimeters)

2275MUXE
   Height  8 inches (centimeters)
   Width  16 inches (centimeters)

E. SERVICE SPACE REQUIREMENTS
   Not applicable.

F. INPUT CURRENT
   Running (DC only) amps

G. INPUT POWER
   Watts

H. HEAT LOSS
   BTU/hr (KgCal/hr.)
VI. DOCUMENTATION LIST

Reference appropriate documents for assemblies which are covered by existing Maintenance Plan.

A. PRINTS
B. MAINTENANCE MANUAL
C. VENDOR MANUALS
D. DIAGNOSTIC ERROR LISTINGS
E. P.M. PROCEDURES
F. REPAIR PLAN
G. BUSINESS PLAN
H. SALES LITERATURE
I. OPERATORS' GUIDE/USER INFORMATION
J. TRAINING WORKBOOK
K. RELATED MAINTENANCE/SUPPORT PLANS
MARKETING

FORECAST

Breakdown by quarter for first year of shipment.

Breakdown by Domestic/International
### PRODUCT MATURE PERFORMANCE

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Product Description</th>
<th>Service Parameter</th>
<th>Rate per Year</th>
<th>Time (hours)</th>
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<tbody>
<tr>
<td>Modelxxx</td>
<td>Product description</td>
<td>Replacements</td>
<td>x.xx</td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Call Duration</td>
<td>x.xx</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Installation Time</td>
<td>xx.xx</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>PM Calls</td>
<td>x.xx</td>
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<td>FCO MTTR</td>
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<td>Upgrades/Model</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Upgrade Install Time</td>
<td>x.xx</td>
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</tr>
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### PRODUCT ANALYSIS WITH GROWTH

**Product Replacements/Year and Calls/Year**

by Month after Installation

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Product Description</th>
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<th>2</th>
<th>3</th>
<th>8+</th>
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<tbody>
<tr>
<td>Modelxxx</td>
<td>Product description</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Replacements/Year</td>
<td>x.xx</td>
<td>x.xx</td>
<td>x.xx</td>
<td>x.xx</td>
</tr>
<tr>
<td></td>
<td>Calls/Year</td>
<td>x.xx</td>
<td>x.xx</td>
<td>x.xx</td>
<td>x.xx</td>
</tr>
</tbody>
</table>

**Periph No. 023**
NOTE:

Every effort has been made to include the most current information available but, these part numbers are subject to change.

C.E. Logistics will provide updated, released part numbers through the normal RSL process.

FRUs, CRUs,

<table>
<thead>
<tr>
<th>part #</th>
<th>DESCRIPTION</th>
<th>FRU</th>
<th>CRU</th>
<th>Unique</th>
<th>B</th>
<th>A</th>
<th>H</th>
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</tr>
</tbody>
</table>

PARTS LIST

Diagnostic Part Number
Parts required for P.M.
**WANG**

**ECO NO. 47059**

**ORIGINATOR**
Gilles Carrier Dept 120

**M/S**
014-390

**EXT.**
74478

**DATE**
11/20/87

**WRITTEN BY**
Carol Sullivan

**M/S**
012-108

**EXT.**
74312

**DATE**
11/20/87

**PART NO.**
210-8824

**DESCRIPTION**
2275 MUX MASTER

**DWG NO.**
8824

**MODEL NO.**
2275 MUX

**PEP #**
PEP HD

**CLASS**
1

**PRELIMINARY**

**DESCRIPTION OF CHANGE**
Change artwork, assembly drawing, fabrication drawing, schematic, parts list and sample board per attached prints and as follows:

- Delete R1, R4, R7 and R32 res 1K 1/4W 5% 200PPM (330-3011)
- Add R35 and R36 res network type (333-0811).

On circuit side:
- Tie R36 pin 10 to J5 pin 9
- Tie R36 pin 9 to J5 pin 11
- Tie R36 pin 8 to J5 pin 13
- Tie R36 pin 7 to J5 pin 15
- Tie R36 pin 6 to J5 pin 17
- Tie R36 pin 5 to J5 pin 19
- Tie R36 pin 4 to J5 pin 21
- Tie R36 pin 3 to J5 pin 23
- Tie R36 pin 2 to J5 pin 25
- Tie R36 pin 1 to L58 pin 20
- Cut etch leading to L13 pin 15

**COMPANY CONFIDENTIAL**

**ECO TO BE**
DEC 30 1987

**CONTINUED**

**REVIEWED**

**REASON/SYMPTOM FOR CHANGE**
To eliminate I90 errors while writing to disk.

**Hold Mike**

**APPROVALS**

**ECO CHAIRPERSON**

**DES ENGRG.**

**CUST. ENGRG.**

**MFG.**

**MTO**

**PP&M**

**FCC**
Michael Bunko 12/9/87

**PROD. SAFETY**
Dick Buerlein 12/9/87

**SECURE SYS.**

**ORIGINATOR**

**OTHER**
DESCRIPTION OF CHANGE

Change artwork, assembly drawing, schematic, parts list and sample board per attached prints and as follows:

Change R34 from 12K RES (330-4013), to 7.5K RES (330-3076).
Lift L31 pin 10.
Lift L33 pin 1.
Lift L33 pin 2.
Tie L33 pin 1 to L33 pin 4.
Tie L33 pin 2 to L3 pin 13.
Tie L33 pin 5 to L31 pin 10.

Change BOM 210-8824 as follows:

<table>
<thead>
<tr>
<th>W/L#</th>
<th>DESCRIPTION</th>
<th>UN</th>
<th>COMP</th>
<th>QTY</th>
<th>QTY</th>
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<tbody>
<tr>
<td>Delete:</td>
<td>330-4013</td>
<td>EA</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ADD:</td>
<td>330-3076</td>
<td>EA</td>
<td>1</td>
<td>1</td>
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</tr>
</tbody>
</table>

PRELIMINARY

REASON/SYMPOTM FOR CHANGE

To eliminate the high rate of errors with the DS disk cabinet.
<table>
<thead>
<tr>
<th>REF. DES.</th>
<th>HANG PART NO.</th>
<th>VALUE/TYPE</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>C65</td>
<td>300-1472-</td>
<td>470P</td>
<td>CAP 470 PF 50V 5% NPO CERAMIC RDL</td>
</tr>
<tr>
<td>C1 - C15</td>
<td>300-1833-</td>
<td>.1U</td>
<td>CAP .1UF 50V +80-20% 25U CER MONO AXL</td>
</tr>
<tr>
<td>C18 - C28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C30 - C31</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C34 - C50</td>
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</tr>
<tr>
<td>C61 - C62</td>
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</tr>
<tr>
<td>C59 - C60</td>
<td>300-4017-</td>
<td>5.6U</td>
<td>CAP 5.6 UF 35V 10% TANTALUM AXIAL</td>
</tr>
<tr>
<td>C63 - C64</td>
<td>300-4022-</td>
<td>15U</td>
<td>CAP 15 UF 20V 10% TANTALUM AXIAL</td>
</tr>
<tr>
<td>Y1</td>
<td>321-1017-</td>
<td>2.0480</td>
<td>CLOCK OSCILLATOR 2.048 MHZ .01% TTL</td>
</tr>
<tr>
<td>SH1</td>
<td>325-1503-</td>
<td>SLIDE</td>
<td>SN SLIDE SPST &amp; POS DIP</td>
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<tr>
<td>R31</td>
<td>330-2034-</td>
<td>330</td>
<td>RES 330 OHM 1/4W 5% METAL FILM 200 PPM</td>
</tr>
<tr>
<td>R1</td>
<td>330-3011-</td>
<td>1K</td>
<td>RES FIXED METAL FILM 1/4W 5% 200PPM</td>
</tr>
<tr>
<td>R4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R7</td>
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<td></td>
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<tr>
<td>R11</td>
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</tr>
<tr>
<td>R11A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>R12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R15 - R16</td>
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</tr>
<tr>
<td>R19 - R23</td>
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<td>R25</td>
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<td>R33</td>
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<tr>
<td>R32</td>
<td>330-3048-</td>
<td>4.7K</td>
<td>RES 4.7K OHM 1/4W 5% METAL FILM 200 PPM</td>
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<tr>
<td>R34</td>
<td>330-4048-</td>
<td>47K</td>
<td>RES 47K OHM 1/4W 5% METAL FILM 200 PPM</td>
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<td>R13</td>
<td>333-0807-</td>
<td>220/330</td>
<td>RESISTOR NETWORK TYPE: 10/16/T/SS</td>
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<tr>
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<td></td>
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<tr>
<td>R14A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>R2 - R3</td>
<td>333-0811-</td>
<td>220.00</td>
<td>RESISTOR NETWORK TYPE: 10/09/C/SS</td>
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<td>R5 - R6</td>
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<td></td>
</tr>
<tr>
<td>R8 - R9</td>
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</tr>
<tr>
<td>R26</td>
<td>333-0837-</td>
<td>1K</td>
<td>RESISTOR NETWORK TYPE: 10/09/C/SS</td>
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<td>R30</td>
<td>337-1010-</td>
<td>10</td>
<td>FIXED 2W 10%</td>
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</table>
**DESCRIPTION OF CHANGE**

Change artwork, assembly drawing, schematic, parts list and sample board per attached prints and as follows:

- Change R34 from 12K RES (330-4013), to 7.5K RES (330-3076).
- Lift L31 pin 10.
- Lift L33 pin 1.
- Lift L33 pin 2.
- Tie L33 pin 1 to L33 pin 4.
- Tie L33 pin 2 to L30 pin 13.
- Tie L33 pin 5 to L31 pin 10.

Change BOM 210-8824 as follows:

<table>
<thead>
<tr>
<th>WLI#</th>
<th>DESCRIPTION</th>
<th>UM</th>
<th>COMP TYPE</th>
<th>QTY</th>
<th>QTY TYPE</th>
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<tbody>
<tr>
<td>Delete</td>
<td>330-4013</td>
<td>EA</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ADD</td>
<td>330-3076</td>
<td>EA</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Note to EDD: Incorporate changes with ECO 44026D.

**REASON/SYMPOTOM FOR CHANGE**

To eliminate the high rate of errors with the DS disk cabinet.
1.etch from L31 pin 10 to L33 pin 5 is connected to L30 pin 13
   L30 pin 13 must be isolated

2. tie feedthru for top of R1 or L2 pin 6, 7, 9, 10 to L18 pin 5

3. tie feedthru for top of R4 or L6 pin 10, 9, 7, 6 to L23 pin 4 or L22 pin 5

4. tie feedthru for top of R7 or L10 pin 4, 7, 9, 10 to L23 pin 2 or L26 pin 5

5. fix schematic sheet 3 of 3 (3 & 12) L23 pin 2 & L26 pin 5

6. make tie pt to L30 pin 2 & L18 pin 5

7. fix ECO 48499 schematic. Cut #2 in wrong place.
1. Rework Artwork 2 Board as follows:

   - Add wire from L2 Pin 10 to L33 Pin 9 to L18 Pin 5.
   - On circuit side add wire from L2 Pin 10 to L33 Pin 9 to L18 Pin 5.

NOTE: Do not create R3 Artwork, not cost justifiable at this time.

2. Make following correction to schematic, sheet 3 of 3, loc C12:

   - Line from L2 Pin 10 (312) to line between L30 Pin 2 and L18 Pin 5 (312). It should not connect to L18 Pin 7 (312).
1. L23 pin 10 tied to L33 pin 5, L30 pin 13, L14 pin 23, L11 pin 3, L1 pin 3, L6 pin 9, 12, 13, R32, and L33 pin 2
2. Top of R1 tied to + L2 pin 9, 10, 7, 6 or + L1 pin 7, 10, 6, 9
   L18 pin 5 tied to L30 pin 2
3. Top of R4 tied to L6 pin 10, 9, 7, 6 or L5 pin 6, 7, 9, 10
   + L23 pin 4 to L22 pin 5
4. Top of R7 tied to L9 pin 6, 7, 9, 10 or L10 pin 6, 7, 9, 10
   + L23 pin 2 to L26 pin 5

48499

5. L33 pin 1 tied to L33 pin 4, 10 or bottom of R19
6. L33 pin 2 to L3 pin 3, L1 pin 3, L11 pin 3

47059

7. R36 pin 10 to J5 pin 9 or L58 pin 18
8. R36 pin 9 to J5 pin 11 or L58 pin 16 or L24 pin 14
9. R36 pin 8 to J5 pin 13 or L58 pin 14 or L24 pin 2
10. R36 pin 7 to J5 pin 15 or L58 pin 9
11. R36 pin 6 to J5 pin 17 or L58 pin 12
12. R36 pin 5 to J5 pin 19 or L46 pin 11
13. R36 pin 4 to J5 pin 21 or L46 pin 13
14. R36 pin 3 to J5 pin 23 or L46 pin 15
15. R36 pin 2 to J5 pin 25 or L46 pin 17
16. R36 pin 1 to L58 pin 20, Top of R29A, L29 pin 16, C30 RT, L13 pin 16, C13 RT, L46 RT 5V
17. L13 pin 15 tied to GROUND or 8824-2?

Tied to L47 pin 8
DESCRIPTION OF CHANGE

Change artwork, assembly drawing, fabrication drawing, schematic, parts list and sample board per attached prints and as follows:

1. Remove etch on circuit side between L30 pin 13 and L31 pin 10.
2. Remove etch on component side leading to L33 pin 5.
3. Add etch from L31 pin 10 to L33 pin 5.
4. Tie feedthru for top of R1 to L18 pin 5.
5. Tie feedthru for top of R4 to L23 pin 4.
6. Tie feedthru for top of R7 to L23 pin 2.

Change note 3 on Fab drawing per attached.

Note to EDD: Incorporate artwork changes with 48499 and 47059.

REASON/SYMPOTOM FOR CHANGE

Rev 1 artwork errors. All other documentation is correct.
NOTES:

1. FABRICATE PER ENGINEERING SPECIFICATION 10-203.
2. DATUM (TOOLING) HOLES MARKED "A" TO BE .0615 ± .0003 DRILLED.
3. MATERIAL FL-UPN EPOXY GLASS LAMINATE .039 (.513) A28 COLOR NATURAL.
4. COPPER PLATE .001" MIN. HOLE WALL THICKNESS AND SOLDER PLATE TO .0001" MIN. (ABSOLUTE) AFTER REFLUX UNLESS OTHERWISE SPECIFIED.
5. FINISHED BOARD THICKNESS (ACROSS CONDUCTORS AFTER PLATING) .062 ± .007 EXCEPT .062 ± .005 AT CONNECTOR FINGER AREA.
6. PLATING ON CONNECTOR FINGER AREA TO BE A MINIMUM OF .0001 NICKEL WITH .00003 GOLD UNLESS OTHERWISE SPECIFIED.
7. SOLDER MASK PER WANG SP1 10-210. (BOTH SIDES)
8. LETTER SCREEN ENAMEL WITH PERMANENT .001 INK PER SCREEN ARTWORK.LATEST REVISION.
9. UNLESS OTHERWISE SPECIFIED. THE DIMENSIONAL TOLERANCES ARE .XX ± .001
    .XXX ± .005
10. THIS IS A FINE LINE BOARD, ON FINAL PRODUCT, MINIMUM LINE WIDTH AND SPACING TO BE .006".

ECO NO 32512

SHT 2 OF 6
**REMARKS**
- PW 2/17 NA
- WPC 2/21 Conf 2/21
- MEX 3/17 NA
- AUST 2/21 NA
- MEX 3/21 ENG Cost $5,550
  Conf 4/4/89
- PB 2/21 NA
- CAT 3/22 NA
- PHI 3/2 NA
- ORE 3/2 NA

**SMS EFFECTIVITY DATE**
4/17/89

**AFFECTED SITES**

<table>
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<tr>
<th>TEWKS</th>
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<td>PT BLVD</td>
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**APPROVALS**

- ECO ADMIN: [Signature]
- MFG ENG:
- QUALITY:
- MATERIALS:
- PROD CONTROL:
- FINANCE:
- RE-MFG:
- OTHER:
**ENGINEERING CHANGE ORDER**
**CUSTOMER ENGINEERING IMPACT SHEET**

**IMPACT COMMENTS**

- No impact

**EST. COST IMPACT**

<table>
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<tr>
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<th>EST. UNIT POP</th>
<th>EST. SPARE POP</th>
<th>TOTAL</th>
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**APPROVALS**

- **MATERIAL**: TECH OPS
- **LABOR**: LOGISTICS
- **TOTAL**: FSC SUPPORT
- **IMPLEMENTATION PERIOD**: FINAL
- **ANNUAL COST**: OTHER

**DATE**

- 9/14

**GENERAL COMMENTS**

- Field units + spares OK
DESCRIPTION OF CHANGE

1. Rework Artwork 2 Board as follows:
   On circuit side cut etch to L30 Pin 13 on both sides of Pin 13.
   Add wire from L31 Pin 10 to L33 Pin 5.
   add wire from L2 Pin 9 to L18 Pin 5.
   add wire from L6 Pin 7 to L22 Pin 5.
   add wire from L10 Pin 7 to L26 Pin 5.

2. Make following correction to schematic, sheet 3 of 3, loc Cl2:
   Line from L2 Pin 10 (312) should tie to line between
   L30 Pin 2 and L18 Pin 5 (3Cl2). It should not connect to
   L18 Pin 7 (3Cl2).

   NOTE: Do not create R3 Artwork, not cost justifiable at this time.

   Note: Remove history information from 110/210 assembly drawing and EREF
       from schematics to support PCA configuration document.

REASON/SYMPOTOM FOR CHANGE

1. To correct Artwork error on Artwork 2 Board.

2. To correct SCHEMATIC.
| ITEM STATUS | 2 | 2 |
| CONFIGURATION REVISION | 0 | 1 |
| E-REV | 4 | 4 |
| SCHEMATIC | 5 | 6 |
| 210 ASSEMBLY DRAWING | 6 | 7 |
| 110 ASSEMBLY DRAWING | NA | NA |
| 510 FAB DRAWING | 2 | 2 |
| ARTWORK LAYERS | 2 | 2 |
| DRILL/ROUTING DATA | 2 | 2 |
| MECHANICAL OUTLINE | 0 | 6 |
| REWORK INSTRUCTION | NO | YES |
| CORP. BOM EFFECT. DATE |  |

**WANG**

LABORATORIES, INC.

PCA CONFIGURATION DOCUMENT

PCA PART NUMBER

210-8824

ITEM MASTER DESCRIPTION | PCA 2275 M K MASTER | PAGE 1 OF 1
1.) CUT ETCH ON BOTH SIDES OF L30-13.
1.) ADD WIRE FROM L31-10 TO L33-5.

2.) ADD WIRE FROM L10-7 TO L26-5.

3.) ADD WIRE FROM L6-7 TO L22-5.

4.) ADD WIRE FROM L2-9 TO L18-5.
**ENGINEERING CHANGE ORDER**
**CUSTOMER ENGINEERING IMPACT SHEET**

<table>
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<th>ALL UNITS</th>
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<table>
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<th>IS A MUB REQUIRED FOR FSC REWORK</th>
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**IMPACT COMMENTS**

No field impact - Mfg. has been reworking R2 PCBs

<table>
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<tr>
<th>EST. COST IMPACT</th>
<th>APPROVALS</th>
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**GENERAL COMMENTS**

Document in MUB
TECHNICAL SERVICE BULLETIN

SECTION: Hardware Technical

NUMBER: HWT 7093
REPLACES: _______
DATE: 05/05/87
PAGE 1 OF 2

MATRIX ID. 4202

PRODUCT/RELEASE# 2275MUX AND 2275MUXE

TITLE: 2275MUX/MUXE NEW PRODUCT INFORMATION

PURPOSE:
To inform the field of the 2275MUX and 2275MUXE.

EXPLANATION:
The 2275 Multiplexer (2275MUX) is a 2200 option board that will allow up
to four 2200 MVP-type, MicroVP, or CS CPUs to share a single disk system.
The 2275MUX provides the disk interface for the CPU in which it resides.
Three additional CPUs may be connected to ports on the 2275MUX through a
22C80 board in each satellite CPU.

The 2275 Multiplexer Extender (2275MUXE) may be used with the 2275MUX to
allow four more CPU's to share a disk system. Up to three 2275MUXEs may
be used with a 2275MUX creating a maximum configuration of sixteen CPUs
sharing a disk system. The 2275MUXE is placed in the CPU with the 2275MUX
and is connected to the 2275MUX by a ribbon cable.

SOFTWARE:
The 2275MUX/MUXE is supported by the current release of the Operating
System (Rev. 2.7).

DIAGNOSTICS:
The 2275MUX/MUXE is supported by Revision 64A5 of the Multi Disk
Exerciser. This diagnostic is part of Diagnostics Package 195-2956-0

PART NUMBER INFORMATION:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<tr>
<td>2275MUX</td>
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<td>210-8824</td>
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<tr>
<td>2275MUXE</td>
<td></td>
<td>210-8825</td>
</tr>
<tr>
<td>Interconnect Cable (MUX to MUXE(s))</td>
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<td>220-3588</td>
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GROUP: VS New Products Hardware
MAIL STOP: 001-220

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TECHNICAL SERVICE BULLETIN
SECTION: Hardware Technical

NUMBER: EMT 7093
REPLACES: 
DATE: 05/05/87 PAGE 2 OF 2

MATRIX ID: 4202
PRODUCT/RELEASE#: 2275MUX AND 2275MUXE

TITLE: 2275MUX/MUXE NEW PRODUCT INFORMATION

EXPLANATION (cont'):

SWITCH SETTINGS:

2275MUX SW1:

ADDRESS 310
SW1 #1 = OFF
#2 = OFF
#3 = OFF
#4 = OFF
#5 = ON
#6 = OFF
#7 = OFF
#8 = OFF

ADDRESS 320
SW1 #1 = OFF
#2 = OFF
#3 = OFF
#4 = OFF
#5 = OFF
#6 = ON
#7 = OFF
#8 = OFF

ADDRESS 330
SW1 #1 = OFF
#2 = OFF
#3 = OFF
#4 = OFF
#5 = ON
#6 = ON
#7 = OFF
#8 = OFF

2275MUXE SW1:

EXTENDER #1
SW #1 = ON
#2 = OFF
#3 = OFF
#4 = OFF

EXTENDER #2
SW #1 = OFF
#2 = OFF
#3 = OFF
#4 = ON

EXTENDER #1
SW #1 = OFF
#2 = OFF
#3 = OFF
#4 = OFF

DOCUMENTATION:
741-1668-1

MAIL STOP: 001-220

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WANG Laboratories, Inc.
TECHNICAL SERVICE BULLETIN
SECTION: Hardware Technical

NUMBER: HWT 7179  REPLACES:  DATE: 09/08/87  PAGE 1 OF 1
MATRIX ID: 4202  PRODUCT/RELEASE #: 2275MUX and 2275MUXE

TITLE: CABLELING RESTRICTIONS

PURPOSE:
To inform the field of the maximum supported distances between the disk unit and CPUs multiplexed to it, and to alert the field of previously released documentation incorrectly listing cable lengths that exceed supportable distances.

EXPLANATION:
The sales brochure titled 'Model 2275MUX Multiplexer and Model 2275MUXE Extender', part number 715-0910, dated 11/86, is in error. It incorrectly lists under 'SPECIFICATIONS' extension cables of 200, 500, 750, and 1000 feet (76, 153, 228, and 305 meters). The maximum supported distance between the master CPU (directly connects to the disk) and up to 15 other CPUs multiplexing to the disk via the 2275MUX or the 2275MUXE is 100 feet (30.5 meters). Maximum supported distance between the 2275MUX (in master CPU) and the disk unit is 12 feet.

ADDITIONAL INFORMATION:

| 2275MUX Board (in master CPU supporting master & 3 additional CPU's) | Part Number |
| 2275MUXE Board (in master CPU, up to 3 brds / 2275MUX, 4 CPUs /brd which combined with the 2275MUX allows for a maximum of 16 CPUs to multiplex with 1 disk unit) | 220-8824 |
| 220-8825 |
| 220-7715 |
| 220-3588 |
| 220-0365 |
| 220-0365 |
| 220-0364 |
| 220-0364 |
| *25 Foot Extension cable from 2275MUX or 2275MUXE to 22C80 | 120-2281-01 |
| *50 Foot Extension cable from 2275MUX or 2275MUXE to 22C80 | 120-2281-02 |
| *100 Foot Extension cable from 2275MUX or 2275MUXE to 22C80 | 120-2281-03 |

* These parts can only be ordered through supplies.

GROUP: VSL/2200 On-Line Support  MAIL STOP 201-260

COMPANY CONFIDENTIAL

WANG Laboratories, Inc.
TECHNICAL SERVICE BULLETIN

SECTION: Hardware Technical

NUMBER: HWT 7262  \hspace{1cm} REPLACES: \hspace{1cm} DATE: 12/08/87  \hspace{1cm} PAGE 1 OF 1

MATRIX ID. 4202  \hspace{1cm} PRODUCT/RELEASE# 2200/CS

TITLE: Problem with the 2275MUX Board

PURPOSE:
To make the field aware of a problem with the 2275MUX Board (210-8824).

EXPLANATION:
There is a hardware design problem with the 2275MUX. Under heavy usage such as a large Sort program, intermittent I90 errors can occur. The problem seems most prevalent with the DS Cabinet. Those sites experiencing problems have reported from 1 error a week to 2 or 3 a day.

R&D has a fix that is currently being beta tested and an ECO is in the process of being documented. ECO 47059 is expected to be released sometime in December.

CORRECTIVE ACTION:
Should a site exhibit these symptoms with a 2275MUX, please call the TAC Center at 1-800-822-1122 and open a call. A program will be given to test the 2275MUX for the problem. Once the 2275MUX is verified as the problem, you will be asked to send it in, and a beta board will be made available.

Should the problem occur with a Phoenix drive with a 2280MDPU, it is suggested the 2275MUX be replaced with the 210-7717 and a 210-7715 as a temporary solution. The 7717 is installed in the MDPU in the first slot to the left of the 210-7422 board, and the 7715 is installed in the master CPU. There should already be a 210-7715 in the secondary CPU. Both 7715's would be cabled to the top 2 ports of the 7717 in the MDPU using the existing cables. A small cable, 220-0257, is then used to connect the bottom port of the 7717 to the 7421 board in the DPU completing the configuration. The 7717 is a known good mux set-up and can get the customer running error-free until the ECO is released and an updated 2275MUX can be installed.
# SPECIAL 2275MUX MASTER with LED's

**Page 1**

**How to Read LED's:**

1. **E.A.S.T.**
2. **LED's 1-4 CEU Identification**

### The DS 320 Attached

<table>
<thead>
<tr>
<th>LED</th>
<th>CPU #</th>
<th>Port #</th>
<th>BOARD</th>
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<tbody>
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### The DS 310 Attached

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<tr>
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</tbody>
</table>

**LED # 5 (1)**

ON disk is waiting for activity.

OFF drive is working.

**LED # 6 (1)**

ON instructions complete on (75 mux bd.)

OFF instructions never completed on (75 mux bd.)

**LED # 7 (1)**

ON instructions complete on (slave mux bd.)

OFF instructions never completed on (slave mux)
TAC
Escalation Call

Control Number 28267902

Contact Name RAJ MAHARAJ Position
Rdb.# 3224 Tdx # TDX Phone # 201 225 8698 Ext #

System Type 2200 Device Type LVP
Utility Name DIAUTO Software Level

Method of Call X T = Telex, P = Phone, M = Memo, E = Ems
Has the Area or District been contacted
Y A = Area, D = District, B = Both, N = None
Is this inquiry pertaining to a National Account?
U Y = Yes, N = No, U = Unknown

Use the following area to describe the site that created this request
Cust/Office Name FRASER BROS Phone # 201 738 7402
Address 1400 940 AMBOY AVE City EDISON State NJ
On Site Contact Name D FITZGERALD

Problem (*) Solution (+)

*09/23/88: CALL CREATED AT REGION FROM REMOTE CALL -S8267004>
09/20/88 CE TRIED TO INSTALL 2 LVP'S TO BE MUXED TOGETHER AND IS HAVING PROBLEMS WITH THE INSTALL. CE IS AT THIS TIME REQUESTING DT'S HELP. FRED DIAUTO IS PRESENTLY WORKING PROBLEM WITH TAC. (RM)

09/20/88 HAVE TRIED ANOTHER SET OF MUX'S BIDS. AND CP/DISK CONTROLLERS WITH SAME RESULTS. CHECKED OVER CONFIGURATION WITH TAC IT SHOULD WORK. PROB. IS EITHER CPU WILL IPL AND RUN WITH 2275MUX INSTALLED BUT WILL HANG WHEN ANOTHER CPU IS CONNECTED TO THE 2275MUX. TAC HAS NO NEW SUGGESTIONS AND RECOMMEND PRODUCT SUPPORT. TAC CALL #0864045. (FRD)

&09/23/88: SENDING TO H.O. FOR ADVISEMENT. <BOB B>
&09/27/88: PLEASE RESPOND TO ESCALATION. <BOB B>
&9/28/88: BOB, HAVE BEEN IN PROCESS OF MOVING IN OUR BLDG & OVER THE LAST FEW DAYS. SORRY FOR DELAY. THERE IS NO REASON WHY THIS SHOULDN'T WORK AS WE HAVE MANY. LVP'S MUX'G ERROR FREE. I BELIEVE THESE 2 LVP'S ARE BEING MUX'D TO A DS CABINET. SEEMS THERE MUST BE EITHER A BRD PROBLEM; GROUNDING IN 1 OF THE 3 UNITS, OR CABLING. WOULD LIKE THE FOLLOWING PLAN USED TO TROUBLESHOOT:
1. REMOVE ALL I/O CONTROLLERS FROM BOTH LVPS EXCEPT FOR 1 MKE OR MXD TERM CONTROLLER IN EA & THE 2275MUX (8824) IN 1 & THE 7715 MUX INTERFACE IN THE OTHER. INSURE I/O BRDS W/IN 1ST 3 SLOTS ON RT.
2. REMOVE ANY NON-WANH W/S'S, CABLES CPU BRDS REMAINING IF ANY.
4. USE 220-0364 OR 220-0365 CABLES FROM 7715 TO
1ST CPU PORT ON 2275MUX & 2275 DISK PORT TO DS.
INSPECT ALL CONNECTORS FOR POSSIBLE DAMAGE.
5. USE ONLY A WANG VIRGIN O/S, 2.4 OR HIGHER.
6. IF STILL FAILING CHECK GROUNDING.
WALL OUTLETS TEST OK & ALL UNITS ARE PROPERLY
GROUND (LOGIC GROUND & CHASSIS GROUND SAME) &
CABLES PROVIDING GROUND.
7. NOW MUST ELIMINATE REMAINING H/W. KEEP IN MIND
POSSIBILITY OF 1 BRD BLOWING OUT ANOTHER. WOULD
SUGGEST BRINGING AT LEAST 1 CPU, 2 IF POSSIBLE W/
BRDS. DOES NOT NEED TO BE LVP. MICROVP WOULD BE
SIMPLEST. IF HAVE 2 CPU, CONNECT TO DS USING NEW
2275MUX, 7715, & DS BRD THAT HAVE NOT BEEN IN CUST
SYS YET & TEST. IF H/W GOOD SHOULD WORK NO PROB.
IF ONLY 1 CPU, TEST ALONE W/ DS W/ 2275MUX & DS BRD
THAT HAVE NOT BEEN IN CUST SYS. IF OK CONNECT 1
LVP W/ NEW 7715 & TEST. IF THIS WORKS DISCONNECT
LVP & TRY 2ND LVP W/ IT'S OWN NEW 7715. IF BOTH
WORK TRY 1 LVP W/ NEW MUX, & CPU BROUGHT TO SITE
CONNECTED VIA THE 7715. SWAP THE LVP'S. IF STILL
NO PROB CONNECT 2ND LVP AS 3RD CPU, THEN AS 2ND.
IF ALL WORKS OLD BRDS SHOULD BE TRIED 1 AT A TIME
TO FIND PROB. IF FAILS AGAIN INSURE WORKING BRD
TRIED IMMEDIATELY. IF STILL FAILS THEN WE HAVE
PROB OF 1 BRD DAMAGING ANOTHER. MIKEB

! UPDATE QUEUED TO FIELD OFFICE
CALL SUCCESSFULLY SENT TO FIELD SYSTEM

$09/28/88: THANKS MIKE WILL KEEP YOU UPDATED. <BOB B>
$10/04/88 DURING THE TIME BETWEEN 9/20/88 AND 10/04/88
$ THE CUSTOMER'S SOFTWARE VENDOR (REDSHAW) HAD
$ UPDATED THE SOFTWARE. AS IT STANDS NOW BOTH LVP'S
$ ARE RUNNING USING A 2275MUX. (FRD)
$10/5/88: WAS MIXING TESTED WITHOUT USING REDSHAW S/W
$ DURING TROUBLESHOOTING. SHOULD NOT USE CUST S/W
$ FOR TROUBLESHOOTING UNLESS WANG S/W HAS BEEN
$ TESTED SUCCESSFULLY. IF WAS TESTED W/ WANG S/W &
$ FAILED, THERE HAD TO BE A H/W PROB WHICH HAD TO BE
$ FIXED FOR REDSHAW S/W TO WORK. IF ONLY TESTED W/
$ REDSHAW S/W & SYMPTOM WAS A HANG COULD OF BEEN S/W
$ PROB. CUST S/W SHOULD OF BEEN ELIMINATED. PLEASE
$ CLARIFY IF TESTED USING JUST WANG S/W & IF SO WHAT
$ WAS DONE THAT MAY HAVE CORRECTED PROB. MIKEB

$10/06/88: CLOSE CALL. THANKS MIKE. <BOB B>
$10/6/88: PLEASE GIVE RESPONSE TO UPDATE OF 10/5 BEFORE
$ CLOSING. THANKS. MIKEB
$10/24/88: STILL WAITING FOR ACTUAL RESOLUTION. CALLED RAJ &
$ HE BELIEVED THERE WERE SOME CABLING PROBLEMS.
$ SUGGESTED TO CALL FRED FOR SPECIFIC RESOLUTION.
$ LEFT MESSAGE AT OFFICE FOR DTS TO CALL. MIKEB
$10/25/88: FRED DIAUTO CALLED IN. WHEN WENT BACK TO SITE,
$ TOOK EVERYTHING APART THEN PUT BACK TOGETHER 1 X 1
$ & NEVER FAILED. THE CUST HAD ALSO UPGRADED THE O/S
$ THE DAY BEFORE. PROB WAS 2ND SYS WOULD NEVER COME
$ UP. & IF CABLED WOULD CAUSE THE PRIMARY SYS TO
$ HANG. SYS HAS NEVER TESTED ON VIRGIN WANG O/S.
$ MOST LIKELY CORRECTED PROBLEM BY RESEATING EVERY-
$ THING BUT COULD OF BEEN O/S RELATED. SHOULD TEST
$ ON A WANG O/S WHEN TROUBLESHOOTING. CLOSING CALL.
$ MIKEB
+CALL CLOSED. RESEATING & RECONNECTING EVERYTHING SEEMED TO
+CORRECT PROBLEM. REDSHAW O/S WAS ALSO UPDATED.

10/26/88 MIKEB