

ANALOG OUTPUTS TO COMPUTER

| | | | |
|---|----------|-----------------------------------|--------------------------------------|
| A | 2-9-1-1 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| B | 2-9-1-2 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| C | 2-9-1-3 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| D | 2-9-1-4 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| E | 2-9-1-5 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| F | 2-9-1-6 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| G | 2-9-1-7 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| H | 2-9-1-8 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| I | 2-9-1-9 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| J | 2-9-1-10 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| K | 2-9-1-11 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| L | 2-9-1-12 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| M | 2-9-1-13 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| N | 2-9-1-14 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| O | 2-9-1-15 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| P | 2-9-1-16 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| Q | 2-9-1-17 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| R | 2-9-1-18 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| S | 2-9-1-19 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| T | 2-9-1-20 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| U | 2-9-1-21 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| V | 2-9-1-22 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| W | 2-9-1-23 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| X | 2-9-1-24 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| Y | 2-9-1-25 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| Z | 2-9-1-26 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |

CONTACT OUTPUTS TO AMPLIFIERS

| | | | |
|----|----------|-----------------------------------|--------------------------------------|
| AA | 2-9-2-1 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AB | 2-9-2-2 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AC | 2-9-2-3 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AD | 2-9-2-4 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AE | 2-9-2-5 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AF | 2-9-2-6 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AG | 2-9-2-7 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AH | 2-9-2-8 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AI | 2-9-2-9 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AJ | 2-9-2-10 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AK | 2-9-2-11 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AL | 2-9-2-12 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AM | 2-9-2-13 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AN | 2-9-2-14 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AO | 2-9-2-15 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AP | 2-9-2-16 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AQ | 2-9-2-17 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AR | 2-9-2-18 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AS | 2-9-2-19 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AT | 2-9-2-20 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AU | 2-9-2-21 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AV | 2-9-2-22 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AW | 2-9-2-23 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AX | 2-9-2-24 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AY | 2-9-2-25 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AZ | 2-9-2-26 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |

CONTACT OUTPUTS TO COMPUTER

| | | | |
|----|----------|-----------------------------------|--------------------------------------|
| AA | 2-9-3-1 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AB | 2-9-3-2 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AC | 2-9-3-3 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AD | 2-9-3-4 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AE | 2-9-3-5 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AF | 2-9-3-6 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AG | 2-9-3-7 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AH | 2-9-3-8 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AI | 2-9-3-9 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AJ | 2-9-3-10 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AK | 2-9-3-11 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AL | 2-9-3-12 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AM | 2-9-3-13 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AN | 2-9-3-14 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AO | 2-9-3-15 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AP | 2-9-3-16 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AQ | 2-9-3-17 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AR | 2-9-3-18 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AS | 2-9-3-19 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AT | 2-9-3-20 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AU | 2-9-3-21 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AV | 2-9-3-22 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AW | 2-9-3-23 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AX | 2-9-3-24 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AY | 2-9-3-25 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AZ | 2-9-3-26 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |

CONTACT OUTPUTS TO AMPLIFIERS

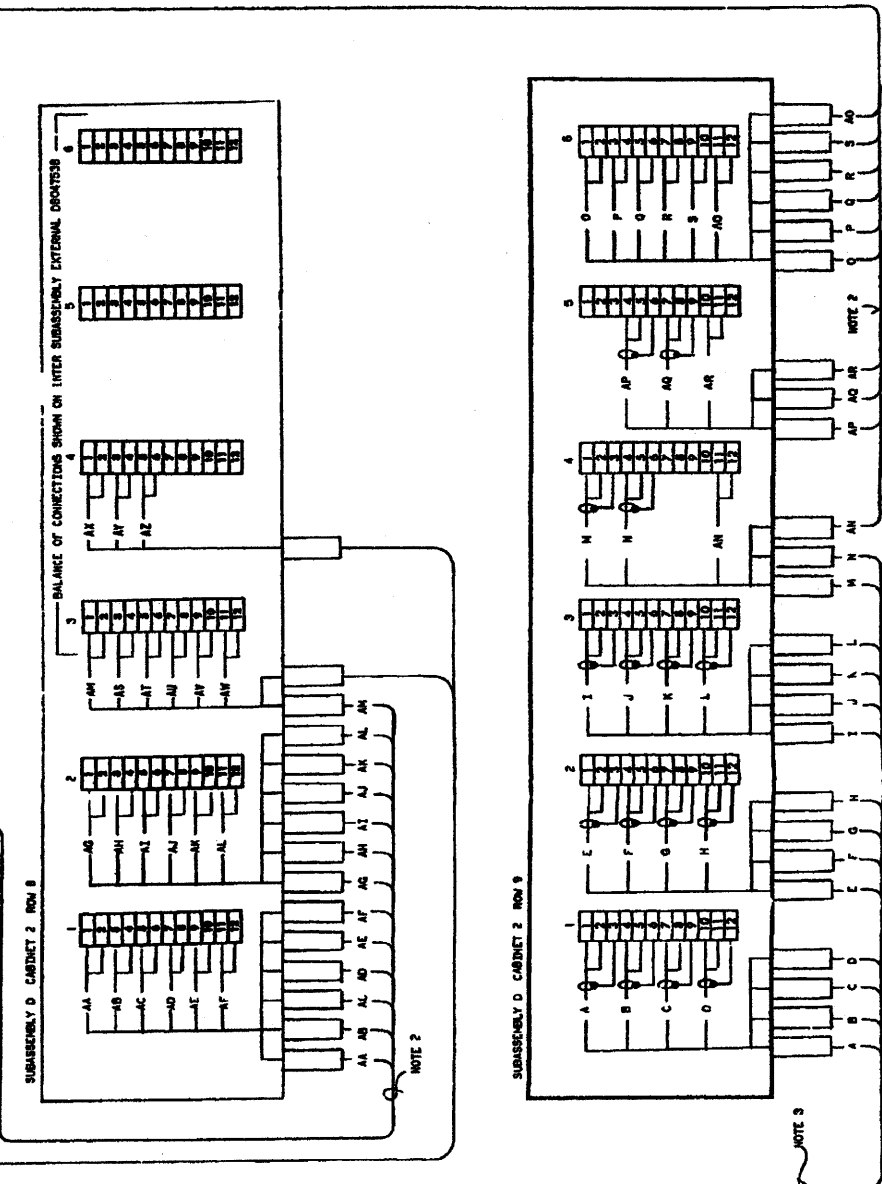
| | | | |
|----|----------|-----------------------------------|--------------------------------------|
| AA | 2-9-4-1 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AB | 2-9-4-2 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AC | 2-9-4-3 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AD | 2-9-4-4 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AE | 2-9-4-5 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AF | 2-9-4-6 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AG | 2-9-4-7 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AH | 2-9-4-8 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AI | 2-9-4-9 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AJ | 2-9-4-10 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AK | 2-9-4-11 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AL | 2-9-4-12 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AM | 2-9-4-13 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AN | 2-9-4-14 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AO | 2-9-4-15 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AP | 2-9-4-16 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AQ | 2-9-4-17 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AR | 2-9-4-18 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AS | 2-9-4-19 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AT | 2-9-4-20 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AU | 2-9-4-21 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AV | 2-9-4-22 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AW | 2-9-4-23 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AX | 2-9-4-24 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AY | 2-9-4-25 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AZ | 2-9-4-26 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |

CONTACT OUTPUTS TO COMPUTER

| | | | |
|----|----------|-----------------------------------|--------------------------------------|
| AA | 2-9-5-1 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AB | 2-9-5-2 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AC | 2-9-5-3 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AD | 2-9-5-4 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AE | 2-9-5-5 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AF | 2-9-5-6 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AG | 2-9-5-7 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AH | 2-9-5-8 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AI | 2-9-5-9 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AJ | 2-9-5-10 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AK | 2-9-5-11 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AL | 2-9-5-12 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AM | 2-9-5-13 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AN | 2-9-5-14 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AO | 2-9-5-15 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AP | 2-9-5-16 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AQ | 2-9-5-17 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AR | 2-9-5-18 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AS | 2-9-5-19 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AT | 2-9-5-20 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AU | 2-9-5-21 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AV | 2-9-5-22 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AW | 2-9-5-23 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AX | 2-9-5-24 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AY | 2-9-5-25 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AZ | 2-9-5-26 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |

CONTACT OUTPUTS TO AMPLIFIERS

| | | | |
|----|----------|-----------------------------------|--------------------------------------|
| AA | 2-9-6-1 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AB | 2-9-6-2 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AC | 2-9-6-3 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AD | 2-9-6-4 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AE | 2-9-6-5 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AF | 2-9-6-6 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AG | 2-9-6-7 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AH | 2-9-6-8 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AI | 2-9-6-9 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AJ | 2-9-6-10 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AK | 2-9-6-11 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AL | 2-9-6-12 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AM | 2-9-6-13 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AN | 2-9-6-14 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AO | 2-9-6-15 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AP | 2-9-6-16 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AQ | 2-9-6-17 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AR | 2-9-6-18 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AS | 2-9-6-19 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AT | 2-9-6-20 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AU | 2-9-6-21 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AV | 2-9-6-22 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |
| AW | 2-9-6-23 | CHANNEL HI-3 (M13) | CHANNEL HI-4 (E29) |
| AX | 2-9-6-24 | DELTA FLUX INDICATOR (0 TO 10 OV) | DELTA FLUX INDICATOR (0 TO +100 MV) |
| AY | 2-9-6-25 | CHANNEL HI-3 (M14) | CHANNEL HI-4 (E28) |
| AZ | 2-9-6-26 | R/C FLOW LOGIC (0 TO +10V) | DETECTOR POWER SUPPLY (0 TO +100 MV) |



- NOTES**
- REFERENCE BRO NUCLEAR INSTRUMENTATION WIRING REQUIREMENTS DWG A01220
 - ALL DIGITAL OUTPUTS TO THE COMPUTER TO BE TWISTED PAIRS IF SHIELDED GROUND SHIELD IN THE COMPUTER CABINETS
 - ALL ANALOG OUTPUTS TO THE COMPUTER TO BE SHIELDED TWISTED PAIRS GROUND SHIELD IN THIS CABINET
 - CABLES MP-COT AND WISED TO PLUG-IN CONNECTORS AT BOTH ENDS
 - ALL DIGITAL OUTPUTS TO COMPUTER AND AMPLIFIERS ARE NORMALLY CLOSED FOR NON-ALARM STATE AND OPEN FOR ALARM STATE INDICATED
 - THIS OUTPUT ALSO GOES TO ICS/OLD PT. A10022, CABINET C5761G, VIA CABLE ALLODE. REFERENCE DWG S. E-583, SH.6 & E-610A SH.31.
 - THIS OUTPUT ALSO GOES TO ICS/OLD PT. A10026, CABINET C5761G, VIA CABLE ALLODE. REFERENCE DWG S. E-583, SH.6 & E-610A SH.31.
 - THIS OUTPUT ALSO GOES TO ICS/OLD PT. A10032, CABINET C5761G, VIA CABLE ALLODE. REFERENCE DWG S. E-583, SH.6 & E-610A SH.31.
 - THIS OUTPUT ALSO GOES TO ICS/OLD PT. A10049, CABINET C5761G, VIA CABLE ALLODE. REFERENCE DWG S. E-583, SH.6 & E-610A SH.31.

7749-M-536-18-X-12

THIS DWG. WAS REDRAWN/SCANNED ON CAD AND SUPERSEDES SUBMITTAL 11.

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|----|--------|-----------------------------------|-----|-----|-----|------|
| NO | DATE | REVISIONS | BY | CHK | APP | DATE |
| 1 | 2/9/90 | INC VDCN M-536-18-1 PER DCRBT-810 | ... | ... | ... | ... |

THE TOLEDO EDISON CO
TOLEDO OHIO
POWER ENGINEERING

EXTERNAL CONNECTION DRAWING SUBASSEMBLY D
CABINET 2 NUCLEAR INSTRUMENTATION & PROTECTION SYSTEM
BOYLS WESSE NUCLEAR POWER STATION UNIT 1

DESIGNED BY: ... DATE: ...
CHECKED BY: ... DATE: ...
DWS NO: 26237 REV 00

BARCOX & WILCOX ONE NO 02 10601550 00
THIS DRAWING PREPARED BY BARCOX & WILCOX UNDER TASK AGREEMENT # 74 ON DATE 5/25-1/81
REFERENCE DWG 8047546
OTHER: T149-M-536-18-B
REFERENCES: BBW-102,103,110,113
PC#20A BYW/BECHTEL TELECOM 3-28-90 46-4-90