1 Introduction

This document provides a summary description of the COMPTEL mass model, as it is encoded in the IDT ("Instrument Definition Table") dataset. The IDT is a required input dataset to the SIMGAM, SIMTRK, and SIMENE tasks of the SIM subsystem of COMPASS. These tasks simulate the response of the COMPTEL detectors to incident γ radiation, using the GEANT Monte Carlo simulation code developed at CERN.

The SIM Development Group at UNH currently consists of Ben Hersh, Cheenu Kappadath, R. Marc Kippen, Mark McConnell, Dan Morris, Greg Stacy, and Xu Peng. George Simpson carried out early SIM studies at UNH. We thank Hans de Boer and Rob van Dijk of Leiden for catching several errors in earlier versions of the IDT tables.

2 Reference List

1. *GEANT Detector Description and Simulation Tool*, CERN Application Software Group, Computing and Networks Division, CERN, Geneva, Switzerland (Edition of March, 1994, for GEANT version 3.21).
2. *Monte Carlo Simulation of the COMPTEL Gamma-Ray Telescope*, R. M. Kippen, Master's Thesis, University of New Hampshire, May, 1991.
3. "Log of available IDT, ISS, and ISP Datasets for SIM Processing," R. M. Kippen, M. McConnell, and J. G. Stacy, COM-RP-UNH-SIM-021, currently under revision.
4. "COMPTEL Requirements for the GRO Mass/Radiation Model," D. J. Morris, COM-TN-UNH-F70-050, 6 March, 1990.
5. "Overview of COMPASS Simulation Tasks (SIM Subsystem)," J. G. Stacy, COM-RP-UNH-SIM-038, 18 February, 1994.
6. "Mass Estimation above and between D1 and D2 Detectors," H. Wolter, COM-TN-MBB-L31-007, 25 November, 1983.
7. "Mass Properties Summary," H. Wolter and M. Kratz, COM-TN-MBB-L31-008, 7 February, 1986.
8. The original of the present document is kept as the file

   `/home/gstacy/tex/sim/idt_desc/sim_idt_desc.tex`

   on comptel.unh.edu at UNH.

3 Description and Structure of the IDT Dataset

The IDT ("Instrument Definitions Table") dataset consists of an encoded physical mass model of the COMPTEL instrument, and is a required input dataset to the SIMGAM, SIMTRK, and SIMENE tasks of the SIM subsystem of COMPASS. These tasks simulate the response of the COMPTEL detectors to incident γ radiation, using the GEANT Monte Carlo simulation code developed and maintained at CERN.

Simply put, the GEANT program simulates the passage of elementary particles through matter. In the COMPASS SIM tasks, incident γ-ray photons are propagated and tracked through a model of the COMPTEL instrument, along with any secondary particles and photons resulting from beam-photon interactions with the material of the instrument model. Energy deposits in sensitive detector volumes are recorded and written, along with associated event parameters, as records to an output event file.

Proper execution of the GEANT program requires that an experimental setup be defined at the time of GEANT initialisation. An experimental setup is composed of a structure of geometrical *volumes* specified by the user. Each volume element is characterized by a *shape* identifier (e.g., 'TUBE' or 'CONE'), whose parameters give the dimensions of the volume. The physical properties of a given volume element are determined by the chemical composition of the homogeneous *material*, prescribed by the user, which uniformly fills that volume. Each volume is *positioned* in a local reference system, with origin and axes defined for each shape. A given volume may contain other volumes; "daughter" volumes are explicitly positioned inside a "mother" volume. Each volume is given a *volume number* by the user; multiple copies of the same volume may be defined and placed inside the same or different mother volumes, as long as each copy is assigned a unique *copy number*. The material contents of each copy of a given volume are identical. *Tracking medium* parameters are also assigned to each volume; these include such information as the material identifier, a flag indicating whether a particular volume should be considered a sensitive detector element, etc. Finally, certain additional *attributes* may be assigned to each volume; these are used primarily in the GEANT drawing routines, to aid in producing viewable figures of the experimental setup (such as those presented later in this document).

The ensemble of all user-specified volumes for an experimental setup defines a physical or geometry *tree*, usually made up of several *levels*. Note that the properties of a daughter volume positioned within a mother volume at a certain level in the tree replace those of the mother within the region of space occupied by the daughter. A volume is therefore fully defined not just by its own intrinsic characteristics, but also by those of all its *descendants*. A geometry tree can be defined with a maximum of 15 levels in the GEANT program. A 4-level tree is sufficient to define the COMPTEL instrument model used in SIM processing.

The figures and tables presented in this document were produced "automatically" (more or less) by execution of the program `idtchk`, written by the author. (Well, actually, it's an extensively modified version of a program originally written by Marc Kippen.) The non-COMPASS task `idtchk`, linked to the GEANT libraries, reads in a selected IDT dataset, fills the GEANT geometry and material databanks with the model information (as in a normal COMPASS SIM-processing job), and prints out summary information in tabular form. This program also provides an interface to the GEANT Draw routines to produce various standard views of the instrument model and its components.

The particular IDT dataset used to produce the figures and tables contained in this document is U1008.IDT (actually, the formatted version, which is U1008.FO.IDT). A listing of this dataset is provided in the appendix. Note that two "versions" of a given IDT dataset exist in the COMPASS ORACLE database: one for use in simulating the "in-flight" response of the instrument (this is currently U1008.IDT), and one for use in simulating pre-launch "calibration" measurements (currently U1009.IDT). The only difference between the two is that, for the in-flight case, the master "dummy" volumes are filled with vacuum, and for calibration simulations the dummy volumes are filled with air.

For those who really want to learn the details: the GEANT manual and miscellaneous related documentation are now available as compressed postscript files via anonymous ftp to CERN in Geneva, Switzerland (ftp to `asis01.cern.ch`, and cd to the directory `cernlib/doc/ps.dir/geant`). Information about CERN and the CERN program library is also available through the World Wide Web (natürlich!) and Mosaic on the Internet (the CERN Home Page can be found at the following URL: `http://www.cern.ch/`).

A final note: the following figures and tables are intended to be as "self-explanatory" as possible, with a minimum of descriptive text surrounding them. If certain details of the COMPTEL instrument model, represented in the IDT dataset, are still unclear after reading, let me know (`stacy@unh.edu`) which points still need amplification, and I will consider drafting a more detailed version of this document (at some future date TBD).

4 List of Volume Names by IDT Volume Number

1 = SETU: The "setup" dummy volume ("The Mother of All Volumes") filled with either vacuum or air, for simulation of either the in-flight or calibration response of the instrument,

2 = DET1: The dummy volume for the upper detector assembly (vacuum or air),

3 = D1PT: The D1 platform,

4 = D1PH: The D1 platform holes below the D1 detector modules (vacuum or air),

5 = D1MD: The dummy volume for a D1 module (vacuum or air),

6 = D1SN: The D1 scintillator material (NE 213A),

7 = D1TP: The top of the D1 module housing,

8 = D1BT: The bottom of the D1 module housing,

9 = D1SD: The side of the D1 module housing,

10 = D1RS: The volume for a D1 reservoir,

11 = D1PM: The volume for a D1 PMT,

12 = DET2: The dummy volume for the lower detector assembly (vacuum or air),

13 = D2PT: The D2 platform,

14 = D2MD: The dummy volume for a D2 module (vacuum or air),

15 = D2SN: The D2 scintillator material (NaI),

16 = D2TP: The top of the D2 module housing,

17 = D2BT: The bottom of the D2 module housing,

18 = D2SD: The side of the D2 module housing,

19 = D2PM: The volume for a D2 PMT,

20 = STRC: The outer structure of the instrument,

21 = V1SD: The side of the V1 anticoincidence dome,

22 = V1TP: The top of the V1 anticoincidence dome,

23 = V2SD: The side of the V2 anticoincidence dome,

24 = V2TP: The top of the V2 anticoincidence dome,

25 = V3SD: The side of the V3 anticoincidence dome,

26 = V3TP: The top of the V3 anticoincidence dome,

27 = V4SD: The side of the V4 anticoincidence dome,

28 = V4TP: The top of the V4 anticoincidence dome,

- `29 = DBCK`: The dummy volume for the D1 backscatter detector (calibration runs only),
- `30 = DBDT`: The scintillator material in the D1 backscatter detector (NaI),
- `31 = MGOB`: The magnesium oxide coating on the bottom of the housing of the D1 backscatter detector,
- `32 = MGOS`: The magnesium oxide coating on the side of the housing of the D1 backscatter detector,
- `33 = CANB`: The bottom of the housing of the D1 backscatter detector
- `34 = CANS`: The side of the housing of the D1 backscatter detector
- `35 = D2RG`: The "D2 Ring," a conical ring of material just below the D2 platform and surrounding the D2 modules which contains miscellaneous structural material not otherwise accounted for in the D2 detector assembly.

5 The Geometry Tree

The following diagram illustrates the structure of the geometry tree used by GEANT in tracking photons and particles through the instrument model, and the "nesting" of the volumes defined within an IDT dataset. Refer to the previous section for a brief description of each volume.

```
                                           COMPTEL SIM MASS MODEL -- GEOMETRY TREE

LEVEL 1:                                                     SETU
                                                    ("THE MOTHER OF ALL VOLUMES")
                                                              |
                                                              |
                           ___________________________________|______________________________________________
                          |                      |                                  |                          |
                          v                      v                                  v                          v
LEVEL 2:                DBCK                   DET1                               DET2                       STRC
(DAUGHTER VOLUMES)        |                      |                                  |                        V1SD
                          |                      |                                  |                        V1TP
                          |                      |                                  |                        V2SD
                          |                      |                                  |                        V2TP
                          |                      |                                  |                        V3SD
                          |                      |                                  |                        V3TP
                          |                      |                                  |                        V4SD
                          |                      |                                  |                        V4TP
                          |                      |                                  |
                          |             _________|__________                ________|______
                          |            |         |          |              |        |      |
                          v            v         v          v              v        v      v
LEVEL 3:                DBDT         D1MD(x7)  D1PT       D1RS(x7)       D2MD(x14) D2PT   D2RG
(GRANDDAUGHTER          MGOB           |         |                         |
 VOLUMES)               MGOS           |         |                         |
                        CANB           |         |                         |
                        CANS           |         |                         |
                                       |         |                         |
                                       v         v                         v
LEVEL 4:                             D1SN      D1PH(x7)                  D2SN
(GREAT-GRANDDAUGHTER                 D1TP                                D2TP
 VOLUMES)                            D1BT                                D2BT
                                     D1SD                                D2SD
                                     D1PM(x8)                            D2PM(x7)
```

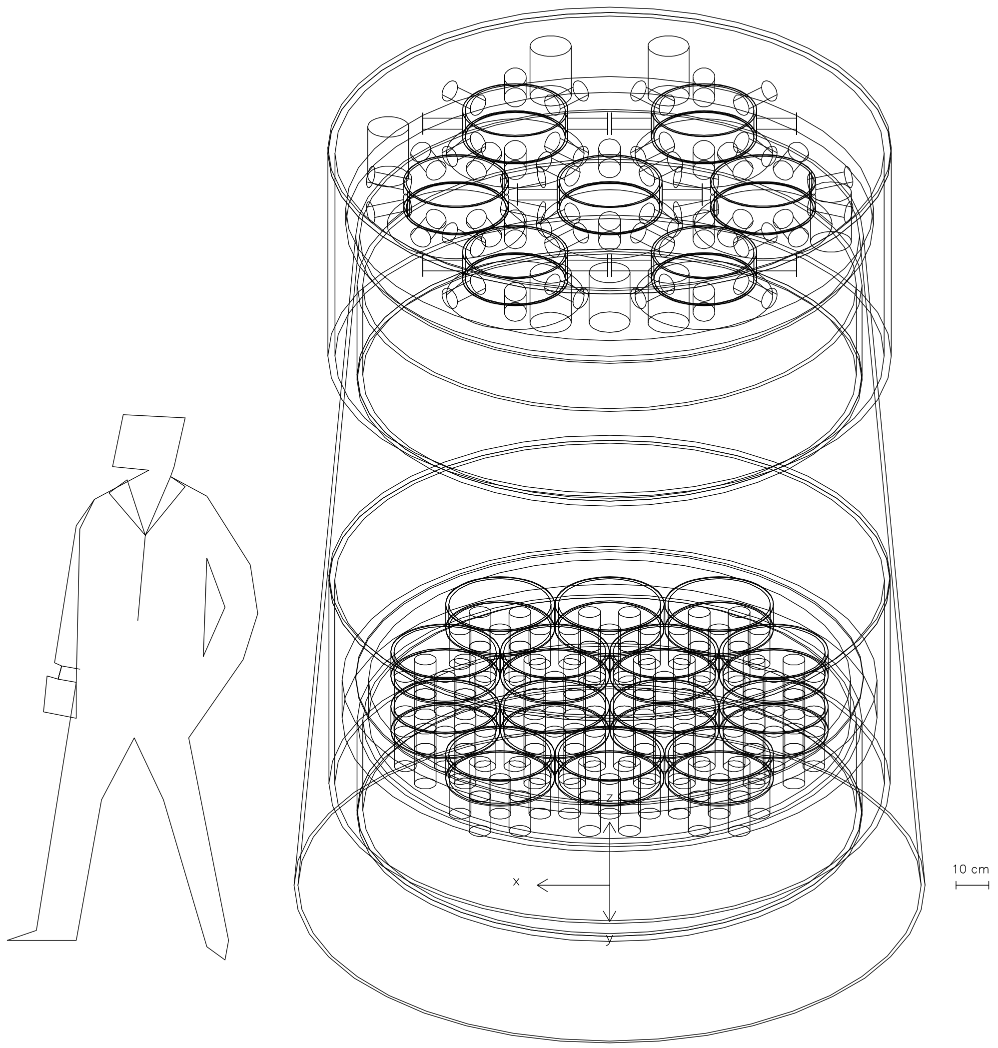
6 Figures

The following sets of figures and diagrams illustrate the various components of the COMPTEL instrument model defined by an IDT dataset and used in COMPASS SIM processing.

[Author's Note: For the diagrams of section 6.3.2, a choice of human figure (to provide a reference scale to the diagram) is *not* available to the user of version 3.15 of GEANT. If desired, comments on this point can be directed to `cernlib@cernvm.cern.ch`. We also note that in the new version 3.21 of GEANT there are apparently *three* (?!) female figures to choose from when illustrating a diagram, and only a single male figure.]

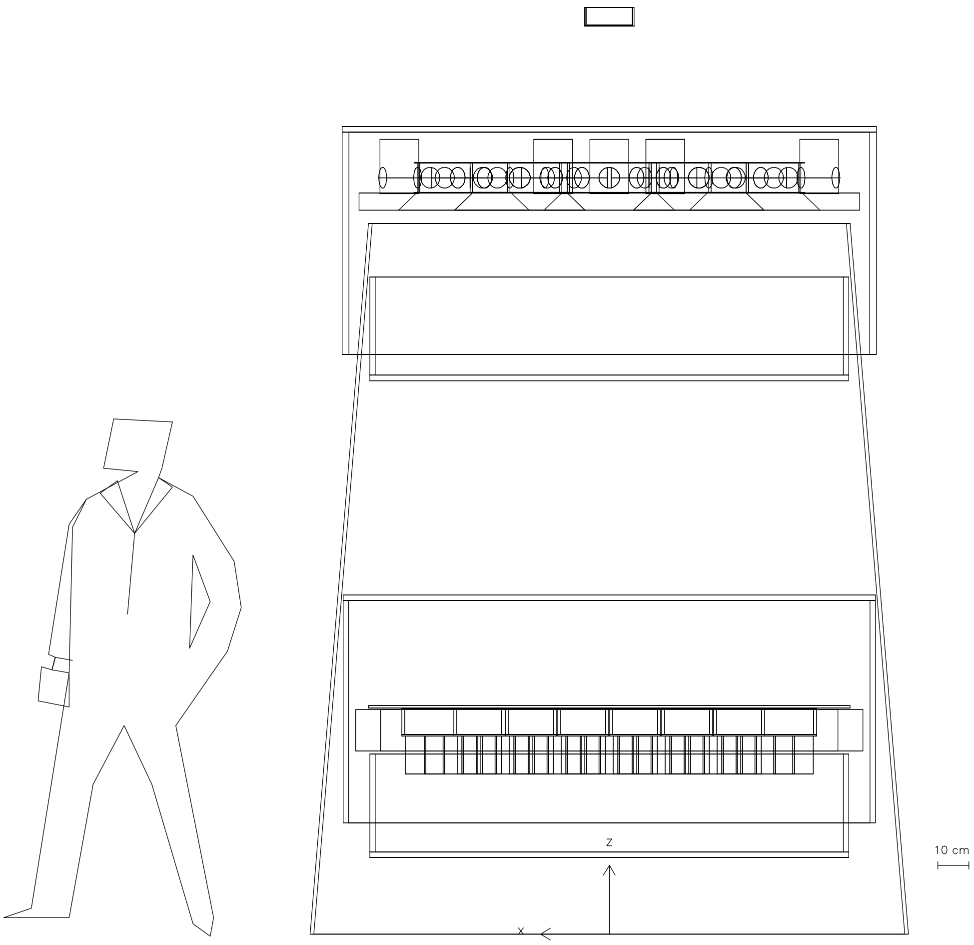
6.1 Full Instrument Views

6.1.1 "Three-dimensional" View (without DBCK)



COMPTEL SIM MODEL 3D VIEW

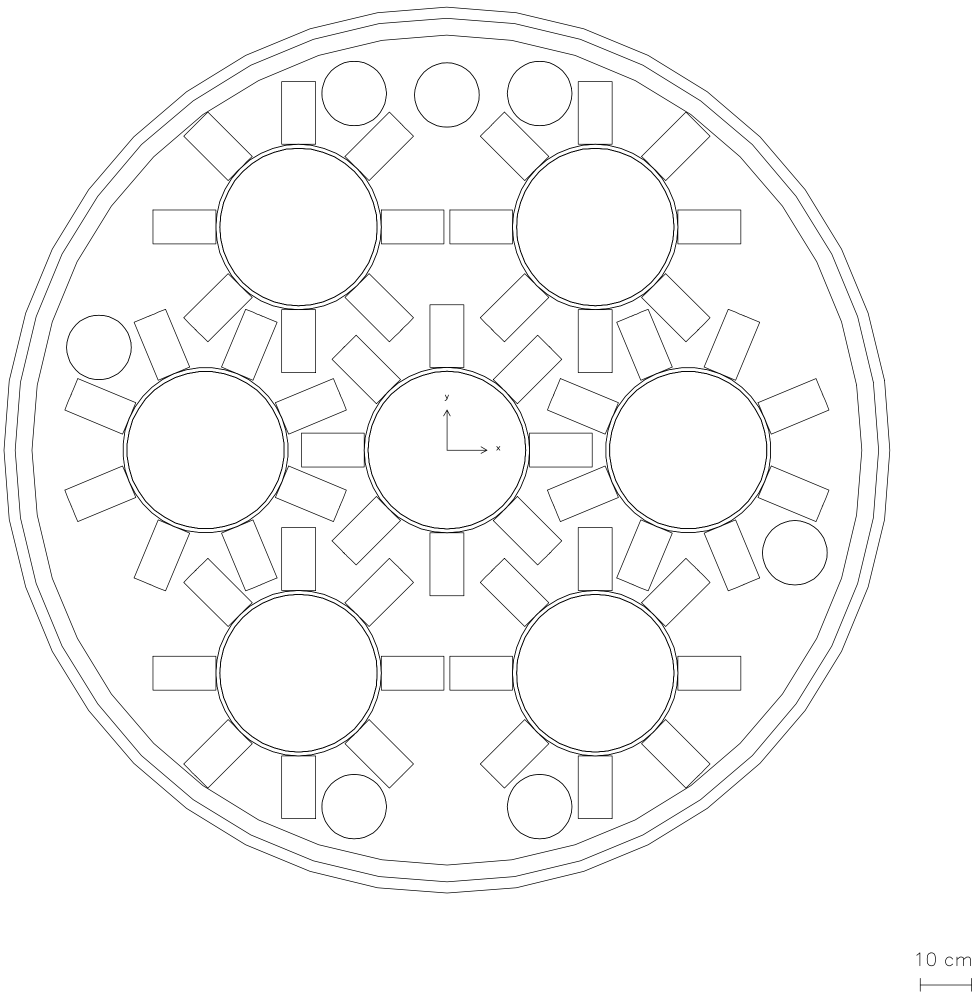
6.1.2 View of a Cut through the X-Z Plane



COMPTEL SIM MODEL X–Z VIEW

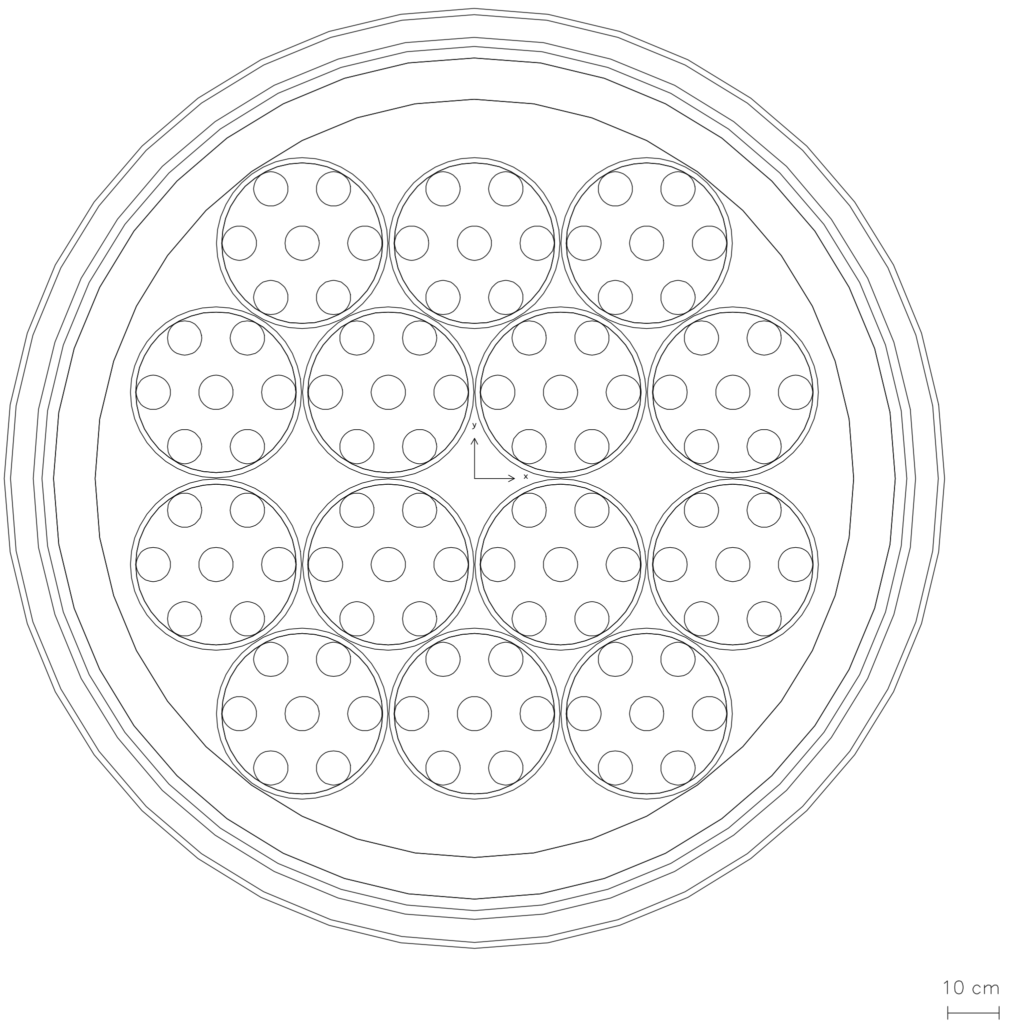
6.2 Cuts through the Detector Planes

6.2.1 The Upper Detector Assembly



COMPTEL SIM MODEL UPPER DETECTOR

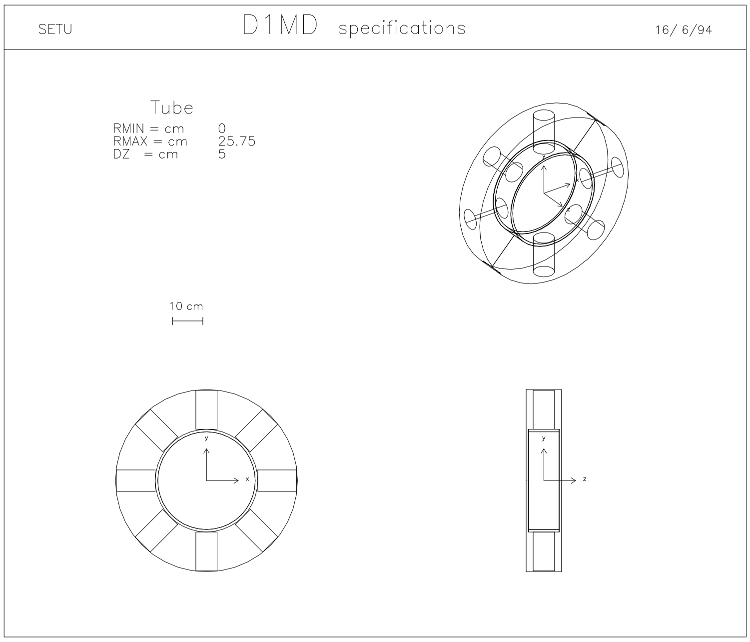
6.2.2 The Lower Detector Assembly

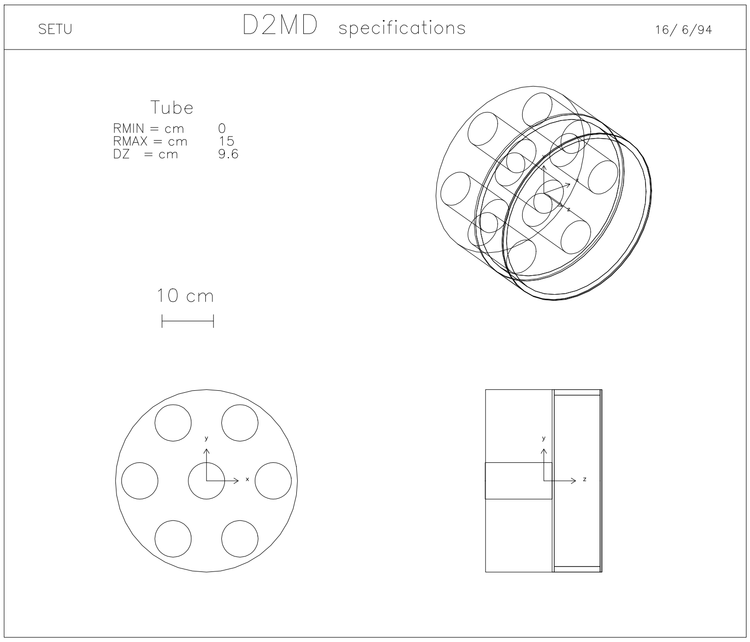


COMPTEL SIM MODEL LOWER DETECTOR

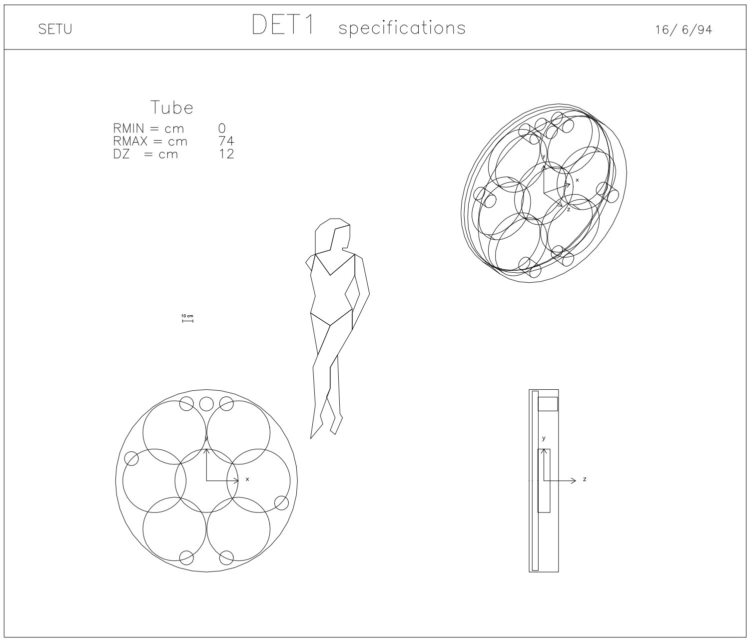
6.3 Module and Detector Specifications and Views

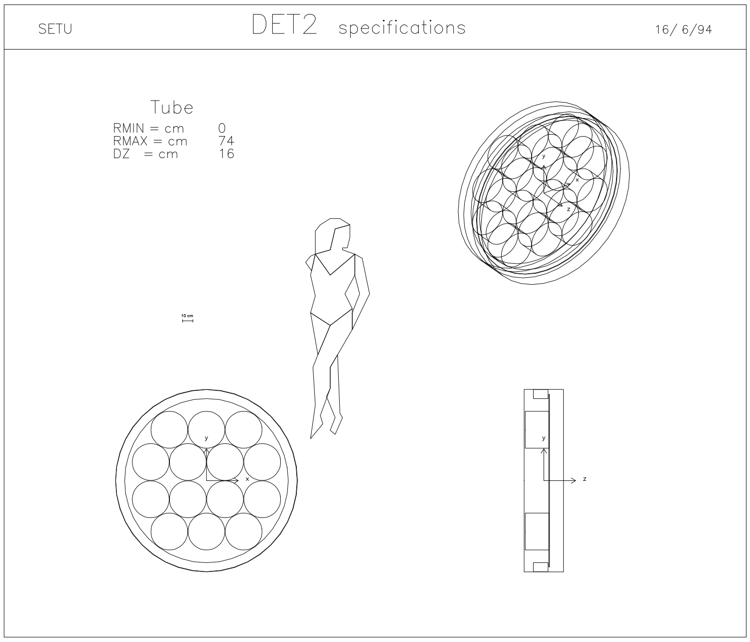
6.3.1 The D1 and D2 Modules





6.3.2 The Upper and Lower Detector Assemblies





7 Summary Tables

The following tables provide summary information describing the various volume elements which make up the COMPTEL instrument model, as defined in an IDT dataset. All were produced "automatically" by execution of the program `idtchk`, written by the author of this document. The non-COMPASS task `idtchk`, linked to the GEANT libraries, reads in a selected IDT dataset, fills the GEANT geometry and material databanks with the model information (as in a normal COMPASS SIM-processing job), and prints out summary information in tabular form. This program also provides an interface to the GEANT Draw routines to produce figures of the instrument model.

Tables 1 and 2 ("Volume Materials and Mixtures" and "Volume Rotation Matrices") are produced by "standard" GEANT output routines available to the user. The remaining tables were produced as "special" summary tables within `idtchk`.

7.1 Table 1: Volume Materials and Mixtures

PAGE 1 OF 2 :

MATERIALS

MATERIAL	A	Z	DENSITY	RADIAT L	ABSORP L	NMIXT	ELEMENT			
1 VACUUM	0.000	0.000	0.000	0.100E+17	0.100E+17	1				
2 ALUMINIUM	26.980	13.000	2.700	0.890E+01	0.372E+02	1				
3 LIQ NE213A	10.940	5.513	0.889	0.491E+02	0.102E+03	2	A	Z	W	
							1.01	1.00	0.097	H
							12.01	6.00	0.903	C
4 NaI(Tl)	110.967	46.558	3.670	0.259E+01	0.469E+02	2	A	Z	W	
							22.99	11.00	0.153	Na
							126.90	53.00	0.847	I
5 STRUCTURE	28.272	13.447	2.210	0.107E+02	0.535E+02	9	A	Z	W	
							1.01	1.00	0.018	H
							12.00	6.00	0.129	C
							16.00	8.00	0.030	O
							26.98	13.00	0.726	Al
							28.09	14.00	0.007	Si
							55.85	26.00	0.004	Fe
							63.55	29.00	0.079	Cu
							118.69	50.00	0.004	Sn
							207.19	82.00	0.004	Pb
6 V1 DOME	11.135	5.609	1.070	0.404E+02	0.855E+02	3	A	Z	W	
							1.01	1.00	0.085	H
							12.00	6.00	0.898	C
							16.00	8.00	0.017	O
7 V2 DOME	10.978	5.530	1.070	0.407E+02	0.847E+02	2	A	Z	W	
							1.01	1.00	0.094	H
							12.01	6.00	0.906	C
8 V3 DOME	11.033	5.555	1.070	0.407E+02	0.851E+02	2	A	Z	W	
							1.01	1.00	0.089	H
							12.01	6.00	0.911	C
9 V4 DOME	10.978	5.530	1.070	0.407E+02	0.847E+02	2	A	Z	W	
							1.01	1.00	0.094	H
							12.01	6.00	0.906	C
10 D1 PLATFORM	32.742	15.305	1.270	0.171E+02	0.972E+02	6	A	Z	W	
							1.01	1.00	0.008	H
							12.01	6.00	0.054	C
							26.98	13.00	0.830	Al
							63.55	29.00	0.079	Cu
							118.69	50.00	0.014	Sn
							207.19	82.00	0.014	Pb
11 D1 RESERVOIR	24.105	11.657	1.470	0.177E+02	0.787E+02	3	A	Z	W	
							1.01	1.00	0.017	H
							12.01	6.00	0.163	C
							26.98	13.00	0.820	Al
12 D1 SIDE HOUS	25.205	12.269	5.850	0.425E+01	0.205E+02	3	A	Z	W	
							16.00	8.00	0.177	O
							26.98	13.00	0.667	Al
							28.09	14.00	0.155	Si

```
PAGE 2 OF 2 :
===================================================       MATERIALS      ==================================================
MATERIAL                                  A          Z      DENSITY  RADIAT L  ABSORP L NMIXT                         ELEMENT

      13 D1 PMT MIXT                 38.548     17.938      1.470 0.130E+02 0.836E+02  11     A      Z      W
                                                                                             1.01   1.00  0.020   H
                                                                                            12.01   6.00  0.117   C
                                                                                            16.00   8.00  0.131   O
                                                                                            26.98  13.00  0.269   Al
                                                                                            28.09  14.00  0.117   Si
                                                                                            52.00  24.00  0.003   Cr
                                                                                            55.85  26.00  0.065   Fe
                                                                                            58.71  28.00  0.098   Ni
                                                                                            63.54  29.00  0.145   Cu
                                                                                           118.69  50.00  0.018   Sn
                                                                                           207.19  82.00  0.018   Pb
      14 D2 PLATFORM                 27.082     12.981      1.429 0.169E+02 0.831E+02   5     A      Z      W
                                                                                             1.01   1.00  0.015   H
                                                                                            12.00   6.00  0.117   C
                                                                                            16.00   8.00  0.007   O
                                                                                            26.98  13.00  0.799  Al
                                                                                            63.55  29.00  0.063  Cu
      15 D2 PMT MIXT                 35.400     16.563      2.050 0.992E+01 0.575E+02  11     A      Z      W
                                                                                             1.01   1.00  0.033   H
                                                                                            12.01   6.00  0.195   C
                                                                                            16.00   8.00  0.141   O
                                                                                            26.98  13.00  0.173   Al
                                                                                            28.09  14.00  0.124   Si
                                                                                            52.00  24.00  0.002   Cr
                                                                                            55.85  26.00  0.052   Fe
                                                                                            58.71  28.00  0.059   Ni
                                                                                            63.54  29.00  0.202   Cu
                                                                                           118.69  50.00  0.010   Sn
                                                                                           207.19  82.00  0.010   Pb
      16 MgO                         21.008     10.412      2.000 0.140E+02 0.571E+02   2     A      Z      W
                                                                                            24.31  12.00  0.603   Mg
                                                                                            16.00   8.00  0.397   O
      17 D2 RING                     28.845     13.720      2.600 0.895E+01 0.474E+02   9     A      Z      W
                                                                                             1.01   1.00  0.001   H
                                                                                            12.01   6.00  0.009   C
                                                                                            16.00   8.00  0.009   O
                                                                                            26.98  13.00  0.957   Al
                                                                                            28.09  14.00  0.002   Si
                                                                                            55.85  26.00  0.002   Fe
                                                                                            63.54  29.00  0.007   Cu
                                                                                           118.69  50.00  0.004   Sn
                                                                                           207.19  82.00  0.008   Pb
      18 D2BT                        30.326     14.482      4.430 0.500E+01 0.283E+02   5     A      Z      W
                                                                                            24.31  12.00  0.027   Mg
                                                                                            26.98  13.00  0.882   Al
                                                                                            52.00  24.00  0.003   Cr
                                                                                            63.54  29.00  0.020   Cu
                                                                                            65.37  30.00  0.068   Zn
      19 D2SD                        30.326     14.482      3.970 0.558E+01 0.316E+02   5     A      Z      W
                                                                                            24.31  12.00  0.027   Mg
                                                                                            26.98  13.00  0.882   Al
                                                                                            52.00  24.00  0.003   Cr
                                                                                            63.54  29.00  0.020   Cu
                                                                                            65.37  30.00  0.068   Zn
===========================================================================================================================
```

7.2 Table 2: Volume Rotation Matrices

The relative position of a volume inside its mother is expressed in GEANT in terms of a translation vector (determined by the position information given in Table 3 in the next section) and a rotation matrix. The rotation matrix expresses the transformation from the "Mother Reference System" (MRS) to the "Daughter Reference System" (DRS). A rotation matrix is determined by giving the polar and azimuthal angles of the axes of the DRS with respect to the MRS. In the following table of rotation matrices THET1,2, and 3 are the polar angles of the x-, y-, and z-axes, respectively, of the DRS with respect to the MRS, and PHI1,2, and 3 are the azimuthal angles.

In the COMPTEL instrument model, the D1 PMTs are rotated to their proper positions surrounding the D1 module housing, and two of the D1 modules are rotated to fit in their proper positions on the D1 platform.

ROTATION MATRICES

MATRIX	<------ ROTATION MATRIX ------>									FLAG	THET1	PHI1	THET2	PHI2	THET3	PHI3
1	-0.707	0.707	0.000	0.000	0.000	1.000	0.707	0.707	0.000	363	90.00	135.00	0.00	315.00	90.00	45.00
2	0.000	1.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000	465	90.00	90.00	0.00	0.00	90.00	0.00
3	0.707	0.707	0.000	0.000	0.000	1.000	0.707	-0.707	0.000	363	90.00	45.00	0.00	225.00	90.00	315.00
4	1.000	0.000	0.000	0.000	0.000	1.000	0.000	1.000	0.000	564	90.00	0.00	0.00	0.00	90.00	90.00
5	0.924	0.383	0.000	-0.383	0.924	0.000	0.000	0.000	1.000	633	90.00	22.50	90.00	112.50	0.00	236.25

7.3 Table 3: Volume/Position Summary Table

PAGE 1 OF 3 :

========================= VOLUME/POSITION INFORMATION FOR IDT TABLE U1008.FO.IDT =========================

NOTE: IN THIS VERSION X/Y/Z MIN/MAX VALUES INVALID FOR ROTATED D1 PMTS (IROT .NE. 0)

VOLUME 1 = SETU CONTAINS 12 DAUGHTER VOLUMES POSITIONED IN THE 'DAUGHTER REFERENCE SYSTEM' AS FOLLOWS :

#	NAME	LEV	MOTHER	COPY#	IROT	X0	Y0	Z0	XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
2	DET1	2	SETU	1	0	0.000	0.000	219.750	-74.000	74.000	-74.000	74.000	207.750	231.750
12	DET2	2	SETU	1	0	0.000	0.000	61.750	-74.000	74.000	-74.000	74.000	45.750	77.750
22	V1TP	2	SETU	1	0	0.000	0.000	233.766	-77.650	77.650	-77.650	77.650	232.900	234.632
24	V2TP	2	SETU	1	0	0.000	0.000	161.570	-69.560	69.560	-69.560	69.560	160.740	162.400
26	V3TP	2	SETU	1	0	0.000	0.000	97.730	-77.350	77.350	-77.350	77.350	96.900	98.560
28	V4TP	2	SETU	1	0	0.000	0.000	23.100	-69.600	69.600	-69.600	69.600	22.300	23.900
21	V1SD	2	SETU	1	0	0.000	0.000	200.650	-77.650	77.650	-77.650	77.650	168.400	232.900
23	V2SD	2	SETU	1	0	0.000	0.000	176.650	-69.560	69.560	-69.560	69.560	162.400	190.900
25	V3SD	2	SETU	1	0	0.000	0.000	64.650	-77.350	77.350	-77.350	77.350	32.400	96.900
27	V4SD	2	SETU	1	0	0.000	0.000	38.150	-69.600	69.600	-69.600	69.600	23.900	52.400
20	STRC	2	SETU	1	0	0.000	0.000	103.250	-85.890	85.890	-85.890	85.890	16.280	190.220
29	DBCK	2	SETU	1	0	0.000	0.000	266.570	-10.000	10.000	-10.000	10.000	256.570	276.570

VOLUME 2 = DET1 CONTAINS 15 DAUGHTER VOLUMES POSITIONED IN THE 'DAUGHTER REFERENCE SYSTEM' AS FOLLOWS :

#	NAME	LEV	MOTHER	COPY#	IROT	X0	Y0	Z0	XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
5	D1MD	3	DET1	1	0	0.000	0.000	0.000	-25.750	25.750	-25.750	25.750	-5.000	5.000
5	D1MD	3	DET1	2	5	-42.300	0.000	0.000	-68.050	-16.550	-25.750	25.750	-5.000	5.000
5	D1MD	3	DET1	3	0	-26.000	39.100	0.000	-51.750	-0.250	13.350	64.850	-5.000	5.000
5	D1MD	3	DET1	4	0	26.000	39.100	0.000	0.250	51.750	13.350	64.850	-5.000	5.000
5	D1MD	3	DET1	5	5	42.300	0.000	0.000	16.550	68.050	-25.750	25.750	-5.000	5.000
5	D1MD	3	DET1	6	0	26.000	-39.100	0.000	0.250	51.750	-64.850	-13.350	-5.000	5.000
5	D1MD	3	DET1	7	0	-26.000	-39.100	0.000	-51.750	-0.250	-64.850	-13.350	-5.000	5.000
3	D1PT	3	DET1	1	0	0.000	0.000	-6.929	-72.725	72.725	-72.725	72.725	-9.429	-4.429
10	D1RS	3	DET1	1	0	0.000	62.250	3.280	-5.650	5.650	56.600	67.900	-4.620	11.180
10	D1RS	3	DET1	2	0	16.250	62.500	3.280	10.600	21.900	56.850	68.150	-4.620	11.180
10	D1RS	3	DET1	3	0	-16.250	62.500	3.280	-21.900	-10.600	56.850	68.150	-4.620	11.180
10	D1RS	3	DET1	4	0	16.250	-62.500	3.280	10.600	21.900	-68.150	-56.850	-4.620	11.180
10	D1RS	3	DET1	5	0	-16.250	-62.500	3.280	-21.900	-10.600	-68.150	-56.850	-4.620	11.180
10	D1RS	3	DET1	6	0	61.000	-18.000	3.280	55.350	66.650	-23.650	-12.350	-4.620	11.180
10	D1RS	3	DET1	7	0	-61.000	18.000	3.280	-66.650	-55.350	12.350	23.650	-4.620	11.180

VOLUME 3 = D1PT CONTAINS 7 DAUGHTER VOLUMES POSITIONED IN THE 'DAUGHTER REFERENCE SYSTEM' AS FOLLOWS :

#	NAME	LEV	MOTHER	COPY#	IROT	X0	Y0	Z0	XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
4	D1PH	4	D1PT	1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-19.000	19.000
4	D1PH	4	D1PT	2	0	-42.300	0.000	0.000	-42.300	-42.300	0.000	0.000	-19.000	19.000
4	D1PH	4	D1PT	3	0	-26.000	39.100	0.000	-26.000	-26.000	39.100	39.100	-19.000	19.000
4	D1PH	4	D1PT	4	0	26.000	39.100	0.000	26.000	26.000	39.100	39.100	-19.000	19.000
4	D1PH	4	D1PT	5	0	42.300	0.000	0.000	42.300	42.300	0.000	0.000	-19.000	19.000
4	D1PH	4	D1PT	6	0	26.000	-39.100	0.000	26.000	26.000	-39.100	-39.100	-19.000	19.000
4	D1PH	4	D1PT	7	0	-26.000	-39.100	0.000	-26.000	-26.000	-39.100	-39.100	-19.000	19.000

VOLUME 4 = D1PH CONTAINS 0 DAUGHTER VOLUMES

PAGE 2 OF 3 :

========================= VOLUME/POSITION INFORMATION FOR IDT TABLE U1008.FO.IDT =========================

NOTE: IN THIS VERSION X/Y/Z MIN/MAX VALUES INVALID FOR ROTATED D1 PMTS (IROT .NE. 0)

VOLUME 5 = D1MD CONTAINS 12 DAUGHTER VOLUMES POSITIONED IN THE 'DAUGHTER REFERENCE SYSTEM' AS FOLLOWS :

#	NAME	LEV	MOTHER	COPY#	IROT	X0	Y0	Z0	XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
6	D1SN	4	D1MD	1	0	0.000	0.000	0.000	-13.800	13.800	-13.800	13.800	-4.250	4.250
7	D1TP	4	D1MD	1	0	0.000	0.000	4.323	-14.500	14.500	-14.500	14.500	4.250	4.397
8	D1BT	4	D1MD	1	0	0.000	0.000	-4.339	-14.500	14.500	-14.500	14.500	-4.429	-4.250
9	D1SD	4	D1MD	1	0	0.000	0.000	0.000	-14.500	14.500	-14.500	14.500	-4.250	4.250
11	D1PM	4	D1MD	1	1	14.142	14.142	0.000	11.142	17.142	11.142	17.142	-5.500	5.500
11	D1PM	4	D1MD	2	2	20.000	0.000	0.000	17.000	23.000	-3.000	3.000	-5.500	5.500
11	D1PM	4	D1MD	3	3	14.142	-14.142	0.000	11.142	17.142	-17.142	-11.142	-5.500	5.500
11	D1PM	4	D1MD	4	4	0.000	-20.000	0.000	-3.000	3.000	-23.000	-17.000	-5.500	5.500
11	D1PM	4	D1MD	5	1	-14.142	-14.142	0.000	-17.142	-11.142	-17.142	-11.142	-5.500	5.500
11	D1PM	4	D1MD	6	2	-20.000	0.000	0.000	-23.000	-17.000	-3.000	3.000	-5.500	5.500
11	D1PM	4	D1MD	7	3	-14.142	14.142	0.000	-17.142	-11.142	11.142	17.142	-5.500	5.500
11	D1PM	4	D1MD	8	4	0.000	20.000	0.000	-3.000	3.000	17.000	23.000	-5.500	5.500

VOLUME 6 = D1SN CONTAINS 0 DAUGHTER VOLUMES
VOLUME 7 = D1TP CONTAINS 0 DAUGHTER VOLUMES
VOLUME 8 = D1BT CONTAINS 0 DAUGHTER VOLUMES
VOLUME 9 = D1SD CONTAINS 0 DAUGHTER VOLUMES
VOLUME 10 = D1RS CONTAINS 0 DAUGHTER VOLUMES
VOLUME 11 = D1PM CONTAINS 0 DAUGHTER VOLUMES

VOLUME 12 = DET2 CONTAINS 16 DAUGHTER VOLUMES POSITIONED IN THE 'DAUGHTER REFERENCE SYSTEM' AS FOLLOWS :

#	NAME	LEV	MOTHER	COPY#	IROT	X0	Y0	Z0	XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
14	D2MD	3	DET2	1	0	30.200	-41.254	-5.500	15.200	45.200	-56.254	-26.254	-15.100	4.100
14	D2MD	3	DET2	2	0	0.000	-41.254	-5.500	-15.000	15.000	-56.254	-26.254	-15.100	4.100
14	D2MD	3	DET2	3	0	-30.200	-41.254	-5.500	-45.200	-15.200	-56.254	-26.254	-15.100	4.100
14	D2MD	3	DET2	4	0	45.300	-15.100	-5.500	30.300	60.300	-30.100	-0.100	-15.100	4.100
14	D2MD	3	DET2	5	0	15.100	-15.100	-5.500	0.100	30.100	-30.100	-0.100	-15.100	4.100
14	D2MD	3	DET2	6	0	-15.100	-15.100	-5.500	-30.100	-0.100	-30.100	-0.100	-15.100	4.100
14	D2MD	3	DET2	7	0	-45.300	-15.100	-5.500	-60.300	-30.300	-30.100	-0.100	-15.100	4.100
14	D2MD	3	DET2	8	0	45.300	15.100	-5.500	30.300	60.300	0.100	30.100	-15.100	4.100
14	D2MD	3	DET2	9	0	15.100	15.100	-5.500	0.100	30.100	0.100	30.100	-15.100	4.100
14	D2MD	3	DET2	10	0	-15.100	15.100	-5.500	-30.100	-0.100	0.100	30.100	-15.100	4.100
14	D2MD	3	DET2	11	0	-45.300	15.100	-5.500	-60.300	-30.300	0.100	30.100	-15.100	4.100
14	D2MD	3	DET2	12	0	30.200	41.254	-5.500	15.200	45.200	26.254	56.254	-15.100	4.100
14	D2MD	3	DET2	13	0	0.000	41.254	-5.500	-15.000	15.000	26.254	56.254	-15.100	4.100
14	D2MD	3	DET2	14	0	-30.200	41.254	-5.500	-45.200	-15.200	26.254	56.254	-15.100	4.100
13	D2PT	3	DET2	1	0	0.000	0.000	4.317	-70.000	70.000	-70.000	70.000	3.997	4.637
35	D2RG	3	DET2	1	0	0.000	0.000	-2.500	-73.750	73.750	-73.750	73.750	-8.500	3.500

VOLUME 13 = D2PT CONTAINS 0 DAUGHTER VOLUMES

PAGE 3 OF 3:

========================= VOLUME/POSITION INFORMATION FOR IDT TABLE U1008.FO.IDT ==========================

NOTE: IN THIS VERSION X/Y/Z MIN/MAX VALUES INVALID FOR ROTATED D1 PMTS (IROT .NE. 0)

VOLUME 14 = D2MD CONTAINS 11 DAUGHTER VOLUMES POSITIONED IN THE 'DAUGHTER REFERENCE SYSTEM' AS FOLLOWS :

#	NAME	LEV	MOTHER	COPY#	IROT	X0	Y0	Z0	XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
15	D2SN	4	D2MD	1	0	0.000	0.000	5.500	-14.085	14.085	-14.085	14.085	1.737	9.262
16	D2TP	4	D2MD	1	0	0.000	0.000	9.380	-15.000	15.000	-15.000	15.000	9.263	9.497
17	D2BT	4	D2MD	1	0	0.000	0.000	1.543	-15.000	15.000	-15.000	15.000	1.348	1.737
18	D2SD	4	D2MD	1	0	0.000	0.000	5.500	-15.000	15.000	-15.000	15.000	1.737	9.262
19	D2PM	4	D2MD	1	0	0.000	0.000	-4.153	-3.000	3.000	-3.000	3.000	-9.653	1.347
19	D2PM	4	D2MD	2	0	11.000	0.000	-4.153	8.000	14.000	-3.000	3.000	-9.653	1.347
19	D2PM	4	D2MD	3	0	-11.000	0.000	-4.153	-14.000	-8.000	-3.000	3.000	-9.653	1.347
19	D2PM	4	D2MD	4	0	5.500	9.526	-4.153	2.500	8.500	6.526	12.526	-9.653	1.347
19	D2PM	4	D2MD	5	0	-5.500	9.526	-4.153	-8.500	-2.500	6.526	12.526	-9.653	1.347
19	D2PM	4	D2MD	6	0	-5.500	-9.526	-4.153	-8.500	-2.500	-12.526	-6.526	-9.653	1.347
19	D2PM	4	D2MD	7	0	5.500	-9.526	-4.153	2.500	8.500	-12.526	-6.526	-9.653	1.347

VOLUME 15 = D2SN CONTAINS 0 DAUGHTER VOLUMES
VOLUME 16 = D2TP CONTAINS 0 DAUGHTER VOLUMES
VOLUME 17 = D2BT CONTAINS 0 DAUGHTER VOLUMES
VOLUME 18 = D2SD CONTAINS 0 DAUGHTER VOLUMES
VOLUME 19 = D2PM CONTAINS 0 DAUGHTER VOLUMES
VOLUME 20 = STRC CONTAINS 0 DAUGHTER VOLUMES
VOLUME 21 = V1SD CONTAINS 0 DAUGHTER VOLUMES
VOLUME 22 = V1TP CONTAINS 0 DAUGHTER VOLUMES
VOLUME 23 = V2SD CONTAINS 0 DAUGHTER VOLUMES
VOLUME 24 = V2TP CONTAINS 0 DAUGHTER VOLUMES
VOLUME 25 = V3SD CONTAINS 0 DAUGHTER VOLUMES
VOLUME 26 = V3TP CONTAINS 0 DAUGHTER VOLUMES
VOLUME 27 = V4SD CONTAINS 0 DAUGHTER VOLUMES
VOLUME 28 = V4TP CONTAINS 0 DAUGHTER VOLUMES

VOLUME 29 = DBCK CONTAINS 5 DAUGHTER VOLUMES POSITIONED IN THE 'DAUGHTER REFERENCE SYSTEM' AS FOLLOWS :

#	NAME	LEV	MOTHER	COPY#	IROT	X0	Y0	Z0	XMIN	XMAX	YMIN	YMAX	ZMIN	ZMAX
30	DBDT	3	DBCK	1	0	0.000	0.000	0.000	-6.675	6.675	-6.675	6.675	-2.540	2.540
31	MGOB	3	DBCK	1	0	0.000	0.000	-2.619	-6.830	6.830	-6.830	6.830	-2.698	-2.540
32	MGOS	3	DBCK	1	0	0.000	0.000	0.000	-6.830	6.830	-6.830	6.830	-2.540	2.540
33	CANB	3	DBCK	1	0	0.000	0.000	-2.758	-7.240	7.240	-7.240	7.240	-2.818	-2.698
34	CANS	3	DBCK	1	0	0.000	0.000	-0.080	-7.240	7.240	-7.240	7.240	-2.699	2.539

VOLUME 30 = DBDT CONTAINS 0 DAUGHTER VOLUMES
VOLUME 31 = MGOB CONTAINS 0 DAUGHTER VOLUMES
VOLUME 32 = MGOS CONTAINS 0 DAUGHTER VOLUMES
VOLUME 33 = CANB CONTAINS 0 DAUGHTER VOLUMES
VOLUME 34 = CANS CONTAINS 0 DAUGHTER VOLUMES
VOLUME 35 = D2RG CONTAINS 0 DAUGHTER VOLUMES

7.4 Table 4: Volume/Mass Summary Table

VOLUME/MASS SPECIFICATIONS FOR TABLE U1008.FO.IDT

VOLUME	MATERIAL	DENSITY (G/CM3)	RMIN Z1/2	RMAX RMN@LOZ	Z1/2 RMX@LOZ (CM)	RMN@HIZ	RMX@HIZ	UNIT VOL (CM3)	UNIT MASS (KG)	#	TOTAL MASS (KG)
			----- VOLUME PARAMETERS (TUBE&CONE) ------								
1 SETU TUBE	1 VACUUM	0.0000	0.0000	300.0000	500.0000	0.0000	0.0000	2.8274E+08	0.0000	1	0.0000
2 DET1 TUBE	1 VACUUM	0.0000	0.0000	74.0000	12.0000	0.0000	0.0000	4.1288E+05	0.0000	1	0.0000
3 D1PT TUBE	10 D1 PLATFORM	1.2700	0.0000	72.7250	2.5000	0.0000	0.0000	8.3078E+04	105.5094	1	105.5094
4 D1PH CONE	1 VACUUM	0.0000	2.5000	0.0000	19.0000	0.0000	13.8000	4.2602E+03	-5.4105	7	-37.8733
5 D1MD TUBE	1 VACUUM	0.0000	0.0000	25.7500	5.0000	0.0000	0.0000	2.0831E+04	0.0000	7	0.0000
6 D1SN TUBE	3 LIQ NE213A	0.8890	0.0000	13.8000	4.2500	0.0000	0.0000	5.0854E+03	4.5209	7	31.6466
7 D1TP TUBE	2 ALUMINIUM	2.7000	0.0000	14.5000	0.0733	0.0000	0.0000	9.6872E+01	0.2616	7	1.8309
8 D1BT TUBE	2 ALUMINIUM	2.7000	0.0000	14.5000	0.0892	0.0000	0.0000	1.1790E+02	0.3183	7	2.2284
9 D1SD TUBE	12 D1 SIDE HOUS	5.8500	13.8000	14.5000	4.2500	0.0000	0.0000	5.2900E+02	3.0946	7	21.6624
10 D1RS TUBE	11 D1 RESERVOIR	1.4705	0.0000	5.6500	7.9000	0.0000	0.0000	1.5845E+03	2.3301	7	16.3105
11 D1PM TUBE	13 D1 PMT MIXT	1.4700	0.0000	3.0000	5.5000	0.0000	0.0000	3.1102E+02	0.4572	56	25.6030
12 DET2 TUBE	1 VACUUM	0.0000	0.0000	74.0000	16.0000	0.0000	0.0000	5.5051E+05	0.0000	1	0.0000
13 D2PT TUBE	14 D2 PLATFORM	1.4290	0.0000	70.0000	0.3200	0.0000	0.0000	9.8520E+03	14.0786	1	14.0786
14 D2MD TUBE	1 VACUUM	0.0000	0.0000	15.0000	9.6000	0.0000	0.0000	1.3572E+04	0.0000	14	0.0000
15 D2SN TUBE	4 NaI(Tl)	3.6700	0.0000	14.0850	3.7625	0.0000	0.0000	4.6900E+03	17.2122	14	240.9707
16 D2TP TUBE	2 ALUMINIUM	2.7000	0.0000	15.0000	0.1170	0.0000	0.0000	1.6540E+02	0.4466	14	6.2523
17 D2BT TUBE	18 D2BT	4.4300	0.0000	15.0000	0.1950	0.0000	0.0000	2.7567E+02	1.2212	14	17.0973
18 D2SD TUBE	19 D2SD	3.9700	14.0850	15.0000	3.7625	0.0000	0.0000	6.2914E+02	2.4977	14	34.9676
19 D2PM TUBE	15 D2 PMT MIXT	2.0500	0.0000	3.0000	5.5000	0.0000	0.0000	3.1102E+02	0.6376	98	62.4835
20 STRC CONE	5 STRUCTURE	2.2100	103.2500	85.8900	86.9700	68.8900	69.9700	1.0920E+05	241.3352	1	241.3352
21 V1SD TUBE	6 V1 DOME	1.0700	75.7000	77.6500	32.2500	0.0000	0.0000	6.0594E+04	64.8354	1	64.8354
22 V1TP TUBE	6 V1 DOME	1.0700	0.0000	77.6500	0.8659	0.0000	0.0000	3.2804E+04	35.1002	1	35.1002
23 V2SD TUBE	7 V2 DOME	1.0700	68.0400	69.5600	14.2500	0.0000	0.0000	1.8726E+04	20.0373	1	20.0373
24 V2TP TUBE	7 V2 DOME	1.0700	0.0000	69.5600	0.8300	0.0000	0.0000	2.5233E+04	26.9998	1	26.9998
25 V3SD TUBE	8 V3 DOME	1.0700	75.7700	77.3500	32.2500	0.0000	0.0000	4.9023E+04	52.4546	1	52.4546
26 V3TP TUBE	8 V3 DOME	1.0700	0.0000	77.3500	0.8300	0.0000	0.0000	3.1202E+04	33.3858	1	33.3858
27 V4SD TUBE	9 V4 DOME	1.0700	68.0000	69.6000	14.2500	0.0000	0.0000	1.9712E+04	21.0919	1	21.0919
28 V4TP TUBE	9 V4 DOME	1.0700	0.0000	69.6000	0.8000	0.0000	0.0000	2.4349E+04	26.0539	1	26.0539
29 DBCK TUBE	1 VACUUM	0.0000	0.0000	10.0000	10.0000	0.0000	0.0000	6.2832E+03	0.0000	1	0.0000
30 DBDT TUBE	4 NaI(Tl)	3.6700	0.0000	6.6750	2.5400	0.0000	0.0000	7.1108E+02	2.6096	1	2.6096
31 MGOB TUBE	16 MgO	2.0000	0.0000	6.8300	0.0790	0.0000	0.0000	2.3155E+01	0.0463	1	0.0463
32 MGOS TUBE	16 MgO	2.0000	6.6750	6.8300	2.5400	0.0000	0.0000	3.3407E+01	0.0668	1	0.0668
33 CANB TUBE	2 ALUMINIUM	2.7000	0.0000	7.2400	0.0600	0.0000	0.0000	1.9761E+01	0.0534	1	0.0534
34 CANS TUBE	2 ALUMINIUM	2.7000	6.8300	7.2400	2.6190	0.0000	0.0000	9.4928E+01	0.2563	1	0.2563
35 D2RG TUBE	17 D2 RING	2.6000	66.5000	73.7500	6.0000	0.0000	0.0000	3.8333E+04	99.6656	1	99.6656

7.5 Table 5: Mass above D1 and between D1 and D2

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============================================================
======= MASS ABOVE D1 (G/CM2) FOR TABLE U1008.FO.IDT =======

                           SIM         MBB        SIM-MBB
============================================================


V1 TOP             :      1.8530      1.8530      0.0000
D1 HOUSING TOP     :      0.3960      0.3960      0.0000

TOTAL              :      2.2490      2.2490      0.0000
============================================================


============================================================
== MASS BETWEEN D1 AND D2 (G/CM2) FOR TABLE U1008.FO.IDT ===

                           SIM         MBB        SIM-MBB
============================================================

D1 HOUSING BOTTOM :       0.4819      0.4820     -0.0001
V2 TOP             :      1.7762      1.7760      0.0002
V3 TOP             :      1.7762      1.7760      0.0002
D2 PLATFORM        :      0.9146      0.9160     -0.0014
D2 HOUSING TOP     :      0.6318      0.6330     -0.0012

TOTAL              :      5.5807      5.5830     -0.0023
============================================================
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7.6 Table 6: Total Mass Summary Table

TOTAL MASS SUMMARY (KG) FOR TABLE U1008.FO.IDT

	SIM	MBB	GRO MDL	SIM-MBB	SIM-GRO MDL
SINGLE D1 MOD W/ PMTS :	11.8530	*********	*********	*********	*********
SINGLE D1 MOD W/ PMTS PLUS RESERVOIR :	14.1831	15.3000	*********	-1.1169	*********
D1 PLATFORM :	67.6361	42.6000	*********	25.0361	*********
ENTIRE D1 ASSEMBLY :	166.9178	149.7000	166.3000	17.2178	0.6178
SINGLE D2 MODULE W/ PMTS :	25.8408	28.2000	*********	-2.3592	*********
D2 PLATFORM PLUS D2 RING :	113.7442	27.0000	*********	86.7442	*********
ENTIRE D2 ASSEMBLY :	475.5155	421.8000	474.7000	53.7155	0.8155
STRUCTURE :	241.3352	238.9000	242.4000	2.4352	-1.0648
V1 DOME :	99.9356	108.2000	101.7000	-8.2644	-1.7644
V2 DOME :	47.0371	67.9000	47.0000	-20.8629	0.0371
V3 DOME :	85.8405	108.2000	85.5000	-22.3595	0.3405
V4 DOME :	47.1458	67.9000	47.0000	-20.7542	0.1458
TOTAL INSTRUMENT MASS :	1163.7274	1162.6000	1164.6000	1.1274	-0.8726

REFERENCES FOR MBB AND GRO MASS-MODEL SPECS :

Mass Estimation above and between D1 and D2 Detectors
H. Wolter, COM-TN-MBB-L31-007, 25-NOV-83

Mass Properties Summary
H. Wolter and M. Kratz, COM-TN-MBB-L31-008, 7-FEB-86

COMPTEL Requirements for the GRO Mass/Radiation Model
D. J. Morris, COM-TN-UNH-F70-050, 6-MAR-90

A Listing of U1008.FO.IDT

```
u1008p1.txt                                   1     Tue Jun 21 16:48:00 1994

INSTRUCTMENT DEFINITIONS TABLE
```

```
u1008p1.txt                                   1     Tue Jun 21 16:48:00 1994

INSTRUMENT DEFINITIONS TABLE
>>>>> ELEMENTS TABLE:>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
2                   <NM> The number of materials (following repeated NM x)
1                   <Material Number> integer
VACUUM$             <Material Name> 12 chrs end in $ VACUUM ==> FLIGHT VERS
1.E-16              <Atomic Weight> real
1.E-16              <Atomic Number> real
1.E-16              <Density> real
1.E+16              <Radiation Length> real
1.E+16              <Absorption Length> real
0.0                 <UBUF> real flag
0.0                 <NWBUF> real flag ...
2
ALUMINIUM$
26.98
13.0
2.7
8.9
37.2
0.0
0.0
>>>>> MIXTURES TABLE:
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
17                  <NN> The # of Mixtures. (Following NN x)
3                   <The Material (Mixture) Number> integer
LIQ NE213A$         <The Mixture Name> 12 chrs end in $
2                   <Number of Elements in Mixture> integer
1.00797             <Array of Component Atm. Weights> in this case H
12.0115              Carbon
1.0                 <Array of Comp. Atm. #'s> in this case H
6.0                  Carbon
0.889               <Density of Mixture (gm/cu. cm)> real
-2                  <NLMAT> integer see GEANT
1.286               <WMAT Array> see GEANT ITC Ratio of H
1.0                  to Carbon
4
NaI(Tl)$            NaI MIXTURE OF Na AND I FOR D2 SCINTILLATORS
2                   (MIXED BY RATIO OF ATOMS IN A MOLECULE)
22.98977
126.9045
11.0
53.0
3.67
-2
1.00
1.00
5
STRUCTURE$          STRUCTURE MIXTURE OF H,C,O,Al AND Cu FOR THE
9                   STRUCTURE (MIXED BY RATIO OF WEIGHTS)
1.0079
12.001
15.999
26.982
28.086
55.847
63.546
118.69
207.19
1.0
6.0
8.0
13.0
14.0
```

```
u1008p1.txt                                   2     Tue Jun 21 16:48:00 1994

26.0
29.0
50.0
82.0
2.21
9
0.0178
0.1292
0.0296
0.7258
0.0074
0.0037
0.0791
0.0037
0.0037
6
V1 DOME$            V1 DOME MATERIAL MIXTURE OF H,C AND O
3                   (MIXED BY RATIO OF WEIGHTS)
1.0079
12.001
15.999
1.0
6.0
8.0
1.07
3
.085
.898
.017
7
V2 DOME$            V2 AND V4 DOME MATERIAL MIXTURE OF H AND C
2                   (MIXED BY RATIO OF WEIGHTS)
1.0079
12.012
1.0
6.0
1.07
2
.094
.906
8
V3 DOME$            V3 DOME MATERIAL MIXTURE OF H AND C
2                   (MIXED BY RATIO OF WEIGHTS)
1.0079
12.012
1.0
6.0
1.07
2
.089
.911
9
V4 DOME$            V2 AND V4 DOME MATERIAL MIXTRE OF H AND C
2                   (MIXED BY RATIO OF WEIGHTS)
1.0079
12.012
1.0
6.0
1.07
2
.094
.906
10
```

```
u1008p1.txt                                   3     Tue Jun 21 16:48:00 1994

D1 PLATFORM MIX$         D1 MIXTURE EXCLUDING THE NE213A IN THE DETECTOR
6                        MODULES OF H,C,Al AND Cu by rel. mass
1.0079
12.011
26.982
63.546
118.69
207.19
1.00
6.00
13.0
29.0
50.0
82.0
1.27
6
0.0083
0.0538
0.8302
0.0791
0.0143
0.0143
11
D1 RESERVOIR MIX$        D1 RESERVOIR MIXTURE MADE OF AL AND NE213A
3
1.0079
12.011
26.982
1.0
6.0
13.0
1.4705
3
0.0167
0.1632
0.8201
12
D1 SIDE HOUSING$      THE MATERIAL OF THE DI CELL SIDES (Al and SiO2)
3
15.999
26.981
28.086
8.0
13.0
14.0
5.85
3
0.1773
0.6674
0.1553
13
D1 PMT MIXT$          D1 PMT MIXTURE APPROXIMATED TO BE AL AND VACUUM
11
1.008
12.011
15.999
26.982
28.086
51.996
55.847
58.710
63.540
118.69
```

```
u1008p1.txt                                   4     Tue Jun 21 16:48:00 1994

207.19
1.0
6.0
8.0
13.0
14.0
24.0
26.0
28.0
29.0
50.0
82.0
1.47
11
0.0197
0.1171
0.1310
0.2690
0.1171
0.0026
0.0648
0.0985
0.1454
0.0175
0.0175
14
D2 PLATFORM MIX$         D2 MIXTURE EXCLUDING THE NaI IN THE DETECTOR
5                        MODULES OF: H,C,O,Al and Cu.
1.0079
12.001
15.998
26.982
63.546
1.0
6.0
8.0
13.0
29.0
1.429
5
0.0146
0.1167
0.0069
0.7988
0.0630
15
D2 PMT MIXT$             D2 PMT ASSEMBLY MIXTURE
11
1.008
12.011
15.999
26.982
28.086
51.996
55.847
58.710
63.540
118.69
207.19
1.0
6.0
8.0
13.0
```

u1008p2.txt **1** **Tue Jun 21 16:48:12 1994**

```
14.0
24.0
26.0
28.0
29.0
50.0
82.0
2.05
11
0.0327
0.1948
0.1406
0.1731
0.1245
0.0016
0.0516
0.0586
0.2017
0.0104
0.0104
16
MgO$                    MGO FROM BACKSCATTER DETECTOR
2
24.305
15.9994
12.0
8.0
2.0
-2
1.0
1.0
17
D2 RING$                D2 RING AROUND D2 MODULES
9
1.008
12.011
15.999
26.982
28.086
55.847
63.540
118.690
207.190
1.0
6.0
8.0
13.0
14.0
26.0
29.0
50.0
82.0
2.60
9
0.0014
0.0085
0.0093
0.9572
0.0021
0.0021
0.0071
0.0044
0.0078
```

u1008p2.txt **2** **Tue Jun 21 16:48:12 1994**

```
18
D2BT$                   D2 HOUSING BOTTOM (MOSTLY Al)
5
24.312
26.982
51.996
63.540
65.370
12.0
13.0
24.0
29.0
30.0
4.43
5
0.027
0.882
0.003
0.020
0.068
19
D2SD$                   D2 HOUSING SIDES (MOSTLY Al)
5
24.312
26.982
51.996
63.540
65.370
12.0
13.0
24.0
29.0
30.0
3.97                jgs 18dec92
5
0.027
0.882
0.003
0.020
0.068
>>>>> TRACKING PARAMETERS TABLE:
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
19                  <NTM> The number of tracking media (following NTM x)
1                   <Tracking Medium Number> integer
VACUUM$             <Tracking Medium Name> 12 chrs. end in $
1                   <Material Number> integer
0                   <Sensitive Volume Flag> sensitive=non-zero
0                   <B Field flag> 0=no field
0.0                 <Max B Field Value (kgauss)> real
0.0                 <Max Angle due to Field (deg)> real
.1                  <Max Disp. For Scatt. in one step (cm)> real
.1                  <Max Fractional Energy Loss in 1 step> real
.01                 <Tracking Precision (cm)> real
.1                  <Min Step due to Ene. Loss or Mult. Scatt.(cm)> real
0.0                 <Array of NWBUF Additional Params>
0.0                 <NWBUF>  ...
2
ALUMINIUM$
2
0
0
0.0
0.0
```

u1008p2.txt **3** **Tue Jun 21 16:48:12 1994**

```
0.1
0.1
0.01
0.1
0.0
0.0
3
LIQ NE213A$         THE SCINTILLATOR IN DETECTOR 1 ARRAY
3
1
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
4
NaI(Tl)$            THE SCINTILLATOR IN DETECTOR 2 ARRAY
4
1
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
5
STRUCTURE$          THE MATERIAL OF THE STRUCTURAL HOUSING
5
0
0
0.0
0.0
.1
.1
.01                 jgs 18dec92
.1
0.0
0.0
6
V1 DOME$            THE MATERIAL OF THE V 1 DOME
6
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
7
V2 DOME$            THE MATERIAL OF THE V 2 & V 4 DOMES
7
0
0
```

u1008p2.txt **4** **Tue Jun 21 16:48:12 1994**

```
0.0
0.0
.1
.1
.01
.1
0.0
0.0
8
V3 DOME$            THE MATERIAL OF THE V 3 DOME
8
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
9
V4 DOME$            THE MATERIAL OF THE V 2 & V 4 DOMES
9
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
10
D1 PLATFORM$        THE MATERIAL OF THE D1 ASSEMBLY, EXCLUDING
10                  THE NE213A IN THE 7 DETECTOR MODULES
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
11
D1 RESERVOIR$       THE MATERIAL OF THE D1 RESERVOIR
11
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
12
D1 SIDE HOUSING$       THE MATERIAL OF THE D1 SIDE HOUSING
12
```

```
u1008p3.txt                                        1     Tue Jun 21 16:48:20 1994

0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
13
D1 PMT MATERIAL$      THE MATERIAL OF THE D1 PMT'S
13
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
14
D2 PLATFORM$       THE MATERIAL OF THE D2 PLATFORM MIXTURE
14
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
15
D2 PMT MATERIAL$      THE MATERIAL OF THE D2 PMT'S
15
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
16
MgO$                  MGO OF BACKSCATTER DETECTOR
16
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
17
```

```
u1008p3.txt                                        2     Tue Jun 21 16:48:20 1994

D2 RING$             D2 RING
17
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
18
D2BT$                D2 HOUSING BOTTOM
18
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
19
D2SD$                D2 HOUSING SIDE
19
0
0
0.0
0.0
.1
.1
.01
.1
0.0
0.0
>>>>> VOLUMES TABLE:
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
35                  <NV> The Number of Vols. Vol Specs repeated NV x
SETU                <Volume Name> 4 characters
TUBE                <Volume Shape> 4 Special Characters as in GEANT
1                   <Tracking Medium Number of Vol> integer
3                   <The Number of Shape Parameters>
0.0                 <Shape Params> real array ..in this case R-Min(cm)
300.0                <R-Max (cm)
500.0                <Half Length in Z-dir (cm)   ...
DET1                DETECTOR 1 ARRAY (VACUUM)
TUBE
1
3
0.0
74.0
12.0
D1PT                DETECTOR 1 PLATFORM (MIXTURE MOSTLY Al)
TUBE
10
3
0.0
72.725
2.5
D1PH                DETECTOR 1 PLATFORM HOLES UNDER MODULES (VACUUM)
```

```
u1008p3.txt                                        3     Tue Jun 21 16:48:20 1994

CONE
1
5
2.5
0.0
19.0
0.0
13.8                jgs 18dec92
D1MD                DETECTOR 1 MODULES (VACUUM)
TUBE
1
3
0.0
25.75
5.0
D1SN                DETECTOR 1 SCINTILLATOR (LIQ NE213A)
TUBE
3
3
0.0
13.8
4.25
D1TP                DETECTOR 1 CELL HOUSING TOP (ALUMINIUM)
TUBE
2
3
0.0
14.5
0.07333
D1BT                DETECTOR 1 CELL HOUSING BOTTOM (ALUMINIUM)
TUBE
2
3
0.0
14.5
0.08925
D1SD                DETECTOR 1 CELL HOUSING SIDES (AL & QUARTZ MIX)
TUBE
12
3
13.8
14.5
4.25
D1RS                DETECTOR 1 SCINTILLATOR RESERVOIR (MIXTURE Al & NE213A)
TUBE
11
3
0.0
5.65
7.90
D1PM                DETECTOR 1 PMT & HOUSINGS (MIXTURE)
TUBE
13
3
0.0
3.0
5.5
DET2                DETECTOR 2 ARRAY (VACUUM)
TUBE
1
3
0.0
74.0
```

```
u1008p3.txt                                        4     Tue Jun 21 16:48:20 1994

16.0
D2PT                DETECTOR 2 PLATFORM (MIXTURE MOSTLY Al)
TUBE
14
3
0.0
70.0
0.32
D2MD                DETECTOR 2 MODULES (VACUUM)
TUBE
1
3
0.0
15.0
9.6
D2SN                DETECTOR 2 SCINTILLATOR (NaI(Tl) MIXTURE)
TUBE
4
3
0.0
14.085
3.7625
D2TP                DETECTOR 2 CELL HOUSING TOP (ALUMINIUM)
TUBE
2
3
0.0
15.0                jgs 18dec92
0.117
D2BT                DETECTOR 2 CELL HOUSING BOTTOM (MIXTURE MOSTLY Al)
TUBE
18
3
0.0
15.0                jgs 18dec92
0.195
D2SD                DETECTOR 2 CELL HOUSING SIDES (MIXTURE MOSTLY Al)
TUBE
19
3
14.085
15.0
3.7625              jgs 18dec92
D2PM                DETECTOR 2 PMT & HOUSINGS (MIXTURE)
TUBE
15
3
0.0
3.0
5.5
STRC                STRUCTURE (APPROXIMATE STRUCTURE MIXTURE)
CONE
5
5
103.25
85.89
86.97
68.89
69.97
V1SD                V1 DOME SIDE (V1 DOME MATERIAL MIXTURE)
TUBE
6
3
```

u1008p4.txt **1** **Tue Jun 21 16:48:28 1994**

```
75.70
77.65              jgs 18dec92
32.25
V1TP               V1 DOME TOP (V1 DOME MATERIAL MIXTURE)
TUBE
6
3
0.0
77.65
0.86589
V2SD               V2 DOME SIDE (V2 & V4 DOME MATERIAL MIXTURE)
TUBE
7
3
68.04
69.56
14.25
V2TP               V2 DOME TOP (V2 & V4 DOME MATERIAL MIXTURE)
TUBE
7
3
0.0
69.56              jgs 18dec92
0.83
V3SD               V3 DOME SIDE (V3 DOME MATERIAL MIXTURE)
TUBE
8
3
75.77
77.35              jgs 18dec92
32.25
V3TP               V3 DOME TOP (V3 DOME MATERIAL MIXTURE)
TUBE
8
3
0.0
77.35
0.83
V4SD               V4 DOME SIDE (V2 & V4 DOME MATERIAL MIXTURE)
TUBE
9
3
68.0
69.6
14.25
V4TP               V4 DOME TOP (V2 & V4 DOME MATERIAL MIXTURE)
TUBE
9
3
0.0
69.6
0.8
DBCK               BACKSCATTER DETECTOR MOTHER VOLUME (VACUUM)
TUBE
1
3
0.0
10.0
10.0
DBDT               BACKSCATTER DETECTOR (NAI)
TUBE
4
3
```

u1008p4.txt **2** **Tue Jun 21 16:48:28 1994**

```
0.0
6.675
2.54
MGOB               BACKSCATTER DETECTOR MGO COATING BOTTOM
TUBE
16
3
0.0
6.83
0.079
MGOS               BACKSCATTER DETECTOR MGO COATING SIDES
TUBE
16
3
6.675
6.83
2.54
CANB               BACKSCATTER DETECTOR AL CAN BOTTOM
TUBE
2
3
0.0
7.24
0.06
CANS               BACKSCATTER DETECTOR AL CAN SIDES
TUBE
2
3
6.83
7.24
2.619
D2RG               D2 RING
TUBE
17
3
66.50
73.75
6.00
ROTATION MATRIX TABLE>>>>>>>>>>
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
5              <The number of rotation data sets to follow>
1              <Rotation Matrix number, IROT (integer)>
90.0           <Polar angle for axis I THETA1 (degrees, real)>
135.0          <Azimuthal angle for axis I PHI1 (degrees, real)>
0.0            <Polar angle for axis II THETA2 (degrees, real)>
315.0          <Azimuthal angle for axis II PHI2 (degrees, real)>
90.0           <Polar angle for axis III THETA3 (degrees, real)>
45.0           <Azimuthal angle for axis III PHI3 (degrees, real)>
2
90.0
90.0
0.0
0.0
90.0
0.0
3
90.0
45.0
0.0
225.0
90.0
315.0
4
```

u1008p4.txt **3** **Tue Jun 21 16:48:28 1994**

```
90.0
0.0
0.0
0.0
90.0
90.0
5
90.0
22.5
90.0
112.5
0.0
236.25
>>>>> POSITIONING TABLE:
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
78                 <NP> The Number of Objects to Position
DET1               <Name of Volume to be positioned> 4 characters
1                  <Copy # of the Volume NAME being placed> integer
SETU               <Mother Volume Name> 4 character Volume name
0.0                <X-Position (cm)> real
0.0                <Y-Position (cm)> real
219.75             <Z-Position (cm)> real
0                  <Rotation Matrix Number> integer
ONLY               <KONLY> 4 character flag  ...
DET2               THE DETECTOR 2 DUMMY MOTHER VOLUME POSITIONED INSIDE
1                  THE MAIN COORDINATE SYSTEM SETU
SETU
0.0
0.0
61.75
0
ONLY
V1TP               V1 TOP POSITIONED IN "SETU"
1
SETU
0.0
0.0
233.76589          jgs 18dec92
0
ONLY
V2TP               V2 TOP POSITIONED IN "SETU"
1
SETU
0.0
0.0
161.57             jgs 18dec92
0
ONLY
V3TP               V3 TOP IN "SETU"
1
SETU
0.0
0.0
97.73              jgs 18dec92
0
ONLY
V4TP               V4 DOME TOP INSIDE MOTHER "SETU"
1
SETU
0.0
0.0
23.1
0
```

u1008p4.txt **4** **Tue Jun 21 16:48:28 1994**

```
ONLY
V1SD               VETO 1 DOME SIDE POSITIONED INSIDE "SETU"
1
SETU
0.0
0.0
200.65
0
ONLY
V2SD               V2 SIDE IN "SETU"
1
SETU
0.0
0.0
176.65
0
ONLY
V3SD               V3 SIDE POSTIONED INSIDE MOTHER "SETU"
1
SETU
0.0
0.0
64.65
0
ONLY
V4SD               V4 SIDE POSITIONED IN MOTHER "SETU"
1
SETU
0.0
0.0
38.15
0
ONLY
STRC               STRUCTURE POSITIONED INSIDE MOTHER "SETU"
1
SETU
0.0
0.0
103.25
0
ONLY
D1SN               THE D1 SCINTILLATOR INSIDE THE D1 MODULE MOTHER DUMMY
1
D1MD
0.0
0.0
0.0
0
ONLY
D1TP               THE D1 MODULE HOUSING TOP INSIDE D1 MODULE
1
D1MD
0.0
0.0
4.32333            jgs 18dec92
0
ONLY
D1BT               THE D1 MODULE HOUSING BOTTOM INSIDE D1 MODULE
1
D1MD
0.0
0.0
-4.33925           jgs 18dec92
```

u1008p5.txt 1 Tue Jun 21 16:48:37 1994

```
0
ONLY
D1SD            THE D1 MODULE HOUSING SIDES INSIDE D1 MODULES
1
D1MD
0.0
0.0
0.0
0
ONLY
D1PM            PMT #1 POSITIONED INSIDE EACH D1 MODULE
1
D1MD
14.142
14.142
0.0
1
ONLY
D1PM            PMT #2 POSITIONED INSIDE EACH D1 MODULE
2
D1MD
20.0
0.0
0.0
2
ONLY
D1PM            PMT #3 POSITIONED INSIDE EACH D1 MODULE
3
D1MD
14.142
-14.142
0.0
3
ONLY
D1PM            PMT #4 POSITIONED INSIDE EACH D1 MODULE
4
D1MD
0.0
-20.0
0.0
4
ONLY
D1PM            PMT #5 POSITIONED INSIDE EACH D1 MODULE
5
D1MD
-14.142
-14.142
0.0
1
ONLY
D1PM            PMT #6 POSITIONED INSIDE EACH D1 MODULE
6
D1MD
-20.0
0.0
0.0
2
ONLY
D1PM            PMT #7 POSITIONED INSIDE EACH D1 MODULE
7
D1MD
-14.142
14.142
```

u1008p5.txt 2 Tue Jun 21 16:48:37 1994

```
0.0
3
ONLY
D1PM            PMT #8 POSITIONED INSIDE EACH D1 MODULE
8
D1MD
0.0
20.0
0.0
4
ONLY
D1MD            THE 7 D1 MODULES POSITIONED INSIDE THE MOTHER DET1
1               MODULE 1
DET1
0.0
0.0
0.0
0
ONLY
D1MD            MODULE 2
2
DET1
-42.3
0.0
0.0
5
ONLY
D1MD            MODULE 3
3
DET1
-26.0
39.10
0.0
0
ONLY
D1MD            MODULE 4
4
DET1
26.0
39.1
0.0
0
ONLY
D1MD            MODULE 5
5
DET1
42.3
0.0
0.0
5
ONLY
D1MD            MODULE 6
6
DET1
26.0
-39.1
0.0
0
ONLY
D1MD            MODULE 7
7
DET1
-26.0
```

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```
-39.1
0.0
0
ONLY
D1PT            THE D1 SUPPORT PLATE INSIDE DET1 DUMMY
1
DET1
0.0
0.0
-6.9285         jgs 18dec92
0
ONLY
D1PH            THE 7 D1 PLATFORM HOLES INSIDE THE PLATFORM UNDER MODULES
1               MODULE 1
D1PT
0.0
0.0
0.0
0
ONLY
D1PH            MODULE 2
2
D1PT
-42.3
0.0
0.0
0
ONLY
D1PH            MODULE 3
3
D1PT
-26.0
39.10
0.0
0
ONLY
D1PH            MODULE 4
4
D1PT
26.0
39.1
0.0
0
ONLY
D1PH            MODULE 5
5
D1PT
42.3
0.0
0.0
0
ONLY
D1PH            MODULE 6
6
D1PT
26.0
-39.1
0.0
0
ONLY
D1PH            MODULE 7
7
D1PT
```

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```
-26.0
-39.1
0.0
0
ONLY
D1RS            THE D1 SCINTILLATOR RESERVOIRS POSITIONED INSIDE
1               DET1 MOTHER
DET1
0.0
62.25
3.28
0
ONLY
D1RS            RESERVOIR #2
2
DET1
16.25
62.5
3.28
0
ONLY
D1RS            RESERVOIR #3
3
DET1
-16.25
62.5
3.28
0
ONLY
D1RS            RESERVOIR #4
4
DET1
16.25
-62.5
3.28
0
ONLY
D1RS            RESERVOIR #5
5
DET1
-16.25
-62.5
3.28
0
ONLY
D1RS            RESERVOIR #6
6
DET1
61.0
-18.0
3.28
0
ONLY
D1RS            RESERVOIR #7
7
DET1
-61.0
18.0
3.28
0
ONLY
D2SN            THE D2 SCINTILLATOR INSIDE THE D2 MODULE MOTHER DUMMY
1
```

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```
D2MD
0.0
0.0
5.5
0
ONLY
D2TP            THE D2 MODULE HOUSING TOP INSIDE D2 MODULE
1
D2MD
0.0
0.0
9.3795          jgs 18dec92
0
ONLY
D2BT            THE D2 MODULE HOUSING BOTTOM INSIDE D2 MODULE
1
D2MD
0.0
0.0
1.5425
0
ONLY
D2SD            THE D2 MODULE HOUSING SIDES INSIDE D2 MODULES
1
D2MD
0.0
0.0
5.5
0
ONLY
D2PM            PMT #1 POSITIONED INSIDE EACH D2 MODULE
1
D2MD
0.0
0.0
-4.1525
0
ONLY
D2PM            PMT #2 POSITIONED INSIDE EACH D2 MODULE
2
D2MD
11.0
0.0
-4.1525
0
ONLY
D2PM            PMT #3 POSITIONED INSIDE EACH D2 MODULE
3
D2MD
-11.0
0.0
-4.1525
0
ONLY
D2PM            PMT #4 POSITIONED INSIDE EACH D2 MODULE
4
D2MD
5.5
9.526
-4.1525
0
ONLY
D2PM            PMT #5 POSITIONED INSIDE EACH D2 MODULE
```

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```
5
D2MD
-5.5
9.526
-4.1525
0
ONLY
D2PM            PMT #6 POSITIONED INSIDE EACH D2 MODULE
6
D2MD
-5.5
-9.526
-4.1525
0
ONLY
D2PM            PMT #7 POSITIONED INSIDE EACH D2 MODULE
7
D2MD
5.5
-9.526
-4.1525
0
ONLY
D2MD            THE 14 D2 MODULES WHICH ARE POSITIONED INSIDE
1               THE MOTHER VOLUME OF "DETECTOR 2"
DET2
30.2
-41.254
-5.5
0
ONLY
D2MD            MODULE 2
2
DET2
0.0
-41.254
-5.5
0
ONLY
D2MD            MODULE 3
3
DET2
-30.2
-41.254
-5.5
0
ONLY
D2MD            MODULE 4
4
DET2
45.3
-15.1
-5.5
0
ONLY
D2MD            MODULE 5
5
DET2
15.1
-15.1
-5.5
0
ONLY
```

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```
D2MD            MODULE 6
6
DET2
-15.1
-15.1
-5.5
0
ONLY
D2MD            MODULE 7
7
DET2
-45.3
-15.1
-5.5
0
ONLY
D2MD            MODULE 8
8
DET2
45.3
15.1
-5.5
0
ONLY
D2MD            MODULE 9
9
DET2
15.1
15.1
-5.5
0
ONLY
D2MD            MODULE 10
10
DET2
-15.1
15.1
-5.5
0
ONLY
D2MD            MODULE 11
11
DET2
-45.3
15.1
-5.5
0
ONLY
D2MD            MODULE 12
12
DET2
30.2
41.254
-5.5
0
ONLY
D2MD            MODULE 13
13
DET2
0.0
41.254
-5.5
0
```

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```
ONLY
D2MD            MODULE 14
14
DET2
-30.2
41.254
-5.5
0
ONLY
D2PT            THE D2 SUPPORT PLATE INSIDE DET2 DUMMY
1
DET2
0.0
0.0
4.3165          jgs 18dec92
0
ONLY
DBCK            THE BASKSCATTER DETECTOR MOTHER VOL INSIDE "SETU"
1
SETU
0.0
0.0
266.57          OR 409.57
0
ONLY
DBDT            THE NAI BACKSCATTER DETECTOR INSIDE "DBCK"
1
DBCK
0.0
0.0
0.0
0
ONLY
MGOB            THE BACKSCATTER DETECTOR MGO BOTTOM COATING
1
DBCK
0.0
0.0
-2.619
0
ONLY
MGOS            THE BACKSCATTER DETECTOR MGO SIDE COATING
1
DBCK
0.0
0.0
0.0
0
ONLY
CANB            THE BACKSCATTER DETECTOR AL CAN BOTTOM
1
DBCK
0.0
0.0
-2.758
0
ONLY
CANS            THE BACKSCATTER DETECTOR AL CAN SIDES
1
DBCK
0.0
0.0
-0.08
```

```
0
ONLY
D2RG              THE D2 RING
1
DET2
0.0
0.0
-2.5
0
ONLY
```

Document Title Description of the COMPTEL SIM Mass Model (IDT Dataset)

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Authorized by

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