**D0-EC RTD WIRING LAYOUT
(NORTH CALORIMETER)**

D-Zero Engineering Note #3740.220-EN-313

Jerry R. Leibfritz

6 / 4 / 9 1

Approved by Keith Primdahl

Keith Primdahl

D0-EC RTD WIRING LAYOUT (NORTH CALORIMETER)

The temperature of the North End-Calorimeter of the D-Zero detector is to be monitored by several RTD temperature sensors. The location and other important information pertaining to each individual RTD is included in the following tables, which are grouped by bundle number.

There are nine 60 pin port connectors. Each connector corresponds to a bundle of twisted pairs. Twisted pairs, of one of eight colors along with either a black or white wire, run to 10-pin connectors which have a mate on the module or cryostat wall. In general, all 60 pins, or all 10 pins are not used. The color scheme of the wires was designed so that all the twisted pairs with white run West from the instrumentation port, and twisted pairs with black run East. This scheme proved to be very successful and efficient during the installation process.

After being installed, every RTD connection was checked and their corresponding resistances were recorded by Jerry Blazey. All the RTD's tested successfully, except for 2. The 2 dead RTD's were: Channel #17 on bundle #4, which is located on the front of MH module #8L; and Channel #13 on bundle #5, which is located on the Bottom of the Middle Coarse Plate of the IH.

D0-EC Wiring Layout (North Calorimeter)

There are nine 60 pin port connectors. Each connector corresponds to a bundle of twisted pairs. Twisted pairs run to 10-pin connectors which have a mate on the module or cryostat wall. In general, all 60 pins, or all 10 pins are not used. The color scheme of the wires was designed so that all the twisted pairs with white run west from the instrumentation port, and twisted pairs with black run east. Each 60-pin feed through port-connector is associated with one external readout board, one external bundle, and one internal bundle of twisted pairs. Each set (readout board, external bundle, 60-pin feed through port connector, and internal twisted pair bundle) is numbered as follows:

12/14/89
revised: 6/4/90
revised: 10/18/90

- 1 Quadrant 1 of hadronic face, right side (west) as viewed from back
- 2 Quadrant 2 of hadronic face, bottom
- 3 Quadrant 3 of hadronic face, left side (east) as viewed from back
- 4 Quadrant 4 of hadronic face, top
- 5 Inner hadronic face
- 6 Upper cryostat, ports, manifolds, etc.
- 7 Lower cryostat, VPT, shell, supports, OH strongback & sling, etc.
- 8 EM, bottom and left side (west) as viewed from front
- 9 EM, top and right side (east) as viewed from front

Bundles (1,2,3,4,5) - See drawings of module locations for assistance

Bundles (5,6,7,8) - See drawings of sensor/connector locations for assistance

Bundle (6) - runs along perimeter of the calorimeter shell aligned with the centerline of the North signal ports

RTD location is abbreviated as follows:

- (OH) - Outer Hadronic Module
- (MH) - Middle Hadronic Module
- (IH) - Inner Hadronic Module
- (#) - Location Number of Module
- (R,L) - Right or Left side of verticle axis
- (F,I,B) -Front,Intermediate, or Back RTD sensor on Module
- (N,S,E,W) - North, South, East, West

D0-Wiring (N i Calorimeter)

Port Connector-#1

Quadrant (1) of Hadronic Face, right
side (West) as viewed from back

Right side=West side (as viewed from the back)

Left side=East side (as viewed from the back)

RTD Location	Channel #	Port Connector #/ 10-Pin Connector #	Port Connector Pin Assignment	10-Pin Connector Pin # (1-10)	Twisted Pair Colors	Cut Length (in)
OH 7R-F	1	(1/1)	(A-B)	(9-10)	W/RED	115
OH 7R-I	2	(1/1)	(C-D)	(5-6)	W/GREEN	115
OH 7R-B	3	(1/1)	(E-F)	(1-2)	W/YELLOW	115
OH 6R-F	4	(1/2)	(G-H)	(9-10)	W/BBLUE	150
OH 6R-I	5	(1/2)	(J-K)	(5-6)	W/BROWN	150
OH 6R-B	6	(1/2)	(L-M)	(1-2)	W/ORANGE	150
OH 5R-F	7	(1/3)	(N-P)	(9-10)	W/GRAY	185
OH 5R-I	8	(1/3)	(R-S)	(5-6)	W/VIOLET	185
OH 5R-B	9	(1/3)	(T-U)	(1-2)	W/RED	185
OH 4R-F	10	(1/4)	(V-W)	(9-10)	W/GREEN	215
OH 4R-I	11	(1/4)	(X-Y)	(5-6)	W/YELLOW	215
OH 4R-B	12	(1/4)	(a-b)	(1-2)	W/BBLUE	215
MH 7R-F	13	(1/5)	(c-d)	(9-10)	W/RED	145
MH 7R-I	14	(1/5)	(e-f)	(5-6)	W/GREEN	145
MH 7R-B	16	(1/5)	(g-h)	(1-2)	W/YELLOW	145
MH 6R-F	17	(1/6)	(i-j)	(9-10)	W/BBLUE	180
MH 6R-I	18	(1/6)	(k-m)	(5-6)	W/BROWN	180
MH 6R-B	19	(1/6)	(n-p)	(1-2)	W/ORANGE	180
MH 5R-F	20	(1/7)	(q-r)	(9-10)	W/GRAY	215
MH 5R-I	21	(1/7)	(s-t)	(5-6)	W/VIOLET	215
MH 5R-B	22	(1/7)	(u-v)	(1-2)	W/RED	215
MH 4R-F	23	(1/8)	(w-x)	(9-10)	W/GREEN	245
MH 4R-I	24	(1/8)	(y-z)	(5-6)	W/YELLOW	245
MH 4R-B	25	(1/8)	(AA-BB)	(1-2)	W/BBLUE	245
TEV Beam(back)	26	(1/9)	(CC-DD)	(1-2)	W/RED	245

TEV Beam(back) 10-pin connector, connects to IH
connector plate in quadrant (1)

Port Connector-#2**Quadrant (2) of Hadronic Face, bottom**

Right side=West side (as viewed from the back)
 Left side=East side (as viewed from the back)

RTD Location	Channel #	Port Connector #/ 10-Pin Connector #	Port Connector Pin Assignment	10-Pin Connector Pin # (1-10)	Twisted Pair Colors	Cut Length (in)
OH 3R-F	1	(2/1)	(A-B)	(9-10)	W/RED	250
OH 3R-I	2	(2/1)	(C-D)	(5-6)	W/GREEN	250
OH 3R-B	3	(2/1)	(E-F)	(1-2)	W/YELLOW	250
OH 2R-F	4	(2/2)	(G-H)	(9-10)	W/BBLUE	285
OH 2R-I	5	(2/2)	(J-K)	(5-6)	W/BROWN	285
OH 2R-B	6	(2/2)	(L-M)	(1-2)	W/ORANGE	285
OH 1R-F	7	(2/3)	(N-P)	(9-10)	W/GRAY	320
OH 1R-I	8	(2/3)	(R-S)	(5-6)	W/VIOLET	320
OH 1R-B	9	(2/3)	(T-U)	(1-2)	W/RED	320
OH 1L-F	10	(2/4)	(V-W)	(9-10)	W/GREEN	355
OH 1L-I	11	(2/4)	(X-Y)	(5-6)	W/YELLOW	355
OH 1L-B	12	(2/4)	(a-b)	(1-2)	W/BBLUE	355
MH 3R-F	13	(2/5)	(c-d)	(9-10)	W/RED	280
MH 3R-I	14	(2/5)	(e-f)	(5-6)	W/GREEN	280
MH 3R-B	16	(2/5)	(g-h)	(1-2)	W/YELLOW	280
MH 2R-F	17	(2/6)	(i-j)	(9-10)	W/BBLUE	315
MH 2R-I	18	(2/6)	(k-m)	(5-6)	W/BROWN	315
MH 2R-B	19	(2/6)	(n-p)	(1-2)	W/ORANGE	315
MH 1-F	20	(2/7)	(q-r)	(9-10)	W/GRAY	350
MH 1-I	21	(2/7)	(s-t)	(5-6)	W/VIOLET	350
MH 1-B	22	(2/7)	(u-v)	(1-2)	W/RED	350
MH 2L-F	23	(2/8)	(w-x)	(9-10)	W/GREEN	385
MH 2L-I	24	(2/8)	(y-z)	(5-6)	W/YELLOW	385
MH 2L-B	25	(2/8)	(AA-BB)	(1-2)	W/BBLUE	385

D0-Wiring (N Calorimeter)

Port Connector-#3

Quadrant (3) of Hadronic Face, left
side (East) as viewed from back

Right side=West side (as viewed from the back)
Left side=East side (as viewed from the back)

RTD Location	Channel #	Port Connector #/ 10-Pin Connector #	Port Connector Pin Assignment	10-Pin Connector Pin # (1-10)	Twisted Pair rs
OH 2L-F	1	(3/1)	(A-B)	(9-10)	B/YELLOW
OH 2L-I	2	(3/1)	(C-D)	(5-6)	B/BLUE
OH 2L-B	3	(3/1)	(E-F)	(1-2)	B/BROWN
OH 3L-F	4	(3/2)	(G-H)	(9-10)	B/GRAY
OH 3L-I	5	(3/2)	(J-K)	(5-6)	B/RED
OH 3L-B	6	(3/2)	(L-M)	(1-2)	B/GREEN
OH 4L-F	7	(3/3)	(N-P)	(9-10)	B/BLUE
OH 4L-I	8	(3/3)	(R-S)	(5-6)	B/BROWN
OH 4L-B	9	(3/3)	(T-U)	(1-2)	B/ORANGE
OH 5L-F	10	(3/4)	(V-W)	(9-10)	B/RED
OH 5L-I	11	(3/4)	(X-Y)	(5-6)	B/GREEN
OH 5L-B	12	(3/4)	(a-b)	(1-2)	B/YELLOW
MH 3L-F	13	(3/5)	(c-d)	(9-10)	B/YELLOW
MH 3L-I	14	(3/5)	(e-f)	(5-6)	B/BLUE
MH 3L-B	16	(3/5)	(g-h)	(1-2)	B/BROWN
MH 4L-F	17	(3/6)	(i-j)	(9-10)	B/GRAY
MH 4L-I	18	(3/6)	(k-m)	(5-6)	B/RED
MH 4L-B	19	(3/6)	(n-p)	(1-2)	B/GREEN
MH 5L-F	20	(3/7)	(q-r)	(9-10)	B/BLUE
MH 5L-I	21	(3/7)	(s-t)	(5-6)	B/BROWN
MH 5L-B	22	(3/7)	(u-v)	(1-2)	B/ORANGE
MH 6L-F	23	(3/8)	(w-x)	(9-10)	B/RED
MH 6L-I	24	(3/8)	(y-z)	(5-6)	B/GREEN
MH 6L-B	25	(3/8)	(AA-BB)	(1-2)	B/YELLOW

Port Connector-#4

Quadrant (4) of Hadronic Face, top

Right side=West side (as viewed from the back)

Left side=East side (as viewed from the back)

RTD Location	Channel #	Port Connector #/ 10-Pin Connector #	Port Connector Pin Assignment	10-Pin Connector Pin # (1-10)	Twisted Pair Colors	Cut Length (in)
OH 6L-F	1	(4/1)	(A-B)	(9-10)	B/YELLOW	235
OH 6L-I	2	(4/1)	(C-D)	(5-6)	B/BLUE	235
OH 6L-B	3	(4/1)	(E-F)	(1-2)	B/BROWN	235
OH 7L-F	4	(4/2)	(G-H)	(9-10)	B/GRAY	200
OH 7L-I	5	(4/2)	(J-K)	(5-6)	B/RED	200
OH 7L-B	6	(4/2)	(L-M)	(1-2)	B/GREEN	200
OH 8L-F	7	(4/3)	(N-P)	(9-10)	B/BLUE	165
OH 8L-I	8	(4/3)	(R-S)	(5-6)	B/BROWN	165
OH 8L-B	9	(4/3)	(T-U)	(1-2)	B/ORANGE	165
OH 8R-F	10	(4/4)	(V-W)	(9-10)	B/RED	130
OH 8R-I	11	(4/4)	(X-Y)	(5-6)	B/GREEN	130
OH 8R-B	12	(4/4)	(a-b)	(1-2)	B/YELLOW	130
MH 7L-F	13	(4/5)	(c-d)	(9-10)	B/YELLOW	265
MH 7L-I	14	(4/5)	(e-f)	(5-6)	B/BLUE	265
MH 7L-B	16	(4/5)	(g-h)	(1-2)	B/BROWN	265
<i>Dead</i> MH 8L-F	17	(4/6)	(i-j)	(9-10)	B/GRAY	230
MH 8L-I	18	(4/6)	(k-m)	(5-6)	B/RED	230
MH 8L-B	19	(4/6)	(n-p)	(1-2)	B/GREEN	230
MH 9-F	20	(4/7)	(q-r)	(9-10)	B/BLUE	195
MH 9-I	21	(4/7)	(s-t)	(5-6)	B/BROWN	195
MH 9-B	22	(4/7)	(u-v)	(1-2)	B/ORANGE	195
MH 8R-F	23	(4/8)	(w-x)	(9-10)	B/RED	160
MH 8R-I	24	(4/8)	(y-z)	(5-6)	B/GREEN	160
MH 8R-B	25	(4/8)	(AA-BB)	(1-2)	B/YELLOW	160
Main Beam(back)	26	(4/9)	(CC-DD)	(1-2)	B/YELLOW	145
Main Beam(front)	27	(4/9)	(EE-FF)	(5-6)	B/BLUE	145

East
(black bundles)

QUADRANT (III)

QUADRANT (IV)

main beam
line

There is one 10-pin connector attached
to each module

There is one 10-pin connector at
the main beam line

QUADRANT (I)

West
(white bundles)

QUADRANT (II)

TOP OF CF IRON

VIEW LOOKING INTO THE SHOWER EC FROM THE SHOWER SIDE
North North

ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.
PARTS LIST			
1	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
2	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
3	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
4	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
5	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
6	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
7	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
8	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
9	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
10	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
FEDERAL NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY			
DO DETECTOR END CAP CALORIMETER ASSEMBLY			
1/8	3740.220-ME-255181	END CAP CALORIMETER ASSEMBLY	1
LONDON VERSION 1.00			

EAST
(black)

WEST
(white)

There is one 10-Pin Connector on each module

REV.	DESCRIPTION	DATE	BY

2	BAR TUBE ALUMINUM T-6061 50.00 X .063 WALL TUBE	2	
1	MOUNTS ALUMINUM T-6061 STOCK	2	
ITEM	PART NO.	DESCRIPTION OR SIZE	QTY.

PARTS LIST

UNLESS OTHERWISE SPECIFIED	ORIGINATOR K. PRIMDAHL	8-8-89
XX	XXV	XXVII
1.03 ±.016	CHECKED S.L. MEREDITH	8-8-89
1.03 ±.016	APPROVED	
1.03 ±.016	USED ON	
1.03 ±.016	MATERIAL	

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

DO DETECTOR END CALORIMETER
OUTER HADRONIC MODULE
CABLE GUIDE BAR ASSY.

SCALE 1:2

FILED 3740.222-MD-278960

CREATED WITH I-DEAS 4.1 USER NAME: SHANIELLE

INCHES 1 2 3 4 5 6 7 8 9 10 11 12 METRIC 25 50 75 100 125 150 175 200

[illegible]

D0-Wiring (N , Calorimeter)

Port Connector-#5

Inner Hadronic Face, as viewed from back

Right side=West side (as viewed from the back)

Left side=East side (as viewed from the back)

RTD Location	Channel #	Port Connector #/ 10-Pin Connector #	Port Connector Pin Assignment	10-Pin Connector Pin # (1-10)	Twisted Pair Colors	Cut Length (in)
West Branch						
IH Right(1)-FP	1	(5/1)	(A-B)	(1-2)	W/RED	245
IH Right(1)-2*strap	2	(5/1)	(C-D)	(3-4)	W/GREEN	245
IH Right(1)-FH	3	(5/1)	(E-F)	(5-6)	W/YELLOW	245
IH Right(1)-8*beam	4	(5/1)	(G-H)	(7-8)	W/BLUE	245
IH Right(2)-BP	5	(5/2)	(J-K)	(1-2)	W/BROWN	245
IH Right(2)-MC	6	(5/2)	(L-M)	(3-4)	W/ORANGE	245
IH Right(2)-FC	7	(5/2)	(N-P)	(5-6)	W/GRAY	245
IH Bot.(1)-FP	8	(5/3)	(R-S)	(1-2)	W/VIOLET	380
IH Bot.(1)-2*strap	9	(5/3)	(T-U)	(3-4)	W/RED	380
IH Bot.(1)-FH	10	(5/3)	(V-W)	(5-6)	W/GREEN	380
IH Bot.(1)-8*beam	11	(5/3)	(X-Y)	(7-8)	W/YELLOW	380
IH Bot.(2)-BP	12	(5/4)	(a-b)	(1-2)	W/BLUE	380
IH Bot.(2)-MC	13	(5/4)	(c-d)	(3-4)	W/BROWN	380
IH Bot.(2)-FC	14	(5/4)	(e-f)	(5-6)	W/ORANGE	380
IH Bot.(2)-Core	16	(5/4)	(g-h)	(7-8)	W/GRAY	380
IH Bot.(2)-Core	17	(5/4)	(i-j)	(9-10)	W/RED	380
East Branch						
IH Top(1)-FP	18	(5/5)	(k-m)	(1-2)	B/RED	230
IH Top(1)-2*strap	19	(5/5)	(n-p)	(3-4)	B/GREEN	230
IH Top(1)-FH	20	(5/5)	(q-r)	(5-6)	B/YELLOW	230
IH Top(1)-8*beam	21	(5/5)	(s-t)	(7-8)	B/BLUE	230
IH Top(2)-BP	22	(5/6)	(u-v)	(1-2)	B/BROWN	230
IH Top(2)-MC	23	(5/6)	(w-x)	(3-4)	B/ORANGE	230
IH Top(2)-FC	24	(5/6)	(y-z)	(5-6)	B/GRAY	230
IH Left(1)-FP	25	(5/7)	(AA-BB)	(1-2)	B/YELLOW	365
IH Left(1)-2*strap	26	(5/7)	(CC-DD)	(3-4)	B/BLUE	365
IH Left(1)-FH	27	(5/7)	(EE-FF)	(5-6)	B/BROWN	365
IH Left(1)-8*beam	28	(5/7)	(GG-HH)	(7-8)	B/ORANGE	365
IH Left(2)-BP	29	(5/8)	(JJ-KK)	(1-2)	B/GRAY	365
IH Left(2)-MC	30	(5/8)	(LL-MM)	(3-4)	B/RED	365
IH Left(2)-FC	31	(5/8)	(NN-PP)	(5-6)	B/GREEN	365

IH - Modules notation description

(Top, Bot., Right, Left) - Location of Connector Plate(see IH Sensor/Conn. Location drawings)

(1,2) - Connector Plate designation(see IH Sensor/Conn. Location drawings)

FP - Front Plate perimeter

FH - Fine Hadronic perimeter(2nd 3/4" plate)

BP - Back Plate perimeter

MC - Middle Coarse plate

FC - Front Coarse plate

As Viewed from back

Top

VIEW B-B

SCALE 1/4
SHEET 1

Bottom

As Viewed from back

SECTION D-D

SCALE 1/4
SHEET 1

ITEM	PART NO.	DESCRIPTION OF SIZE	QTY
PARTS LIST			
1	100-100000-001	W. HOPKINS	1.00
2	100-100000-002	W.D. HOPKINS	1.00
3	100-100000-003	W.D. HOPKINS	1.00
4	100-100000-004	W.D. HOPKINS	1.00
5	100-100000-005	W.D. HOPKINS	1.00
6	100-100000-006	W.D. HOPKINS	1.00
7	100-100000-007	W.D. HOPKINS	1.00
8	100-100000-008	W.D. HOPKINS	1.00
9	100-100000-009	W.D. HOPKINS	1.00
10	100-100000-010	W.D. HOPKINS	1.00
SEE SHEET ONE			
FEDERAL NATIONAL ACCELERATOR LABORATORY UNITED STATES DEPARTMENT OF ENERGY			
DEVELOPER AND CALORIMETER W.D. HOPKINS FEDERAL NATIONAL ACCELERATOR LABORATORY			

D0-IH Sensor/Conn. Location

(North and South Calorimeter)

IH - RTD Sensor/Connector Locations

JRL 12/14/89

There are 2, 10-pin connectors at each location (top, bottom, right, left)
 attached to the connector plates on the back of the IH module
 Locations(times) are designated as viewed from back(see attached drawing)

10-Pin Connector Location	Connector Pin Number	RTD Sensor Location
Top(1)	(1-2)	Front plate perimeter-12:00
	(3-4)	On 2" Strap(middle of fine section)-10:30
	(5-6)	Fine hadronic perim.(2nd 3/4" plate)-12:00
	(7-8)	On 8" Beam-12:00
	(9-10)	open
Top(2)	(1-2)	Back plate perimeter-12:00
	(3-4)	Middle coarse plate-10:30
	(5-6)	Front coarse plate-12:00
	(7-8)	open
	(9-10)	open
Right(1)	(1-2)	Front plate perimeter-3:00
	(3-4)	On 2" Strap(middle of fine section)-1:30
	(5-6)	Fine hadronic perim.(2nd 3/4" plate)-3:00
	(7-8)	On 8" beam-3:00
	(9-10)	open
Right(2)	(1-2)	Back plate perimeter-3:00
	(3-4)	Middle coarse plate-1:30
	(5-6)	Front coarse plate-3:00
	(7-8)	open
	(9-10)	open
Bottom(1)	(1-2)	Front plate perimeter-6:00
	(3-4)	On 2" Strap(middle of fine section)-4:30
	(5-6)	Fine hadronic perim.(2nd 3/4" plate)-6:00
	(7-8)	On 8" beam-6:00
	(9-10)	open
Bottom(2)	(1-2)	Back plate perimeter-6:00
	(3-4)	Middle coarse plate-4:30
	(5-6)	Front coarse plate-6:00
	(7-8)	At Core of front coarse plate(near beam li
	(9-10)	At Core of front coarse plate(near beam li
Left(1)	(1-2)	Front plate perimeter-9:00
	(3-4)	On 2" Strap(middle of fine section)-7:30
	(5-6)	Fine hadronic perim.(2nd 3/4" plate)-9:00
	(7-8)	On 8" beam-9:00
	(9-10)	open
Left(2)	(1-2)	Back plate perimeter-9:00
	(3-4)	Middle coarse plate-7:30
	(5-6)	Front coarse plate-9:00
	(7-8)	open
	(9-10)	open

F-F	SHEET 3
E-E	SHEET 4
D-D	SHEET 3
C-C	SHEET 3
B-B	SHEET 2
A-A	SHEET 2
IDENT	SHEET NO

SECTION, VIEW, AND
DETAIL INDEX

26	MC-255230	.750 THK. PL. 18"X19"X1"
25	MC-255234	CHANNEL DETAIL
24	MC-255233	CHANNEL DETAIL
27	MC-255235	CHANNEL DETAIL
25		5/8"X182 3/16 L.G. 12 PT.
26		5/8" AN 860 C WASHER
24		W10X205.5 L.G. 12 PT.
26		6 5/8" X 2.625 LB. PIN
22		7/16" AN 860 C WASHER
21		7/16"X202 3/16 L.G. 12 PT.
17		1/2"X202 15/16 L.G. 12 PT.
19		1/2"X202 3/16 L.G. 12 PT.
18		1/2" AN 860 C WASHER
17		1/2"X211 11/16 L.G. HEX HD
16		6 5/8" X 2.125 LB. PIN
15		3/8" AN 860 C WASHER
14		3/8"X202 5/16 L.G. HEX HD.
13		SHIM BLOCK
12		SHIM BLOCK
11	MC-255236	BEAM TUBE
10	MC-255232	WR. PLATE AS. 8"X10 HOLES
9		.158 SIGNAL BOARD
8	MC-255231	WR. PLATE AS. 8"X10LES
7	MC-255235	1" X 1/2" STRIP
6	MC-255231	CHANNEL DETAIL
5	MC-255230	1.75 THK. REAR PLATE
4	MC-255247	1.83 THK. INTER. PLATE
3	MC-255248	1.83 THK. INTER. PLATE
2	MC-255247	1.75 THK. INTER. PLATE
1	MC-255248	1.25 THK. FRONT PLATE
4 FROM	ASMT HO.	DESCRIPTION OR ALIAS

44-38861-Subpoena duces tecum granted 10/25/70 by U.S. District Court (Produced Pursuant to Subpoena)		PARTS LIST Q10 - 11400700 1. HEADLAMP 2. O.D. HEADLAMP 3. HEADLAMP 4. HEADLAMP 5. HEADLAMP 6. HEADLAMP 7. HEADLAMP 8. HEADLAMP 9. HEADLAMP 10. HEADLAMP 11. HEADLAMP 12. HEADLAMP 13. HEADLAMP 14. HEADLAMP 15. HEADLAMP 16. HEADLAMP 17. HEADLAMP 18. HEADLAMP 19. HEADLAMP 20. HEADLAMP 21. HEADLAMP 22. HEADLAMP 23. HEADLAMP 24. HEADLAMP 25. HEADLAMP 26. HEADLAMP 27. HEADLAMP 28. HEADLAMP 29. HEADLAMP 30. HEADLAMP 31. HEADLAMP 32. HEADLAMP 33. HEADLAMP 34. HEADLAMP 35. HEADLAMP 36. HEADLAMP 37. HEADLAMP 38. HEADLAMP 39. HEADLAMP 40. HEADLAMP 41. HEADLAMP 42. HEADLAMP 43. HEADLAMP 44. HEADLAMP 45. HEADLAMP 46. HEADLAMP 47. HEADLAMP 48. HEADLAMP 49. HEADLAMP 50. HEADLAMP 51. HEADLAMP 52. HEADLAMP 53. HEADLAMP 54. HEADLAMP 55. HEADLAMP 56. HEADLAMP 57. HEADLAMP 58. HEADLAMP 59. HEADLAMP 60. HEADLAMP 61. HEADLAMP 62. HEADLAMP 63. HEADLAMP 64. HEADLAMP 65. HEADLAMP 66. HEADLAMP 67. HEADLAMP 68. HEADLAMP 69. HEADLAMP 70. HEADLAMP 71. HEADLAMP 72. HEADLAMP 73. HEADLAMP 74. HEADLAMP 75. HEADLAMP 76. HEADLAMP 77. HEADLAMP 78. HEADLAMP 79. HEADLAMP 80. HEADLAMP 81. HEADLAMP 82. HEADLAMP 83. HEADLAMP 84. HEADLAMP 85. HEADLAMP 86. HEADLAMP 87. HEADLAMP 88. HEADLAMP 89. HEADLAMP 90. HEADLAMP 91. HEADLAMP 92. HEADLAMP 93. HEADLAMP 94. HEADLAMP 95. HEADLAMP 96. HEADLAMP 97. HEADLAMP 98. HEADLAMP 99. HEADLAMP 100. HEADLAMP 101. HEADLAMP 102. HEADLAMP 103. HEADLAMP 104. HEADLAMP 105. HEADLAMP 106. HEADLAMP 107. HEADLAMP 108. HEADLAMP 109. HEADLAMP 110. HEADLAMP 111. HEADLAMP 112. HEADLAMP 113. HEADLAMP 114. HEADLAMP 115. HEADLAMP 116. HEADLAMP 117. HEADLAMP 118. HEADLAMP 119. HEADLAMP 120. HEADLAMP 121. HEADLAMP 122. HEADLAMP 123. HEADLAMP 124. HEADLAMP 125. HEADLAMP 126. HEADLAMP 127. HEADLAMP 128. HEADLAMP 129. HEADLAMP 130. HEADLAMP 131. HEADLAMP 132. HEADLAMP 133. HEADLAMP 134. HEADLAMP 135. HEADLAMP 136. HEADLAMP 137. HEADLAMP 138. HEADLAMP 139. HEADLAMP 140. HEADLAMP 141. HEADLAMP 142. HEADLAMP 143. HEADLAMP 144. HEADLAMP 145. HEADLAMP 146. HEADLAMP 147. HEADLAMP 148. HEADLAMP 149. HEADLAMP 150. HEADLAMP 151. HEADLAMP 152. HEADLAMP 153. HEADLAMP 154. HEADLAMP 155. HEADLAMP 156. HEADLAMP 157. HEADLAMP 158. HEADLAMP 159. HEADLAMP 160. HEADLAMP 161. HEADLAMP 162. HEADLAMP 163. HEADLAMP 164. HEADLAMP 165. HEADLAMP 166. HEADLAMP 167. HEADLAMP 168. HEADLAMP 169. HEADLAMP 170. HEADLAMP 171. HEADLAMP 172. HEADLAMP 173. HEADLAMP 174. HEADLAMP 175. HEADLAMP 176. HEADLAMP 177. HEADLAMP 178. HEADLAMP 179. HEADLAMP 180. HEADLAMP 181. HEADLAMP 182. HEADLAMP 183. HEADLAMP 184. HEADLAMP 185. HEADLAMP 186. HEADLAMP 187. HEADLAMP 188. HEADLAMP 189. HEADLAMP 190. HEADLAMP 191. HEADLAMP 192. HEADLAMP 193. HEADLAMP 194. HEADLAMP 195. HEADLAMP 196. HEADLAMP 197. HEADLAMP 198. HEADLAMP 199. HEADLAMP 200. HEADLAMP 201. HEADLAMP 202. HEADLAMP 203. HEADLAMP 204. HEADLAMP 205. HEADLAMP 206. HEADLAMP 207. HEADLAMP 208. HEADLAMP 209. HEADLAMP 210. HEADLAMP 211. HEADLAMP 212. HEADLAMP 213. HEADLAMP 214. HEADLAMP 215. HEADLAMP 216. HEADLAMP 217. HEADLAMP 218. HEADLAMP 219. HEADLAMP 220. HEADLAMP 221. HEADLAMP 222. HEADLAMP 223. HEADLAMP 224. HEADLAMP 225. HEADLAMP 226. HEADLAMP 227. HEADLAMP 228. HEADLAMP 229. HEADLAMP 230. HEADLAMP 231. HEADLAMP 232. HEADLAMP 233. HEADLAMP 234. HEADLAMP 235. HEADLAMP 236. HEADLAMP 237. HEADLAMP 238. HEADLAMP 239. HEADLAMP 240. HEADLAMP 241. HEADLAMP 242. HEADLAMP 243. HEADLAMP 244. HEADLAMP 245. HEADLAMP 246. HEADLAMP 247. HEADLAMP 248. HEADLAMP 249. HEADLAMP 250. HEADLAMP 251. HEADLAMP 252. HEADLAMP 253. HEADLAMP 254. HEADLAMP 255. HEADLAMP 256. HEADLAMP 257. HEADLAMP 258. HEADLAMP 259. HEADLAMP 260. HEADLAMP 261. HEADLAMP 262. HEADLAMP 263. HEADLAMP 264. HEADLAMP 265. HEADLAMP 266. HEADLAMP 267. HEADLAMP 268. HEADLAMP 269. HEADLAMP 270. HEADLAMP 271. HEADLAMP 272. HEADLAMP 273. HEADLAMP 274. HEADLAMP 275. HEADLAMP 276. HEADLAMP 277. HEADLAMP 278. HEADLAMP 279. HEADLAMP 280. HEADLAMP 281. HEADLAMP 282. HEADLAMP 283. HEADLAMP 284. HEADLAMP 285. HEADLAMP 286. HEADLAMP 287. HEADLAMP 288. HEADLAMP 289. HEADLAMP 290. HEADLAMP 291. HEADLAMP 292. HEADLAMP 293. HEADLAMP 294. HEADLAMP 295. HEADLAMP 296. HEADLAMP 297. HEADLAMP 298. HEADLAMP 299. HEADLAMP 300. HEADLAMP 301. HEADLAMP 302. HEADLAMP 303. HEADLAMP 304. HEADLAMP 305. HEADLAMP 306. HEADLAMP 307. HEADLAMP 308. HEADLAMP 309. HEADLAMP 310. HEADLAMP 311. HEADLAMP 312. HEADLAMP 313. HEADLAMP 314. HEADLAMP 315. HEADLAMP 316. HEADLAMP 317. HEADLAMP 318. HEADLAMP 319. HEADLAMP 320. HEADLAMP 321. HEADLAMP 322. HEADLAMP 323. HEADLAMP 324. HEADLAMP 325. HEADLAMP 326. HEADLAMP 327. HEADLAMP 328. HEADLAMP 329. HEADLAMP 330. HEADLAMP 331. HEADLAMP 332. HEADLAMP 333. HEADLAMP 334. HEADLAMP 335. HEADLAMP 336. HEADLAMP 337. HEADLAMP 338. HEADLAMP 339. HEADLAMP 340. HEADLAMP 341. HEADLAMP 342. HEADLAMP
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D0-Wiring (N₂ Calorimeter)

Port Connector-#6 Upper Cryostat, Ports, Manifolds, etc.

Right side=West side (as viewed from the back)
Left side=East side (as viewed from the back)

RTD Location	Channel #	Port Connector #/ 10-Pin Connector #	Port Connector Pin Assignment	10-Pin Connector Pin # (1-10)	Twisted Pair Colors	Cut Length (in)
East Branch						
C/D Inlet Manifold(W)	1	(6/1)	(A-B)	(1-2)	B/RED	115
S.S. Inlet Manifold	2	(6/2)	(C-D)	(1-2)	B/GREEN	160
Outlet Manifold	3	(6/2)	(E-F)	(5-6)	B/YELLOW	160
Spare	4	(6/3)	(G-H)	(1-2)	B/BLUE	160
Spare	5	(6/3)	(J-K)	(5-6)	B/BROWN	160
C/D Inlet Manifold(E)	6	(6/4)	(L-M)	(1-2)	B/ORANGE	165
Signal Port (NE-bot)	7	(6/5)	(N-P)	(1-2)	B/GRAY	235
Signal Port (NE-top)	8	(6/5)	(R-S)	(5-6)	B/RED	235
Signal Port (SE-bot)	9	(6/6)	(T-U)	(1-2)	B/GREEN	260
Signal Port (SE-top)	10	(6/6)	(V-W)	(3-4)	B/YELLOW	260
HV Port (SE-bot)	11	(6/6)	(X-Y)	(5-6)	B/BLUE	260
HV Port (SE-top)	12	(6/6)	(a-b)	(7-8)	B/BROWN	260
West Branch						
Signal Port(NW-bot)	13	(6/7)	(c-d)	(1-2)	B/ORANGE	100
Signal Port(NW-top)	14	(6/7)	(e-f)	(3-4)	B/GRAY	100
VPT(top)	16	(6/7)	(g-h)	(5-6)	B/RED	100
VPT(top)	17	(6/7)	(i-j)	(7-8)	B/GREEN	100
Signal Port (SW-bot)	18	(6/8)	(k-m)	(1-2)	B/YELLOW	135
Signal Port (SW-top)	19	(6/8)	(n-p)	(3-4)	B/BLUE	135
HV Port (SW-bot)	20	(6/8)	(q-r)	(5-6)	B/BROWN	135
HV Port (SW-top)	21	(6/8)	(s-t)	(7-8)	B/ORANGE	135

RTD's NEAR HEATERS

(Placed in wiring, along back sling lined up by center of heaters. These wires will run west from instrument port.)

Between OH4R-OH5R	22	(6/9)	(u-v)	(1-2)	W/RED	265
Between OH3R-OH4R	23	(6/9)	(w-x)	(5-6)	W/YELLOW	265
At OH2R	24	(6/10)	(y-z)	(1-2)	W/GREEN	310
At OH1R	25	(6/10)	(AA-BB)	(5-6)	W/BLUE	310
At OH1L	26	(6/11)	(CC-DD)	(1-2)	W/BROWN	400
At OH2L	27	(6/11)	(EE-FF)	(5-6)	W/GREY	400
Between OH3L-OH4L	28	(6/12)	(GG-HH)	(1-2)	W/ORANGE	470
Between OH4L-OH5L	29	(6/12)	(JJ-KK)	(5-6)	W/VIOLET	470

Note: East Branch ((6) 10-Pin Connectors) cannot be put in place until after cryo piping is installed (tied to manifold piping)

D0-Wiring (N - Calorimeter)

Port Connector-#7

Lower Cryostat, VPT, shell, supports,
OH strongback & sling, etc.

Right side=West side (as viewed from the back)

Left side=East side (as viewed from the back)

RTD Location	Channel #	Port Connector #/ 10-Pin Connector #	Port Connector Pin Assignment	10-Pin Connector Pin # (1-10)	Twisted Pair Colors	Cut Length (in)
VPT-equat(W) on bulb	1	(7/1)	(A-B)	(1-2)	W/RED	185
VPT-equator(W) 2	2	(7/1)	(C-D)	(5-6)	W/GREEN	185
SLING 2R-back	3	(7/2)	(E-F)	(1-2)	W/YELLOW	265
SLING 2R-front	4	(7/2)	(G-H)	(3-4)	W/BBLUE	265
SLING Strongback-W	5	(7/2)	(J-K)	(5-6)	W/BROWN	265
Supprt Sockt-Front (W)	6	(7/2)	(L-M)	(7-8)	W/ORANGE	265
Supprt Sockt-Back (W)	7	(7/2)	(N-P)	(9-10)	W/GRAY	265
SHELL back support	8	(7/3)	(R-S)	(1-2)	W/VIOLET	265
SHELL front support	9	(7/3)	(T-U)	(5-6)	W/RED	265
SHELL Strongback-W	10	(7/3)	(V-W)	(9-10)	W/GREEN	265
CABLE COVER-1R	11	(7/4)	(X-Y)	(1-2)	W/YELLOW	295
CABLE COVER-1L	12	(7/5)	(a-b)	(1-2)	W/BBLUE	340
VPT-bottom 1	13	(7/6)	(c-d)	(1-2)	W/BROWN	345
VPT-bottom (on bulb)	14	(7/6)	(e-f)	(5-6)	W/ORANGE	345
CABLE COVER-2R	16	(7/7)	(g-h)	(1-2)	W/GRAY	365
CABLE COVER-2L	17	(7/8)	(i-j)	(1-2)	W/VIOLET	405
SLING 2L-back	18	(7/9)	(k-m)	(1-2)	W/RED	425
SLING 2L-front	19	(7/9)	(n-p)	(3-4)	W/GREEN	425
SLING Strongback-E	20	(7/9)	(q-r)	(5-6)	W/YELLOW	425
SUPPORT-Front (E)	21	(7/9)	(s-t)	(7-8)	W/BBLUE	425
SUPPORT-Back (E)	22	(7/9)	(u-v)	(9-10)	W/BROWN	425
SHELL back support	23	(7/10)	(w-x)	(1-2)	W/ORANGE	425
SHELL front support	24	(7/10)	(y-z)	(5-6)	W/GRAY	425
SHELL Strongback-E	25	(7/10)	(AA-BB)	(9-10)	W/VIOLET	425
Shell 2R-back	26	(7/11)	(CC-DD)	(1-2)	W/RED	480
Shell 2R-front	27	(7/11)	(EE-FF)	(5-6)	W/YELLOW	480
Shell 2L-back	28	(7/12)	(GG-HH)	(1-2)	W/RED	455
Cable Cover 3R	29	(7/13)	(JJ-KK)	(1-2)	W/GREEN	455
Cable Cover 3L	30	(7/14)	(LL-MM)	(1-2)	W/BROWN	455
Shell 2L-front	31	(7/15)	(NN-PP)	(1-2)	W/ORANGE	455

D0-(N)Shell Connector Locations

Beam Line, Shell, and Sling RTD Connector Locations

6/4/90

Port Connector #	10-Pin Connector #	10-Pin Connector Location
6	1	West cool-down inlet manifold
6	2	between steady-state inlet and outlet manifold
6	3	VPT-top
6	4	East cool-down inlet manifold
6	5	near NE signal port
6	6	near SE signal port
6	7	near NW signal port
6	8	near SW signal port
6	9	Along back sling at OH4R
6	10	Along back sling between OH1R-OH2R
6	11	Along back sling between OH1L-OH2L
6	12	Along back sling at OH4L
7	1	VPT-equator West side
7	2	near West/back support foot
7	3	near West/back support foot
7	4	near signal cable cover on OH2R
7	5	near signal cable cover on OH1R
7	6	VPT-bottom
7	7	near signal cable cover on OH1L
7	8	near signal cable cover on OH2L
7	9	near East/back support foot
7	10	near East/back support foot
7	11	VPT-equator East side
7	12	spare
7	13	spare
7	14	spare
7	15	spare

The connector locations are intended to provide easy access from the back of the cryostat during assembly. An effort has also been made to run 2 or more RTD's to a single 10-Pin connector.

For actual RTD locations, see (D0-Shell Sensor Locations) sheet.

D0-Shell Sensor Locations

Beam Line, Shell, and Sling Sensor Locations

6/4/90

RTD-Locations

1	On centerline of back and front slings, outboard,
centered over OH2R and OH2L	(4 required)
2	On center of east and west strongback, outboard	(2 required)
3	On cryostat wall across from (1) and (2)	(6 required)
4	On each signal cable cover, centered in Z above the heaters,
on modules OH2L, OH1L, OH1R, OH2R	(4 required)
5	On each support socket, facing front or back, just above
thermal siphons	(4 required)
6	On cryostat wall, two near each VPT (top, bottom, equat	(6 required)
7	On TEV beam pipe, just fore and aft of calorimeter	(2 required)
8	On Main Ring beam pipe, just fore and aft of calorimeter	(2 required)
9	On East and West cool-down inlet manifold	(2 required)
10	On steady-state inlet manifold	(1 required)
11	On outlet manifold	(1 required)
12	At 1/3 and 2/3 height of each	
	(2)-HV ports	(4 required)
	(4)-signal ports	(8 required)
	(1)-instrumentation port	(2 required)
13	Along back sling, stuck in wiring at
center of heaters	(8 required)

Total: 56

D0-(N) EM Sensor/Conn. Location
(North Calorimeter)

EM - RTD Sensor/Connector Locations

JRL 12/14/89

(I,II,III,IV) - Connector locations (see drawing)
2, 10-pin connectors at each location (1Front,1Back)

- (I) - 4:30
- (II) - 7:30
- (III) - 10:30
- (IV) - 1:30

RTD locations designated by letter (see Drawing)

10-Pin Connector Location	Connector Pin Number	RTD Sensor Location
I(Front)	(1-2)	EM1 face(A) Contact sensor
	(3-4)	EM1 face(B)
	(5-6)	Strong Back Perimeter at (3:00)
	(7-8)	EM3 Perimeter at (3:00)
	(9-10)	open
I(Back)	(1-2)	EM4 face(J)
	(3-4)	Central Support Tube (back)
	(5-6)	EM4 Perimeter at (3:00)
	(7-8)	open
	(9-10)	open
II(Front)	(1-2)	EM1 face(C) Contact sensor
	(3-4)	EM1 face(D)
	(5-6)	Strong Back Perimeter at (6:00)
	(7-8)	EM3 Perimeter at (6:00)
	(9-10)	open
II(Back)	(1-2)	EM4 face(K)
	(3-4)	EM4 face(L)
	(5-6)	EM4 face(M)
	(7-8)	EM4 Perimeter at (6:00)
	(9-10)	open
III(Front)	(1-2)	EM1 face(E) Contact sensor
	(3-4)	EM1 face(F)
	(5-6)	Central Support Tube (front)
	(7-8)	Strong Back Perimeter at (9:00)
	(9-10)	EM3 Perimeter at (9:00)

D0-(N) EM Sensor/Conn. Location

10-Pin Connector Location	Connector Pin Number	RTD Sensor Location
III(Back)	(1-2)	EM4 face(N)
	(3-4)	EM4 Perimeter at (9:00)
	(5-6)	open
	(7-8)	open
	(9-10)	open
IV(Front)	(1-2)	EM1 face(G) Contact sensor
	(3-4)	EM1 face(H)
	(5-6)	Strong Back Perimeter at (12:00)
	(7-8)	EM3 Perimeter at (12:00)
	(9-10)	open
IV(Back)	(1-2)	EM4 face(P)
	(3-4)	EM4 face(Q)
	(5-6)	EM4 face(R)
	(7-8)	EM4 Perimeter at (12:00)
	(9-10)	open

(2) 10-pin Connectors at each Location (I, II, III, IV) (12:00)

- BEFORE WELDING HALVES TOGETHER,
BREAK EDGES 90/93 ALONG ENTIRE
BUTTING EDGE.

(NORTH)

(12:00)

- BEFORE WELDING FINISH TOGETHER,
BREAK EDGES .010/.015 ALONG ENTIRE
BUTTING EDGE.

west

East

(III)
(10:30)

(IV)
(1:30)

50)

STUD —
PI

WARPING OF MINIMUM

84.774 ~~SECRET~~

(II)
(7:30)

(I) (4:30)

51 DE

10-24 UNC #316 ST
PERCUSSION WELD TO
12 STUDS, EG SP, STA
FROM E ON DD 2-6

250 A B

MINIMIZE LOCAL WAR
BY MAKING MINIMUM
WELDS.

START WELD ON 4.505 DIA.
STAGGER WELD ON OPPOSITE
SIDE 5" C-C.
FINISH WITH 1/4" WELD ON 81.776 DIA
TYP OTHER HALF OF PLATE
(N.S. - NEAR SIDE)
(F.S. - FAR SIDE)
GRIND WELDS FLUSH.
MINIMIZE LOCAL WARPING OF DISK BY
MAKING SMALL MINIMUM HEATING WELDS.

(6:00) VERTICAL &
(USE BUTT
WELD JOINT)

Technical drawing of a weld detail showing a cross-section of a joint. A horizontal plate is welded to a vertical plate. The weld is labeled "TACK WELD". Dimensions include a .003 R. MAX. fillet radius, a .25 inch gap, and a .18 inch thickness.

- STAINLESS STEEL BAR
1/4" = 1/2" STOCK

Diagram illustrating a 50-stick bundle. The bundle is shown as a rectangular structure with a height of 0.7m and a width of 50 sticks. The bundle is labeled "50 STICK" and "R_{max}".

-HORIZONTAL
VERTICAL

DETAIL B

1-1
THERMOCOUPLE MOUNT

R#	LOCATION	QTY
120	ON VERT G	2 180° APART
240	ON VERT G	2 180° APART
360	ON VERT G	2 180° APART
360	ON HORIZ G	2 180° APART
		E TOTAL

D7	80.276 DIA	32 HOLES
D6	---	---
D5	68.792 DIA	24 HOLES
D4	58.652 DIA	8 HOLES
D3	52.652 DIA	16 HOLES
D2	37.233 DIA	8 HOLES
D1	22.494 DIA	8 HOLES

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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