

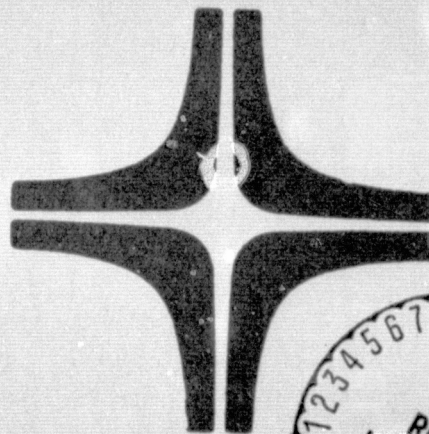
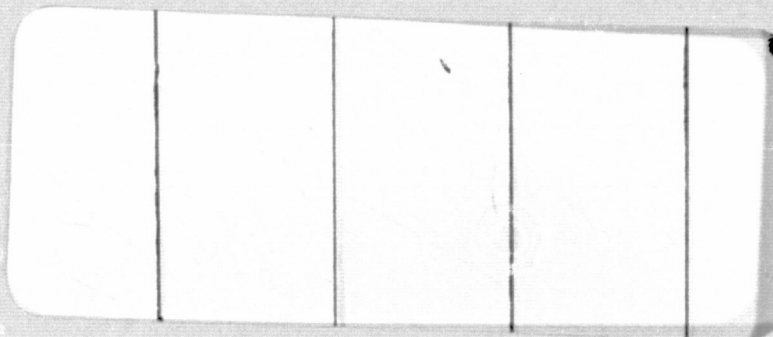
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THERMAL SYSTEMS ANALYSIS Final Report
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June 15, 1977

FINAL REPORT: ATMOSPHERIC
CLOUD PHYSICS THERMAL
SYSTEMS ANALYSIS

Prepared for:

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

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1.0 SUMMARY

Engineering analyses performed on the Atmospheric Cloud Physics (ACPL) Science Simulator expansion chamber and associated thermal control/conditioning system are reported herein. Primary objectives of the analyses were to develop a verified thermal model and to perform parametric thermal investigations to evaluate systems performance characteristics. The required scope of work under Contract NAS8-32231 as delineated below has been completed.

- o Develop an analytical model of the Science Simulator expansion chamber fluid/thermal subsystem. The loop includes the expansion chamber, manifold, pump, insulation, and servo control network in a configuration that will be tested by MSFC.
- o Update the analytical model as changes are made in the test system. In addition to the components listed above, the final test system will evolve to include additional pumps, fluid tanks, heat exchangers, and other equipment.
- o Compare test data obtained by MSFC with predictions of the model. Analyze results and modify the model to resolve any discrepancies.
- o Using the model of the final, complete system, run parametric evaluations to define the optimum system performance. Make recommendations for modifications which would improve the system's performance.

Thermal network representations of solid components and the complete fluid conditioning system were solved simultaneously using the Systems Improved Numerical Differencing Analyzer (SINDA) computer program. Experimental data from tests being conducted by MSFC were required to verify the analytical models. By simulation of

the test conditions and subsequent comparison of predicted and measured data, it was possible to modify thermal model parameters to closely correlate predicted and measured values.

Additional parametric system studies were conducted with the verified analytical model to predict system's operational characteristics. Descriptions of techniques, methods, analytical models developed and results of analyses are described in subsequent sections.

2.0 INTRODUCTION

Cloud Physics Expansion Chamber experiment objectives require that the chamber temperature be controlled through prescribed time-dependent profiles. An additional requirement is that the chamber internal surfaces be maintained at near uniform temperatures (within 0.1°C) during these temperature excursions. The technique selected by NASA to control the temperature and simultaneously to maintain the approximate uniform temperature condition involves a controlled fluid conditioning network which is coupled to the expansion chamber via internal heat exchanger surfaces. Internally grooved fluid passages in the cylindrical and end disks sections of the expansion chamber provide the internal heat exchanger surfaces and paths for the fluid to flow in a counter-flow manner. General arrangement of the fluid flow system, the proportional servo control valve, and the fluid reservoirs are shown in Figure 1.

Thermal systems testing of the Science Simulator expansion chamber and the fluid conditioning network is currently being conducted by Marshall Space Flight Center (MSFC) personnel. The initial testing phase was conducted without the controller and proportional flow valve and experimental data obtained from these tests was utilized by Sperry to verify the analytical model which was developed to represent the fluid manifold and expansion chamber system.

Sperry Support Services previously performed engineering analyses of the Atmospheric Cloud Physics expansion chamber fluid thermal conditioning system preliminary design under Contract NAS8-32016. The purpose of this initial analysis was to evaluate and determine systems components, and a design configuration which would lead to a feasible design approach. The hardware and the baseline control system available for evaluation were specified by MSFC as design constraints. Subsequent to completion of the required engineering analyses, MSFC made improvements in the expansion chamber internal fluid flow channels, fluid piping manifold designs

and in the fluid thermal controller transfer function. It was necessary to incorporate these changes into the existing analytical model and to perform parametric investigations to determine system performance characteristics. Results of analyses were used to support hardware design/development activities at MSFC. Results of Sperry's thermal/fluid analyses were documented in References 1 and 2.

Several major modifications and changes occurred in MSFC hardware development from the earlier studies to initiation of these analyses. These modifications included redesign of the expansion chamber fluid manifolds and piping system, updated fluid controller and servo valve and the use of Oronite Flo-Cool 100 working fluid.

The purpose of this analytical study is to develop an updated model of the Science Simulator expansion chamber fluid/thermal system, verified with experimental data, and to perform parametric evaluations of systems performance. Results of parametric systems performance evaluations are used to make recommendations to improve the system's operational characteristics. Therefore, the scope of work under the current Contract (NAS8-32231) required development of a comprehensive thermal representation of the expansion chamber and the associated fluid network.

3.0 ANALYTICAL TECHNIQUES

The Systems Improved Numerical Differencing Analyzer computer program (SINDA) was used to solve thermal network representations of the expansion chamber physical system and simultaneously the coupled fluid flow network and control valving. Models of the control system were formulated and programmed internally to the SINDA program. The complete lumped parameter analytical model, when subject to the transient thermal boundaries, enabled Sperry analyst to accurately predict systems performance characteristics for various operational conditions and systems parameters of interest.

3.1 Thermal System Model

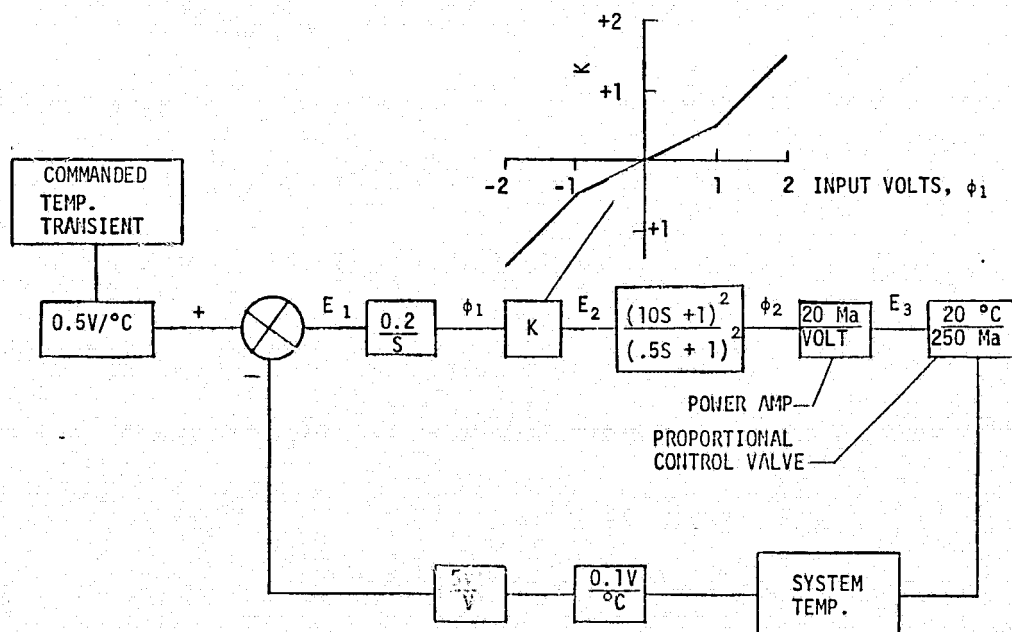
Presented in Figure 2 is a sketch depicting the analytical model of the expansion chamber solid material. The nodal designations as indicated represent the position at which an element of material is lumped in a thermal capacitance and adjacent nodal locations are connected by thermal conductance terms. Separate analytical models of the fluid flow circuits are shown in Figures 3 through 8. These models were carefully tailored to correspond with the expansion chamber solid representation since the two models are coupled by convective heat transfer from the moving fluid to the solid. Convective heat transfer rates were related to the fluid flow rates through the expansion chamber based upon experimental data supplied by Mr. J. L. Moses, EP45. These heat transfer coefficients were related to the mass flow rate by the equation, $h = 1.48 (10^{-6}) (w)^{.332}$; where, h , watts/cm²°C and w , lbm/hr. Thermal insulation used on the expansion chamber external surfaces, to minimize heat transfer to the ambient, consisted of 2.54 cm thickness of Dyna-Flex Type RF600 refractory fiber material. The analytical model represented the heat losses/gains through the insulating material to 21°C ambient conditions.

Analytical model updates were performed as changes are made by MSFC in the test system hardware and operational conditions. Analytical model updates and modifications were made using the UNIVAC 1108 ELT processor to maintain magnetic tape records of individual model updated input data.

3.2 Control System Model

The fluid controller utilizes the signals derived from the prescribed temperature transient profile and a sensed temperature on the expansion chamber to control a two way proportional flow valve which admits fluid to the expansion chamber manifold system. When the inlet fluid temperature of the fluid is properly controlled, very small temperature deviations between the expansion chamber sensor and the prescribed temperature profile are achieved. The control valve acts to mix the working fluid from two temperature sources in a proportion as regulated by the controller output.

Presented in the sketch below is a block diagram which illustrates the controller functions.



The ratio of output to input voltage for the control operation is converted by the z-transformation to finite difference form as,

$$\frac{\phi_1}{E_1} = 0.1 \Delta\theta \frac{1+z^{-1}}{1-z^{-1}}$$

and

$$\frac{\phi_2}{E_2} = \frac{100 + 10\Delta\theta \frac{1+z^{-1}}{1-z^{-1}} + \frac{(\Delta\theta)^2}{12} \frac{1+10z^{-1}+z^{-2}}{1-2z^{-1}+z^{-2}}}{25 + \frac{\Delta\theta}{2} \frac{1+z^{-1}}{1-z^{-1}} + \frac{(\Delta\theta)^2}{12} \frac{1+10z^{-1}+z^{-2}}{1-2z^{-1}+z^{-2}}}$$

where

E is the input voltage

ϕ is the output voltage

$\Delta\theta$ is the time step size

z^{-n} is the respective input or output voltage at the previous n interval.

The variable K factor as shown in the above diagram operates as a multiplier as follows,

$$E_2 = K\phi_1$$

where, K varies as shown in the graph.

The above finite difference control equations were programmed with each constant coefficient being a variable parameter in the model. Output voltage, ϕ_2 , is converted to current by the ratio of $\frac{20 \text{ ma}}{\text{volt}}$. This current is then used to drive the proportional fluid control valve with the following relations,

$$T = \frac{E_3}{12.5} \text{ } ^\circ\text{C} \quad ; (-250 \text{ Ma} \leq E_3 \leq 250 \text{ Ma})$$

$$T = -20^\circ\text{C} \quad ; E_3 < -250 \text{ Ma (cold reservoir temperature)}$$

$$T = +20^\circ\text{C} \quad ; E_3 > 250 \text{ Ma (hot reservoir temperature)}$$

where,

T is the proportional fluid temperature at the valve discharge which is dependent upon the voltage, ϕ_2 , and the fluid reservoir temperatures.

The controlled temperature of the fluid at the valve exit is used in the thermal model as a boundary condition at node 1000.

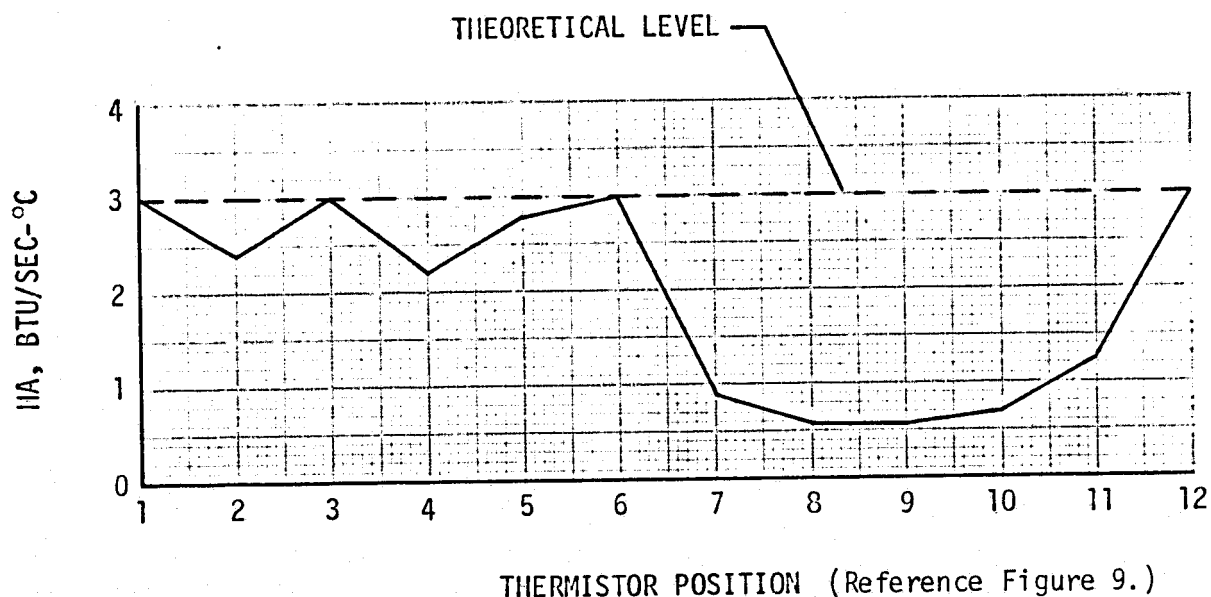
4.0 RESULTS OF ANALYSES

4.1 Thermal Model Verification

Experimental data recorded by MSFC during systems tests was utilized by Sperry to verify the systems model representing the test hardware. Large quantities of data, involving transient flow rates and temperatures were available from the tests on cataloged files at MSFC computer facilities. Sperry analyst retrieved this data at execution of the analytical predictions which facilitated preparation of computer plots to directly compare predicted/test data.

Presented in Figure 9 is a sketch which illustrates the location of the measurement sensors used in tests at MSFC. Experimental data utilized for comparison and model verification correspond to test 11 as performed by MSFC on February 9, 1977.

Initially, two computer cases were used to verify fluid inlet manifold model representations. Once the predicted transient response of the fluid inlet manifold was satisfactorily correlated, approximately six parametric model computer updates were made to improve the response of the expansion chamber predictions as compared with experimental data. Generally, good agreement was achieved on the top and bottom heat exchanger surfaces with minimal updates to the theoretical model. Modifications of convective heat transfer conductors between the cylindrical heat exchanger surfaces and the fluid coolant were required to achieve agreement with the experimental data. The extent of modifications to the theoretical values that were necessary are indicated in the following sketch.



CIRCUMFERENTIAL VARIATION OF THE CONVECTIVE HEAT TRANSFER CONDUCTOR

It was observed from the test data that surfaces of the cylindrical heat exchanger, in the vicinity of temperature sensor number 8, responded much slower than the theoretical predictions or the measured values at other circumferential positions. This phenomena can be principally attributed to effects due to the following test conditions:

- o Non-uniform fluid flow distribution.
- o Separation of the chamber at the fluid flow passages.

Either of the above conditions could have lead to the non-uniform cooling transients which were evident in the test data.

In the analytical model updates reported herein to verify the model with experimental values, it was assumed that a combination of the parameter uncertainties in the physical system would result in non-uniform convective heat transfer conductors on the heat exchanger surfaces. The other thermal model parameters were set "hard" and were not varied in the correlation.

Presented in Figures 10A through 10PP are comparisons of corresponding predicted and experimental temperatures which were made in the final verification model. In general, the computed values are in close agreement with the predictions. It is noted that the analytical model nodal representation did not always align with the temperature sensor locations and in several plots it was necessary to compare a temperature sensor value with several adjacent analytical model nodes.

4.2 Controller/Thermal Model Verification

Using the coupled controller model with the verified thermal model, several initial computations were made independently varying the K value. This was a result of hardware updates made by NASA during early phases of testing, where the gain factor, K, was modified.

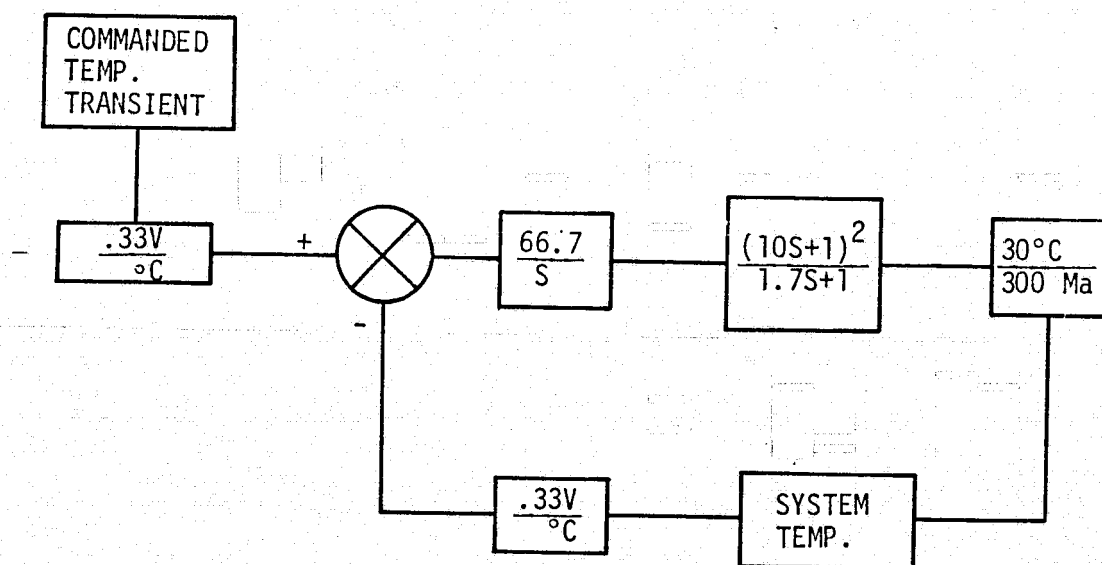
Shown in Figures 11 and 12 are computed temperature response characteristics of the expansion chamber as compared to a prescribed temperature profile corresponding to approximately 8°C/minute. In this analytical prediction, the fluid flow rate of 2 gpm was not adequate to achieve the prescribed or commanded system response. However, the predicted transient value with $K = 0.75\phi_1$ stabilizes at a faster rate as indicated in Figure 12.

Additional analyses with, $K = 0.75\phi_1$, and the power amplifier set at 1000 Ma/volt, were performed with 2.2 gpm and a commanded cool-down rate of 3.3°C/minute. Results of these computations are compared with measured data of test #23 as shown in Figure 13. An initial oscillation in the controlled temperature was predicted at the initiation of the commanded cool-down which continues through the computational period.

Several additional computations were performed with the result that the controller function was apparently unstable. These efforts were conducted concurrently with parametric studies of system's performance which are reported in a subsequent section.

4.3 Parametric Systems Studies

Thermal models of two conceptual thermal systems designs were developed using thermal/controller characteristics as supplied by NASA. Flow schematics of these concepts are shown in Figure 14. The intent of these thermal investigations was to determine the design concept and operating conditions which would lead to minimum reservoir sizes and satisfy thermal requirements. Due to the contract schedule and delays in NASA's test program it was necessary to conduct these parametric studies concurrently with analyses to verify the coupled controller and thermal model. After extensive checkout of the programmed controller functions, Sperry analyst realized that the controller equations as supplied by NASA were erroneous. Subsequently, cognizant NASA controller personnel were questioned in regard to the controller function and it was found that the tested controller function was as follows:



Since the original controller functions as supplied by NASA were erroneous, it was not possible within the term of this contract to update the controller model and to perform the parametric studies and computations with the present controller function would lead to erroneous results.

5.0 CONCLUSIONS AND RECOMMENDATIONS

A complete thermal representation of the expansion chamber was developed and verified using pertinent test data. Additional thermal modelling was performed to represent the fluid network, controller logic and valving. It was determined that the controller function as supplied by NASA was not correct since computed results would not correlate with the test data.

Analytical model of two design concepts were developed for parametric system's evaluations. However, these models were determined to be invalid due to erroneous controller functions.

The analytical model as developed of thermal system is an accurate representation of the expansion chamber thermal physical system. Using this model as a basis, an experienced thermal analyst could update the controller functions and subsequently conduct systems performance evaluations. Complete listings of input data for the models are contained in the Appendix.

It is recommended that further testing be performed to determine the cause of the unsymmetrical temperature response which was observed in the expansion chamber data. A test is recommended to supply fluid into a single inlet manifold and observe the possibility of fluid leakage into adjacent counterflow passages on the cylindrical section. Additional tests are recommended to determine the possibility of fluid flow restrictions in localized portions of the chamber. These tests will involve pressure and flow rate measurements on specific portions of the cylinder section.

REFERENCES

1. Schultz, W. E., Stephen, L. A., and Usher, L. H., "Final Report Atmospheric Cloud Physics Laboratory Project Study," Sperry Support Services, June 22, 1976.
2. Stephen, L. A., Usher, L. H., "Analyses of ACPL Thermal/Fluid Conditioning System," Sperry Support Services, October 29, 1976.

- ITEM - DESCRIPTION
- 1 - BEMCO LN₂ HEX
 - 2 - HOT RESERVOIR
 - 3 - PUMP
 - 4 - EXPANSION CHAMBER
 - 5 - PROPORTIONAL FLOW VALVE

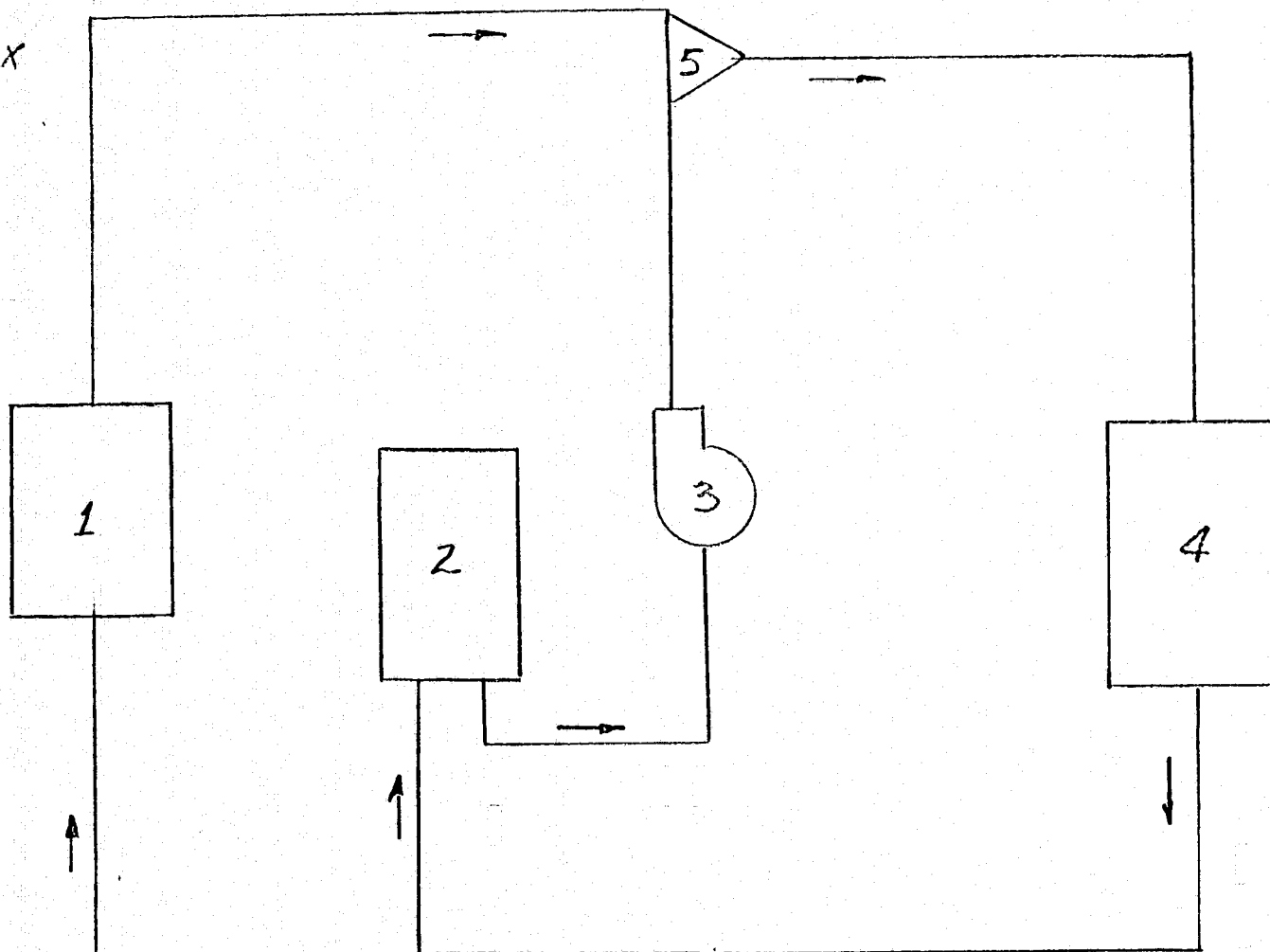
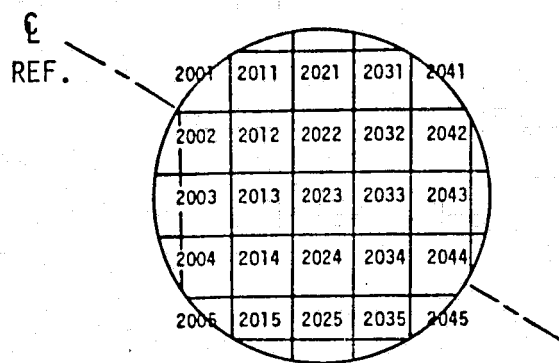
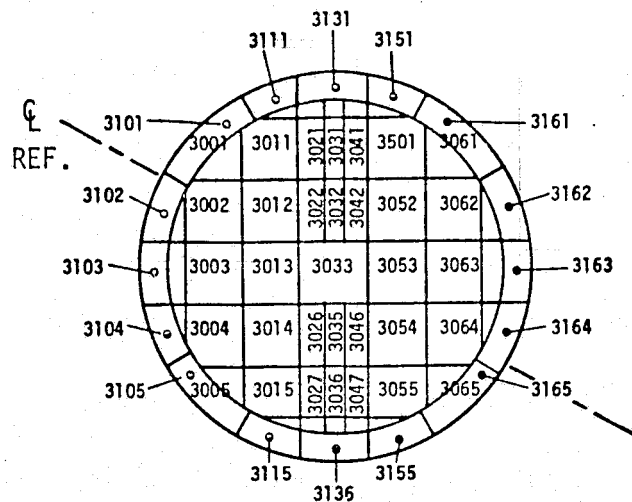


Figure 1. Test System Schematic



TOP COVER



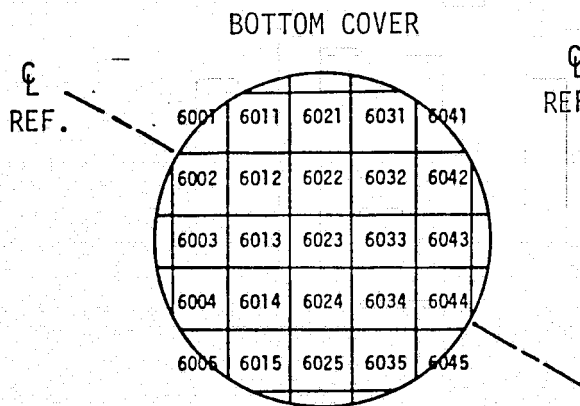
TOP DISC HEAT EXCHANGER

OBSERVATION WINDOW

4041	4031	4021	4011	4001	4111	4101	4091	4081	4071	4061	4051
4042	4032	4022	4012	4002	4112	4102	4092	4082	4072	4062	4052
4043	4033	4023	4013	4003	4113	4103	4093	4083	4073	4063	4053
4044	4034	4024	4014	4004	4114	4104	4094	4084	4074	4064	4054
4045	4035	4025	4015	4005	4115	4105	4095	4085	4075	4065	4055

CYLINDER SECTION (OUTSIDE SURFACE)

BOTTOM DISC HEAT EXCHANGER



BOTTOM COVER

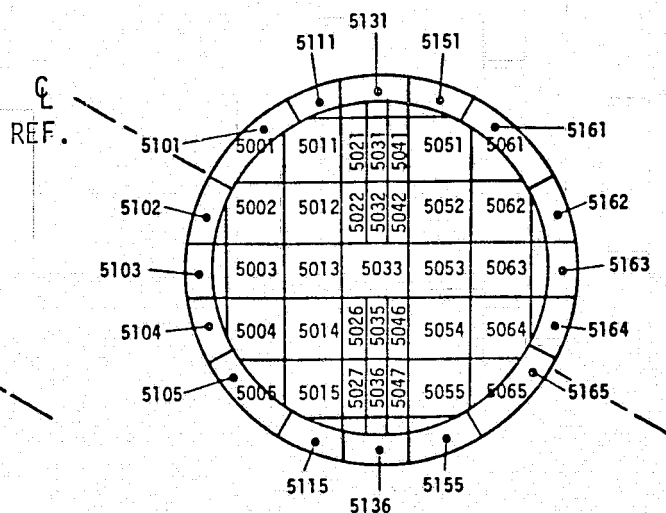


Figure 2. Model Representation of Expansion Chamber.

- NOTES: 1. NUMBERS WITH () REPRESENT ONE PIPE.
 2. NUMBERS UNDERLINED REPRESENT THREE PIPES.
 3. XX PREFIX ON EXCHANGER REFER TO CIRCUITS AS FOLLOWS:
 (XX = 35) INDICATES FLOW FROM 3600 SOURCE
 (XX = 37) INDICATES FLOW FROM 3700 SOURCE

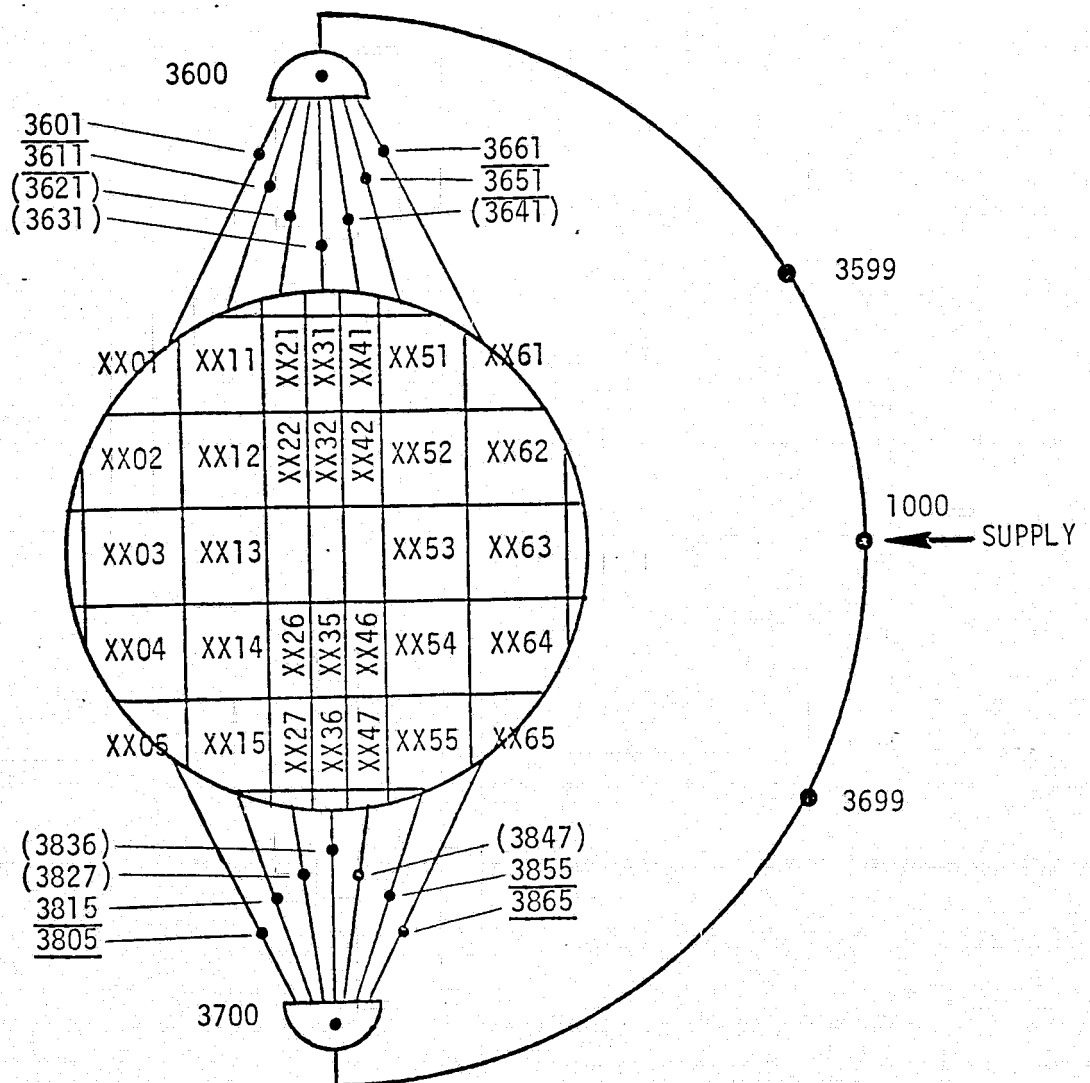


Figure 3. Representation of Liquid Supply System (Top Heat Exchanger).

- NOTES: 1. NUMBERS WITH () REPRESENT TWO PIPES.
 2. XX PREFIX ON EXCHANGER REFER TO FLOW CIRCUITS AS FOLLOWS:
 (XX=35) INDICATES FLOW TO 7001 LOCATION.
 (XX=37) INDICATES FLOW TO 7002 LOCATION.

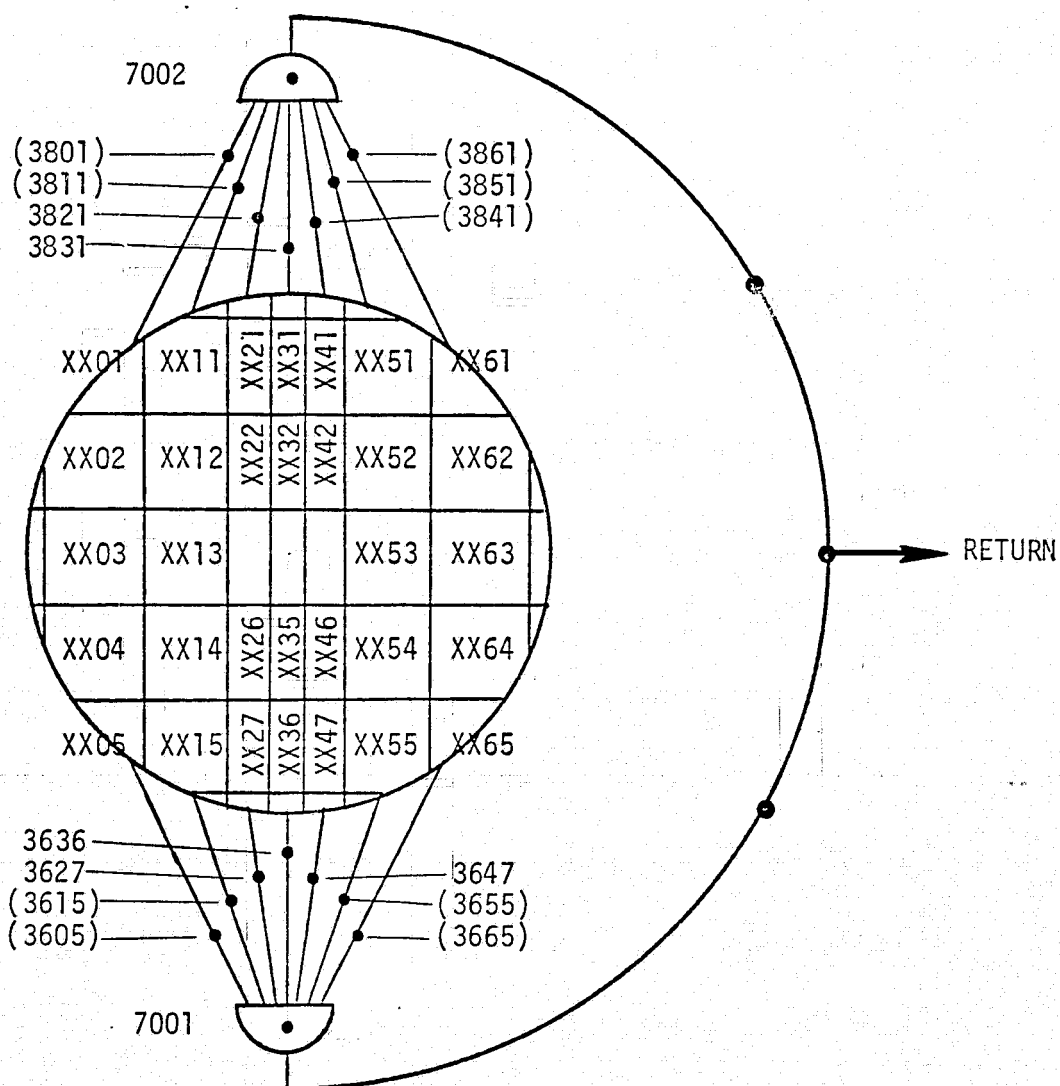


Figure 4. Representation of Liquid Return System (Top Heat Exchanger).

- NOTES: 1. NUMBERS WITH () REPRESENT ONE PIPE.
2. XX PREFIX ON EXCHANGER REFER TO FLOW CIRCUITS AS FOLLOWS:
 (XX=55) INDICATES FLOW FROM 5600 SOURCE.
 (XX=57) INDICATES FLOW FROM 5700 SOURCE.

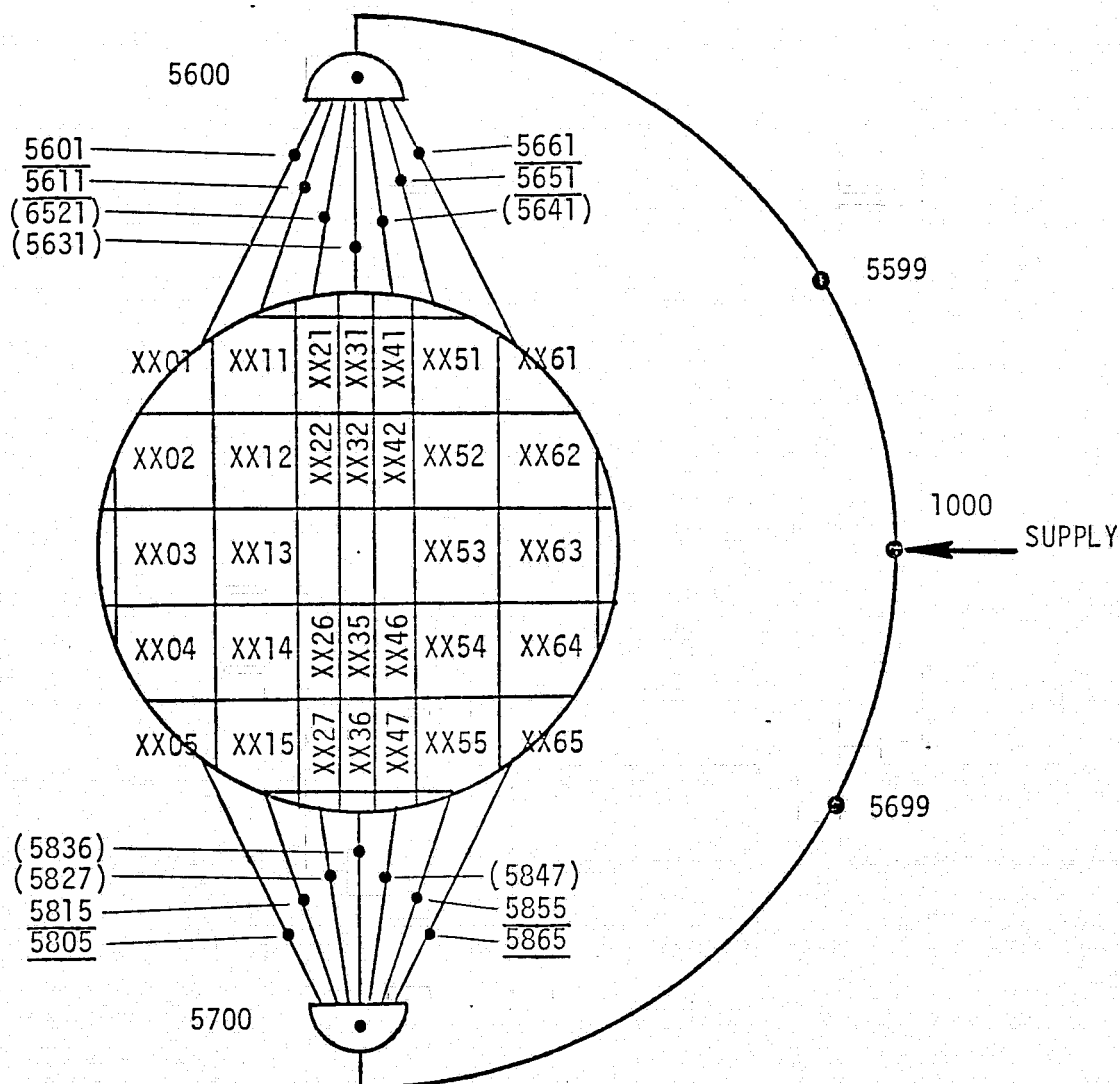


Figure 5. Representation of Liquid Supply System (Bottom Heat Exchanger).

- NOTES: 1. NUMBERS WITH () REPRESENT TWO PIPES.
 2. XX PREFIX ON EXCHANGER REFER TO FLOW CIRCUITS AS FOLLOWS:
 (XX=55) INDICATES FLOW TO 7003 LOCATION.
 (XX=57) INDICATES FLOW TO 7004 LOCATION.

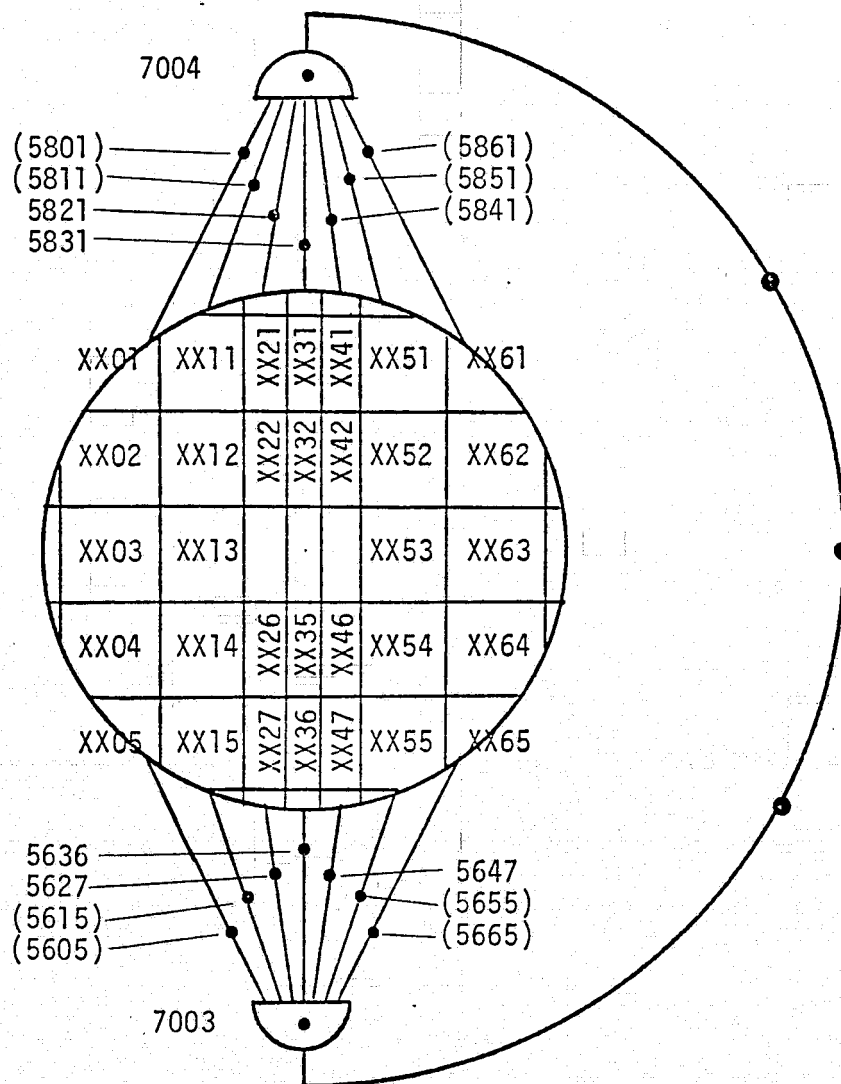


Figure 6. Representation of Liquid Return System
 (Bottom Heat Exchanger).

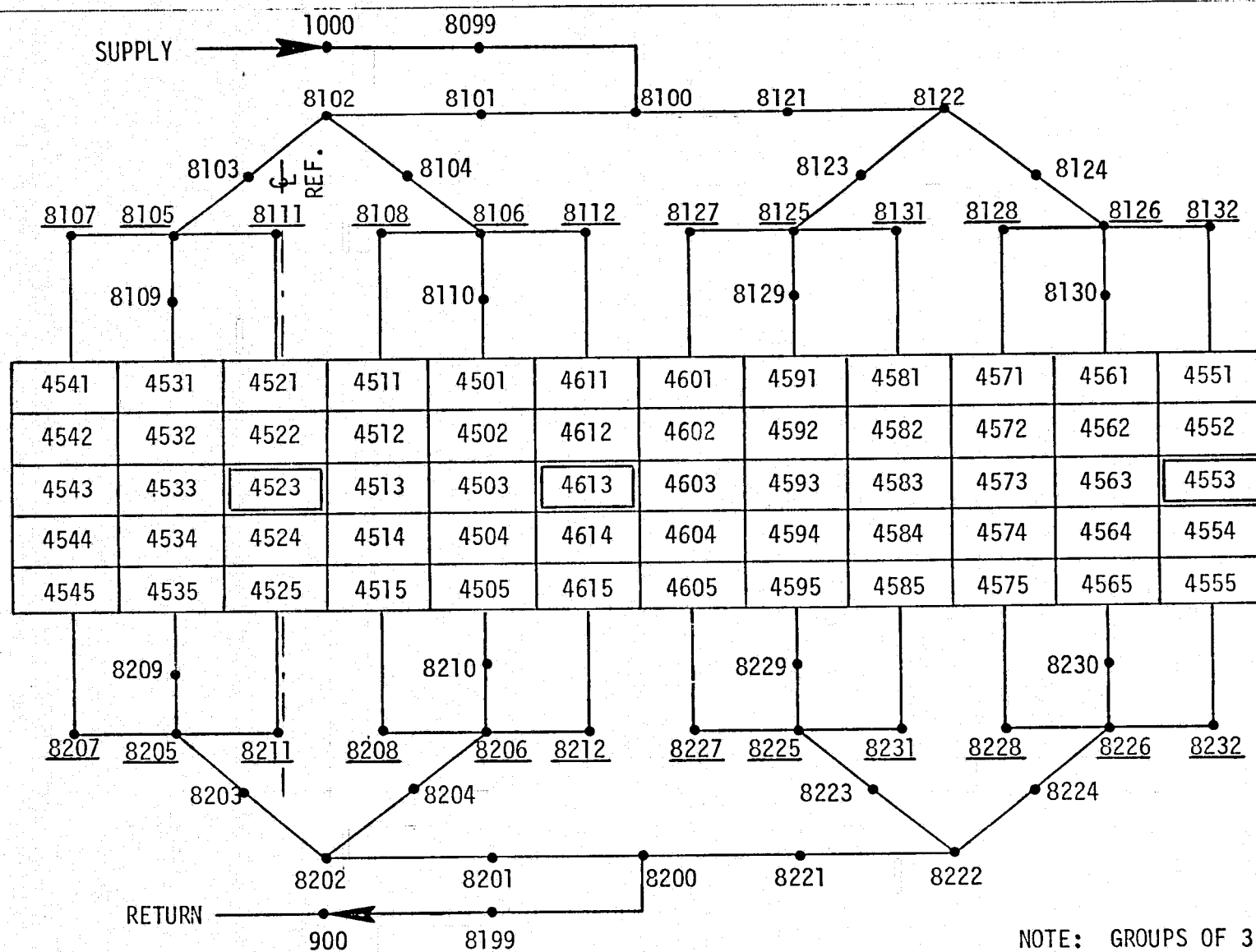
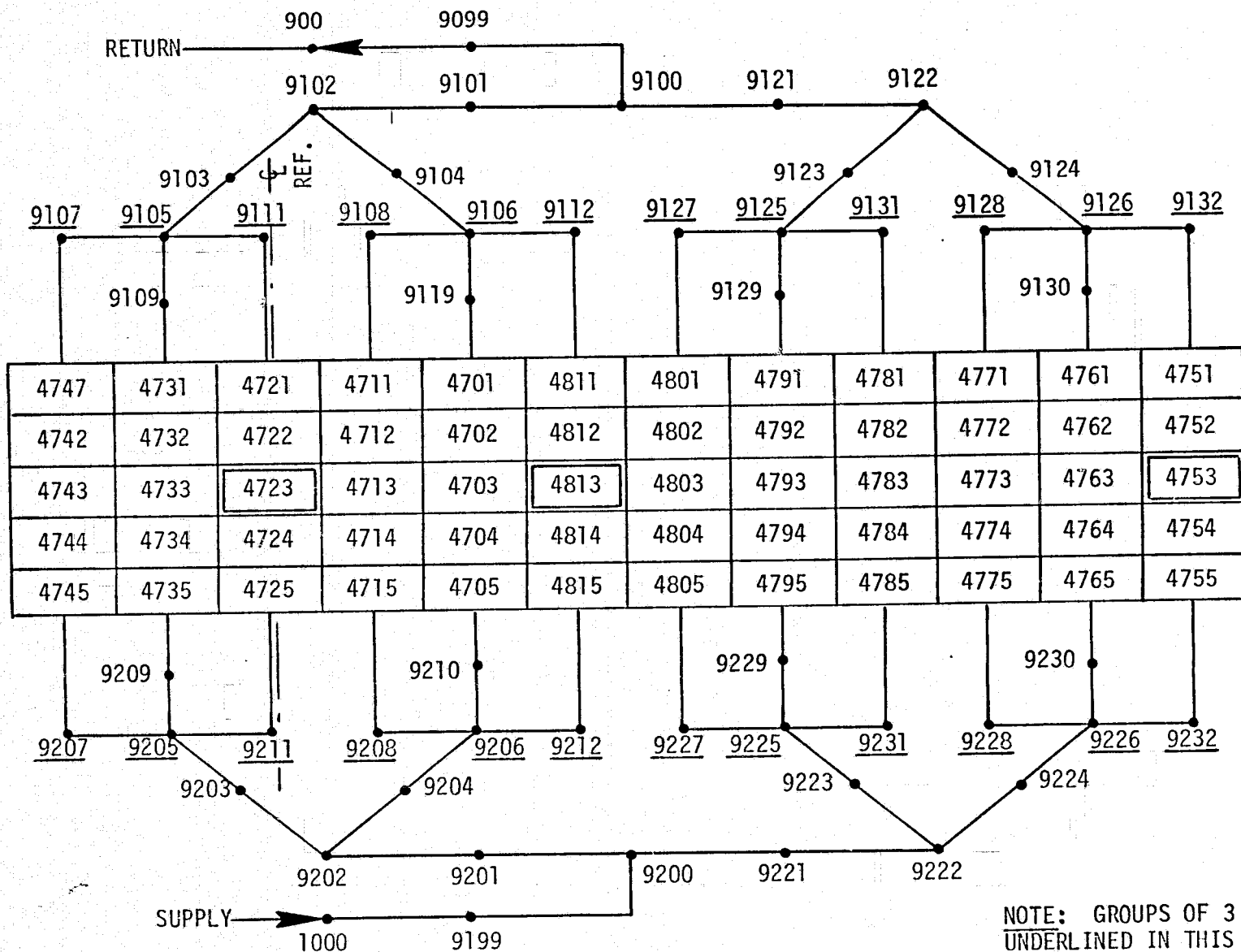


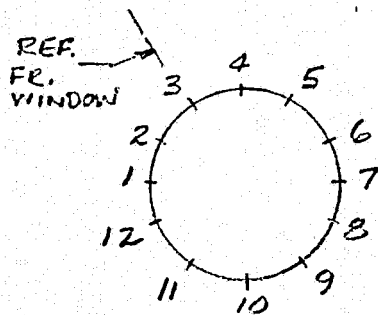
Figure 7. Representation of Liquid Supply Entering Upper Cylinder Manifold and Return Circuit.



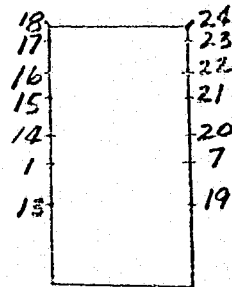
NOTE: GROUPS OF 3 PIPES
UNDERLINED IN THIS MODEL
REPRESENT 2 PIPES IN THE
PHYSICAL SYSTEM.

Figure 8. Representation of Liquid Supply Entering Lower Cylinder Manifold and Return Circuit.

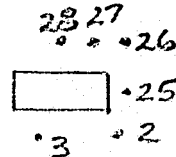
MID-BELT



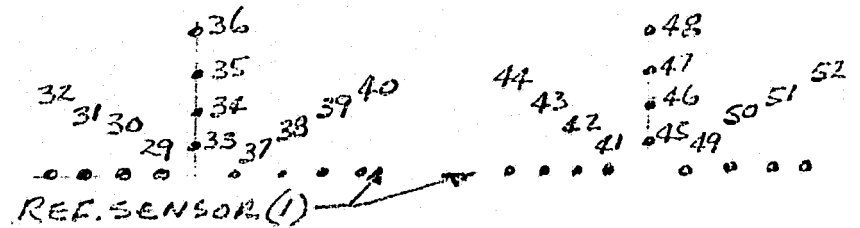
SIDE



FRONT WINDOW



TOP END ASSY

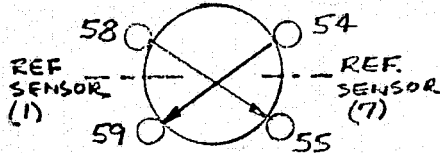


VIEWED FROM TOP

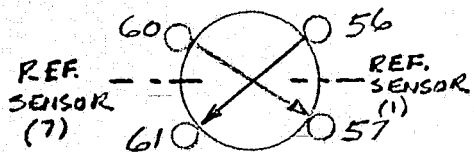
BOTTOM END ASSY.

VIEWED FROM TOP

TOP

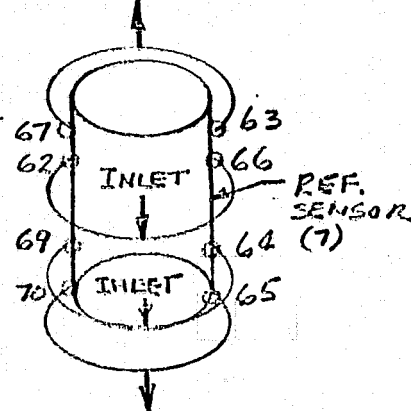


BOTTOM



END ASSY. FLUID MANIFOLDS

OUTLET



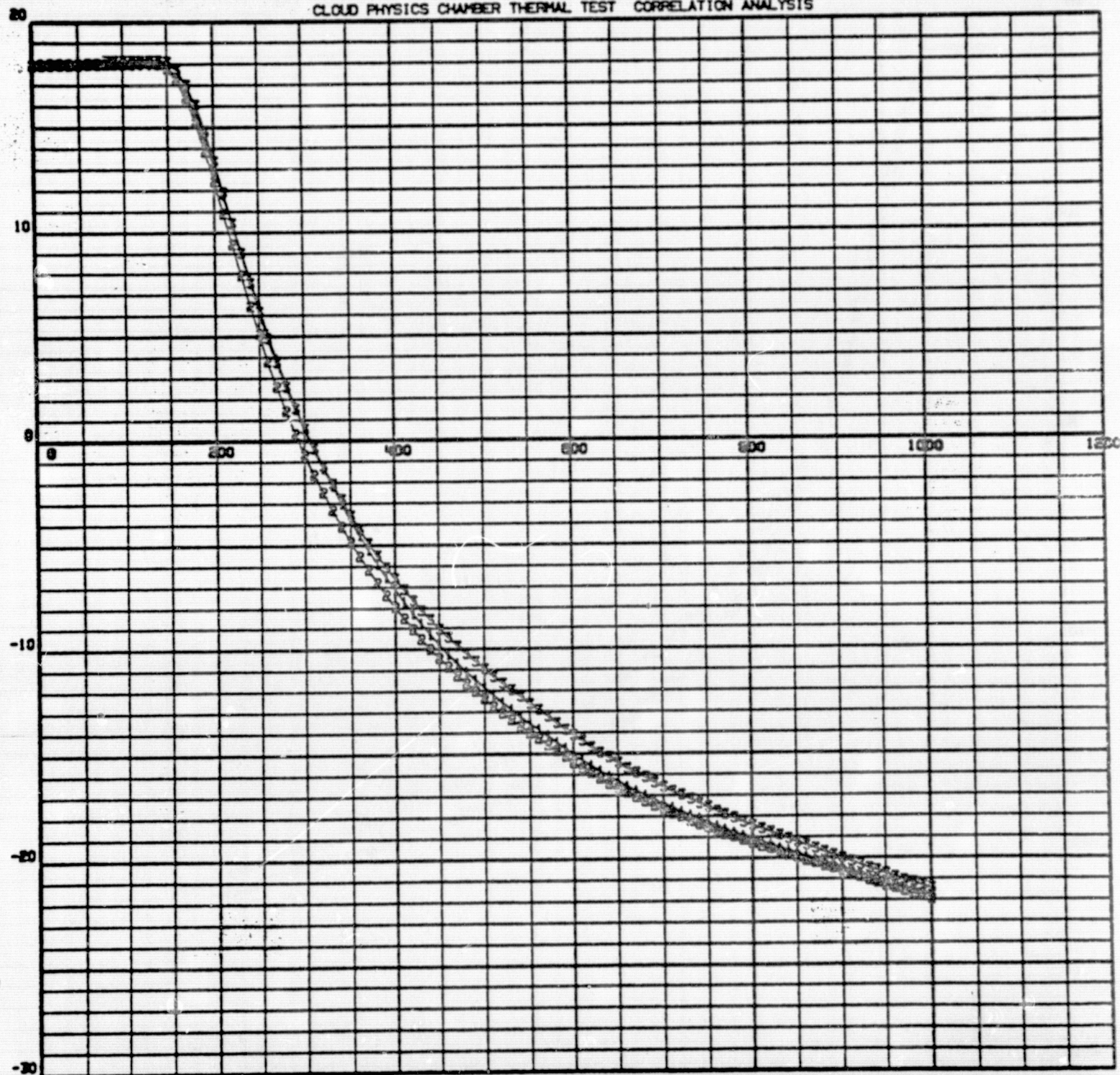
OUTLET CYLINDER ASSY MANIFOLDS

OTHER SENSORS

- 53 SUPPLY MANIFOLD
- 71 COLD SUPPLY
- 72 COLD INPUT
- 73 HOT SUPPLY
- 74 CHAMBER OUTLET
- 75 BENCO RETURN
- 76 HOT FLUID INPUT

Figure 9. Measurement Sensor Location

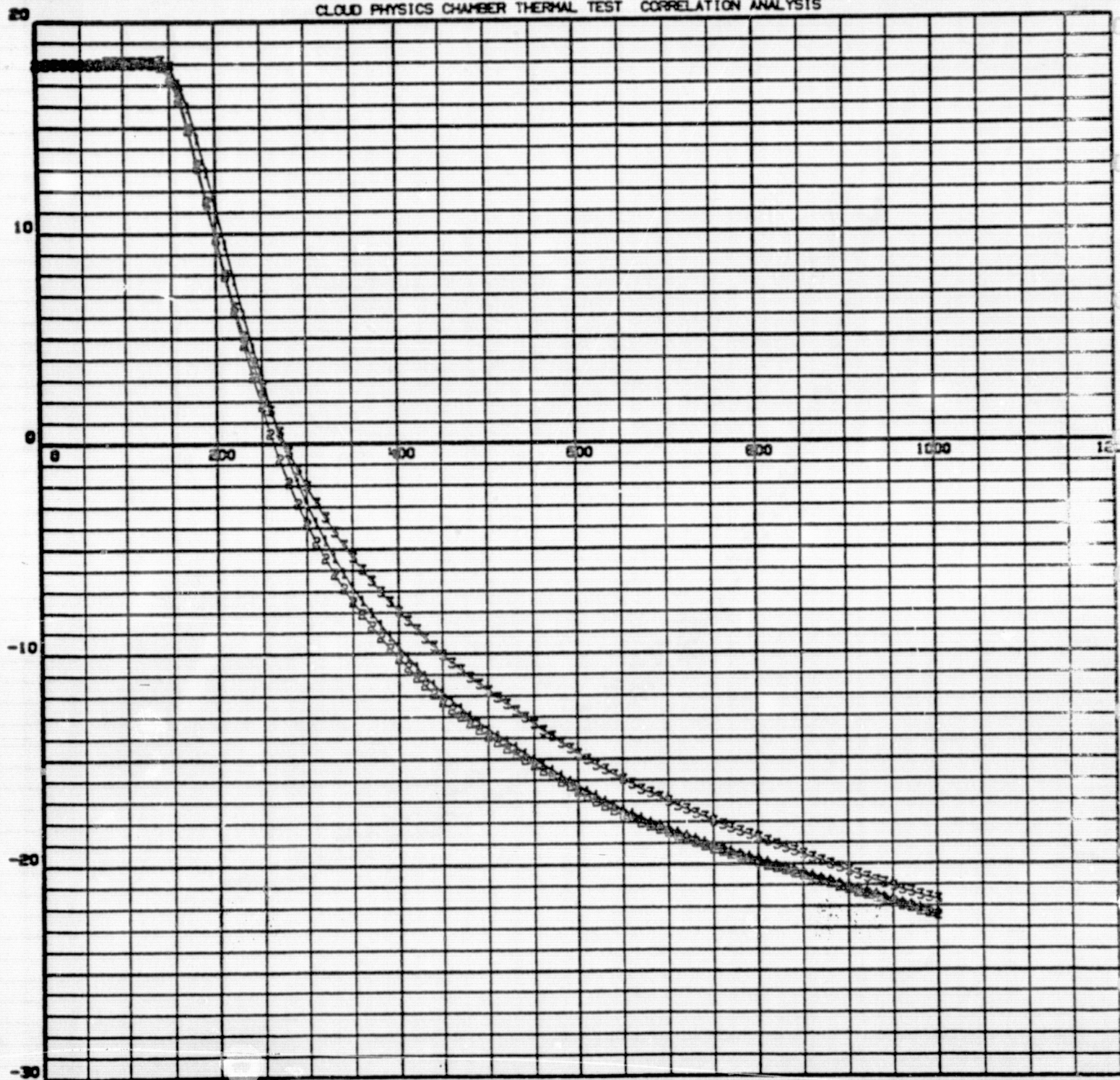
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4003, 4004, SENSOR 1

Figure 10A. Comparison of Measured and Predicted Data

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4013,4014, SENSOR 2

Figure 10B. Figure 10A Continued

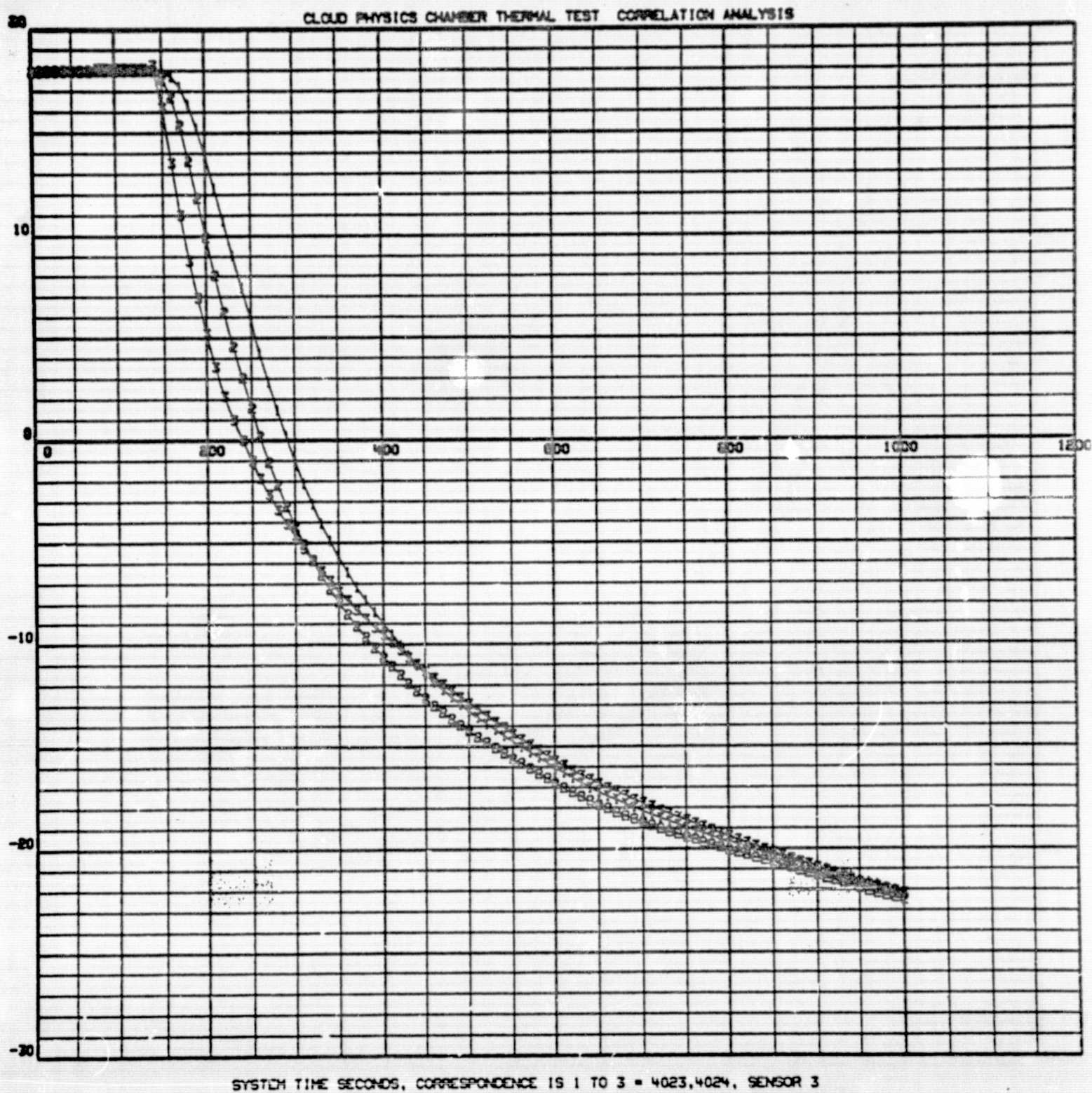
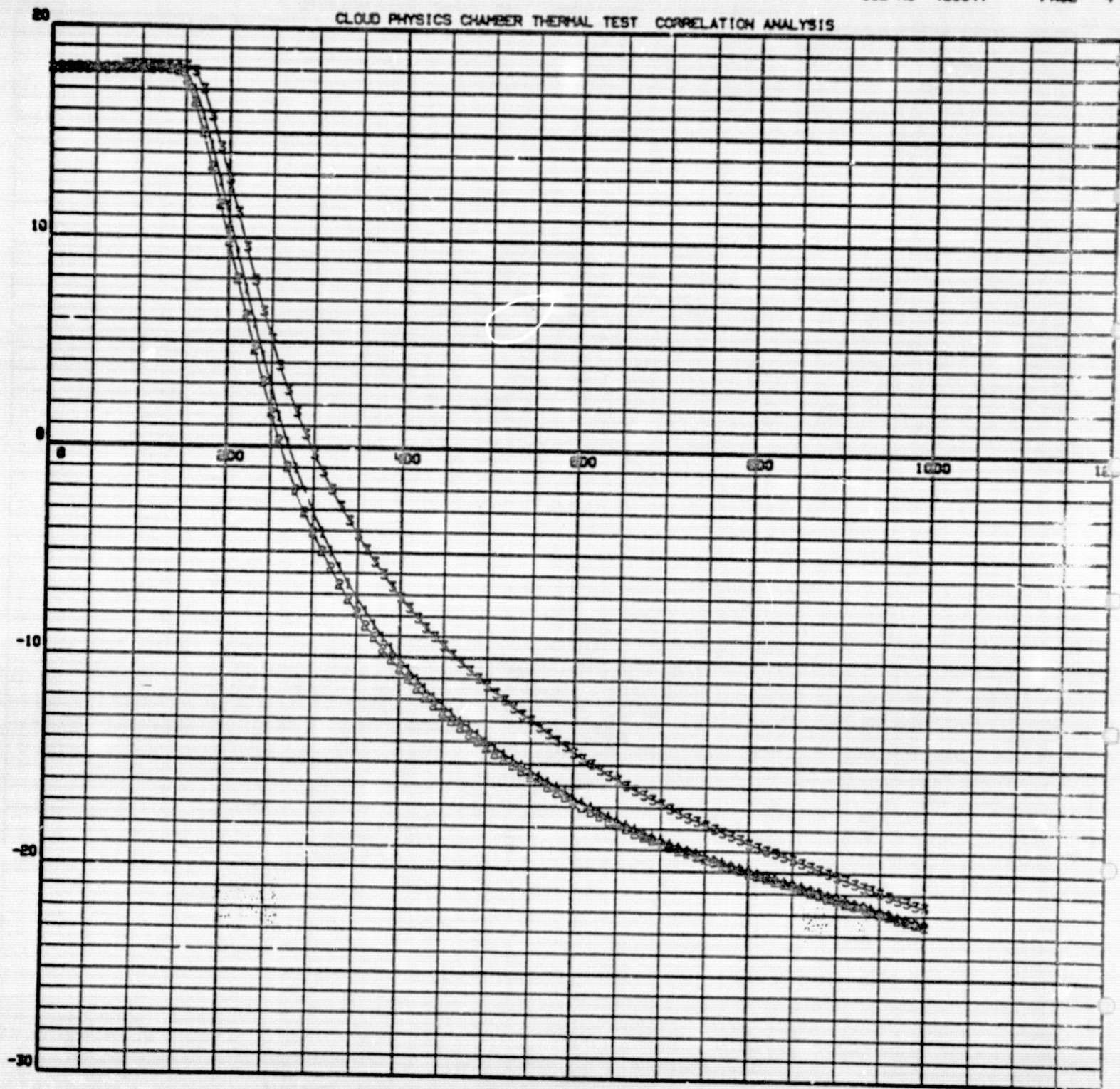


Figure 10C. Figure 10A Continued

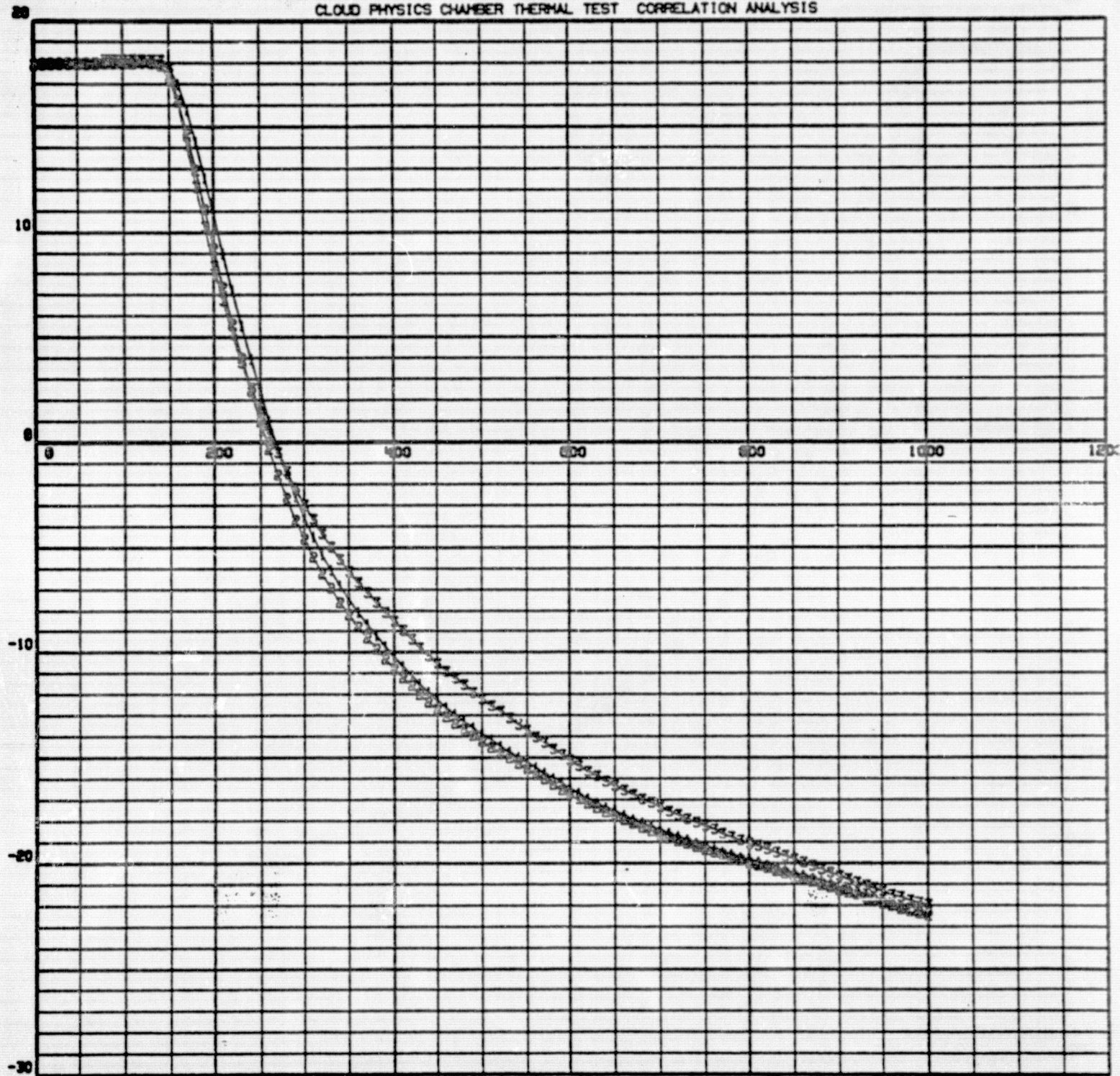
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4033,4034, SENSOR 4

Figure 10D. Figure 10A Continued

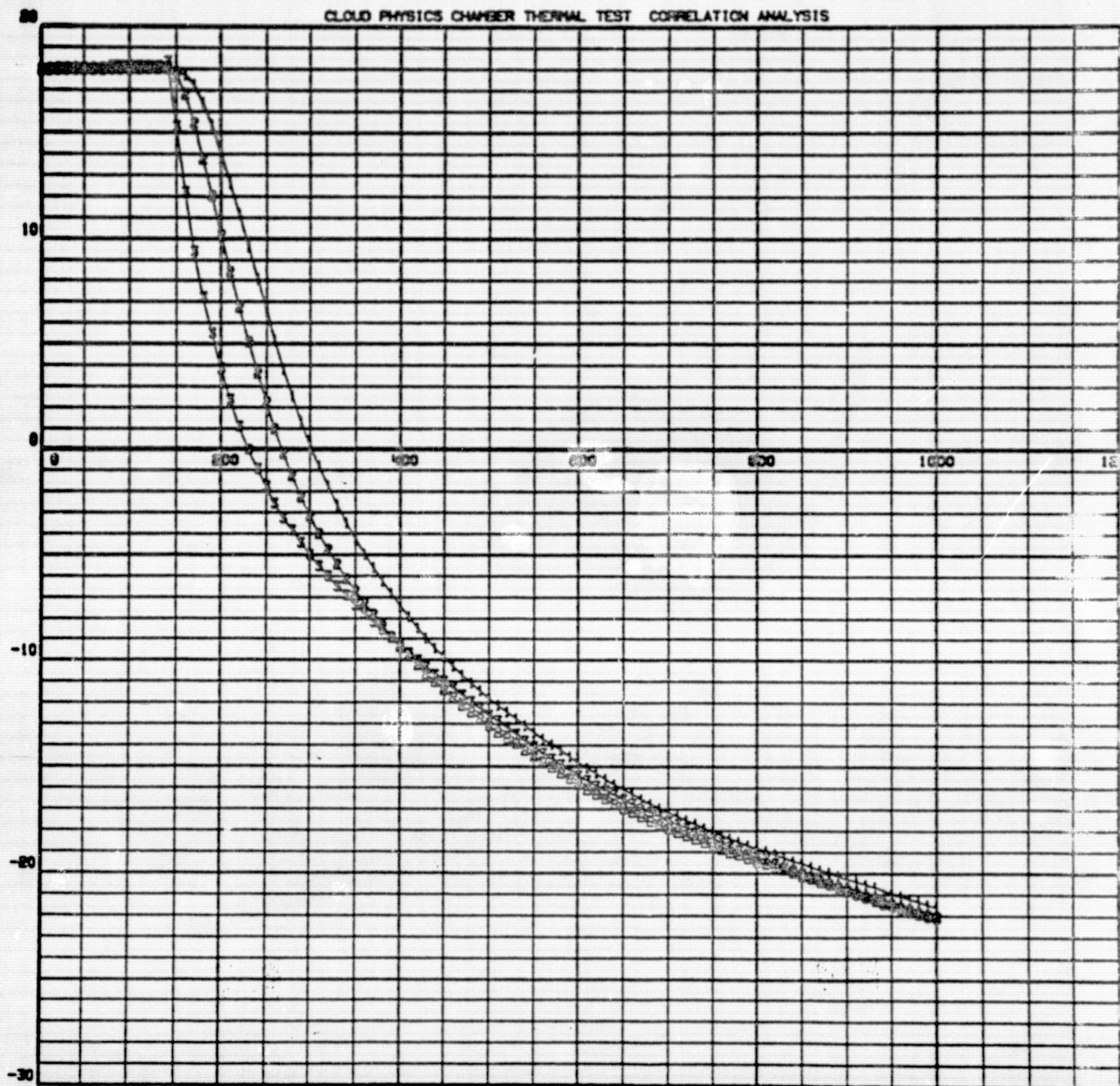
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4043, 4044, SENSOR 5

Figure 10E. Figure 10A Continued

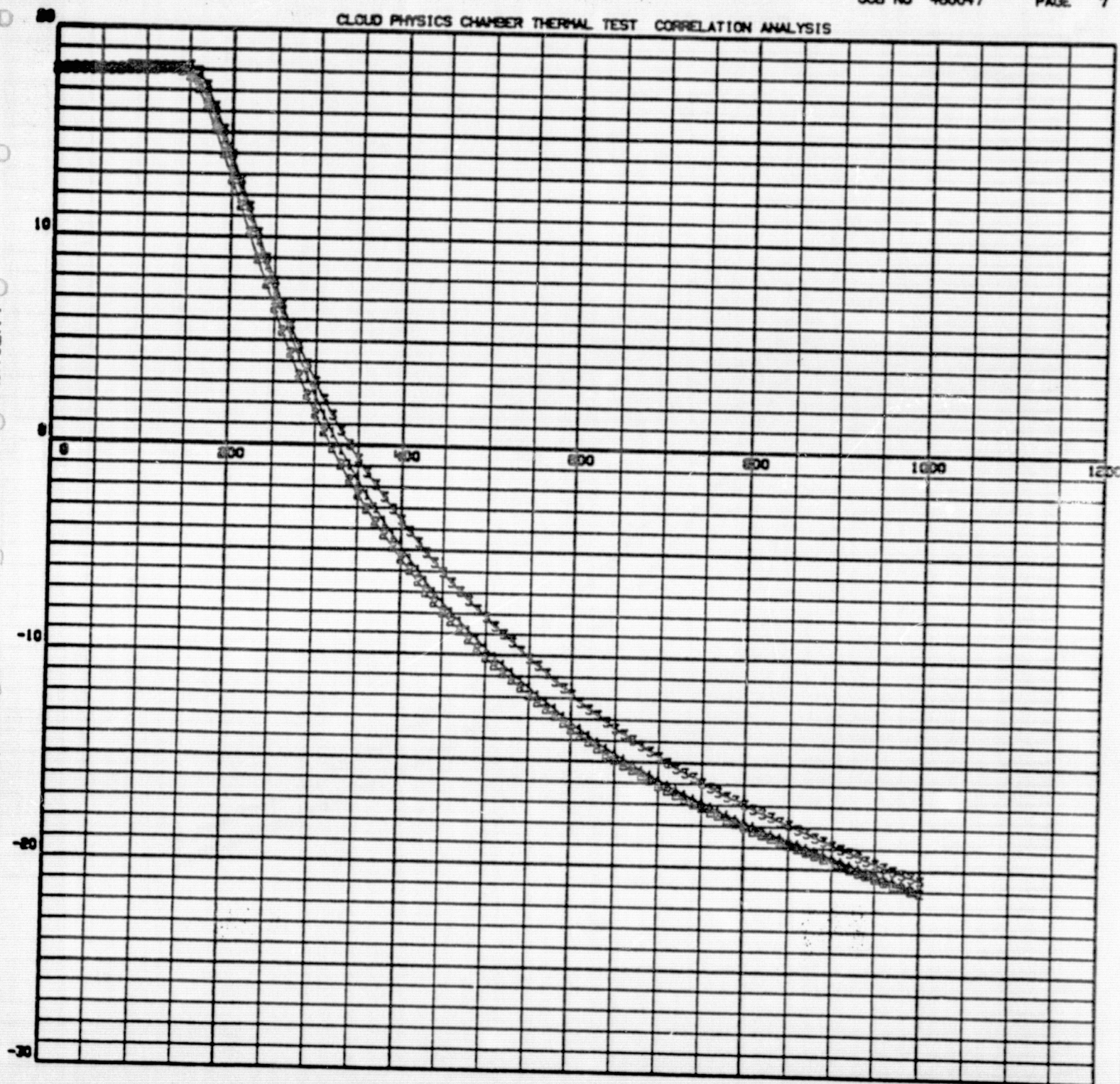
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4053, 4054, SENSOR 6

Figure 10F. Figure 10A Continued

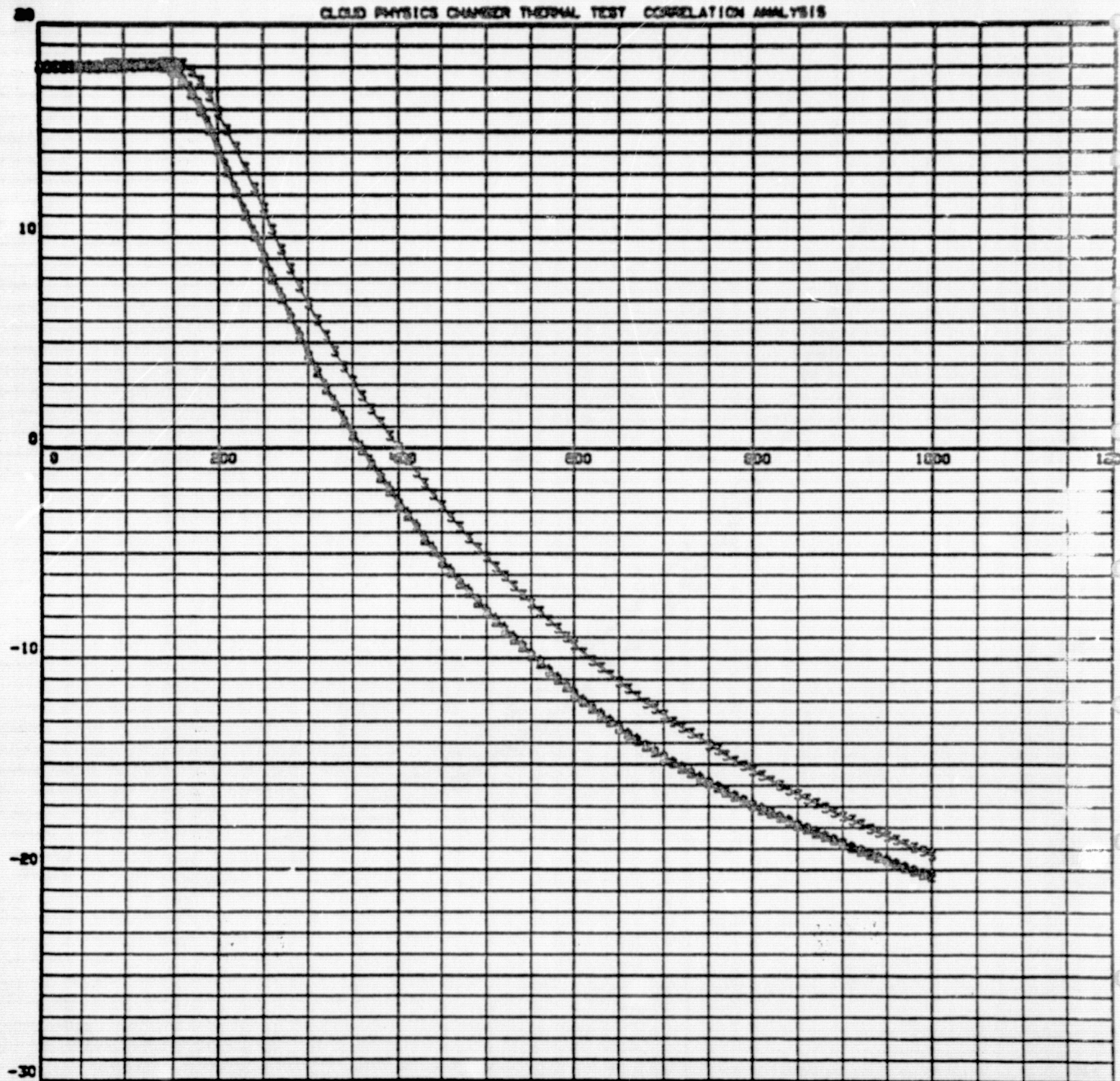
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4083.4084, SENSOR 7

Figure 10G. Figure 10A Continued

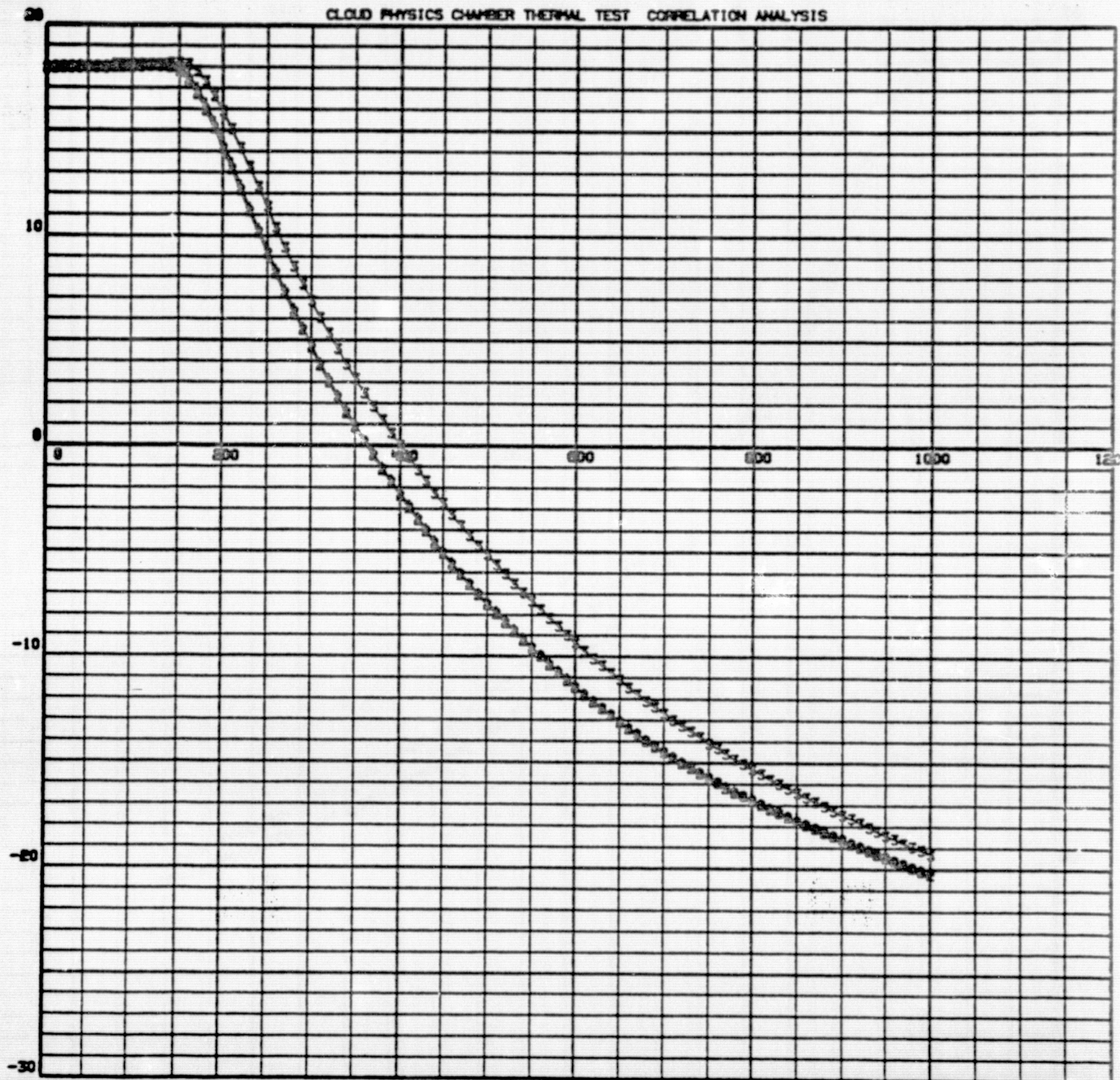
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4073,4074, SENSOR 8

Figure 10H. Figure 10A Continued

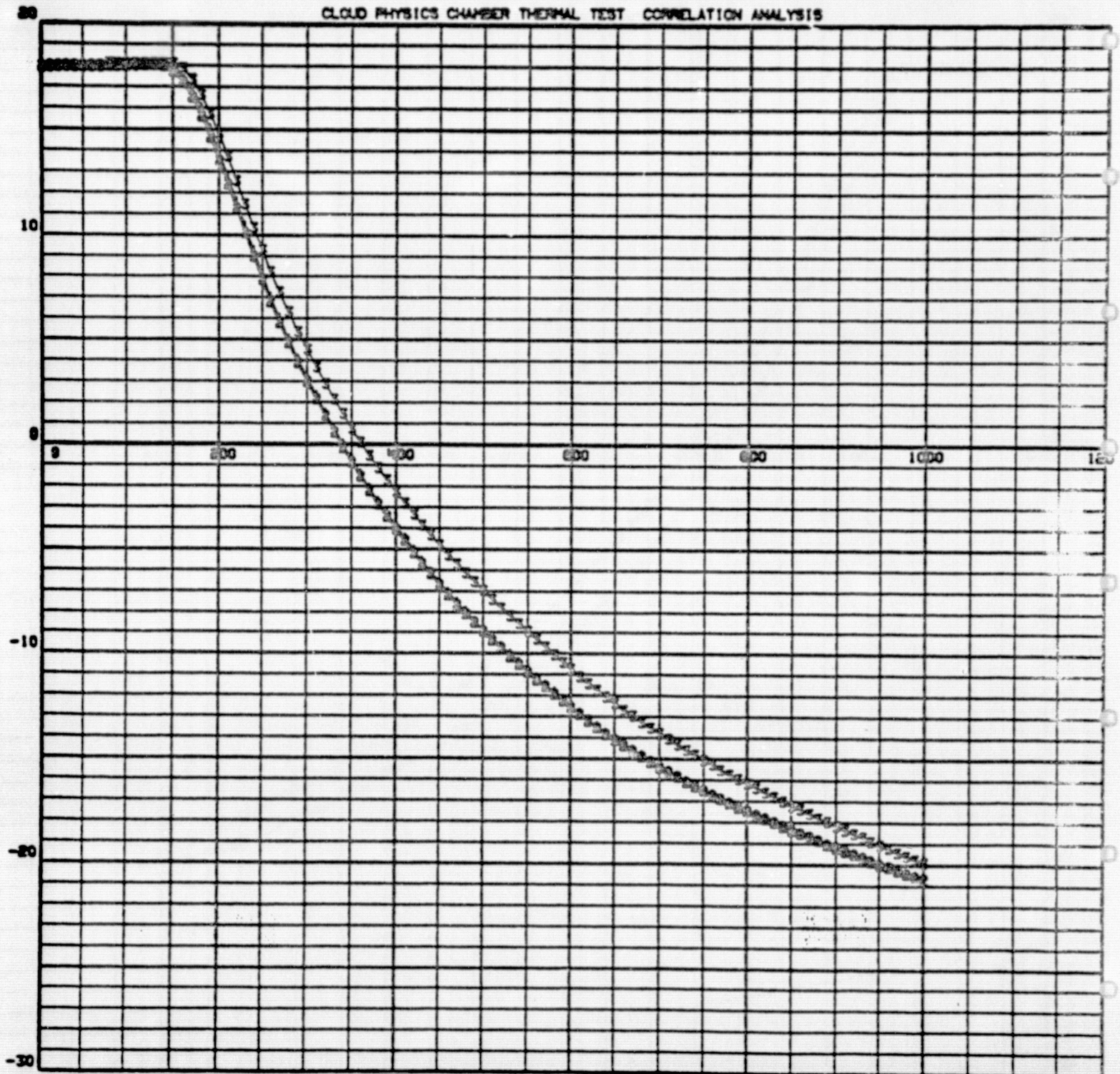
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4083,4084, SENSOR 9

Figure 10I. Figure 10A Continued

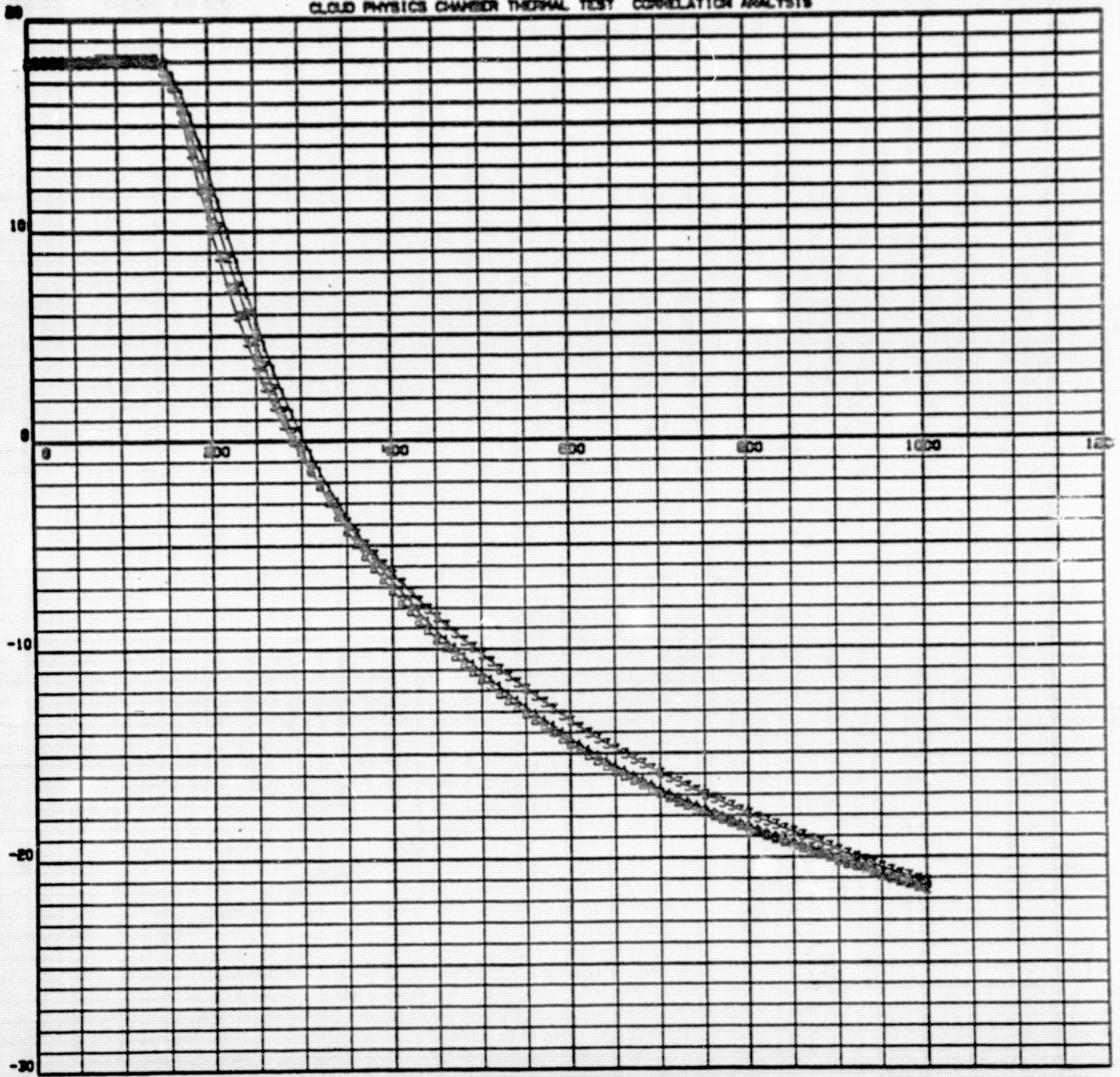
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS. CORRESPONDENCE IS 1 TO 3 = 4083.4094. SENSOR 10

Figure 10J. Figure 10A Continued

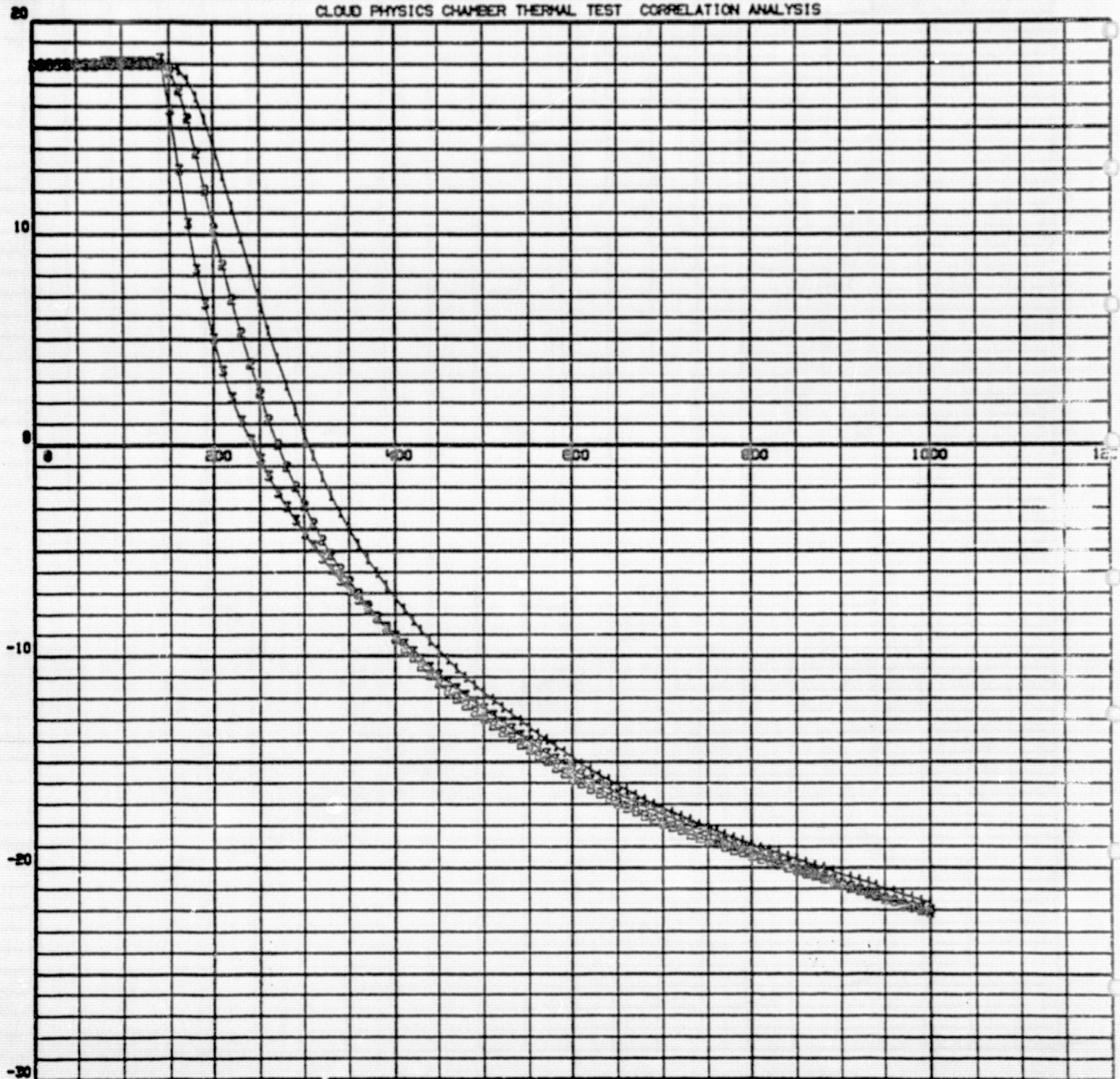
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS. CORRESPONDENCE IS 1 TO 3 = 4103,4104, SENSOR 11

Figure 10K. Figure 10A Continued

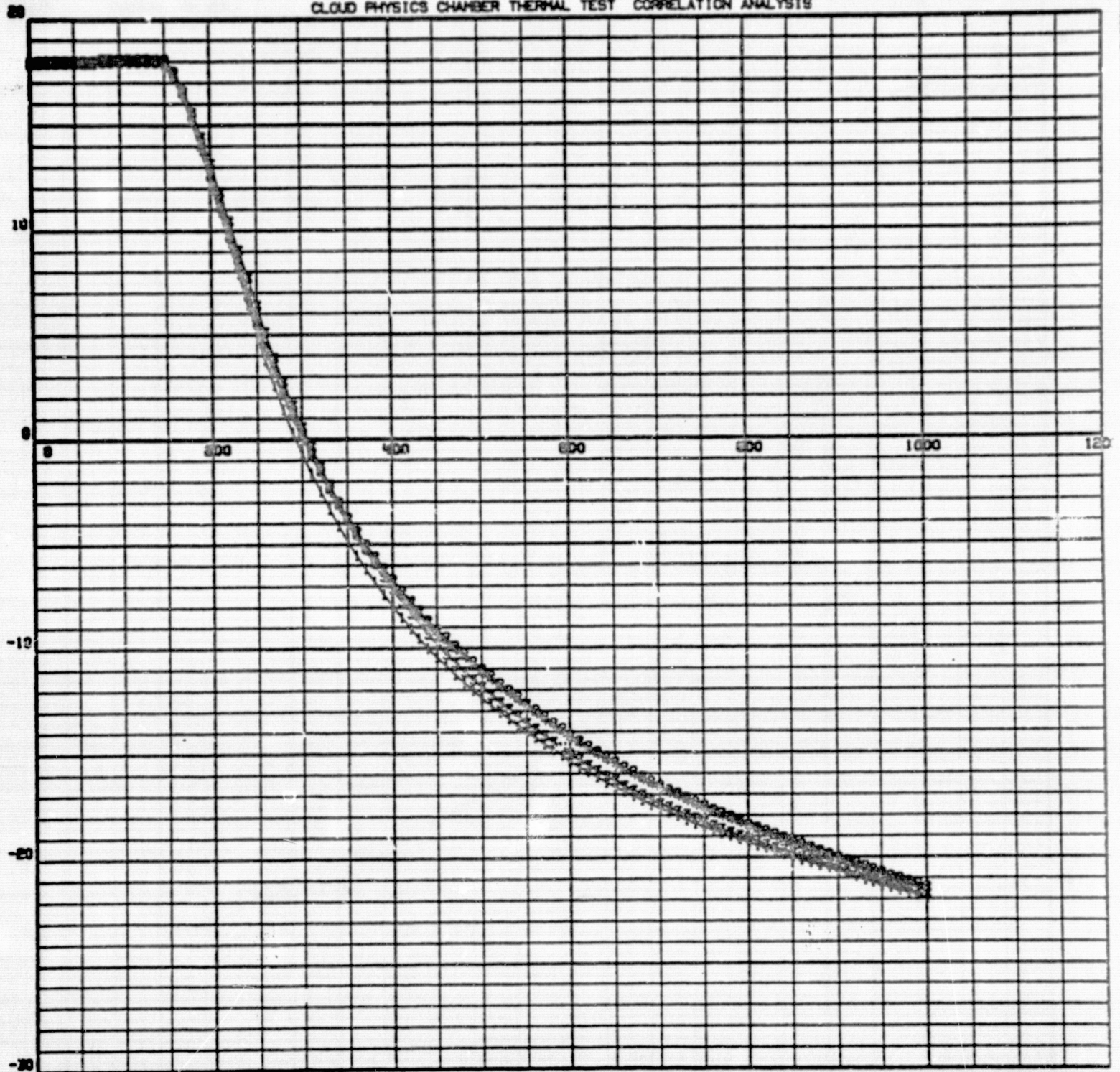
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4113, 4114, SENSOR 12

Figure 10L. Figure 10A Continued

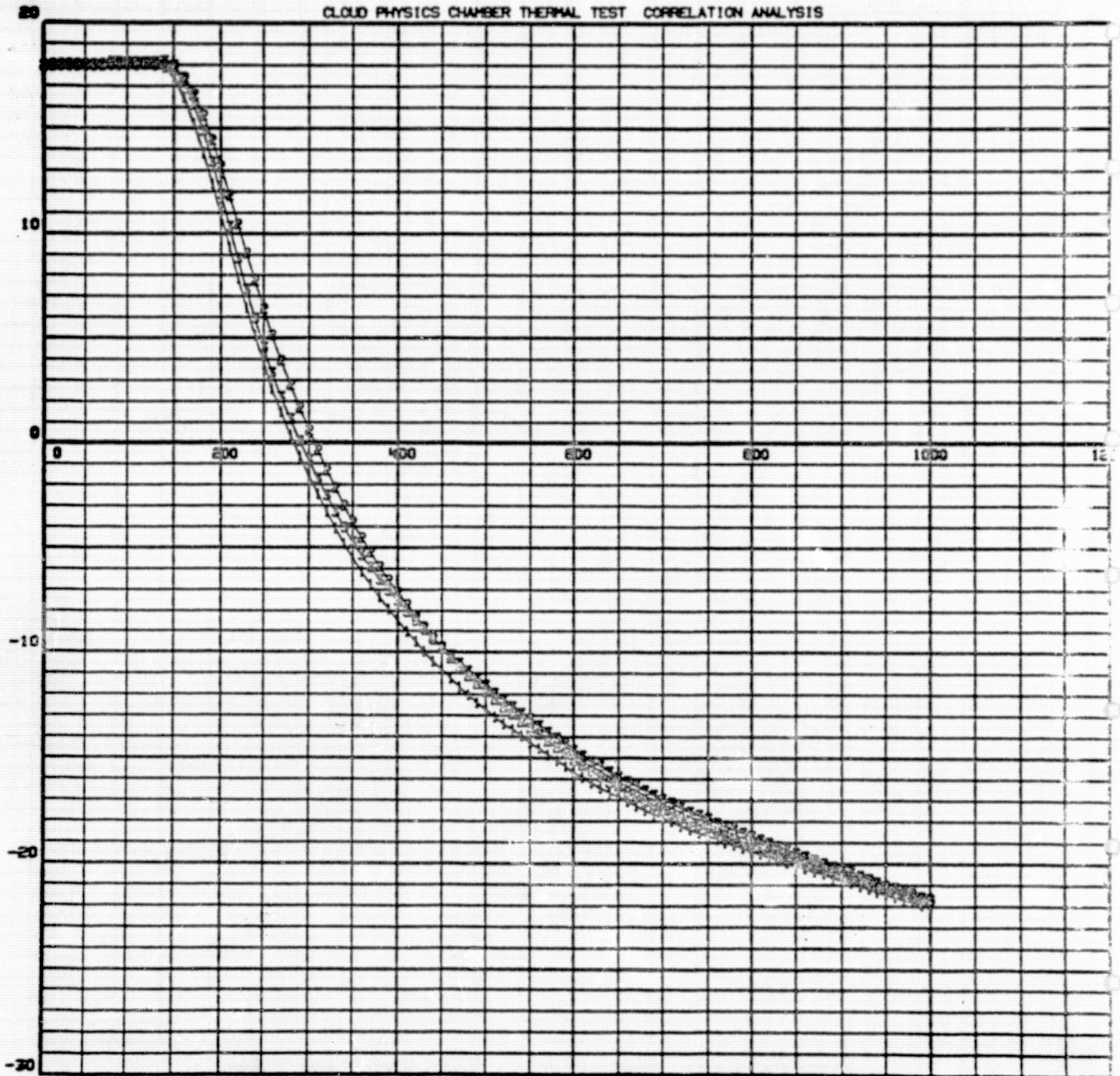
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1704-4004, SENSOR13, 4003, SENSOR14

Figure 10M. Figure 10A Continued

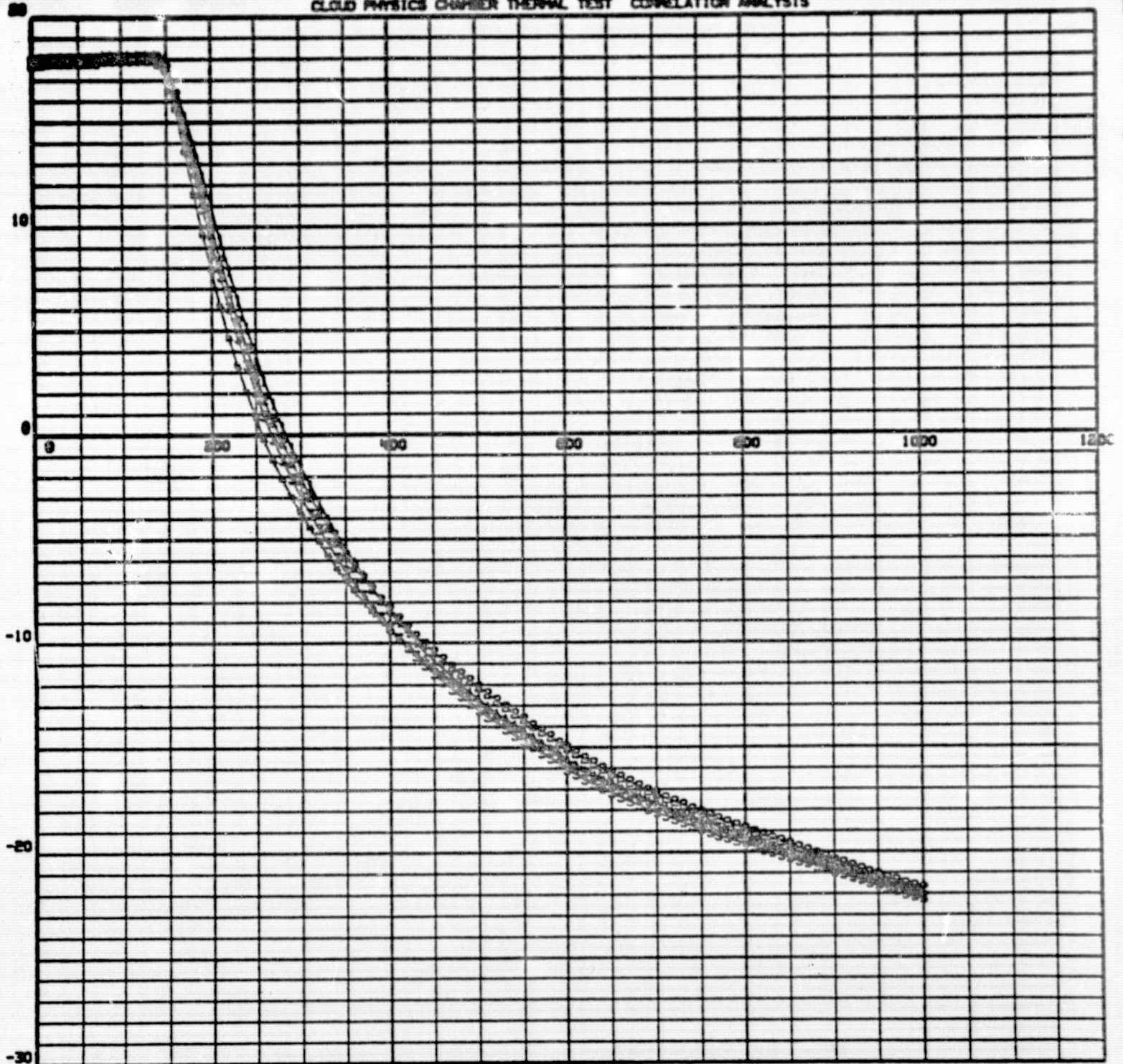
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4002, 4003, SENSOR 15

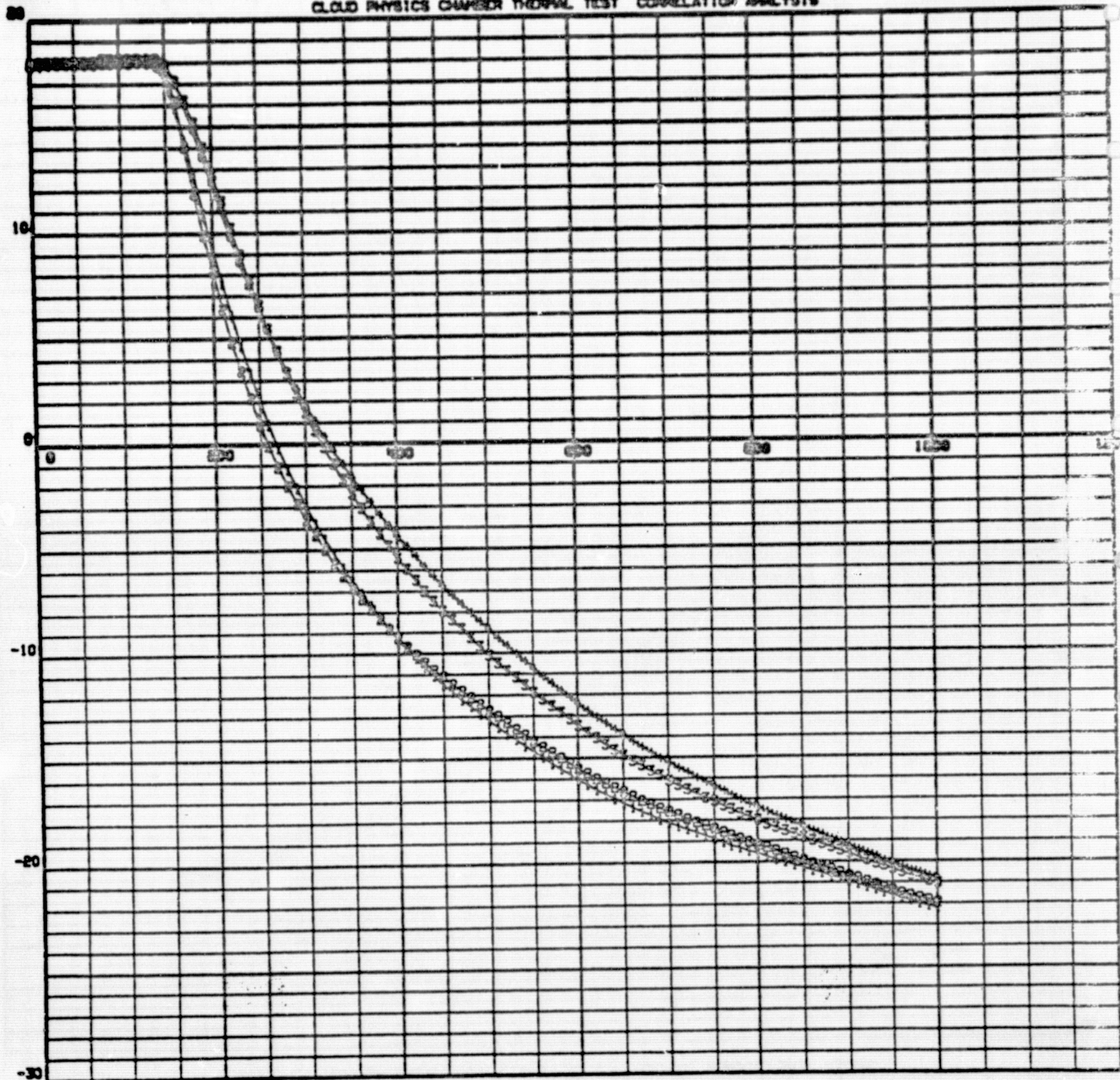
Figure 10N. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-4002, SENSOR16, 4001, SENSOR17

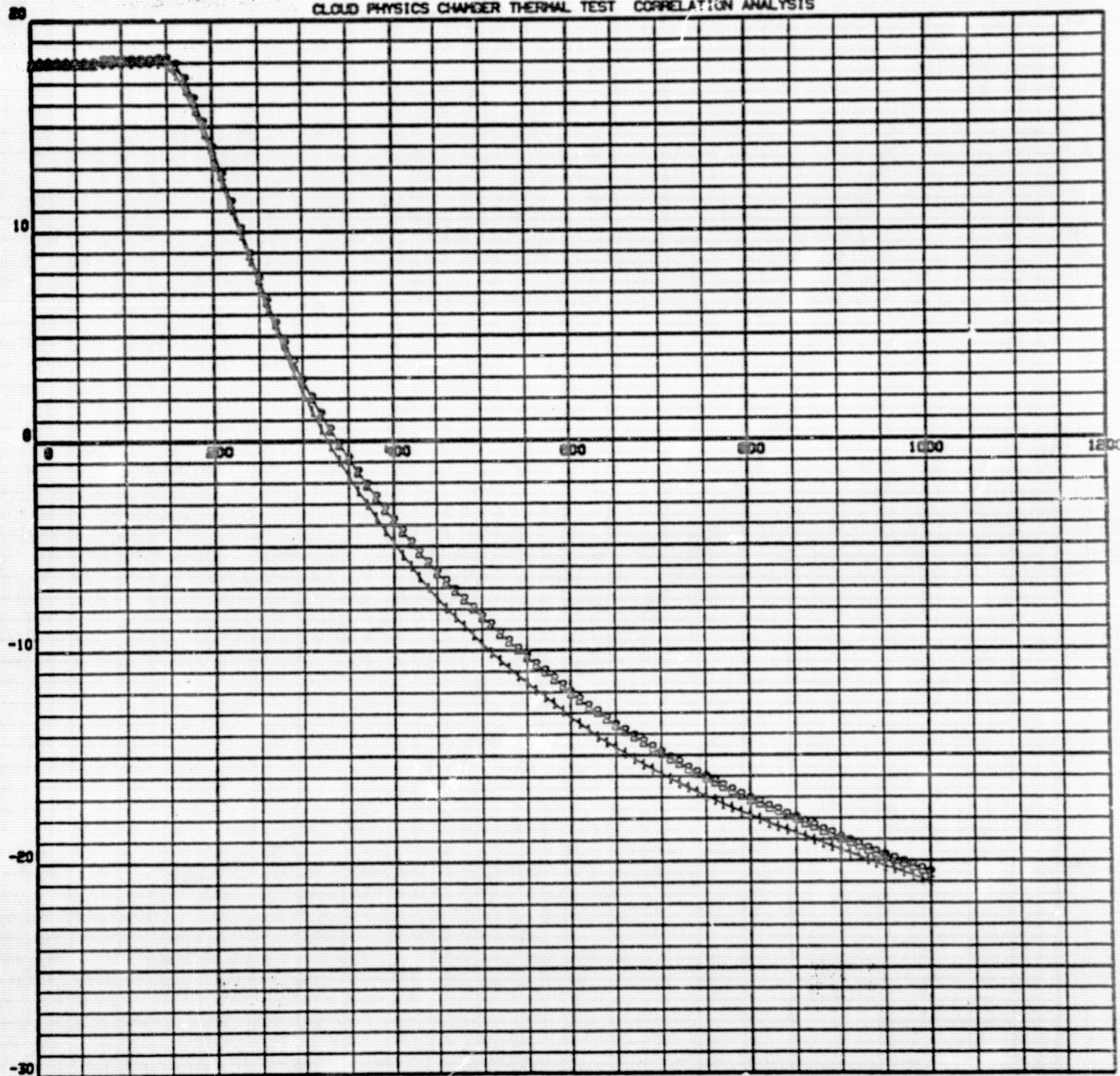
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-4001, SENSOR19, 4084, SENSOR19

Figure 10P. Figure 10A Continued

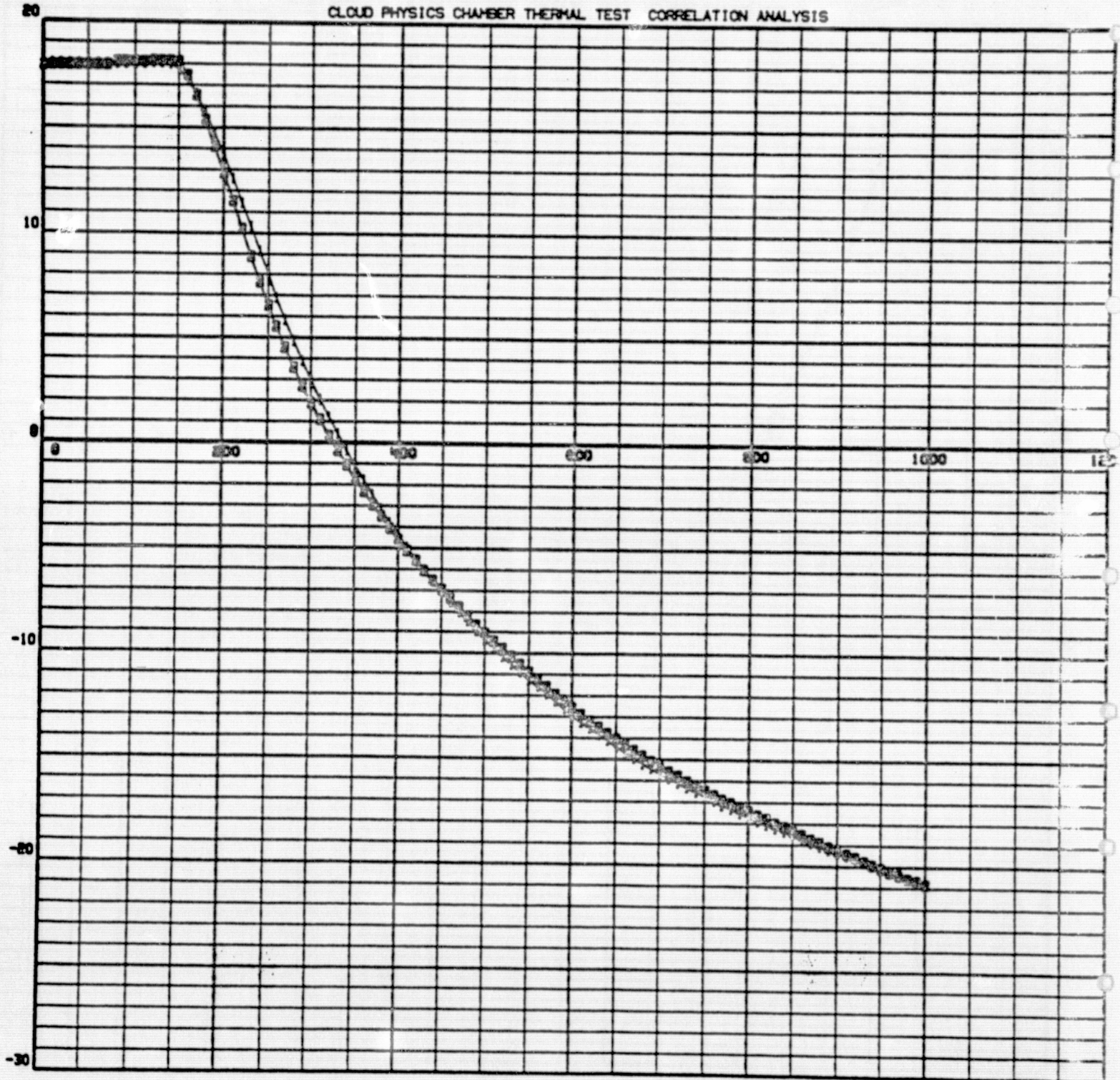
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS. CORRESPONDENCE IS 1 TO 2 = 4083. SENSOR 20

Figure 10Q. Figure 10A Continued

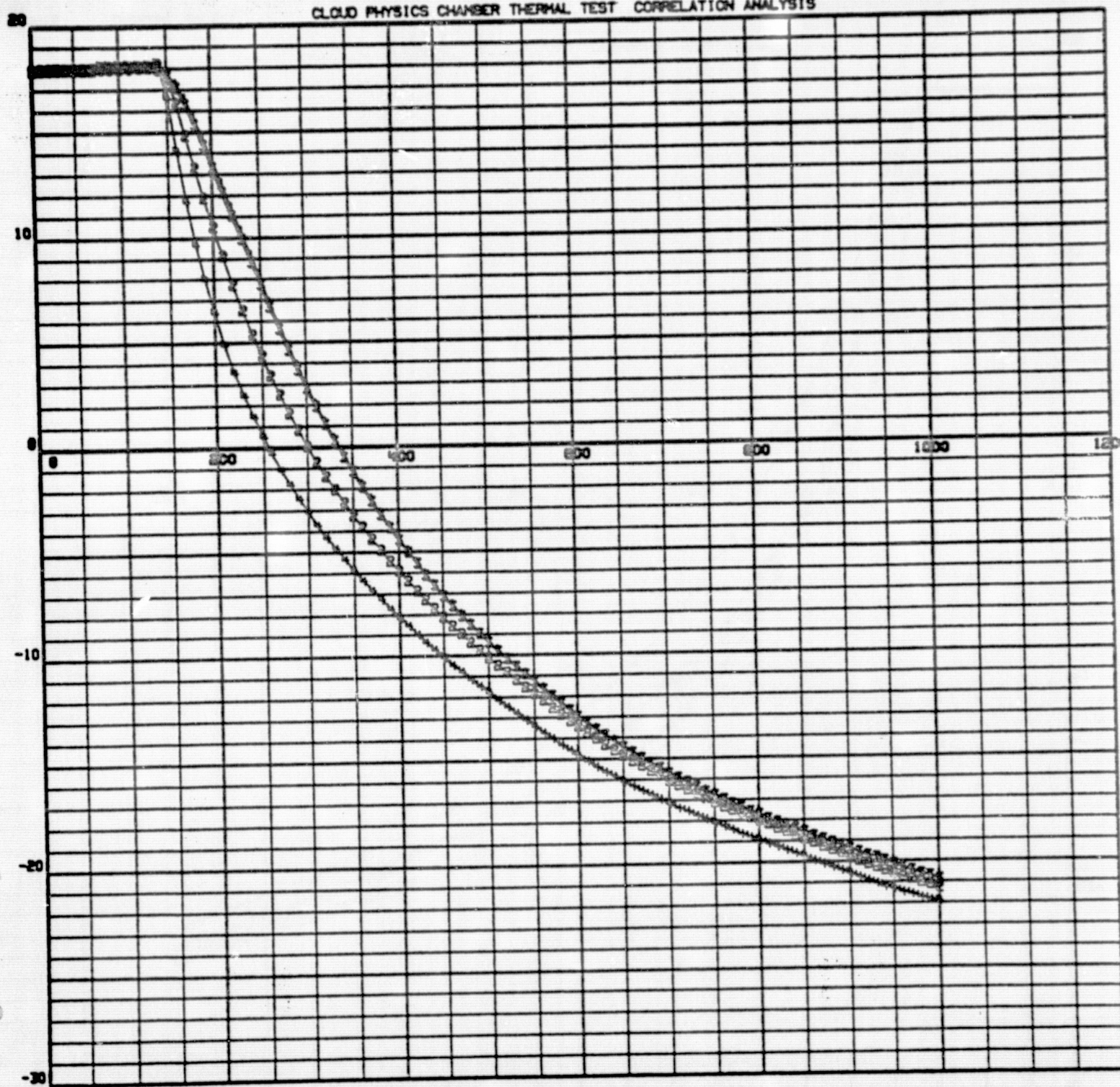
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1 TO 3 = 4062,4063, SENSOR 21

Figure 10R. Figure 10A Continued

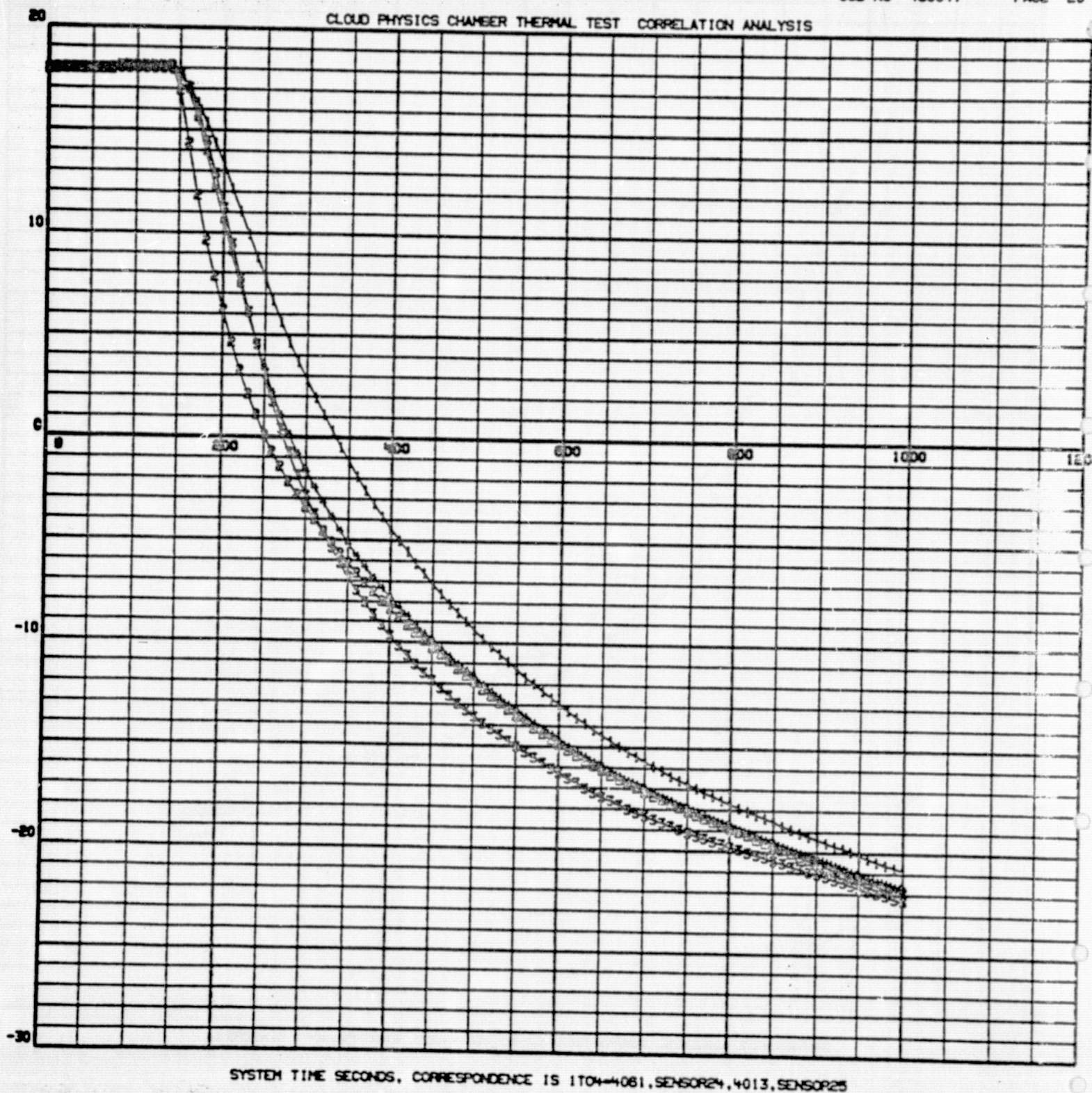
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-4062, SENSOR22, 4061, SENSOR23

Figure 10S. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-4061, SENSOR24, 4013, SENSOR25

Figure 10T. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS

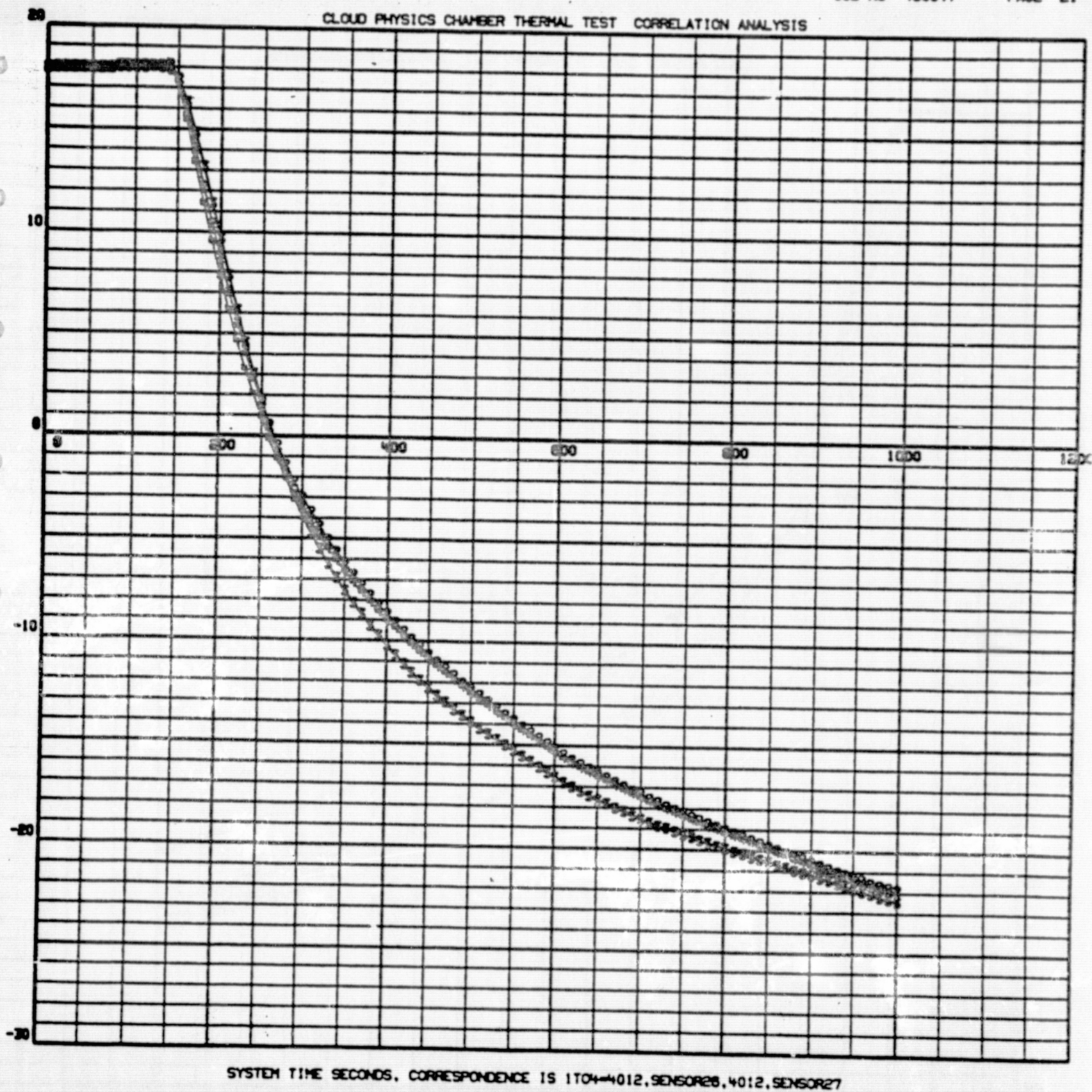


Figure 10U. Figure 10A Continued

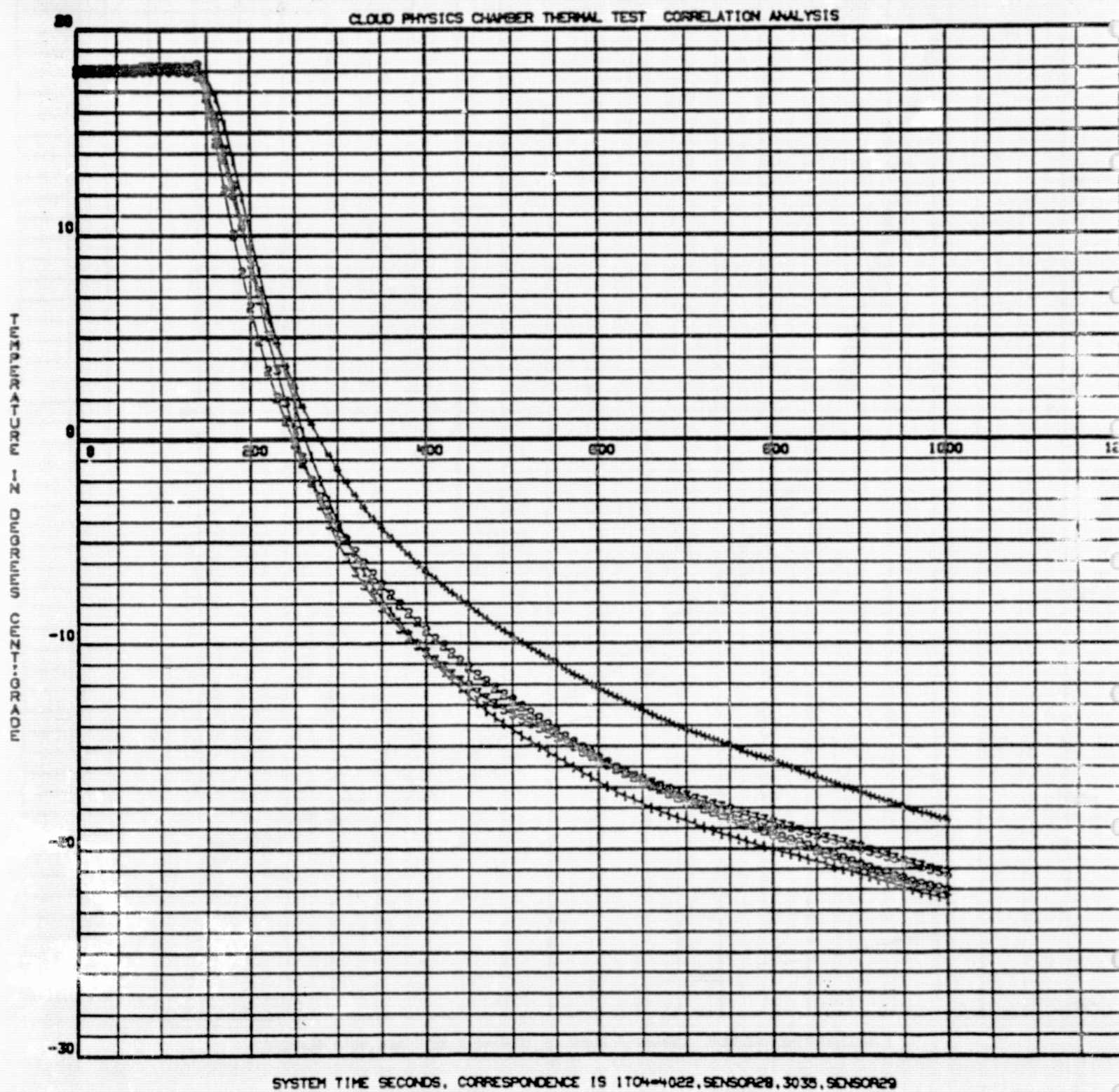


Figure 10V. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS

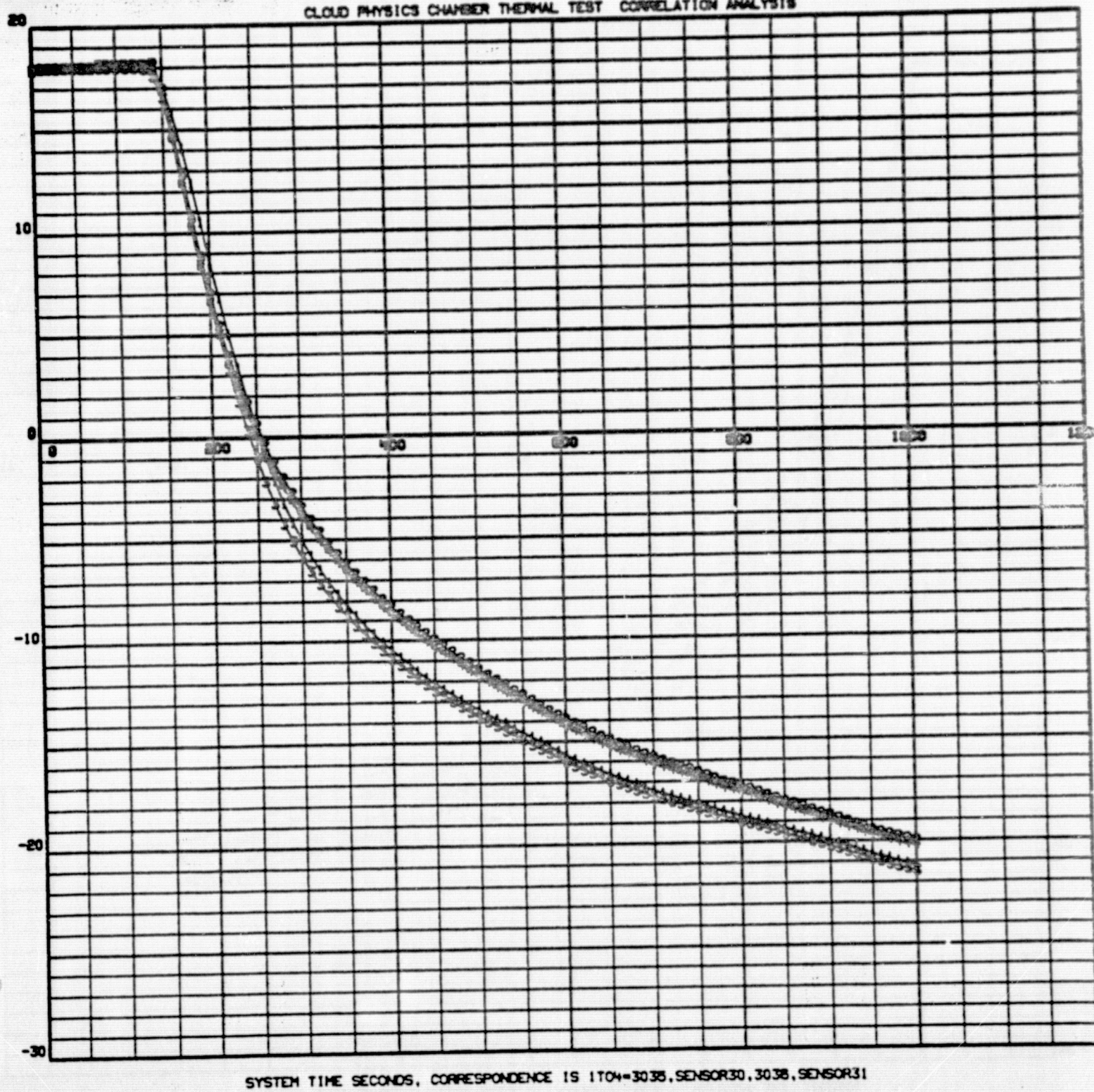
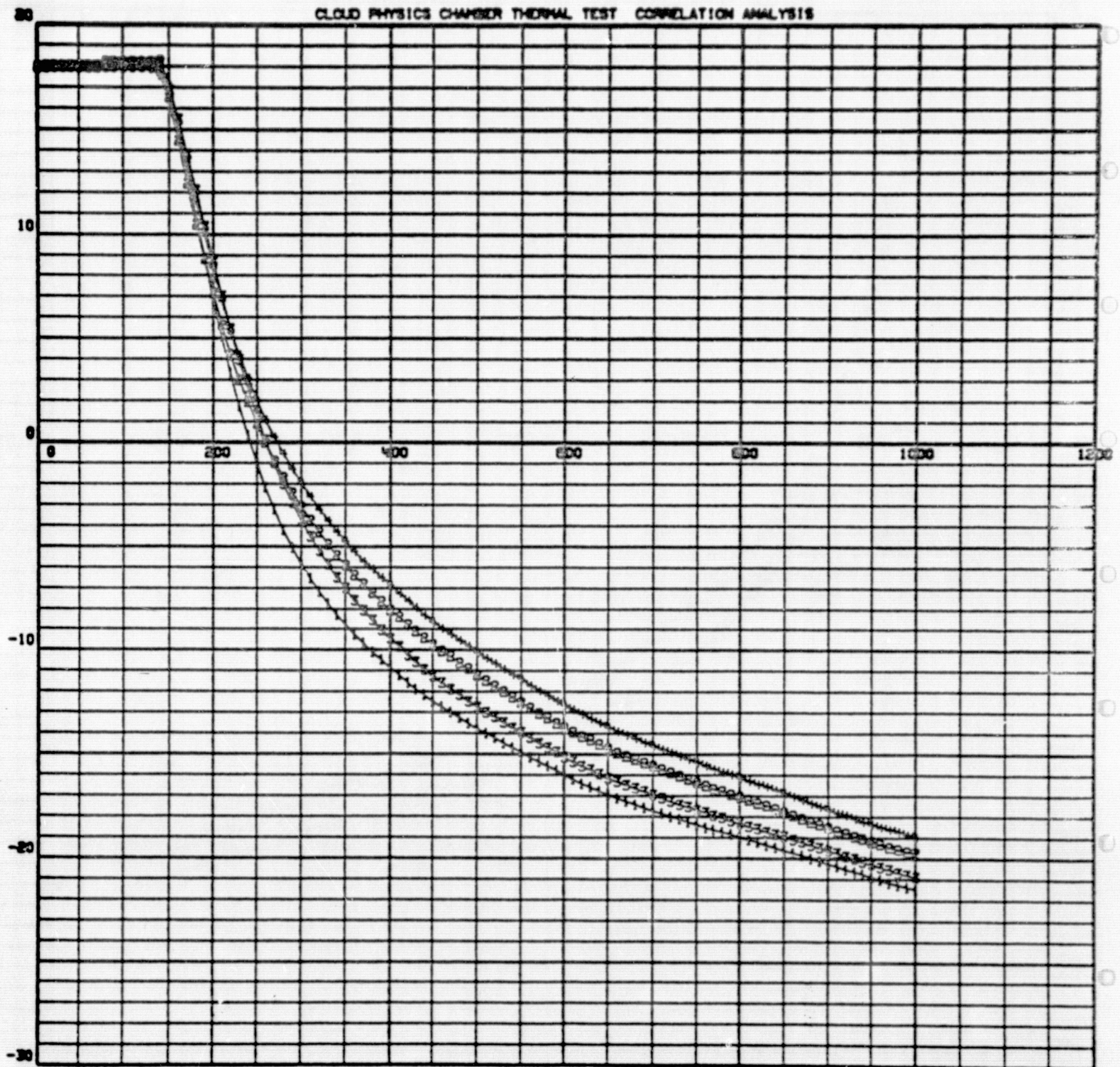


Figure 10W. Figure 10A Continued

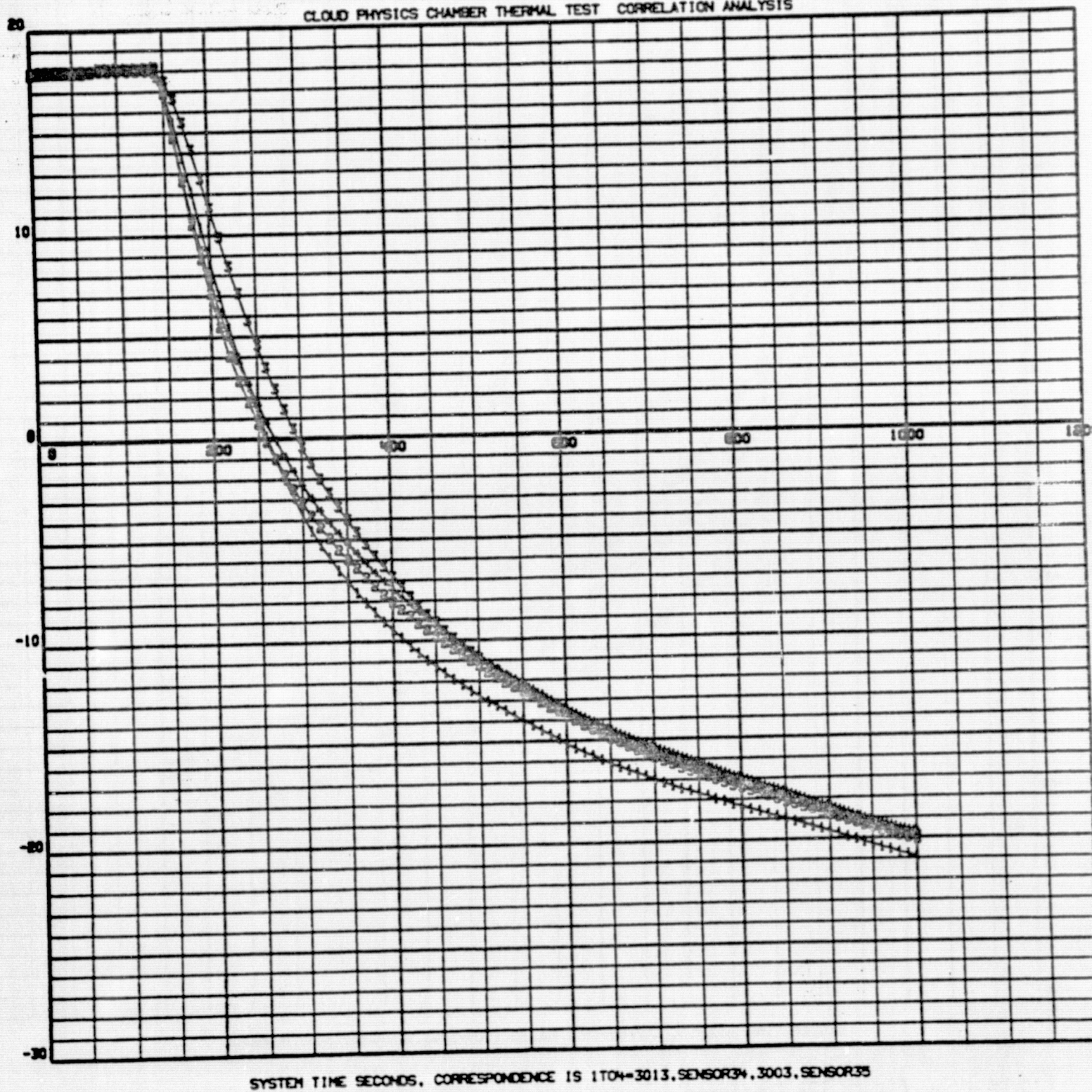
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS ITO+3036, SENSOR32, 3013, SENSOR33

Figure 10X. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1T04-3013, SENSOR34, 3003, SENSOR35

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS

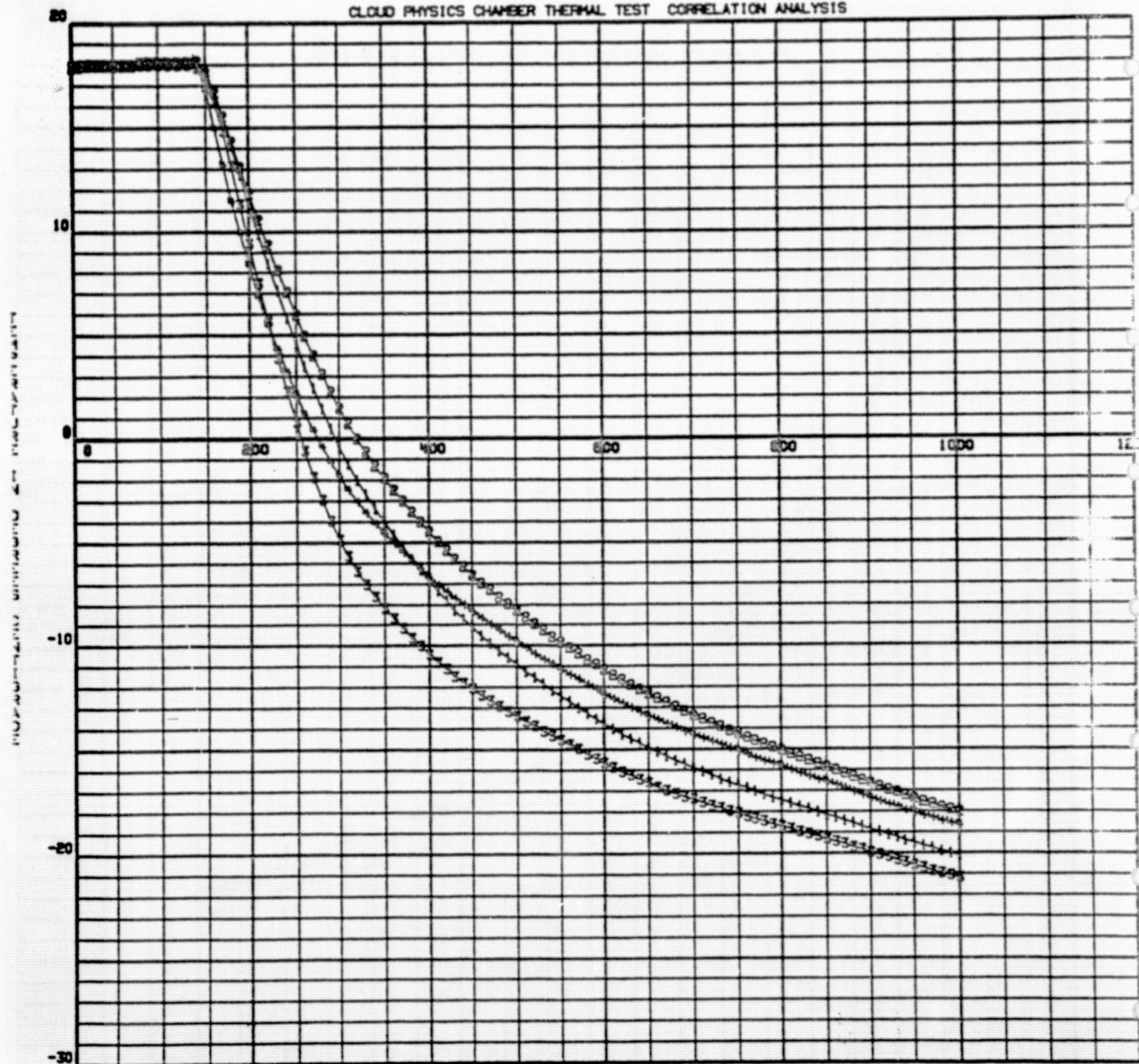


Figure 10Z. Figure 10A Continued

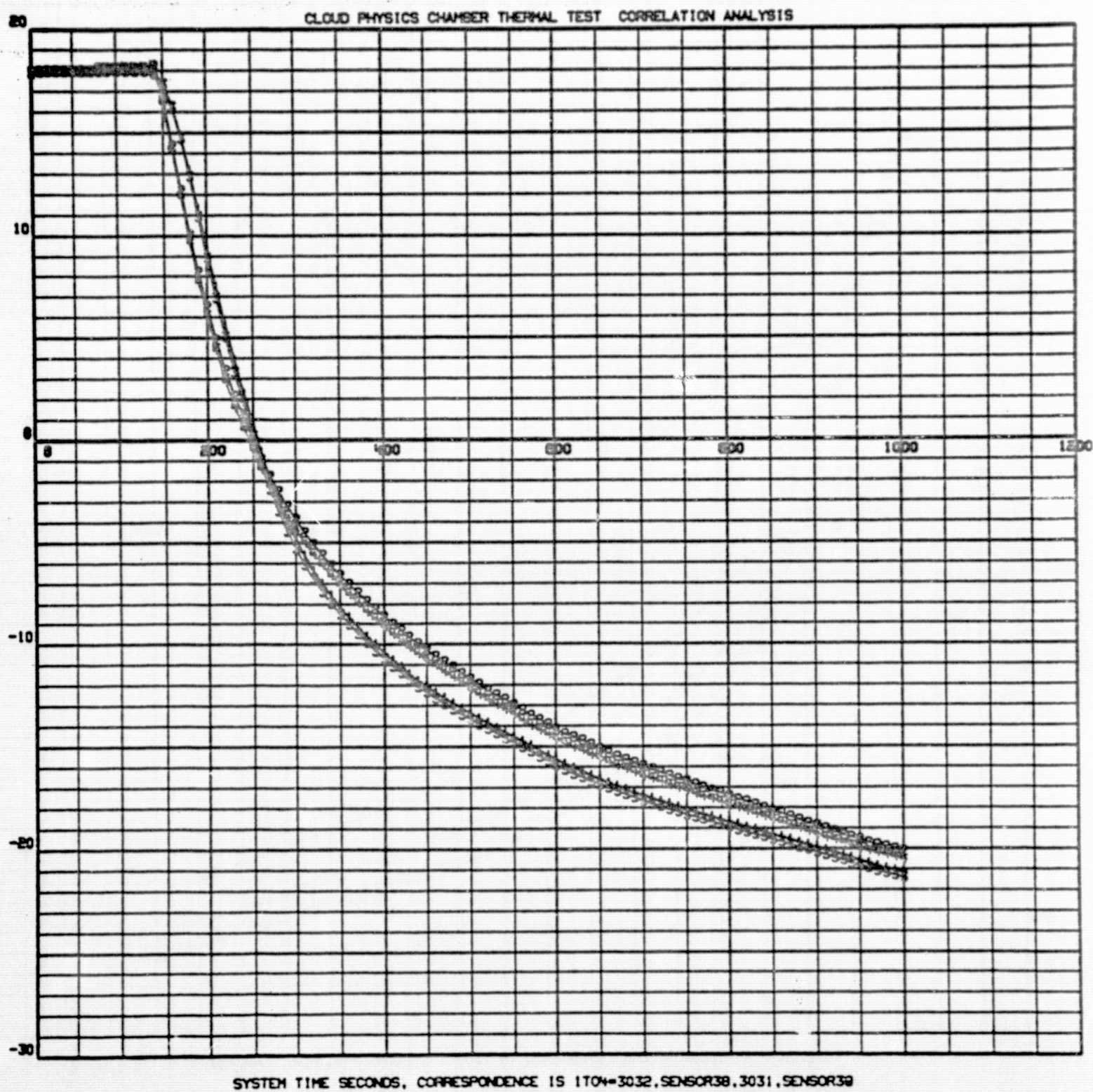


Figure 10AA. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS

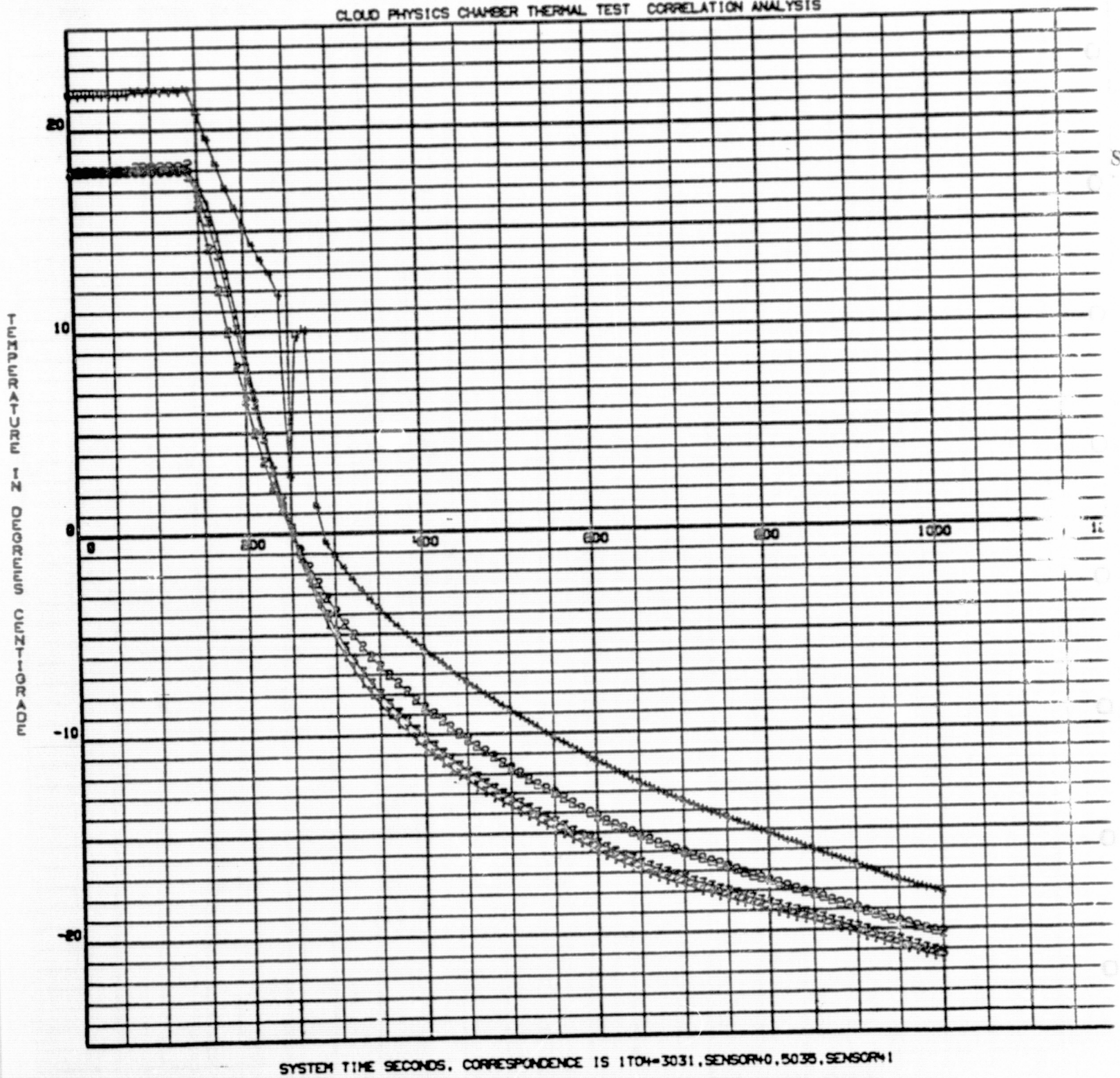
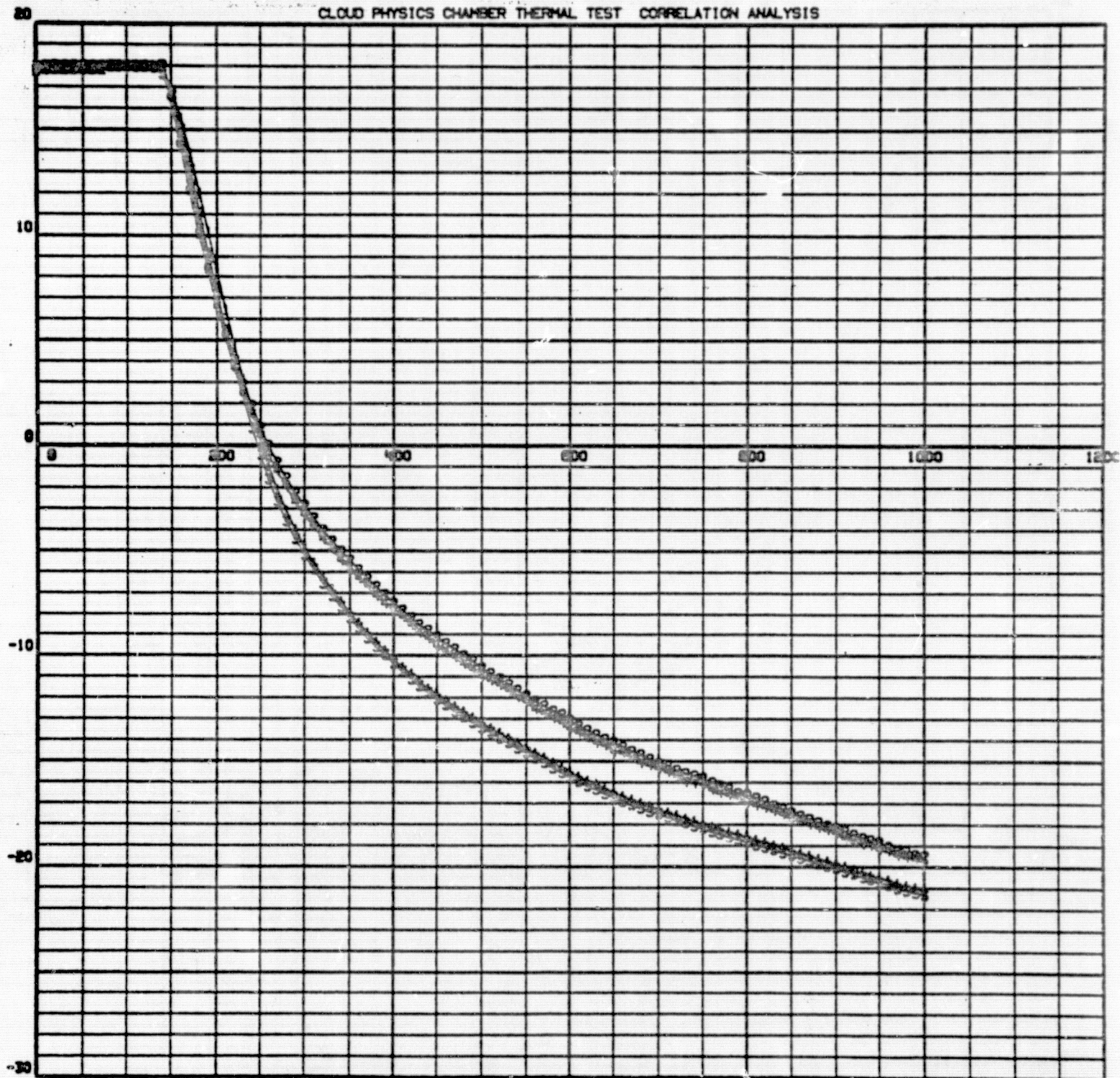


Figure 10BB. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-5035, SENSOR#2, 5036, SENSOR#3

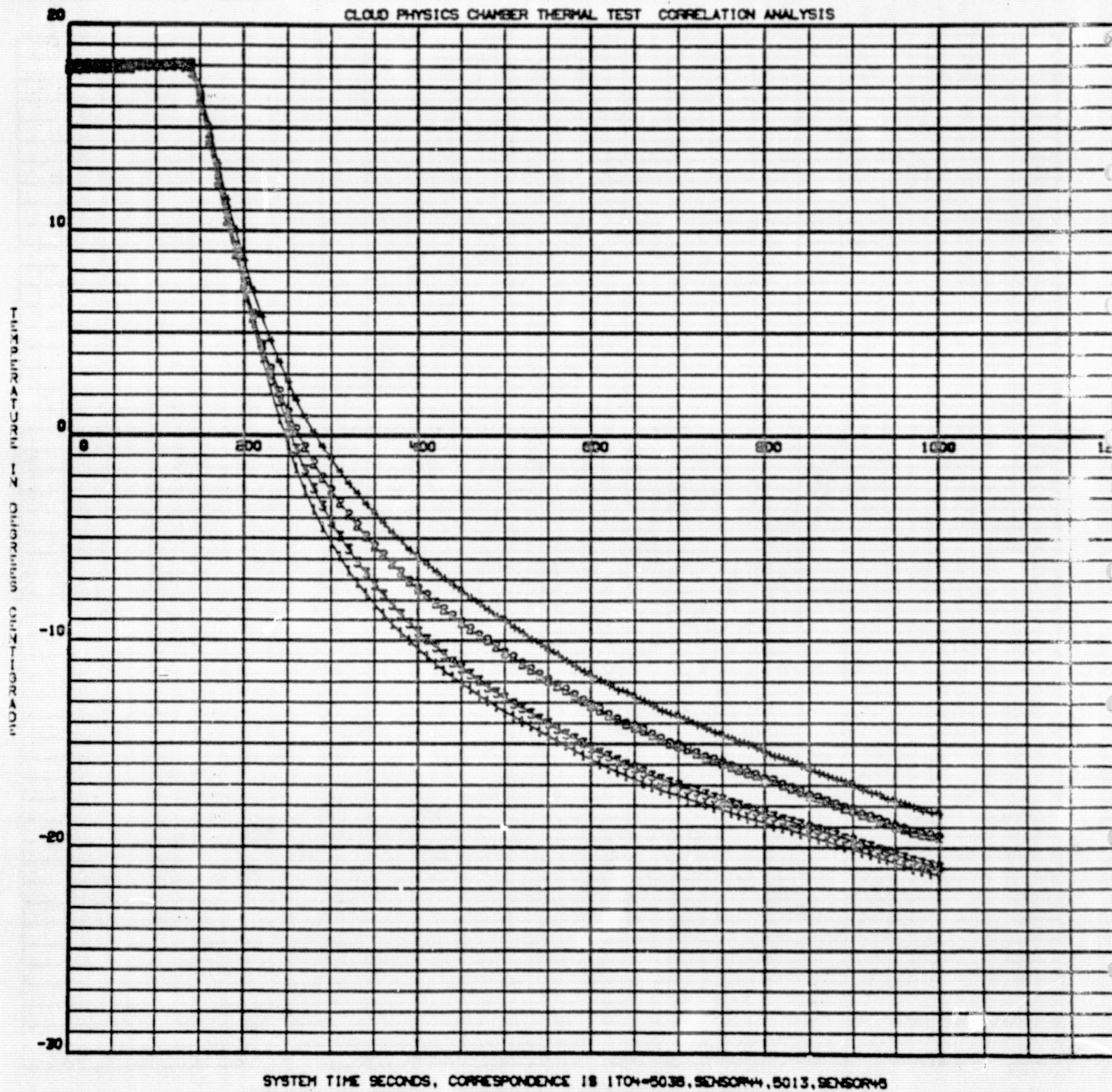
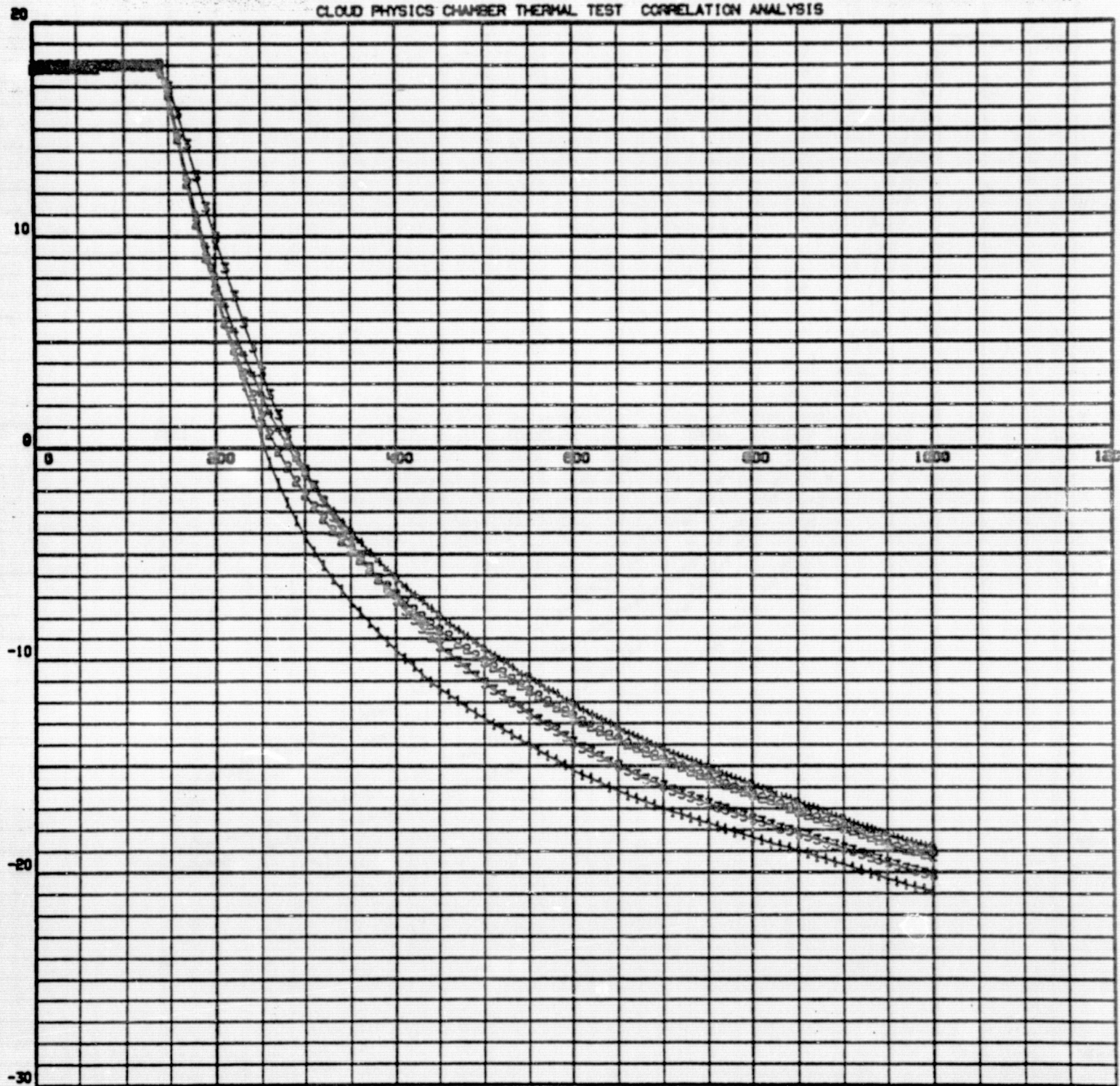


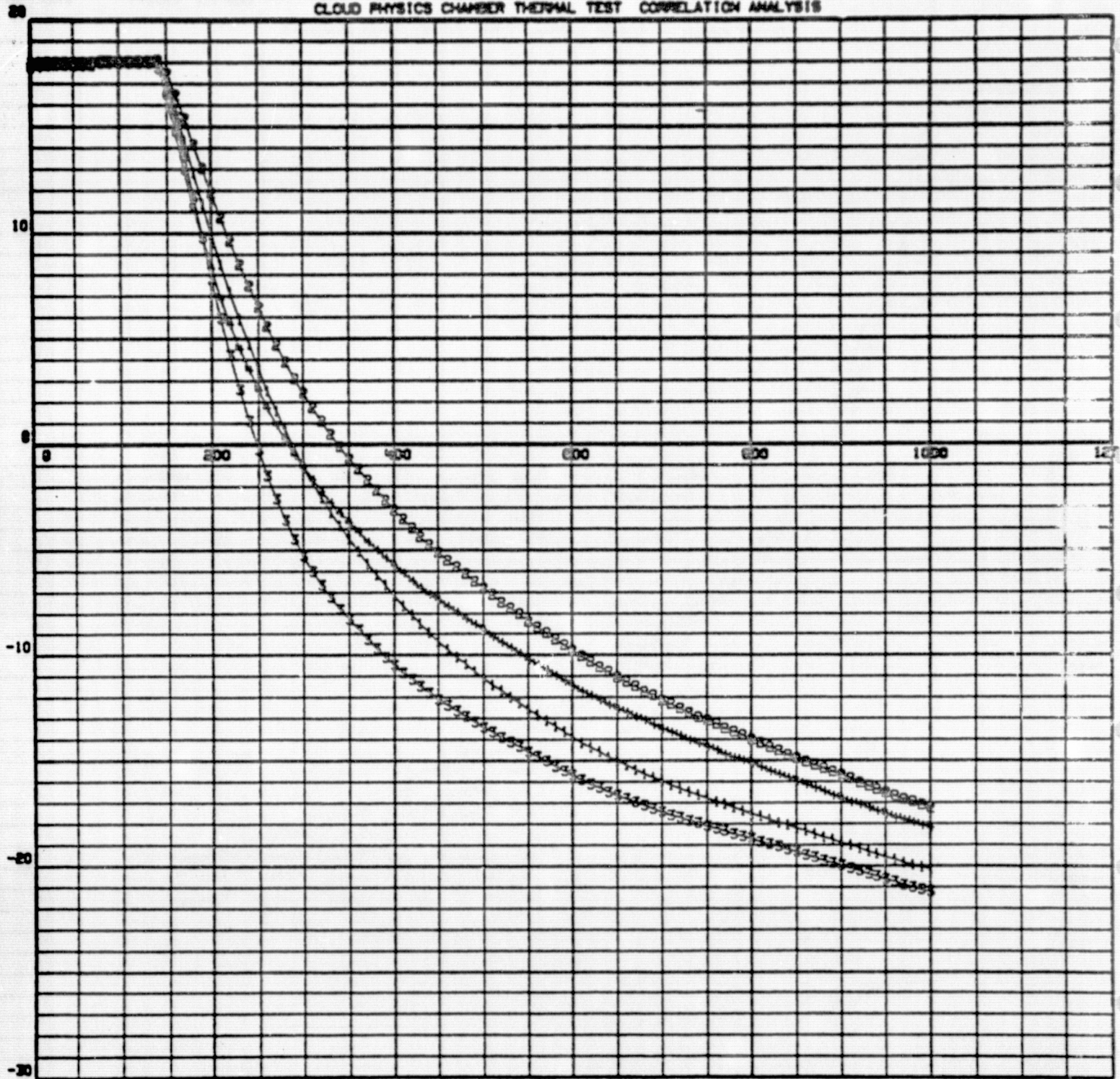
Figure 10DD. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-5013, SENSOR#8, 5003, SENSOR#7

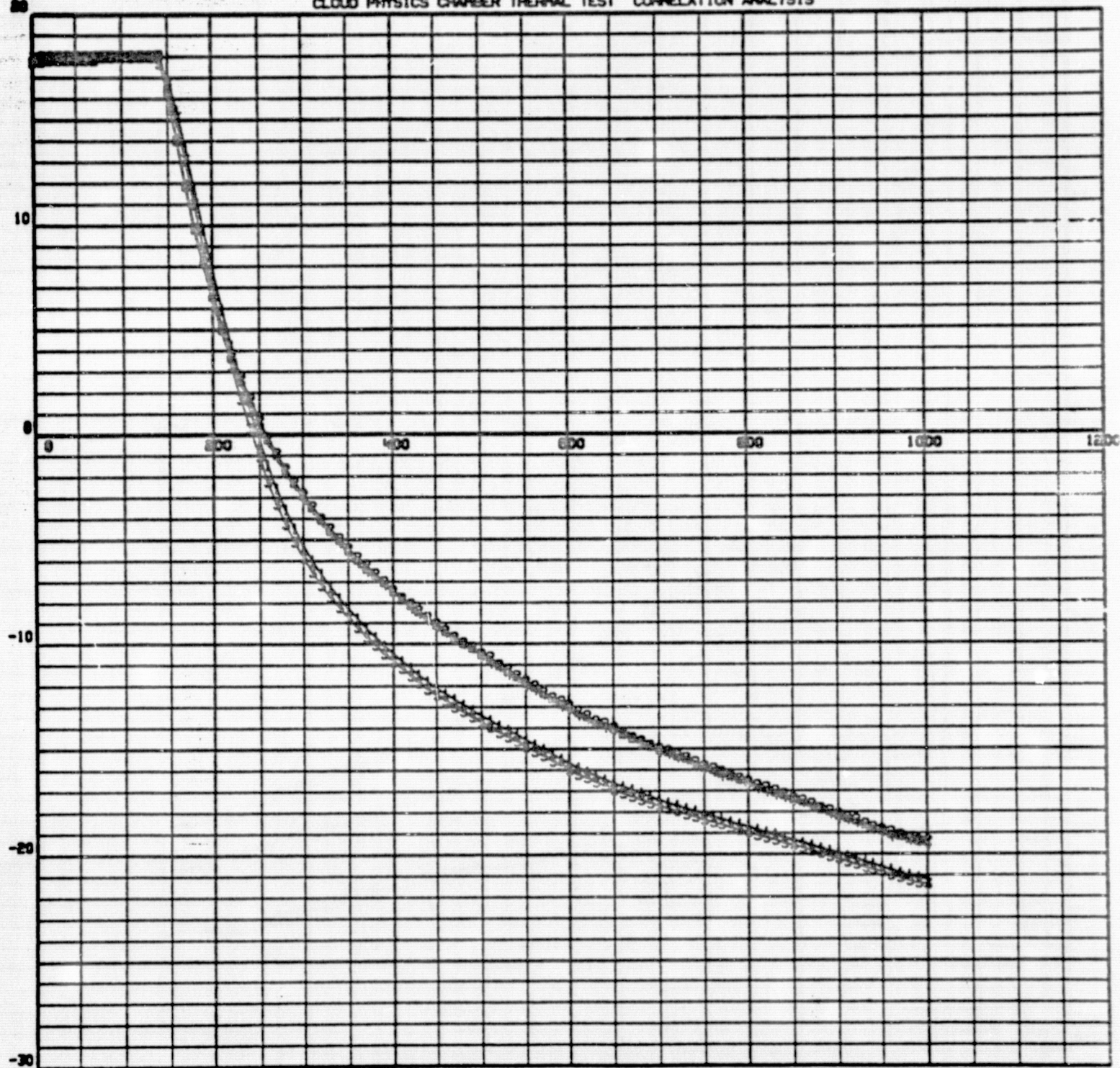
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-5003, SENSOR#0, 5032, SENSOR#9

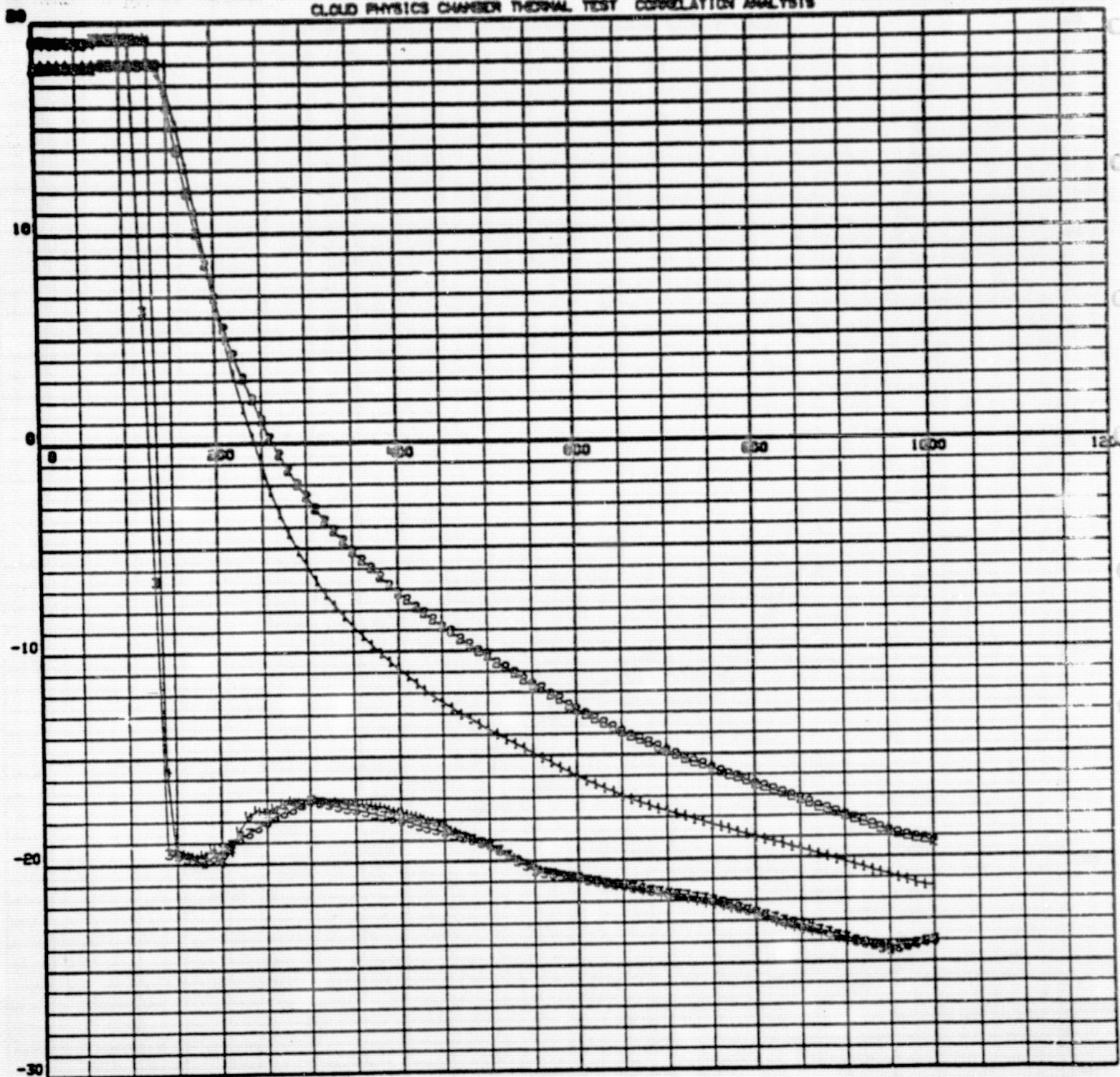
Figure 10FF. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



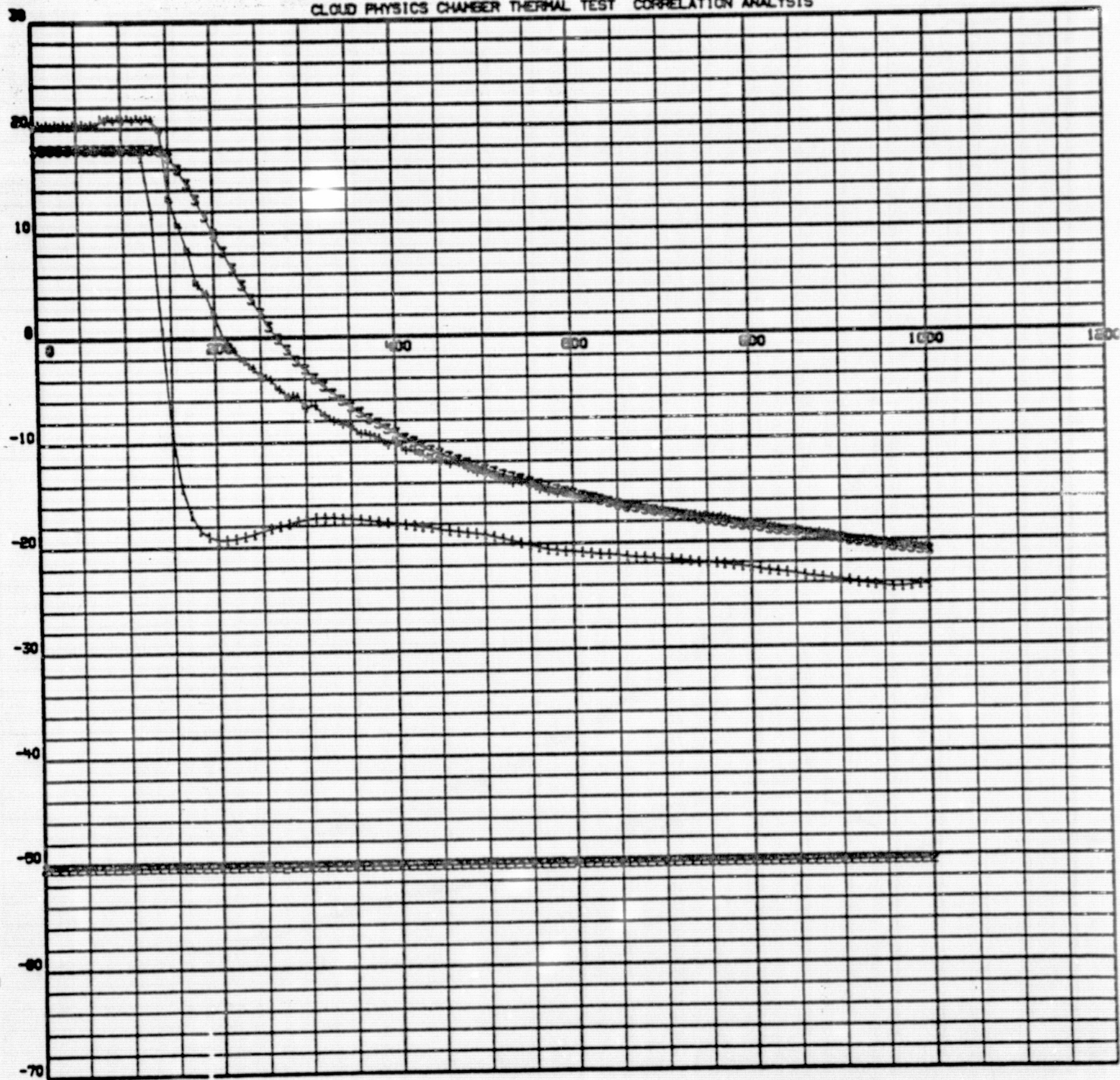
SYSTEM TIME SECONDS. CORRESPONDENCE IS 1104-5032, SENSOR50, 5031, SENSOR51

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-5031, SENSOR52, 1000, SENSOR53

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104=3800, SENSOR04, 7002, SENSOR05

Figure 10II. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS

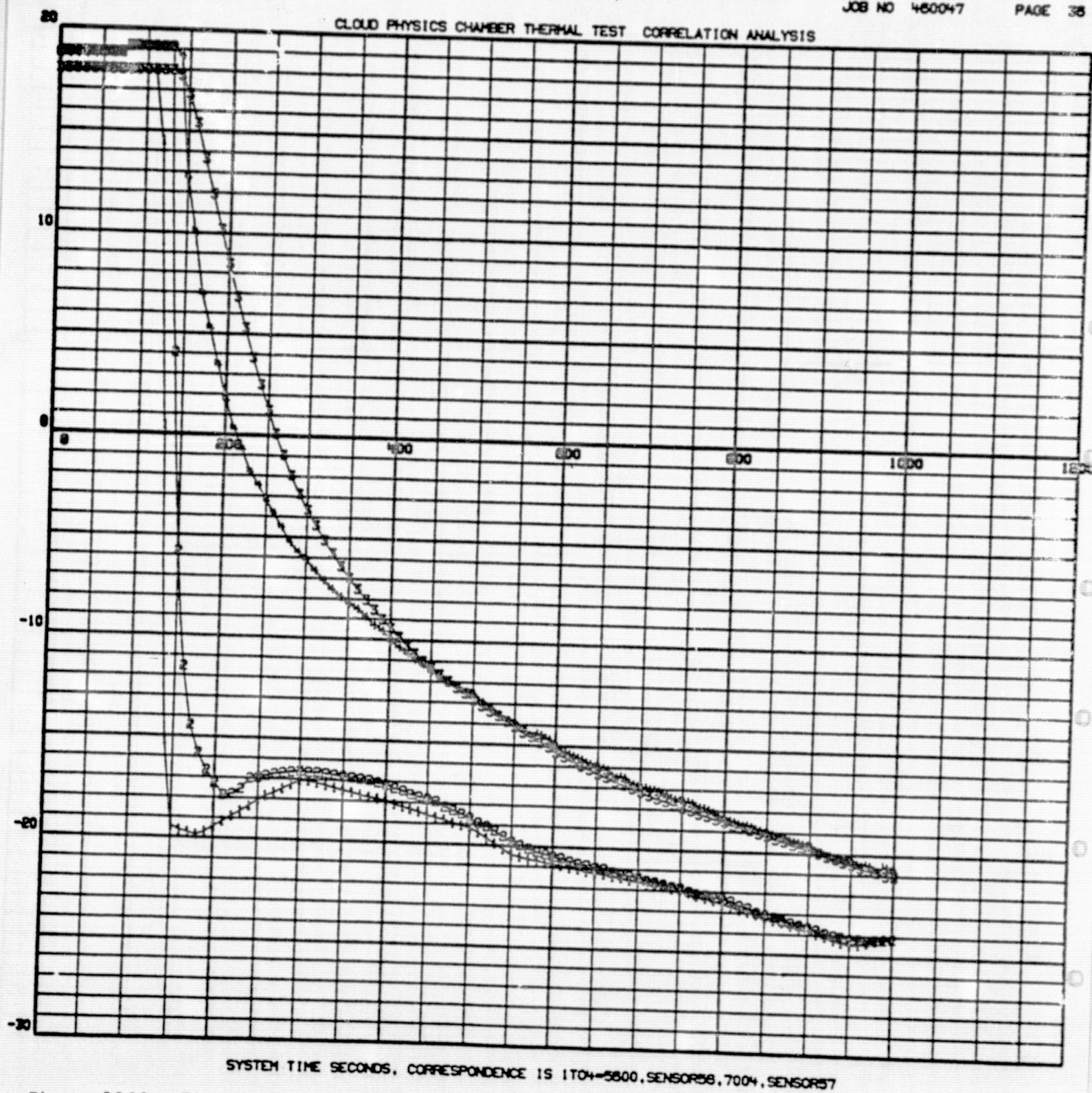
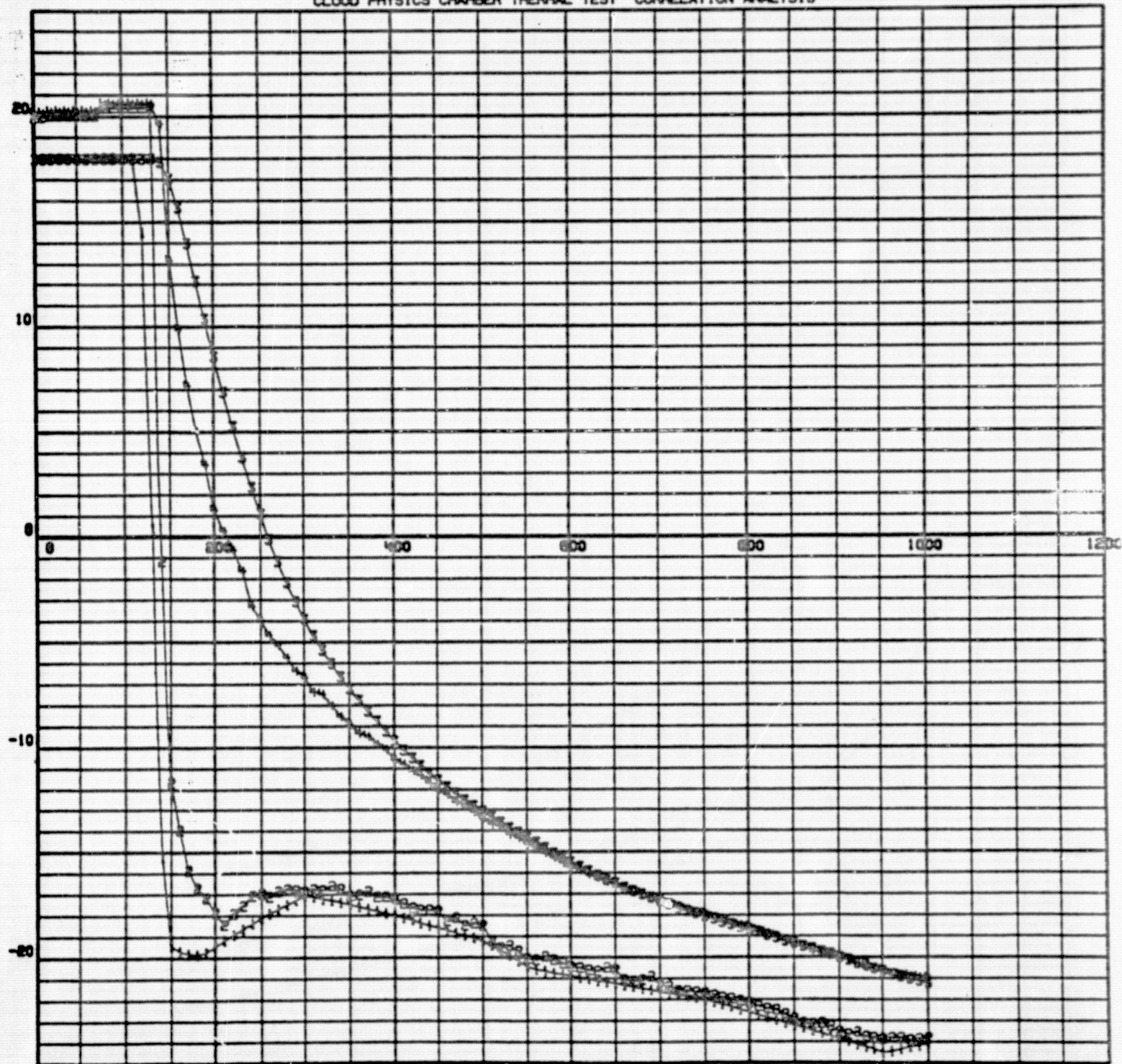


Figure 10JJ. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1704=3700, SENSOR58, 7001, SENSOR59

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS

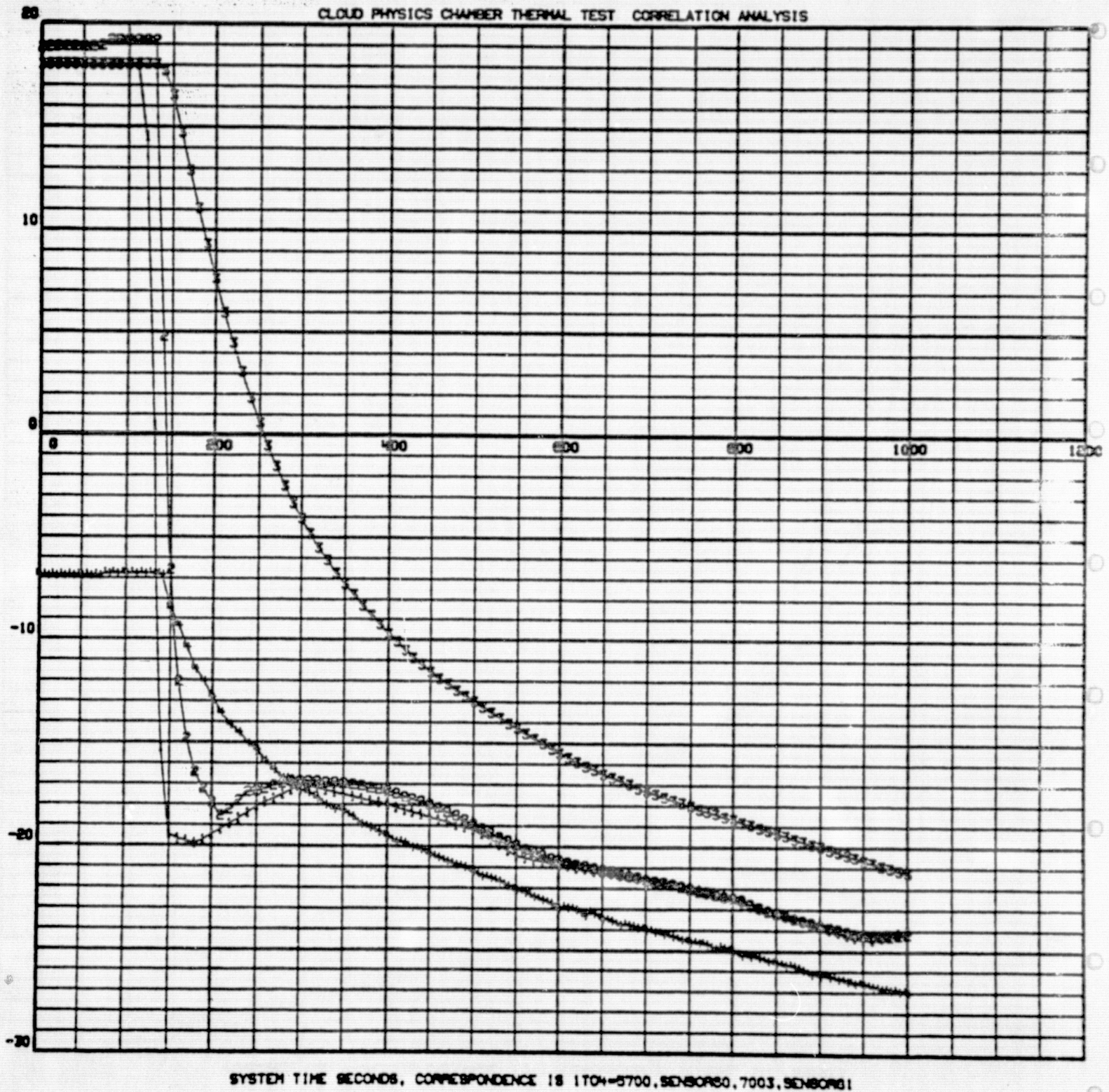


Figure 10LL. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS

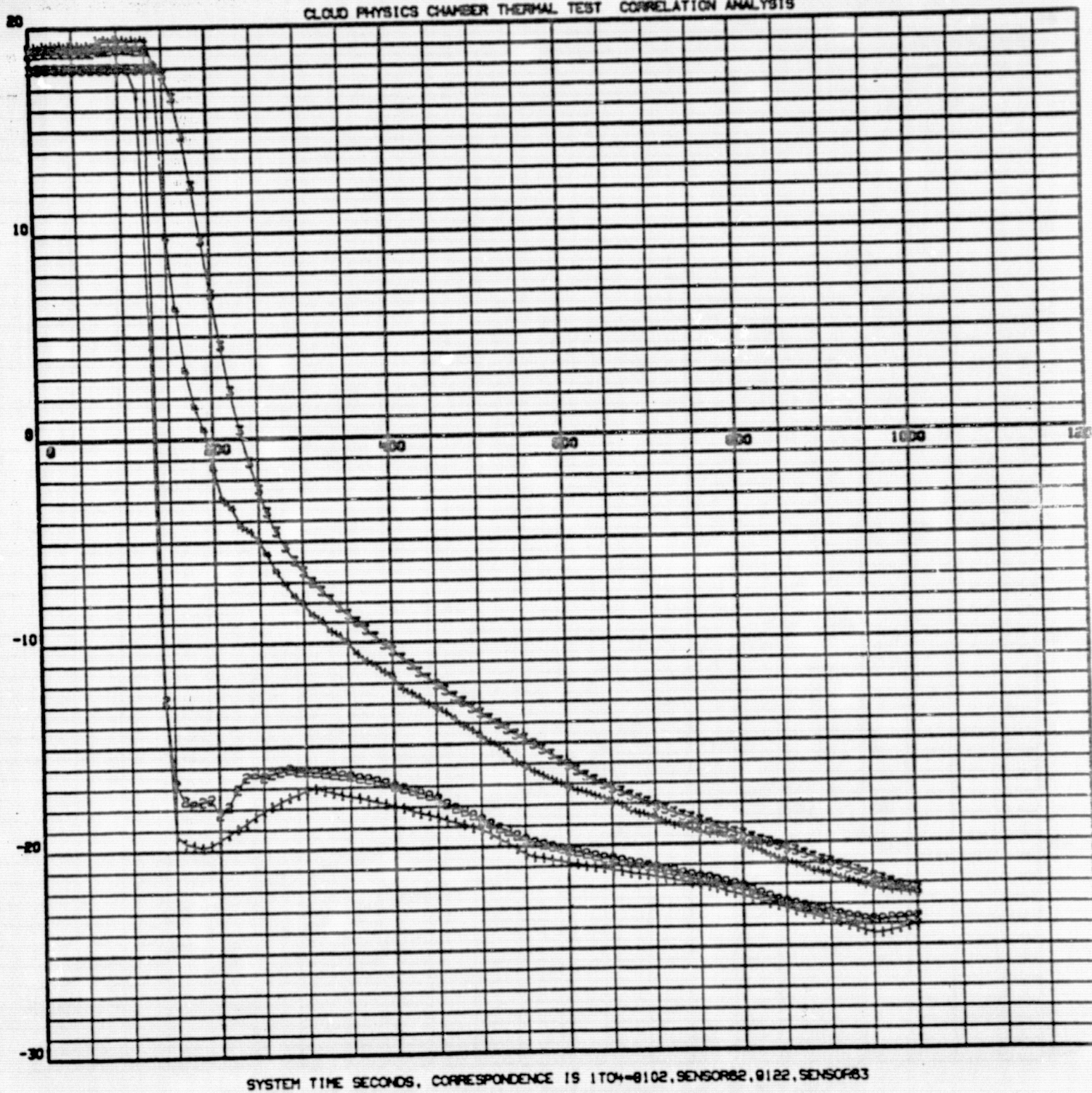
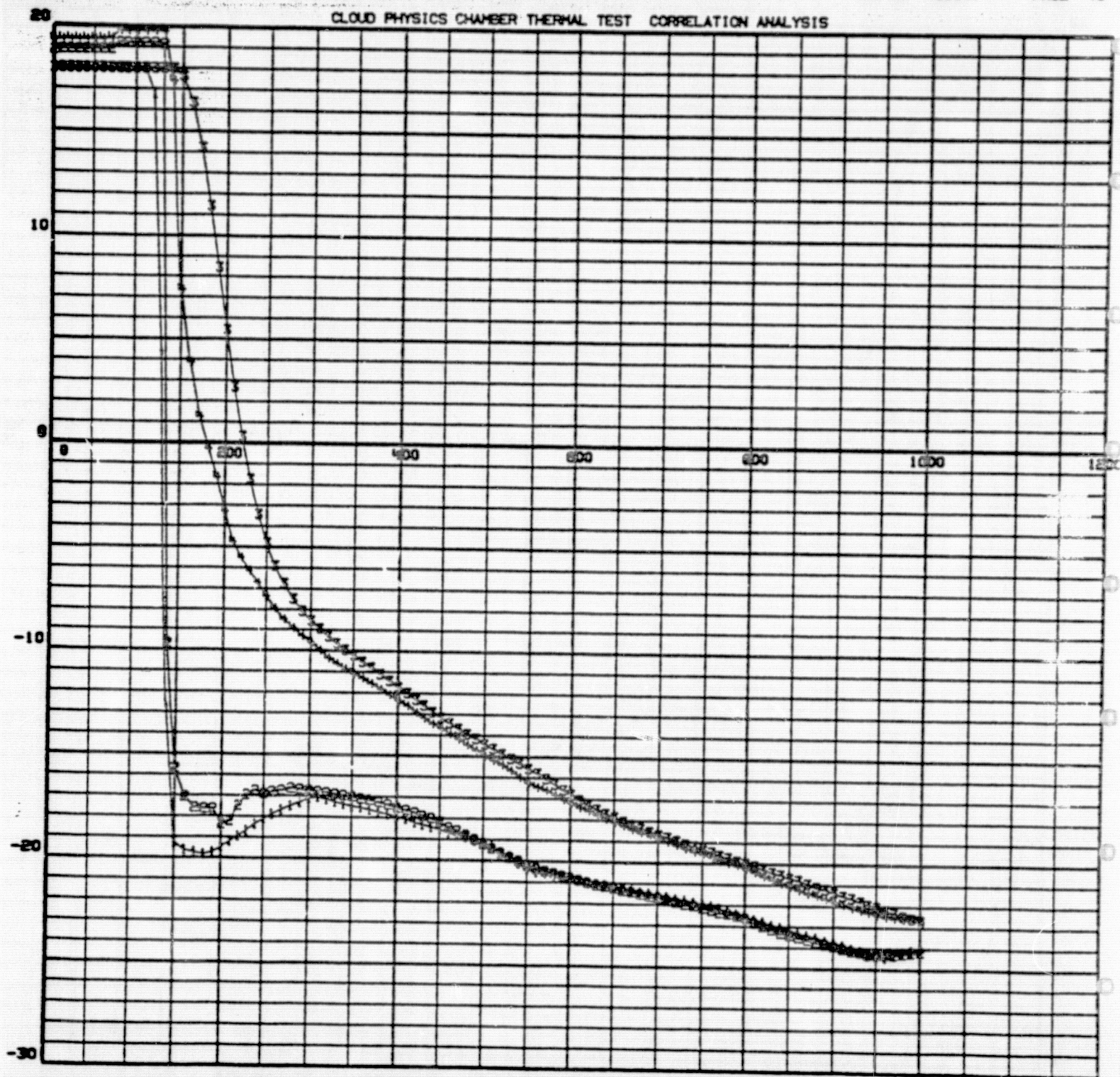


Figure 10MM. Figure 10A Continued

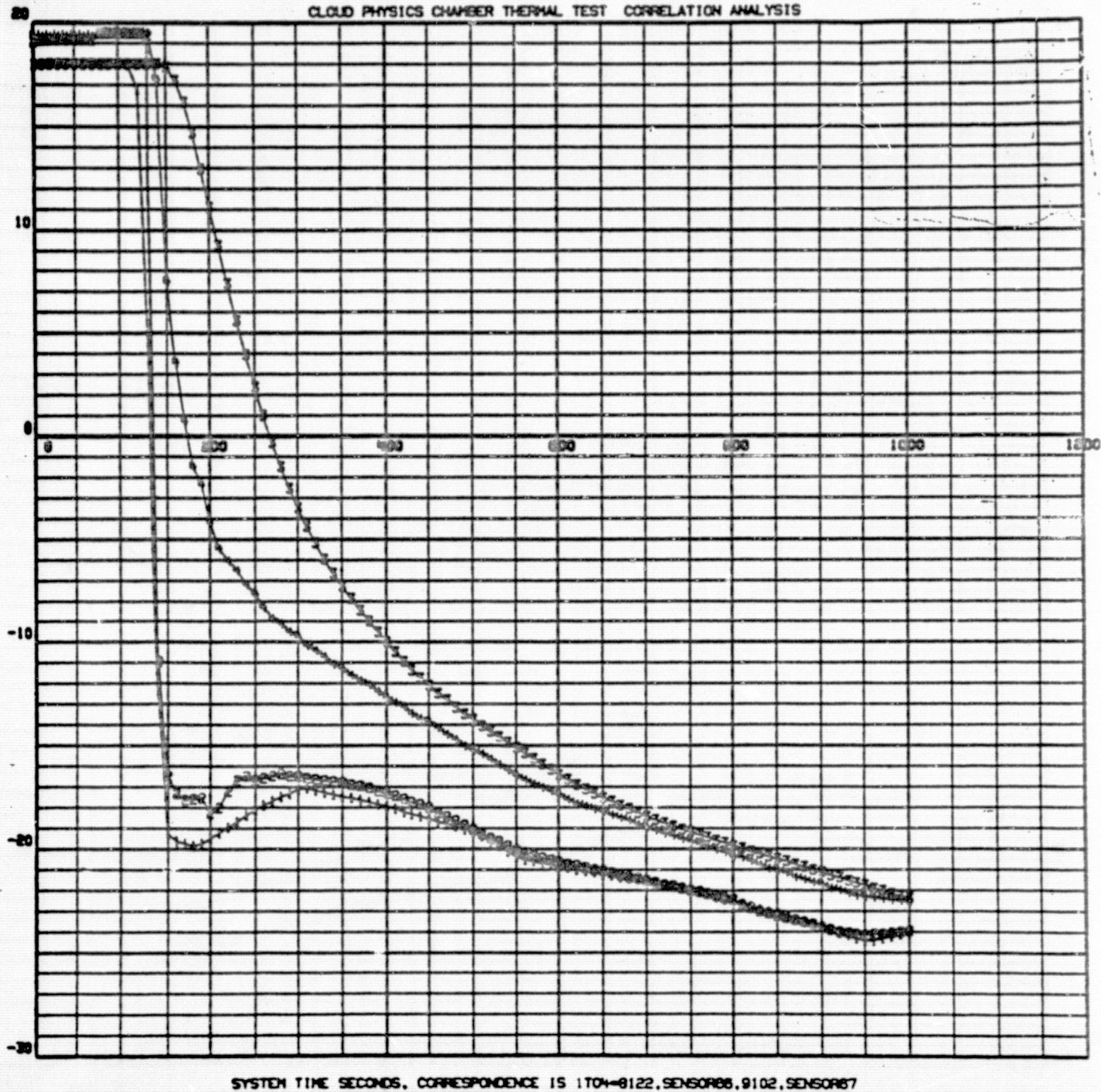
CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



SYSTEM TIME SECONDS, CORRESPONDENCE IS 1104-9222, SENSOR64, 8222, SENSOR65

Figure 10NN. Figure 10A Continued

CLOUD PHYSICS CHAMBER THERMAL TEST CORRELATION ANALYSIS



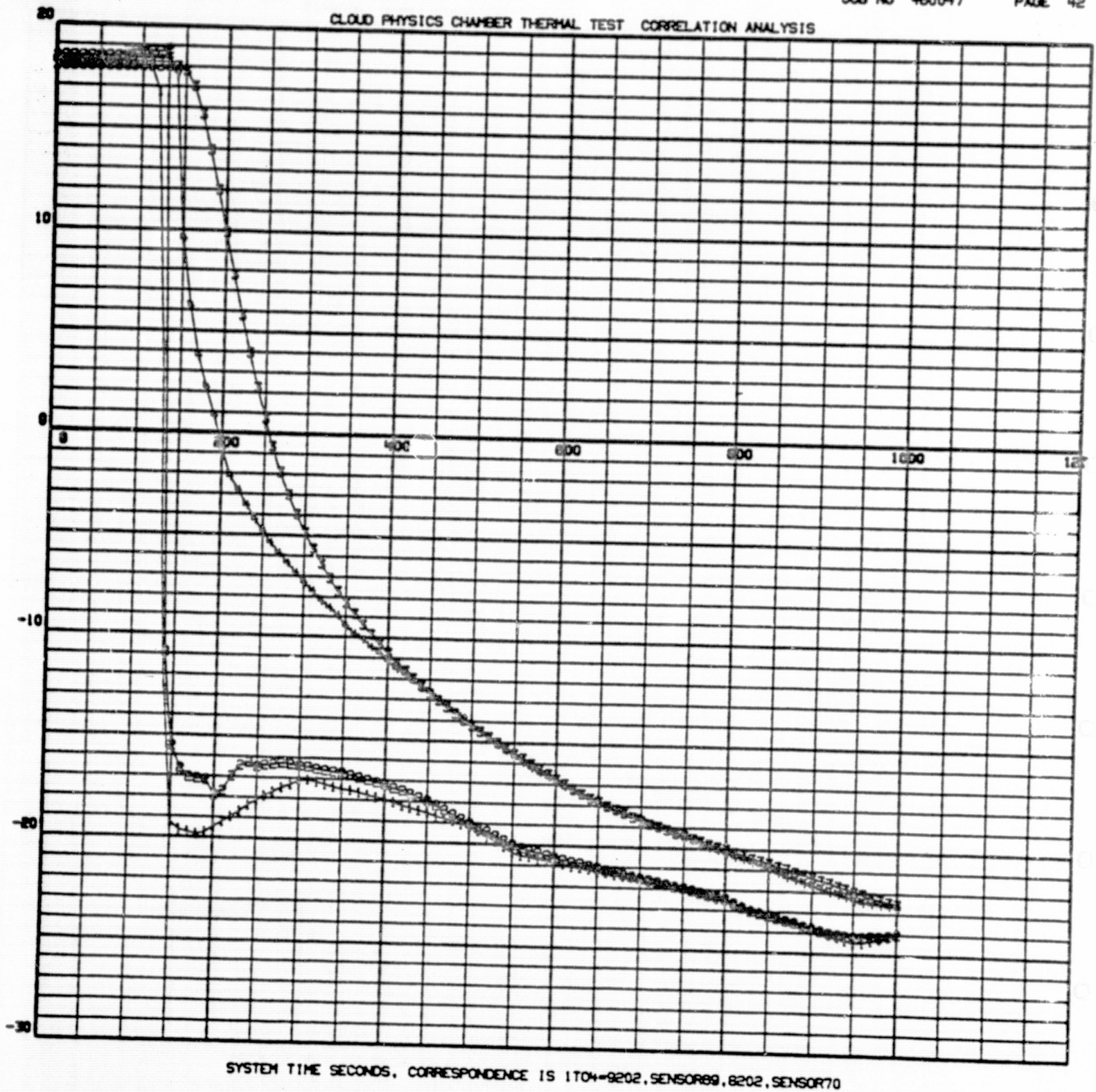


Figure 10PP. Figure 10A Continued

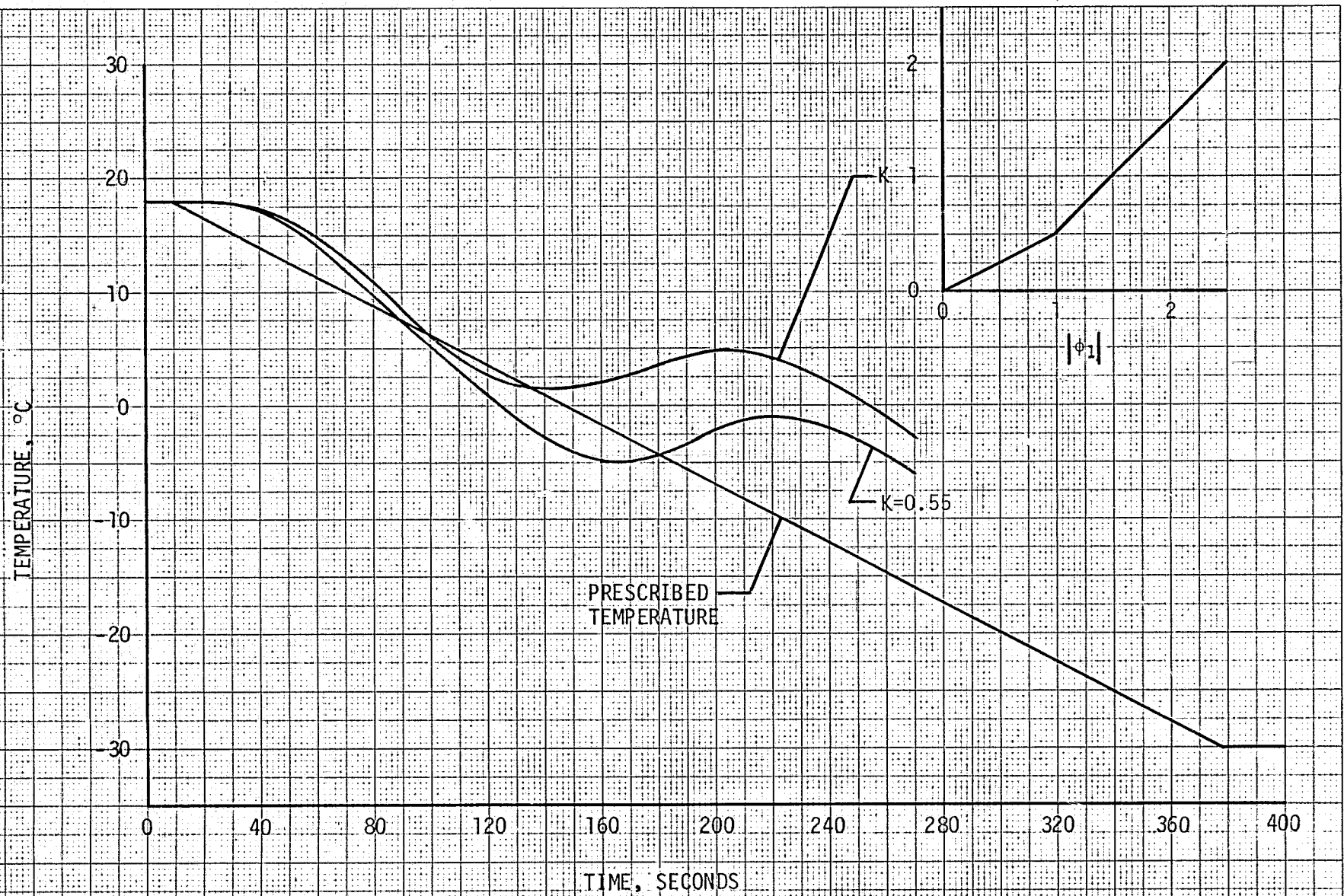


FIGURE 11. COMPUTED ACPL EXPANSION CHAMBER TEMPERATURE RESPONSE
WITH K AS INDICATED

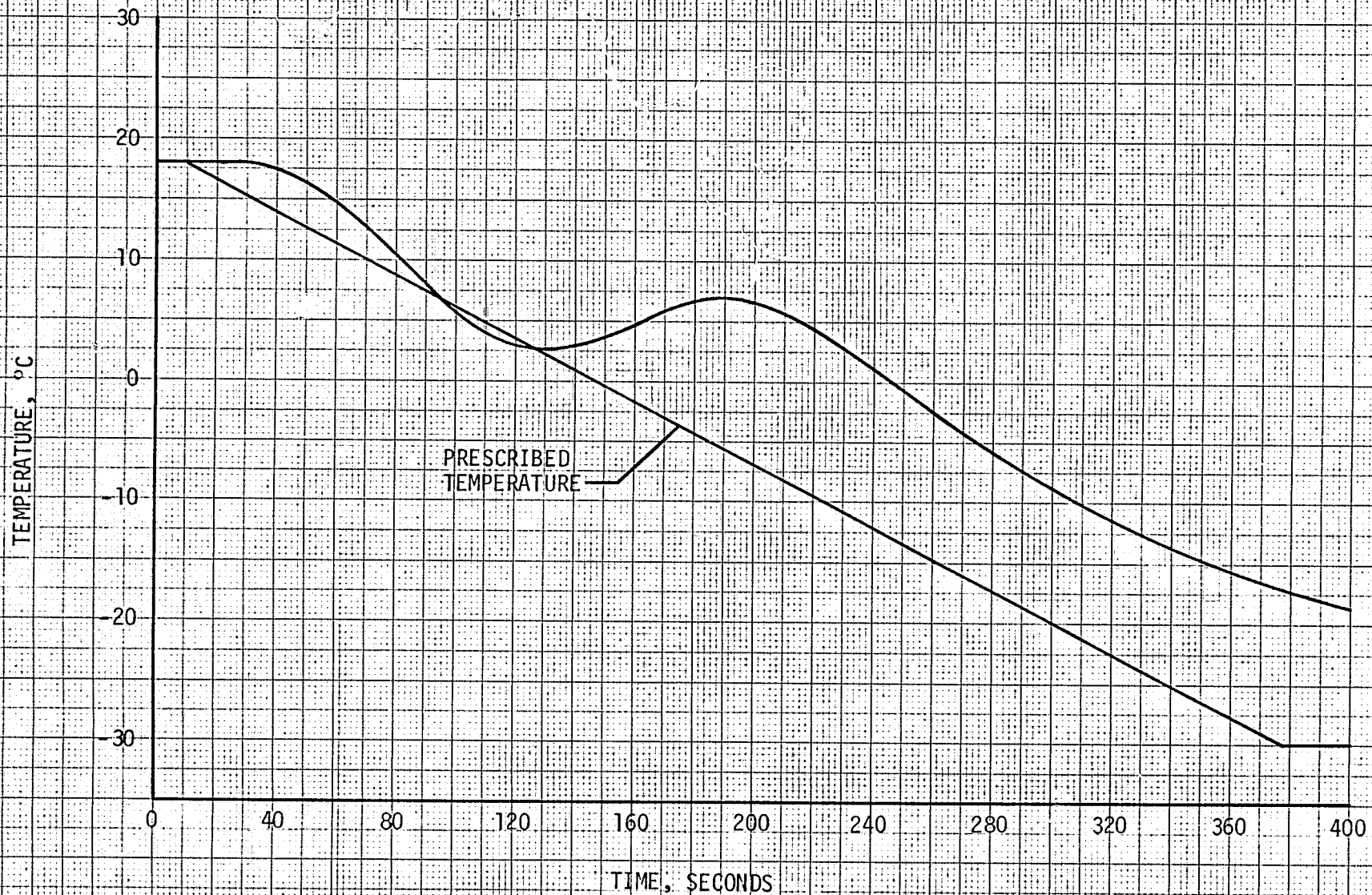


FIGURE 12. COMPUTED ACPC EXPANSION CHAMBER TEMPERATURE RESPONSE
WITH $K = 0.75 \cdot \phi_1$

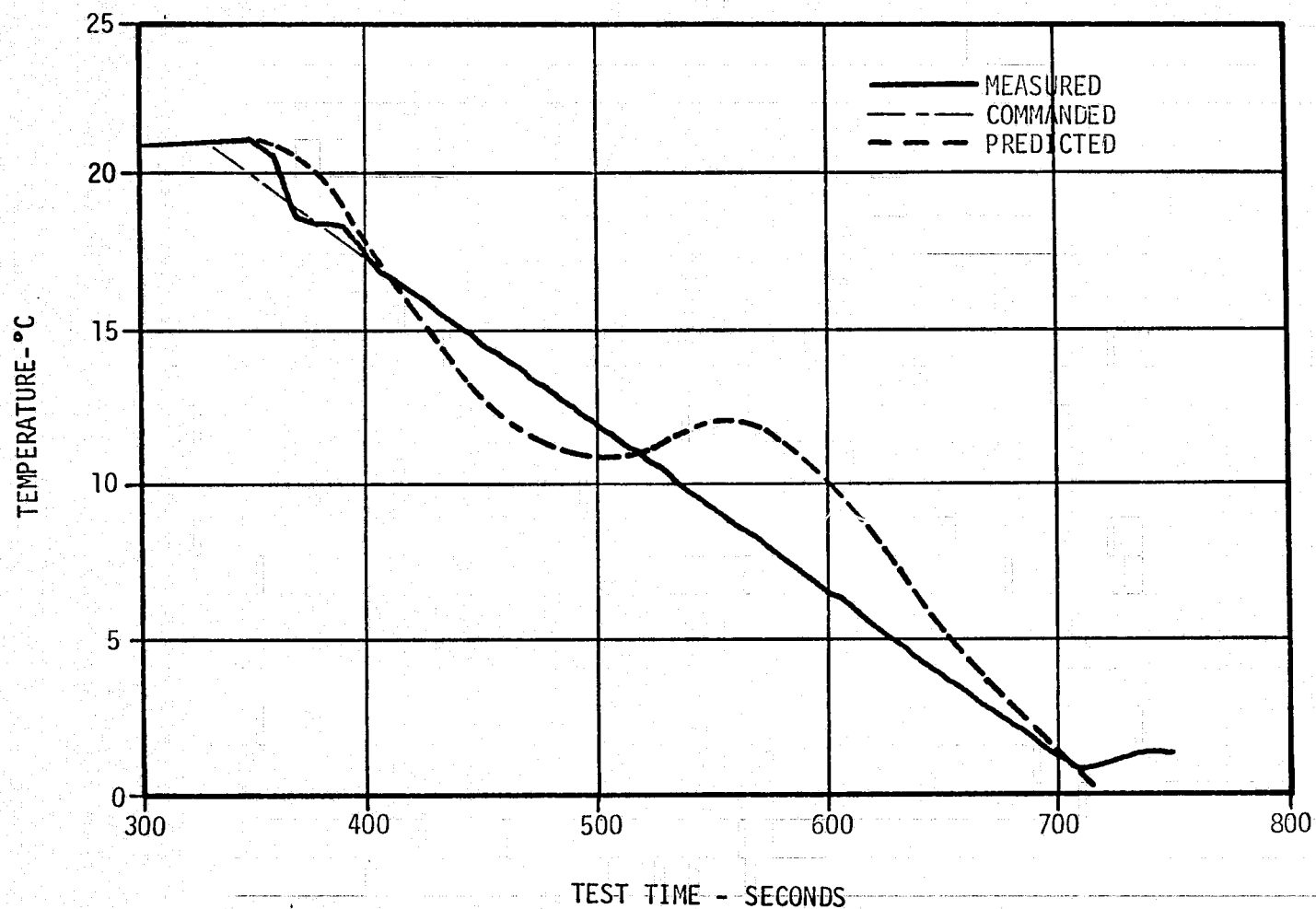
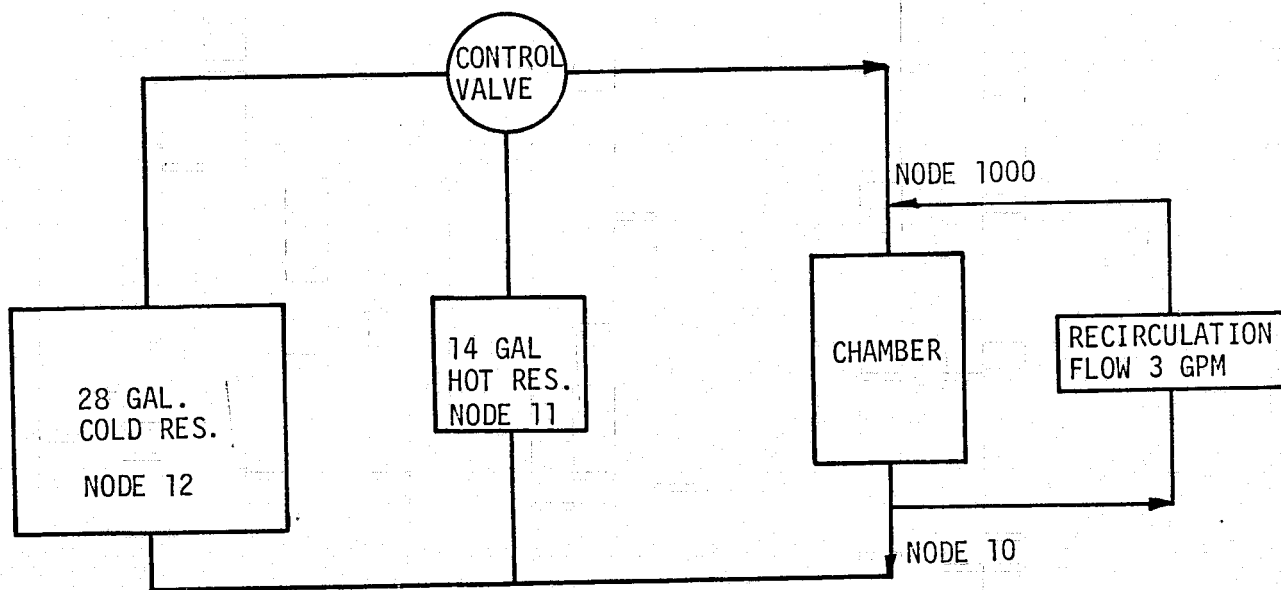


FIGURE 13. COMPARISON OF PREDICTED CONTROL SENSOR TEMPERATURE WITH COMMANDED/MEASURED VALUES OF TEST NO. 23

CONCEPT 1



- NOTES: 1. PUMP POWER INPUT IS EQUAL TO $Q\Delta P$ WHERE, Q IS THE VOLUMETRIC FLOW RATE AND ΔP IS THE PRESSURE DIFFERENTIAL ACROSS THE PUMP.
2. NODAL LOCATIONS ARE INDICATED ON THE SCHEMATIC TO RELATE THE MODEL INTERFACE LOCATIONS.

CONCEPT 2

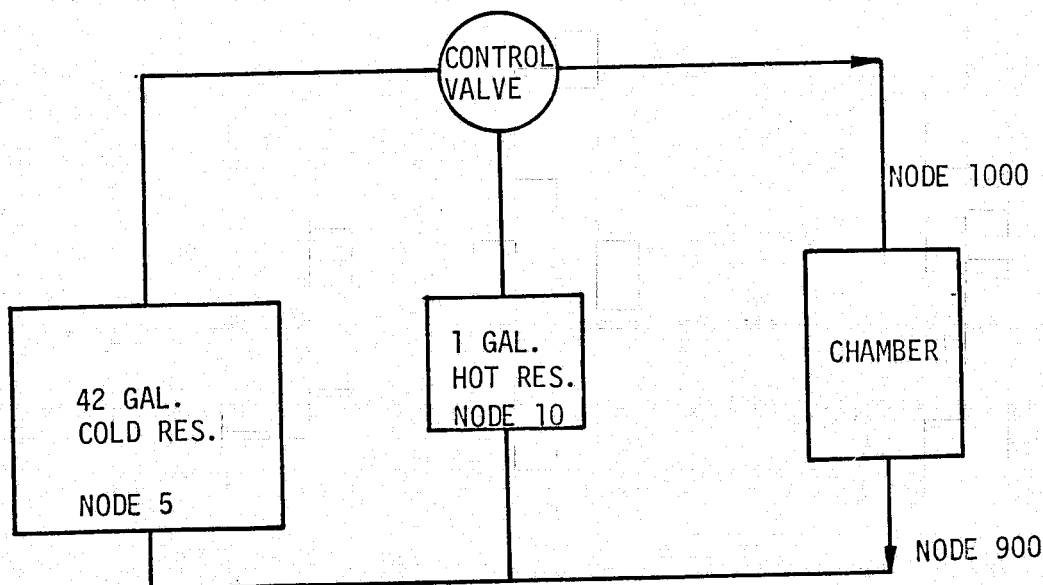


FIGURE 14. FLOW CONTROL CONCEPTS ANALYZED

6.0 APPENDIX: DOCUMENTATION OF COMPUTER MODELS

Enclosed in the Appendix is a copy of the SINDA computer program inputs used to simulate the ACPL cloud chamber without and with a controller. The first input is for the case without a controller, ACPL Test No. 11. This input data is on MSFC tape No. 35312 under file name TPF5 and element name CLD6CAS1. The second input is for ACPL test no. 25 with a controller. This input is generated with the use of MSFC tape no. 35312 and the element updates shown in the left hand column of the printout.

ACPL TEST NO. 11 VERIFICATION MODEL LISTING

PRUN CLOUD1,1HEP45460047,LANCESBIN209,100,2000

MSG,N REMOVE AT CARD READER 04-11-77 CLOCK NO 3806

MSG,T C,T,18292

REWIND C.
FURPUR 27H3 RL71-3 04/12/77 03:14:25

WCOPY,G C.,TPFS.
LANCESBIN209-A(6) COPIED ON 02/12/77 AT 04:15:37
8 BLOCKS COPIED.
EOF ENCOUNTERED ON INPUT TAPE

WADD,P .ASSIGNA

MSG,T A,F///200

REWIND C.
FURPUR 27H3 RL71-3 04/12/77 03:15:37

WCOPY,G C.,A.
LANCESBIN209-A(0) COPIED ON 02/12/77 AT 04:15:37
8 BLOCKS COPIED.
EOF ENCOUNTERED ON INPUT TAPE

REWIND C.

WADD,P A.NSINDA

WADD,P A.OLDORNEWSIN

MSG,N ALL TAPE ASSIGNMENTS MUST BE MADE BY THE USER.

MSG,N FILE 25 IS ALLOCATED AUTOMATICALLY IN CASE THE

MSG,N USER WOULD LIKE TO USE SOME OF THE SPECIAL PRINT

1
MSG,N OPTIONS SUCH AS FFPRT2,CFPRT2, AND, CCPRT2.

MSG,N **CAUTION** IF TAPE IS TO BE USED, THEN USE A

MSG,N DIFFERENT UNIT THAN 25.

MSG,T 25,F///1000 . FOR PRINT ROUTINES

ADD,P A,ASSIGNTPF

FREE TPFS.

MSG,T TPFS.,F///500

REWIND C.

FURPUR 27H3 RL71-3 04/12/77 03:15:43

USE 10,1CONT

MOVE C,2

FURPUR 27H3 RL71-3 04/12/77 03:15:48

ERS

END ERS.

COPY,G C.,TPFS.

LANCESBIN209*ABB(U) COPIED ON 02/27/77 AT 02:36:22

180 BLOCKS COPIED.

EOF ENCOUNTERED ON INPUT TAPE

MSG,T DATATAP,T,14497

USE 26,DATATAP

WED TPFs.CLD&CASI,TPFs.CLD&CASI
CASE UPPER ASSUMED
ED 15.00-04/12/77-03:16:25-(0.)
EDIT

3501,,-1., 3502,,-1., 3503,.,.1, 3504,,-1., 3505,,-1.5
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3561,,-.01, 3562,,-.01, 3563,.,.01, 3564,,-.01, 3565,,-.015
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3611,.,.04, 3621,.,.04, 3631,.,.04, 3641,.,.04
3651,.,.04, 3661,.,.04, 3605,.,.04, 3615,.,.04
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3665,.,.04, 7001,,-1.5
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3827,.,.04, 3836,.,.04, 3847,.,.04, 3855,.,.04
3865,.,.04, 3801,.,.04, 3611,.,.04, 3821,.,.04
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 4811,-1., 4812,-1., 4814,,.04, 4815,-1. S
 PG 11.04, 13
 8099,,.04, 8100,-1., 8101,,.04, 8102,-1., 8103,,.04
 8104,,.04, 8105,-1., 8106,-1., 8107,,.04, 8108,,.04
 8109,,.04, 8110,,.04, 8111,,.04, 8112,,.04, 8121,,.04
 8122,-.04, 8123,,.04, 8124,,.04, 8125,-1., 8126,-1.5
 8127,,.04, 8128,,.04, 8129,,.04, 8130,,.04, 8131,,.04
 8132,,.04
 8199,,.04, 8200,-1., 8201,,.04, 8202,-1., 8203,,.04
 8204,,.04, 8205,-1., 8206,-1., 8207,,.04, 8208,,.04
 8209,,.04, 8210,,.04, 8211,,.04, 8212,,.04, 8221,,.04
 8222,-.04, 8223,,.04, 8224,,.04, 8225,-1., 8226,-1.5
 8227,,.04, 8228,,.04, 8229,,.04, 8230,,.04, 8231,,.04
 8232,,.04
 900,,-.04
 9099,,.04, 9100,-1., 9101,,.04, 9102,-1., 9103,,.04
 9104,,.04, 9105,-1., 9106,-1., 9107,,.04, 9108,,.04
 9109,,.04, 9110,,.04, 9111,,.04, 9112,,.04, 9121,,.04
 9122,-.04, 9123,,.04, 9124,,.04, 9125,-1., 9126,-1.5
 9127,,.04, 9128,,.04, 9129,,.04, 9130,,.04, 9131,,.04
 9132,,.04
 9199,,.04, 9200,-1., 9201,,.04, 9202,-1., 9203,,.04
 9204,,.04, 9205,-1., 9206,-1., 9207,,.04, 9208,,.04
 9209,,.04, 9210,,.04, 9211,,.04, 9212,,.04, 9221,,.04
 9222,-.04, 9223,,.04, 9224,,.04, 9225,-1., 9226,-1.5
 9227,,.04, 9228,,.04, 9229,,.04, 9230,,.04, 9231,,.04
 9232,,.04

421,4021,4521,,1., 451,4051,4551,,1., 511,4111,4611,,1.5
 421,4021,4521,3., 451,4051,4551,3., 511,4111,4611,3.5

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422,4022,4522,3., 423,4024,4524,3., 424,4025,4525,3.5
452,4052,4552,3., 453,4054,4554,3., 454,4055,4555,3.5
512,4112,4612,3., 513,4114,4614,3., 514,4115,4615,3.5
621,4021,4721,3., 651,4051,4751,3., 711,4111,4811,3.5
622,4022,4722,3., 623,4024,4724,3., 624,4025,4725,3.5
652,4052,4752,3., 653,4054,4754,3., 654,4055,4755,3.5
712,4112,4812,3., 713,4114,4814,3., 714,4115,4815,3.5

E
LINES:1435 FIELDATA

MELT,LU .CLD&CASI

ELT007 RL1870 04/12-03:16130-(0,1)

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BCD 3THERMAL SPCS

BCD 9CLOUD PHISICS TEST CORRELATION

END

BCD 3NODE DATA

2001...0315, 2002...0819, 2003...0964, 2004...0819, 2005...0315 RAYH
2011...0819, 2012...0761, 2013...0761, 2014...0761, 2015...0819 RAYH
2021...0964, 2022...0761, 2023...0259, 2024...0761, 2025...0964 RAYH
2031...0819, 2032...0761, 2033...0761, 2034...0761, 2035...0819 RAYH
2041...0315, 2042...0819, 2043...0964, 2044...0819, 2045...0315 RAYH
3001...0315, 3002...0819, 3003...0964, 3004...0819, 3005...0315 RAYH
3011...0619, 3012...0761, 3013...0761, 3014...0761, 3015...0819 RAYH
3021...0321, 3022...0254, 3026...0254, 3027...0321, 3031...0322 RAYH
3032...0254, 3033...0195, 3035...0254, 3036...0322, 3041...0321 RAYH
3042...0254, 3046...0254, 3047...0321, 3051...0819, 3052...0761 RAYH
3053...0761, 3054...0761, 3055...0819, 3061...0315, 3062...0819 RAYH
3063...0964, 3064...0819, 3065...0315, 3101...0040, 3102...0520 RAYH
3103...0520, 3104...0520, 3105...0640, 3115...0520, 3130...0582 RAYH
3155...0520, 3165...0640, 3164...0520, 3163...0582, 3164...0520 RAYH
3161...0640, 3151...0520, 3131...0582, 3111...0520, 4011...0796 RAYH
4012...0796, 4013...088, 4014...0796, 4015...0796, 4021...0796 RAYH
4022...0796, 4023...081, 4024...0796, 4025...0796, 4041...0796 RAYH
4042...0796, 4043...088, 4044...0796, 4045...0796, 4051...0796 RAYH
4052...0796, 4053...081, 4054...0796, 4055...0796, 4101...0796 RAYH
4102...0796, 4103...088, 4104...0796, 4105...0796, 4111...0796 RAYH
4112...0796, 4113...081, 4114...0796, 4115...0796, 5001...0315 RAYH
5002...0819, 5003...0964, 5004...0819, 5005...0315, 5011...0819 RAYH
5012...0761, 5013...0761, 5014...0761, 5015...0819, 5021...0321 RAYH
5022...0254, 5026...0254, 5027...0321, 5031...0322, 5032...0254 RAYH
5033...0195, 5035...0254, 5036...0322, 5041...0321, 5042...0254 RAYH
5046...0254, 5047...0321, 5051...0819, 5052...0761, 5053...0761 RAYH
5054...0761, 5055...0819, 5061...0315, 5062...0819, 5063...0964 RAYH
5064...0819, 5065...0315, 5101...0640, 5102...0520, 5103...0582 RAYH
5104...0520, 5105...0640, 5115...0520, 5136...0582, 5155...0520 RAYH
5165...0640, 5164...0520, 5163...0582, 5162...0520, 5161...0640 RAYH
5151...0520, 5131...0582, 5111...0520, 6001...0315, 6002...0819 RAYH
6003...0764, 6004...0819, 6005...0315, 6011...0819, 6012...0761 RAYH
6013...0761, 6014...0761, 6015...0819, 6021...0964, 6022...0761 RAYH
6023...0259, 6024...0761, 6025...0964, 6031...0819, 6032...0761 RAYH
6033...0761, 6034...0761, 6035...0819, 6041...0315, 6042...0819 RAYH
6043...0964, 6044...0819, 6045...0315 RAYH

GEN 4001,5,1,70...0796 S

GEN 4031,5,1,70...0796 S

GEN 4061,5,1,70...0796 S

GEN 4071,5,1,70...0796 S

GEN 4081,5,1,70...0796 S

GEN 4091,5,1,70...0796 S

REM

REM PG 1

REM

3501...-1., 3502...-1., 3503...01, 3504...-1., 3505...-1.5
3511...-1., 3512...-1., 3513...01, 3514...-1., 3515...-1.5
3521...-1., 3522...-1., 3526...-1., 3527...-1.
3531...01, 3532...-01, 3535...-01, 3536...-01

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000055 000 3541,.-1., 3542,.-1., 3546,.-1., 3547,.-1. $
000056 000 3551,.-.01, 3552,.-.01, 3553,.-.01, 3554,.-.01, 3555,.-.015
000057 000 3561,.-.01, 3562,.-.01, 3563,.-.01, 3564,.-.01, 3565,.-.015
000058 000 3701,.-1., 3702,.-1., 3703,.-.01, 3704,.-1., 3705,.-1.5
000059 000 3711,.-1., 3712,.-1., 3713,.-.01, 3714,.-1., 3715,.-1.5
000060 000 3721,.-1., 3722,.-1., 3726,.-1., 3727,.-1. $
000061 000 3731,.-.01, 3732,.-.01, 3735,.-.01, 3736,.-.01 $
000062 000 3741,.-.01, 3742,.-.01, 3746,.-.01, 3747,.-.01 $
000063 000 3751,.-.01, 3752,.-.01, 3753,.-.01, 3754,.-.01, 3755,.-.015
000064 000 3761,.-.01, 3762,.-.01, 3763,.-.01, 3764,.-.01, 3765,.-.015
000065 000 5501,.-1., 5502,.-1., 5503,.-.01, 5504,.-1., 5505,.-1.5
000066 000 5511,.-1., 5512,.-1., 5513,.-.01, 5514,.-1., 5515,.-1.5
000067 000 5521,.-1., 5522,.-1., 5526,.-1., 5527,.-1. $
000068 000 5531,.-.01, 5532,.-.01, 5535,.-.01, 5536,.-.01 $
000069 000 5541,.-.01, 5542,.-.01, 5546,.-.01, 5547,.-.01 $
000070 000 5551,.-.01, 5552,.-.01, 5553,.-.01, 5554,.-.01, 5555,.-.015
000071 000 5561,.-.01, 5562,.-.01, 5563,.-.01, 5564,.-.01, 5565,.-.015
000072 000 5701,.-1., 5702,.-1., 5703,.-.01, 5704,.-1., 5705,.-1.5
000073 000 5711,.-1., 5712,.-1., 5713,.-.01, 5714,.-1., 5715,.-1.5
000074 000 5721,.-1., 5722,.-1., 5726,.-1., 5727,.-1. $
000075 000 5731,.-.01, 5732,.-.01, 5735,.-.01, 5736,.-.01 $
000076 000 5741,.-.01, 5742,.-.01, 5746,.-.01, 5747,.-.01 $
000077 000 5751,.-.01, 5752,.-.01, 5753,.-.01, 5754,.-.01, 5755,.-.015
000078 000 5761,.-.01, 5762,.-.01, 5763,.-.01, 5764,.-.01, 5765,.-.015
000079 000 REM
000080 000 REM PG 1.1
000081 000 REM
000082 000 REM LIQUID NODES (SUPPLY TO AND RETURN FROM TOP H/E) RED CIRCUIT
000083 000 -1000,.-22.0. $ SUPPLY BOUNDARY NODE
000084 000 3599,.-.04, 3600,.-1., 3601,.-.04 $
000085 000 3611,.-.04, 3621,.-.04, 3631,.-.04, 3641,.-.04 $
000086 000 3651,.-.04, 3661,.-.04, 3605,.-.04, 3615,.-.04 $
000087 000 3627,.-.04, 3636,.-.04, 3647,.-.04, 3655,.-.04 $
000088 000 3665,.-.04, 7001,.-1.5
000089 000 REM LIQUID NODES (SUPPLY TO AND RETURN FROM TOP H/E) BLUE CIRCUIT
000090 000 3699,.-.04, 3700,.-1., 3805,.-.04, 3815,.-.04 $
000091 000 3827,.-.04, 3836,.-.04, 3847,.-.04, 3855,.-.04 $
000092 000 3865,.-.04, 3801,.-.04, 3811,.-.04, 3821,.-.04 $
000093 000 3831,.-.04, 3841,.-.04, 3851,.-.04, 3861,.-.04, 7002,.-1.5
000094 000 REM LIQUID NODES (SUPPLY TO AND RETURN FROM BOTTOM H/E) RED CIRCUIT
000095 000 5599,.-.04, 5600,.-1., 5601,.-.04, 5611,.-.04 $
000096 000 5621,.-.04, 5631,.-.04, 5641,.-.04, 5651,.-.04 $
000097 000 5661,.-.04, 5605,.-.04, 5615,.-.04, 5627,.-.04 $
000098 000 5636,.-.04, 5647,.-.04, 5655,.-.04, 5665,.-.04, 7003,.-1.5
000099 000 REM LIQUID NODES (SUPPLY TO AND RETURN FROM BOTTOM H/E) BLUE CIRCUIT
000100 000 5699,.-.04, 5700,.-1., 5805,.-.04, 5815,.-.04 $
000101 000 5827,.-.04, 5836,.-.04, 5847,.-.04, 5855,.-.04 $
000102 000 5865,.-.04, 5801,.-.04, 5811,.-.04, 5821,.-.04 $
000103 000 5831,.-.04, 5841,.-.04, 5851,.-.04, 5861,.-.04, 7004,.-1.5
000104 000 REM
000105 000 REM PG 7,8,9
000106 000 REM
000107 000 REM LIQUID NODES FOR CHAMBER (RED CIRCUIT)
000108 000 4501,.-1., 4502,.-1., 4503,.-.04, 4504,.-1., 4505,.-1.5
000109 000 4511,.-1., 4512,.-1., 4513,.-.04, 4514,.-1., 4515,.-1.5
000110 000 4521,.-.04, 4522,.-.04, 4524,.-.01, 4525,.-.04 $

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4531,-1., 4532,-1., 4533,.04, 4534,-1., 4535,-1.5
4541,-1., 4542,-1., 4543,.04, 4544,-1., 4545,-1.5
4551,-.04, 4552,.04, 4553,-.01, 4554,-.04
4561,-1., 4562,-1., 4563,.04, 4564,-1., 4565,-1.5
4571,-1., 4572,-1., 4573,.04, 4574,-1., 4575,-1.5
4581,-1., 4582,-1., 4583,.04, 4584,-1., 4585,-1.5
4591,-1., 4592,-1., 4593,.04, 4594,-1., 4595,-1.5
4601,-1., 4602,-1., 4603,.04, 4604,-1., 4605,-1.5
4611,-1., 4612,.04, 4613,-.01, 4614,-1.
4615,-1.
4701,-1., 4702,-1., 4703,.04, 4704,-1., 4705,-1.5
4711,-1., 4712,-1., 4713,.04, 4714,-1., 4715,-1.5
4721,-1., 4722,-.04, 4723,.04, 4724,-1.
4725,-1.
4731,-1., 4732,-1., 4733,.04, 4734,-1., 4735,-1.5
4741,-1., 4742,-1., 4743,.04, 4744,-1., 4745,-1.5
4751,-1., 4752,-.04, 4753,.04, 4754,-1., 4755,-1.5
4761,-1., 4762,-1., 4763,.04, 4764,-1., 4765,-1.5
4771,-1., 4772,-1., 4773,.04, 4774,-1., 4775,-1.5
4781,-1., 4782,-1., 4783,.04, 4784,-1., 4785,-1.5
4791,-1., 4792,-1., 4793,.04, 4794,-1., 4795,-1.5
4801,-1., 4802,-1., 4803,.04, 4804,-1., 4805,-1.5
4811,-1., 4812,-1., 4813,.04, 4814,-1., 4815,-1.
4816,-1.
REM LIQUID NODES FOR CHAMBER (BLUE CIRCUIT)
4701,-1., 4702,-1., 4703,.04, 4704,-1., 4705,-1.5
4711,-1., 4712,-1., 4713,.04, 4714,-1., 4715,-1.5
4721,-1., 4722,-.04, 4723,.04, 4724,-1.
4725,-1.
4731,-1., 4732,-1., 4733,.04, 4734,-1., 4735,-1.5
4741,-1., 4742,-1., 4743,.04, 4744,-1., 4745,-1.5
4751,-1., 4752,-.04, 4753,.04, 4754,-1., 4755,-1.5
4761,-1., 4762,-1., 4763,.04, 4764,-1., 4765,-1.5
4771,-1., 4772,-1., 4773,.04, 4774,-1., 4775,-1.5
4781,-1., 4782,-1., 4783,.04, 4784,-1., 4785,-1.5
4791,-1., 4792,-1., 4793,.04, 4794,-1., 4795,-1.5
4801,-1., 4802,-1., 4803,.04, 4804,-1., 4805,-1.5
4811,-1., 4812,-1., 4813,.04, 4814,-1., 4815,-1.
4816,-1.
REM
REM PG 11.04, 13
REM
REM LIQUID SUPPLY TO CHAMBER (RED CIRCUIT)
8199,.04, 8100,-1., 8101,.04, 8102,-1., 8103,.045
8104,.04, 8105,-1., 8106,-1., 8107,.04, 8108,.045
8109,.04, 8110,.04, 8111,.04, 8112,.04, 8113,.045
8122,-.04, 8123,.04, 8124,.04, 8125,-1., 8126,-1.5
8127,.04, 8128,.04, 8129,.04, 8130,.04, 8131,.045
8132,.045
REM LIQUID RETURN FROM CHAMBER (RED CIRCUIT)
8199,.04, 8200,-1., 8201,.04, 8202,-1., 8203,.045
8204,.04, 8205,-1., 8206,-1., 8207,.04, 8208,.045
8209,.04, 8210,.04, 8211,.04, 8212,.04, 8213,.045
8222,-.04, 8223,.04, 8224,.04, 8225,-1., 8226,-1.5
8227,.04, 8228,.04, 8229,.04, 8230,.04, 8231,.045
8232,.045
900,-.045
REM LIQUID SUPPLY TO CHAMBER (BLUE CIRCUIT)
9199,.04, 9100,-1., 9101,.04, 9102,-1., 9103,.045
9104,.04, 9105,-1., 9106,-1., 9107,.04, 9108,.045
9109,.04, 9110,.04, 9111,.04, 9112,.04, 9113,.045
9122,-.04, 9123,.04, 9124,.04, 9125,-1., 9126,-1.5
9127,.04, 9128,.04, 9129,.04, 9130,.04, 9131,.045
9132,.045
REM LIQUID RETURN FROM CHAMBER (BLUE CIRCUIT)
9199,.04, 9200,-1., 9201,.04, 9202,-1., 9203,.045
9204,.04, 9205,-1., 9206,-1., 9207,.04, 9208,.045
9209,.04, 9210,.04, 9211,.04, 9212,.04, 9213,.045
9222,-.04, 9223,.04, 9224,.04, 9225,-1., 9226,-1.5
9227,.04, 9228,.04, 9229,.04, 9230,.04, 9231,.045
9232,.045
-100.60,.1.5 LIQUID SUPPLY (MORE MUST BE ADDED LATER)
-1.7C,.1.5 AMBIENT AIR TEMPERATURE

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000167	000	END	BCD	3CONDUCTOR DATA
000168	000			
000169	000	N		2001,2001,2002,2.864, 2002,2002,2.03,3.446, 2003,2003,2004,3.4465RAYH
000170	000			2004,2004,2005,2.864, 2005,2011,2.012,2.685, 2006,2012,2013,2.7975RAYH
000171	000			2007,2013,2014,2.797, 2008,2014,2015,2.685, 2009,2021,2022,2.4685RAYH
000172	000			2010,2022,2023,5.176, 2011,2023,2.24,5.176, 2012,2024,2025,2.4685RAYH
000173	000			2013,2031,2032,2.685, 2014,2032,2.33,2.797, 2015,2033,2034,2.7975RAYH
000174	000			2016,2034,2035,2.685, 2017,2041,2.42,2.864, 2018,2042,2043,3.4465RAYH
000175	000			2019,2043,2044,3.446, 2020,2044,2.45,2.864, 2021,2041,2011,2.8645RAYH
000176	000			2022,2011,2021,3.446, 2023,2021,2.31,3.446, 2024,2031,2041,2.8645RAYH
000177	000			2025,2002,2012,2.685, 2026,2012,2.22,2.797, 2027,2022,2032,2.7975RAYH
000178	000			2028,2032,2042,2.685, 2029,2003,2.13,2.468, 2030,2013,2023,5.1765RAYH
000179	000			2031,2023,2033,5.176, 2032,2033,2.43,2.468, 2033,2004,2014,2.6855RAYH
000180	000			2034,2014,2024,2.797, 2035,2024,2.34,2.797, 2036,2034,2044,2.6855RAYH
000181	000			2037,2005,2015,2.864, 2038,2015,2.25,3.446, 2039,2025,2035,3.4465RAYH
000182	000			2040,2035,2045,2.864, 2041,2001,3.101,0.281, 2042,2002,3.102,0.2645RAYH
000183	000			2043,2003,3.103,0.249, 2044,2004,3.104,0.264, 2045,2005,3.105,0.2815RAYH
000184	000			2046,2015,3.115,0.264, 2047,2025,3.136,0.249, 2048,2035,3.155,0.2645RAYH
000185	000			2049,2045,3.165,0.281, 2050,2044,3.164,0.264, 2051,2043,3.163,0.2495RAYH
000186	000			2052,2042,3.162,0.264, 2053,2041,3.161,0.281, 2054,2031,3.151,0.2645RAYH
000187	000			2055,2021,3.131,0.249, 2056,2011,3.111,0.264, 2057,3.101,3.102,1.7 SRAYH
000188	000			2058,3.102,3.103,1.611, 2059,3.103,3.104,1.611, 2060,3.104,3.105,1.7 SRAYH
000189	000			2061,3.105,3.115,1.7, 2062,3.115,3.136,1.611, 2063,3.136,3.155,1.6115RAYH
000190	000			2064,3.155,3.165,1.7, 2065,3.165,3.164,1.7, 2066,3.164,3.163,1.6115RAYH
000191	000			2067,3.163,3.162,1.611, 2068,3.162,3.161,1.7, 2069,3.161,3.151,1.7 SRAYH
000192	000			2070,3.151,3.131,1.611, 2071,3.131,3.111,1.611, 2072,3.111,3.101,1.7 SRAYH
000193	000			3001,3001,3002,2.864, 3002,3002,3.03,3.446, 3003,3003,3004,3.4465RAYH
000194	000			3004,3004,3005,2.864, 3005,3011,3.012,2.685, 3006,3012,3013,2.7975RAYH
000195	000			3007,3013,3014,2.797, 3008,3014,3.015,2.685, 3009,3021,3022,0.8235RAYH
000196	000			3010,3022,3033,1.725, 3011,3033,3026,1.752, 3012,3026,3027,0.8235RAYH
000197	000			3013,3031,3032,0.822, 3014,3032,3033,1.726, 3015,3033,3035,1.7265RAYH
000198	000			3016,3035,3036,0.822, 3017,3041,3.042,0.823, 3018,3042,3033,1.7255RAYH
000199	000			3019,3033,3046,1.725, 3020,3046,3.047,0.823, 3021,3051,3052,2.6855RAYH
000200	000			3022,3052,3053,2.797, 3023,3053,3.054,2.797, 3024,3054,3055,2.6855RAYH
000201	000			3025,3061,3062,2.864, 3026,3062,3063,3.446, 3027,3063,3064,3.4465RAYH
000202	000	E		3028,3064,3065,2.864, 3029,3001,3.011,2.864, 3030,3011,3021,5.1685RAYH
000203	000			3031,3021,3031,10.33, 3032,3031,3041,10.33, 3033,3041,3051,5.1685RAYH
000204	000	N		3034,3051,3061,2.864, 3035,3002,3.012,2.685, 3036,3012,3022,4.1955RAYH
000205	000			3037,3022,3032,8.389, 3038,3032,3042,8.389, 3039,3042,3052,4.1955RAYH
000206	000			3040,3052,3062,2.685, 3041,3003,3.013,2.468, 3042,3013,3033,5.1765RAYH
000207	000			3043,3033,3053,5.176, 3044,3053,3063,2.468, 3045,3004,3014,2.6855RAYH
000208	000			3046,3014,3026,4.195, 3047,3026,3035,8.389, 3048,3035,3046,8.3895RAYH
000209	000	E		3049,3054,3064,4.195, 3050,3054,3064,2.685, 3051,3005,3015,2.8645RAYH
000210	000			3052,3015,3027,5.168, 3053,3027,3036,10.33, 3054,3036,3047,10.335RAYH
000211	000			3055,3047,3055,5.168, 3056,3055,3065,2.864, 3057,3001,3.101,5.6665
000212	000			3058,3062,3.102,3.357, 3059,3003,3.103,2.974, 3060,3004,3.104,3.3575
000213	000			3061,3005,3.105,5.666, 3062,3015,3.115,3.357, 3063,3027,3.136,0.9925
000214	000			3064,3036,3.136,0.99, 3065,3047,3.136,0.992, 3066,3055,3.155,3.3575RAYH
000215	000			3067,3065,3.165,5.666, 3068,3064,3.164,3.357, 3069,3063,3.163,2.9745RAYH
000216	000			3070,3052,3.162,3.357, 3071,3061,3.161,5.666, 3072,3051,3.151,3.3575RAYH
000217	000			3073,3041,3.131,0.992, 3074,3031,3.131,0.99, 3075,3021,3.131,0.9925RAYH
000218	000			3076,3011,3.111,3.357, 3077,3033,2.23,1.263, 3078,3004,4001,0.161 SRAYH
000219	000			3079,3005,4001,0.057, 3080,3002,4.011,0.054, 3081,3003,4011,0.149 SRAYH
000220	000			3082,3001,4021,0.114, 3083,3002,4.021,0.107, 3084,3001,4031,0.057 SRAYH
000221	000			3085,3011,4031,0.161, 3086,3021,4.041,0.05, 3087,3031,4041,0.05 SRAYH
000222	000			3088,3041,4041,0.05, 3089,3051,4041,0.054, 3090,3051,4051,0.107 SRAYH

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3091,3061,4051,114 : 3092,3061,4061,057 : 3093,3062,4061,161 SRAYH
3094,3063,4071,149 : 3095,3064,4071,054 : 3096,3064,4081,107 SRAYH
3097,3065,4081,114 : 3098,3065,4091,161 : 3099,3065,4091,057 SRAYH
3100,3015,4101,054 : 3101,3027,4101,05 : 3102,3036,4101,05 SRAYH
3103,3047,4101,05 : 3104,3005,4111,114 : 3105,3015,4111,107 SRAYH
4005,4011,4012,5.461 : 4006,4012,4013,3.867 : 4007,4013,4014,3.867 SRAYH
4008,4014,4015,5.461 : 4009,4021,4022,5.461 : 4010,4022,4023,4.529 SRAYH
4011,4023,4024,4.529 : 4012,4024,4025,5.461 : 4017,4041,4042,5.461 SRAYH
4018,4042,4043,3.867 : 4019,4043,4044,3.867 : 4020,4044,4045,5.461 SRAYH
4021,4051,4052,5.461 : 4022,4052,4053,4.529 : 4023,4053,4054,4.529 SRAYH
4024,4054,4055,5.461 : 4041,4101,4102,5.461 : 4042,4102,4103,3.867 SRAYH
4043,4103,4104,3.867 : 4044,4104,4105,5.461 : 4045,4111,4112,5.461 SRAYH
4046,4112,4113,4.529 : 4047,4113,4114,4.529 : 4048,4114,4115,5.461 SRAYH
4060,4111,4061,1.433 : 4072,4112,4072,1.433 : 4073,4003,4013,1.433 SRAYH
4074,4013,4023,1.29 : 4075,4023,4033,1.516 : 4076,4033,4043,1.433 SRAYH
4077,4043,4053,1.29 : 4078,4053,4063,1.516 : 4079,4063,4073,1.433 SRAYH
4080,4073,4083,1.433 : 4081,4083,4093,1.433 : 4082,4093,4103,1.433 SRAYH
4083,4103,4113,1.29 : 4084,4113,4093,1.516 : 4096,4114,4004,1.433 SRAYH
4108,4115,4065,1.433 : 5001,5001,5002,2.864 : 5002,5002,5003,3.446 SRAYH
5003,5003,5004,3.446 : 5004,5004,5005,2.864 : 5005,5011,5012,2.685 SRAYH
5006,5012,5013,2.797 : 5007,5013,5014,2.797 : 5008,5014,5015,2.685 SRAYH
5009,5021,5022,0.823 : 5010,5022,5033,1.725 : 5011,5033,5026,1.752 SRAYH
5012,5026,5027,0.823 : 5013,5031,5032,0.822 : 5014,5032,5033,1.726 SRAYH
5015,5033,5035,1.726 : 5016,5035,5036,0.822 : 5017,5041,5042,0.823 SRAYH
5018,5042,5033,1.725 : 5019,5033,5046,1.725 : 5020,5046,5047,0.823 SRAYH
5021,5051,5052,2.685 : 5022,5052,5053,2.797 : 5023,5053,5054,2.797 SRAYH
5024,5054,5055,2.685 : 5025,5061,5062,2.864 : 5026,5062,5063,3.446 SRAYH
5027,5063,5064,3.446 : 5028,5064,5065,2.864 : 5029,5061,5011,2.864 SRAYH
5030,5011,5021,5.168 : 5031,5021,5031,10.33 : 5032,5031,5041,10.33 SRAYH
5033,5041,5051,5.168 : 5034,5051,5061,2.864 : 5035,5062,5012,2.685 SRAYH
5036,5012,5022,4.195 : 5037,5022,5032,8.389 : 5038,5032,5042,8.389 SRAYH
5039,5042,5052,4.195 : 5040,5052,5062,2.685 : 5041,5063,5013,2.468 SRAYH
5042,5013,5033,5.176 : 5043,5033,5053,5.176 : 5044,5053,5063,2.468 SRAYH
5045,5064,5014,2.685 : 5046,5014,5026,4.195 : 5047,5026,5035,8.389 SRAYH
5048,5035,5046,8.389 : 5049,5046,5054,4.195 : 5050,5054,5064,2.685 SRAYH
5051,5055,5015,2.864 : 5052,5015,5027,5.168 : 5053,5027,5036,10.33 SRAYH
5054,5036,5047,10.33 : 5055,5047,5055,5.168 : 5056,5055,5065,2.864 SRAYH
5057,5001,5101,5.666 : 5058,5002,5102,3.357 : 5059,5003,5103,2.974 SRAYH
5060,5004,5104,3.357 : 5061,5005,5105,5.666 : 5062,5015,5115,3.357 SRAYH
5063,5027,5136,0.992 : 5064,5036,5130,0.99 : 5065,5047,5136,0.992 SRAYH
5066,5055,5155,3.357 : 5067,5065,5165,5.666 : 5068,5064,5164,3.357 SRAYH
5069,5063,5163,2.974 : 5070,5062,5162,3.357 : 5071,5061,5161,5.666 SRAYH
5072,5051,5151,3.357 : 5073,5041,5131,0.992 : 5074,5031,5131,0.99 SRAYH
5075,5021,5131,0.992 : 5076,5011,5111,3.357 : 5077,5033,6023,1.263 SRAYH
5078,5004,4005,161 : 5079,5005,4005,057 : 5080,5002,4015,054 SRAYH
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5084,5001,4035,057 : 5085,5011,4035,161 : 5086,5021,4045,05 SRAYH
5087,5031,4045,05 : 5088,5041,4045,05 : 5089,5051,4045,054 SRAYH
5090,5051,4055,107 : 5091,5061,4055,114 : 5092,5061,4065,057 SRAYH
5093,5062,4065,161 : 5094,5063,4075,149 : 5095,5064,4075,054 SRAYH
5096,5064,4085,107 : 5097,5065,4085,114 : 5098,5055,4095,161 SRAYH
5099,5065,4095,057 : 5100,5015,4105,054 : 5101,5027,4105,05 SRAYH
5102,5036,4105,05 : 5103,5047,4105,05 : 5104,5055,4115,114 SRAYH
5105,5015,4115,107 : 6001,6001,6002,2.864 : 6002,6002,6003,3.446 SRAYH
6003,6003,6004,3.446 : 6004,6004,6005,2.864 : 6005,6011,6012,2.685 SRAYH
6006,6012,6013,2.797 : 6007,6013,6014,2.797 : 6008,6014,6015,2.685 SRAYH

000279	000	6009,6021,6022,2.468, 6010,6022,6023,5.176, 6011,6023,6024,5.1765RAYH
000280	000	6012,6024,6025,2.468, 6013,6031,6032,2.685, 6014,6032,6033,2.7975RAYH
000281	000	6015,6033,6034,2.797, 6016,6034,6035,2.685, 6017,6041,6042,2.8645RAYH
000282	000	6018,6042,6043,3.446, 6019,6043,6044,3.446, 6020,6044,6045,2.8645RAYH
000283	000	6021,6041,6042,2.864, 6022,6041,6042,3.446, 6023,6041,6042,3.4465RAYH
000284	000	6024,6031,6041,2.864, 6025,6002,6012,2.685, 6026,6012,6022,2.7975RAYH
000285	000	6027,6022,6032,2.797, 6028,6032,6042,2.685, 6029,6033,6013,2.4685RAYH
000286	000	6030,6013,6023,5.176, 6031,6023,6033,5.176, 6032,6033,6043,2.4685RAYH
000287	000	6033,6034,6014,2.685, 6034,6014,6024,2.797, 6035,6024,6034,2.7975RAYH
000288	000	6036,6034,6044,2.685, 6037,6005,6015,2.864, 6038,6015,6025,3.4465RAYH
000289	000	6039,6025,6035,3.446, 6040,6035,6045,2.864, 6041,6031,5101,0.2815RAYH
000290	000	6042,6022,5102,0.264, 6043,6003,5103,0.249, 6044,6004,5104,0.2645RAYH
000291	000	6045,6005,5105,0.281, 6046,6015,5115,0.264, 6047,6025,5130,0.2495RAYH
000292	000	6048,6035,5155,0.264, 6049,6045,5165,0.281, 6050,6044,5164,0.2645RAYH
000293	000	6051,6043,5163,0.249, 6052,6042,5162,0.264, 6053,6041,5161,0.2815RAYH
000294	000	6054,6031,5151,0.264, 6055,6021,5131,0.249, 6056,6011,5111,0.2645RAYH
000295	000	6057,5101,5102,1.7, 6058,5102,5103,1.611, 6059,5103,5104,1.6115RAYH
000296	000	6060,5104,5105,1.7, 6061,5105,5115,1.7, 6062,5115,5136,1.6115RAYH
000297	000	6063,5136,5155,1.611, 6064,5155,5165,1.7, 6065,5165,5164,1.7 5RAYH
000298	000	6066,5164,5163,1.611, 6067,5163,5162,1.611, 6068,5162,5161,1.7 5RAYH
000299	000	6069,5161,5151,1.7, 6070,5151,5131,1.611, 6071,5131,5111,1.6115RAYH
000300	000	6072,5111,5101,1.7 5
000301	000	GEN 4001,4,1,4001,1,4002,1,5.461, 4013,4,1,4031,1,4032,1,5.4615 RAYH
000302	000	GEN 4025,4,1,4001,1,4002,1,5.461, 4029,4,1,4071,1,4072,1,5.4615 RAYH
000303	000	GEN 4033,4,1,4001,1,4002,1,5.461, 4037,4,1,4091,1,4092,1,5.4615 RAYH
000304	000	GEN 4049,11,1,4001,10,4011,10,1.433, 4061,11,1,4002,10,4012,10,1.4335RAYH
000305	000	GEN 4085,11,1,4004,10,4014,10,1.433, 4097,11,1,4005,10,4015,10,1.4335RAYH
000306	000	REM
000307	000	REM PAGE 30
000308	000	REM
000309	000	REM LIQUID TO SOLID NODES TOP HE (RED AND BLUE CIRCUIT)
000310	000	N 3201,3501,3001,0.1, 3205,3505,3005,0.1, 3214,3514,3014,0.15
000311	000	3202,3502,3002,0.1, 3203,3503,3003,0.1, 3204,3504,3004,0.15
000312	000	3211,3511,3011,0.1, 3212,3512,3012,0.1, 3213,3513,3013,0.15
000313	000	3215,3515,3015,0.1, 3221,3521,3021,0.1, 3222,3522,3022,0.15
000314	000	3226,3526,3026,0.1, 3235,3535,3035,0.1, 3246,3546,3046,0.15
000315	000	3227,3527,3027,0.1, 3231,3531,3031,0.1, 3232,3532,3032,0.15
000316	000	3236,3536,3036,0.1, 3241,3541,3041,0.1, 3242,3542,3042,0.15
000317	000	3247,3547,3047,0.1, 3251,3551,3051,0.1, 3252,3552,3052,0.15
000318	000	3253,3553,3053,0.1, 3262,3562,3062,0.1, 3301,3701,3001,0.15
000319	000	3254,3554,3054,0.1, 3255,3555,3055,0.1, 3261,3561,3061,0.15
000320	000	3263,3563,3063,0.1, 3264,3564,3064,0.1, 3265,3565,3065,0.15
000321	000	3302,3702,3002,0.1, 3303,3703,3003,0.1, 3304,3704,3004,0.15
000322	000	3305,3705,3005,0.1, 3314,3714,3014,0.1, 3326,3726,3026,0.15
000323	000	3311,3711,3011,0.1, 3312,3712,3012,0.1, 3313,3713,3013,0.15
000324	000	3315,3715,3015,0.1, 3321,3721,3021,0.1, 3322,3722,3022,0.15
000325	000	3327,3727,3027,0.1, 3331,3731,3031,0.1, 3332,3732,3032,0.15
000326	000	3335,3735,3035,0.1, 3346,3746,3046,0.1, 3353,3753,3053,0.15
000327	000	3336,3736,3036,0.1, 3341,3741,3041,0.1, 3342,3742,3042,0.15
000328	000	3347,3747,3047,0.1, 3351,3751,3051,0.1, 3352,3752,3052,0.15
000329	000	3354,3754,3054,0.1, 3355,3755,3055,0.1, 3361,3761,3061,0.15
000330	000	E 3363,3763,3063,0.1, 3364,3764,3064,0.1, 3365,3765,3065,0.15
000331	000	3362,3762,3062,0.15
000332	000	REM LIQUID TO SOLID NODES BOTTOM HE (RED AND BLUE CIRCUITS)
000333	000	N 5201,5501,5001,0.1, 5205,5505,5005,0.1, 5214,5514,5014,0.15
000334	000	5202,5502,5002,0.1, 5203,5503,5003,0.1, 5204,5504,5004,0.15

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000335	000	5211,5511,5011,.1, 5212,5512,5012,.1, 5213,5513,5013,.15
000336	000	5215,5515,5015,.1, 5221,5521,5021,.1, 5222,5522,5022,.15
000337	000	5226,5526,5026,.1, 5235,5535,5035,.1, 5246,5546,5046,.15
000338	000	5247,5527,5027,.1, 5231,5531,5031,.1, 5232,5532,5032,.15
000339	000	5236,5536,5036,.1, 5241,5541,5041,.1, 5242,5542,5042,.15
000340	000	5247,5547,5047,.1, 5251,5551,5051,.1, 5252,5552,5052,.15
000341	000	5253,5553,5053,.1, 5262,5562,5062,.1, 5301,5701,5001,.15
000342	000	5254,5554,5054,.1, 5255,5555,5055,.1, 5261,5561,5061,.15
000343	000	5263,5563,5063,.1, 5264,5564,5064,.1, 5265,5565,5065,.15
000344	000	5302,5702,5002,.1, 5303,5703,5003,.1, 5304,5704,5004,.15
000345	000	5305,5705,5005,.1, 5314,5714,5014,.1, 5326,5726,5026,.15
000346	000	5311,5711,5011,.1, 5312,5712,5012,.1, 5313,5713,5013,.15
000347	000	5315,5715,5015,.1, 5321,5721,5021,.1, 5322,5722,5022,.15
000348	000	5327,5727,5027,.1, 5331,5731,5031,.1, 5332,5732,5032,.15
000349	000	5335,5735,5035,.1, 5346,5746,5046,.1, 5353,5753,5053,.15
000350	000	5336,5736,5036,.1, 5341,5741,5041,.1, 5342,5742,5042,.15
000351	000	5347,5747,5047,.1, 5351,5751,5051,.1, 5352,5752,5052,.15
000352	000	5354,5754,5054,.1, 5355,5755,5055,.1, 5361,5761,5061,.15
000353	000	5363,5763,5063,.1, 5364,5764,5064,.1, 5365,5765,5065,.15
000354	000	5362,5762,5062,.15
000355	000	REM
000356	000	REM PAGE 31
000357	000	REM
000358	000	REM LIQUID TO SOLID NODES CHAMBER (RED CIRCUIT)
000359	NEW 001	GEN 401,5,1,4001,1,4501,1,3,411,5,1,4011,1,4511,1,2,45
000360	NEW 001	GEN 431,5,1,4031,1,4531,1,2,175,441,5,1,4041,1,4541,1,2,775
000361	NEW 001	GEN 461,5,1,4061,1,4561,1,0,89,471,5,1,4071,1,4571,1,5,65
000362	NEW 001	GEN 481,5,1,4081,1,4581,1,57,491,5,1,4091,1,4591,1,5,685
000363	NEW 001	GEN 501,5,1,4101,1,4601,1,1,265
000364	-05 000	N 421,4021,4521,3, 451,4051,4551,3, 511,4111,4611,3,5
000365	000	422,4022,4522,3, 423,4024,4524,3, 424,4025,4525,3,5
000366	000	452,4052,4552,3, 453,4054,4554,3, 454,4055,4555,3,5
000367	000	E 512,4112,4612,3, 513,4114,4614,3, 514,4115,4615,3,5
000368	000	REM LIQUID TO SOLID NODES CHAMBER (BLUE CIRCUIT)
000369	NEW 001	GEN 601,5,1,4301,1,4701,1,3,611,5,1,4011,1,4711,1,2,4
000370	NEW 001	GEN 631,5,1,4331,1,4731,1,2,175,641,5,1,4041,1,4741,1,2,775
000371	NEW 001	GEN 661,5,1,4361,1,4761,1,0,89,671,5,1,4071,1,4771,1,5,65
000372	NEW 001	GEN 681,5,1,4381,1,4781,1,57,691,5,1,4091,1,4791,1,5,685
000373	NEW 001	GEN 701,5,1,4401,1,4801,1,1,265
000374	-05 000	N 621,4021,4721,3, 651,4051,4751,3, 711,4111,4811,3,5
000375	000	622,4022,4722,3, 623,4024,4724,3, 624,4025,4725,3,5
000376	000	652,4052,4752,3, 653,4054,4754,3, 654,4055,4755,3,5
000377	000	E 712,4112,4812,3, 713,4114,4814,3, 714,4115,4815,3,5
000378	000	REM LIQUID CONDUCTORS FOR MAIN SUPPLY TO TOTAL SYSTEM (FROM RESERVOIR)
000379	000	100,100,1000,1,5
000380	000	REM
000381	000	REM PG 2
000382	000	REM
000383	000	REM LIQUID CONDUCTORS
000384	000	N 3501,-3501,3502,1, 3502,-3502,3503,1, 3503,-3503,3504,1,5
000385	000	3504,-3504,3505,1, 3511,-3511,3512,1, 3512,-3512,3513,1,5
000386	000	3513,-3513,3514,1, 3514,-3514,3515,1, 3521,-3521,3522,1,5
000387	000	3522,-3522,3523,1, 3526,-3526,3527,1, 3531,-3531,3532,1,5
000388	000	3532,-3532,3533,1, 3535,-3535,3536,1, 3541,-3541,3542,1,5
000389	000	3542,-3542,3543,1, 3546,-3546,3547,1, 3551,-3551,3552,1,5
000390	000	E 3552,-3552,3553,1, 3553,-3553,3554,1, 3554,-3554,3555,1,5

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000391	000		3561,-3561,3562,1.0	3562,-3562,3563,1.0	3563,-3563,3564,1.0
000392	000		3564,-3564,3565,1.0		
000393	000	N	3705,-3705,3704,1.0	3704,-3704,3703,1.0	3703,-3703,3702,1.0
000394	000		3702,-3702,3701,1.0	3715,-3715,3714,1.0	3714,-3714,3713,1.0
000395	000		3713,-3713,3712,1.0	3712,-3712,3711,1.0	3727,-3727,3726,1.0
000396	000		3726,-3726,3722,1.0	3722,-3722,3721,1.0	3736,-3736,3735,1.0
000397	000		3735,-3735,3732,1.0	3732,-3732,3731,1.0	3747,-3747,3746,1.0
000398	000		3746,-3746,3742,1.0	3742,-3742,3741,1.0	3755,-3755,3754,1.0
000399	000		3754,-3754,3753,1.0	3753,-3753,3752,1.0	3752,-3752,3751,1.0
000400	000	E	3765,-3765,3764,1.0	3764,-3764,3763,1.0	3763,-3763,3762,1.0
000401	000		3762,-3762,3761,1.0		
000402	000	N	5501,-5501,5502,1.0	5502,-5502,5503,1.0	5503,-5503,5504,1.0
000403	000		5504,-5504,5505,1.0	5511,-5511,5512,1.0	5512,-5512,5513,1.0
000404	000		5513,-5513,5514,1.0	5514,-5514,5515,1.0	5521,-5521,5522,1.0
000405	000		5522,-5522,5526,1.0	5526,-5526,5527,1.0	5531,-5531,5532,1.0
000406	000		5532,-5532,5535,1.0	5535,-5535,5536,1.0	5541,-5541,5542,1.0
000407	000		5542,-5542,5546,1.0	5546,-5546,5547,1.0	5551,-5551,5552,1.0
000408	000		5552,-5552,5553,1.0	5553,-5553,5554,1.0	5554,-5554,5555,1.0
000409	000	E	5561,-5561,5562,1.0	5562,-5562,5563,1.0	5563,-5563,5564,1.0
000410	000		5564,-5564,5565,1.0		
000411	000	N	5705,-5705,5704,1.0	5704,-5704,5703,1.0	5703,-5703,5702,1.0
000412	000		5702,-5702,5701,1.0	5715,-5715,5714,1.0	5714,-5714,5713,1.0
000413	000		5713,-5713,5712,1.0	5712,-5712,5711,1.0	5727,-5727,5726,1.0
000414	000		5726,-5726,5722,1.0	5722,-5722,5721,1.0	5736,-5736,5735,1.0
000415	000		5735,-5735,5732,1.0	5732,-5732,5731,1.0	5747,-5747,5746,1.0
000416	000		5746,-5746,5742,1.0	5742,-5742,5741,1.0	5755,-5755,5754,1.0
000417	000		5754,-5754,5753,1.0	5753,-5753,5752,1.0	5752,-5752,5751,1.0
000418	000	E	5765,-5765,5764,1.0	5764,-5764,5763,1.0	5763,-5763,5762,1.0
000419	000		5762,-5762,5761,1.0		
000420	000		REM		
000421	000		REM PG 3,4		
000422	000		REM		
000423	000		REM LIQUID CONDUCTORS (SUPPLY FOR TOP H/E) RED CIRCUIT		
000424	000	N	3600,-3600,3599,1.0	3601,-3599,3600,1.0	3602,-3600,3601,1.0
000425	000		3603,-3601,3501,1.0	3607,-3600,3611,1.0	3605,-3611,3511,1.0
000426	000		3606,-3600,3621,1.0	3607,-3621,3521,1.0	3608,-3600,3631,1.0
000427	000		3609,-3631,3531,1.0	3610,-3600,3641,1.0	3611,-3641,3541,1.0
000428	000	E	3612,-3600,3651,1.0	3613,-3651,3551,1.0	3614,-3600,3661,1.0
000429	000		3615,-3601,3561,1.0		
000430	000		REM LIQUID CONDUCTORS (RETURN FOR TOP H/E) RED CIRCUIT		
000431	000	N	3651,-3505,3605,1.0	3652,-3605,7001,1.0	3653,-3515,3615,1.0
000432	000		3654,-3615,7001,1.0	3655,-3527,3627,1.0	3656,-3627,7001,1.0
000433	000		3657,-3536,3636,1.0	3658,-3636,7001,1.0	3659,-3547,3647,1.0
000434	000	E	3660,-3647,7001,1.0	3661,-3555,3655,1.0	3662,-3655,7001,1.0
000435	000		3663,-3565,3665,1.0	3664,-3665,7001,1.0	
000436	000		REM LIQUID CONDUCTORS (SUPPLY FOR TOP H/E) BLUE CIRCUIT		
000437	000	N	3800,-3800,3699,1.0	3801,-3699,3700,1.0	3802,-3700,3805,1.0
000438	000		3803,-3805,3705,1.0	3804,-3700,3815,1.0	3805,-3815,3715,1.0
000439	000		3806,-3700,3827,1.0	3807,-3827,3727,1.0	3808,-3700,3836,1.0
000440	000		3809,-3836,3736,1.0	3810,-3700,3847,1.0	3811,-3847,3747,1.0
000441	000	E	3812,-3700,3855,1.0	3813,-3855,3755,1.0	3814,-3700,3865,1.0
000442	000		3815,-3865,3765,1.0		
000443	000		REM LIQUID CONDUCTORS (RETURN FOR TOP H/E) BLUE CIRCUIT		
000444	000	N	3851,-3701,3801,1.0	3852,-3801,7002,1.0	3853,-3711,3811,1.0
000445	000		3854,-3811,7002,1.0	3855,-3721,3821,1.0	3856,-3821,7002,1.0
000446	000		3857,-3731,3831,1.0	3858,-3831,7002,1.0	3859,-3741,3841,1.0

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000447	000	E	3860,-3841,7002,1.1, 3861,-3751,3851,1.1, 3862,-3851,7002,1.1
000448	000		3863,-3761,3861,1.1, 3864,-3861,7002,1.1
000449	000	REM	LIQUID CONDUCTORS (SUPPLY FOR BOTTOM H/E) RED CIRCUIT
000450	000	N	5600,-5600,5599,1.1, 5601,-5599,5600,1.1, 5602,-5600,5601,1.1
000451	000		5603,-5601,5501,1.1, 5604,-5600,5611,1.1, 5605,-5611,5511,1.1
000452	000		5606,-5600,5621,1.1, 5607,-5621,5521,1.1, 5608,-5600,5631,1.1
000453	000		5609,-5631,5531,1.1, 5610,-5600,5641,1.1, 5611,-5641,5541,1.1
000454	000	E	5612,-5600,5651,1.1, 5613,-5651,5551,1.1, 5614,-5600,5661,1.1
000455	000		5615,-5661,5561,1.1
000456	000	REM	LIQUID CONDUCTORS (RETURN FOR BOTTOM H/E) RED CIRCUIT
000457	000	N	5651,-5505,5605,1.1, 5652,-5605,7003,1.1, 5653,-5515,5615,1.1
000458	000		5654,-5615,7003,1.1, 5655,-5527,5627,1.1, 5656,-5627,7003,1.1
000459	000		5657,-5536,5636,1.1, 5658,-5636,7003,1.1, 5659,-5547,5647,1.1
000460	000	E	5660,-5647,7003,1.1, 5661,-5555,5655,1.1, 5662,-5655,7003,1.1
000461	000		5663,-5565,5665,1.1, 5664,-5665,7003,1.1
000462	000	REM	LIQUID CONDUCTORS (SUPPLY FOR BOTTOM H/E) BLUE CIRCUIT
000463	000	N	5800,-5800,5699,1.1, 5801,-5699,5700,1.1, 5802,-5700,5805,1.1
000464	000		5803,-5805,5705,1.1, 5804,-5700,5815,1.1, 5805,-5815,5715,1.1
000465	000		5806,-5700,5827,1.1, 5807,-5827,5727,1.1, 5808,-5700,5836,1.1
000466	000		5809,-5836,5736,1.1, 5810,-5700,5847,1.1, 5811,-5847,5747,1.1
000467	000	E	5812,-5700,5855,1.1, 5813,-5855,5755,1.1, 5814,-5700,5865,1.1
000468	000		5815,-5865,5765,1.1
000469	000	REM	LIQUID CONDUCTORS (RETURN FOR BOTTOM H/E) BLUE CIRCUIT
000470	000	N	5851,-5701,5801,1.1, 5852,-5801,7004,1.1, 5853,-5711,5811,1.1
000471	000		5854,-5811,7004,1.1, 5855,-5721,5821,1.1, 5856,-5821,7004,1.1
000472	000		5857,-5731,5831,1.1, 5858,-5831,7004,1.1, 5859,-5741,5841,1.1
000473	000	E	5860,-5841,7004,1.1, 5861,-5751,5851,1.1, 5862,-5851,7004,1.1
000474	000		5863,-5761,5861,1.1, 5864,-5861,7004,1.1
000475	000	REM	
000476	000	REM	PG 7,8,9
000477	000	REM	
000478	000	REM	LIQUID CONDUCTORS FOR CHAMBER (RED CIRCUIT-DOWN)
000479	000	N	4501,-4501,4502,1.1, 4502,-4502,4503,1.1, 4503,-4503,4504,1.1
000480	000		4504,-4504,4505,1.1, 4511,-4511,4512,1.1, 4512,-4512,4513,1.1
000481	000		4513,-4513,4514,1.1, 4514,-4514,4515,1.1, 4521,-4521,4522,1.1
000482	000		4522,-4522,4524,1.1, 4524,-4524,4525,1.1, 4531,-4531,4532,1.1
000483	000		4532,-4532,4533,1.1, 4533,-4533,4534,1.1, 4534,-4534,4535,1.1
000484	000		4541,-4541,4542,1.1, 4542,-4542,4543,1.1, 4543,-4543,4544,1.1
000485	000		4544,-4544,4545,1.1, 4551,-4551,4552,1.1, 4552,-4552,4554,1.1
000486	000		4554,-4554,4555,1.1, 4561,-4561,4562,1.1, 4562,-4562,4563,1.1
000487	000		4563,-4563,4564,1.1, 4564,-4564,4565,1.1, 4571,-4571,4572,1.1
000488	000		4572,-4572,4573,1.1, 4573,-4573,4574,1.1, 4574,-4574,4575,1.1
000489	000		4581,-4581,4582,1.1, 4582,-4582,4583,1.1, 4583,-4583,4584,1.1
000490	000		4584,-4584,4585,1.1, 4591,-4591,4592,1.1, 4592,-4592,4593,1.1
000491	000		4593,-4593,4594,1.1, 4594,-4594,4595,1.1, 4601,-4601,4602,1.1
000492	000		4602,-4602,4603,1.1, 4603,-4603,4604,1.1, 4604,-4604,4605,1.1
000493	000	E	4611,-4611,4612,1.1, 4612,-4612,4614,1.1, 4614,-4614,4615,1.1
000494	000	REM	LIQUID CONDUCTORS FOR CHAMBER (BLUE CIRCUIT-UP)
000495	000	N	4705,-4705,4704,1.1, 4704,-4704,4703,1.1, 4703,-4703,4702,1.1
000496	000		4702,-4702,4701,1.1, 4715,-4715,4714,1.1, 4714,-4714,4713,1.1
000497	000		4713,-4713,4712,1.1, 4712,-4712,4711,1.1, 4725,-4725,4724,1.1
000498	000		4724,-4724,4722,1.1, 4722,-4722,4721,1.1, 4735,-4735,4734,1.1
000499	000		4734,-4734,4733,1.1, 4733,-4733,4732,1.1, 4732,-4732,4731,1.1
000500	000		4745,-4745,4744,1.1, 4744,-4744,4743,1.1, 4743,-4743,4742,1.1
000501	000		4742,-4742,4741,1.1, 4755,-4755,4754,1.1, 4754,-4754,4752,1.1
000502	000		4752,-4752,4751,1.1, 4765,-4765,4764,1.1, 4764,-4764,4763,1.1

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000503	000		4763,-4763,4762:0.1	4762,-4762,4761:0.1	4775,-4775,4774:0.15
000504	000		4774,-4774,4773:0.1	4773,-4773,4772:0.1	4772,-4772,4771:0.15
000505	000		4785,-4785,4784:0.1	4784,-4784,4783:0.1	4783,-4783,4782:0.15
000506	000		4782,-4782,4781:0.1	4795,-4795,4794:0.1	4794,-4794,4793:0.15
000507	000		4793,-4793,4792:0.1	4792,-4792,4791:0.1	4805,-4805,4804:0.15
000508	000		4804,-4804,4803:0.1	4803,-4803,4802:0.1	4802,-4802,4801:0.15
000509	000	E	4815,-4815,4814:0.1	4814,-4814,4812:0.1	4812,-4812,4811:0.15
000510	000				
000511	000	REM	PG 11.1. 13		
000512	000	REM			
000513	000	REM	LIQUID SUPPLY TO CHAMBER (RED CIRCUIT)		
000514	000	N	8099,-8099,8098:0.1	8103,-8099,8100:0.1	8101,-8100,8101:0.15
000515	000		8102,-8101,8102:0.1	8103,-8102,8103:0.1	8104,-8103,8105:0.15
000516	000		8105,-8105,8107:0.1	8106,-8105,8109:0.1	8107,-8105,8111:0.15
000517	000		8108,-8102,8104:0.1	8109,-8104,8106:0.1	8110,-8106,8108:0.15
000518	000		8111,-8106,8110:0.1	8112,-8106,8112:0.1	8121,-8100,8121:0.15
000519	000		8122,-8121,8122:0.1	8123,-8122,8123:0.1	8124,-8123,8125:0.15
000520	000		8125,-8125,8127:0.1	8126,-8125,8129:0.1	8127,-8125,8131:0.15
000521	000	E	8128,-8122,8124:0.1	8129,-8124,8126:0.1	8130,-8126,8128:0.15
000522	000		8131,-8126,8130:0.1	8132,-8126,8132:0.15	
000523	000	REM	LIQUID RETURN FROM CHAMBER (RED CIRCUIT)		
000524	000	N	8201,-8207,8205:0.1	8202,-8209,8205:0.1	8203,-8211,8205:0.15
000525	000		8204,-8205,8203:0.1	8205,-8203,8202:0.1	8206,-8208,8206:0.15
000526	000		8207,-8210,8206:0.1	8208,-8212,8206:0.1	8209,-8206,8204:0.15
000527	000		8210,-8204,8202:0.1	8211,-8202,8201:0.1	8212,-8201,8200:0.15
000528	000		8221,-8227,8225:0.1	8222,-8229,8225:0.1	8223,-8231,8225:0.15
000529	000		8224,-8225,8223:0.1	8225,-8223,8222:0.1	8226,-8228,8226:0.15
000530	000		8227,-8230,8226:0.1	8228,-8232,8226:0.1	8229,-8226,8224:0.15
000531	000	E	8230,-8224,8222:0.1	8231,-8222,8221:0.1	8232,-8221,8200:0.15
000532	000		8233,-8200,8194:0.1	8234,-8199,900:0.15	
000533	000	REM	LIQUID SUPPLY TO CHAMBER (BLUE CIRCUIT)		
000534	NEW 001		9099,-1000,9199:0.1	9100,-9100,9099:0.1	9101,-9101,9100:0.15
000535	NEW 001		9102,-9102,9101:0.1	9103,-9103,9102:0.1	9104,-9105,9103:0.15
000536	NEW 001		9105,-9107,9105:0.1	9106,-9109,9105:0.1	9107,-9111,9105:0.15
000537	NEW 001		9108,-9104,9102:0.1	9109,-9106,9104:0.1	9110,-9108,9106:0.15
000538	NEW 001		9111,-9110,9106:0.1	9112,-9112,9106:0.1	9121,-9121,9100:0.15
000539	NEW 001		9122,-9122,9121:0.1	9123,-9123,9122:0.1	9124,-9125,9123:0.15
000540	NEW 001		9125,-9127,9125:0.1	9126,-9129,9125:0.1	9127,-9131,9125:0.15
000541	NEW 001		9128,-9124,9122:0.1	9129,-9126,9124:0.1	9130,-9128,9126:0.15
000542	NEW 001		9131,-9130,9126:0.1	9132,-9132,9126:0.15	
000543	NEW 001	REM	LIQUID RETURN FROM CHAMBER (BLUE CIRCUIT)		
000544	NEW 001		9201,-9205,9207:0.1	9202,-9205,9209:0.1	9203,-9205,9211:0.15
000545	NEW 001		9204,-9203,9205:0.1	9205,-9202,9203:0.1	9206,-9206,9208:0.15
000546	NEW 001		9207,-9206,9210:0.1	9208,-9206,9212:0.1	9209,-9204,9206:0.15
000547	NEW 001		9210,-9202,9204:0.1	9211,-9201,9202:0.1	9212,-9200,9201:0.15
000548	NEW 001		9221,-9225,9227:0.1	9222,-9225,9229:0.1	9223,-9222,9231:0.15
000549	NEW 001		9224,-9223,9225:0.1	9225,-9222,9223:0.1	9226,-9226,9228:0.15
000550	NEW 001		9227,-9226,9230:0.1	9228,-9226,9232:0.1	9229,-9224,9226:0.15
000551	NEW 001		9230,-9222,9224:0.1	9231,-9221,9222:0.1	9232,-9200,9221:0.15
000552	NEW 001		9233,-9199,9200:0.1	9234,-900,9099:0.15	
000553	NEW 001	REM			
000554	000	REM	PG 15		
000555	000	REM			
000556	000	REM	LIQUID SUPPLY AND RETURN CONNECTIONS TO CHAMBER (RED CIRCUIT)		
000557	000	N	8301,-8110,4501:0.1	8302,-8108,4511:0.1	8303,-8111,4521:0.15
000558	000		8304,-8109,4531:0.1	8305,-8107,4541:0.1	8306,-8132,4551:0.15

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000559      000      8307,-8130,4561,.1, 8308,-8128,4571,.1, 8309,-8131,4581,.15
000560      000      8310,-8129,4591,.1, 8311,-8127,4601,.1, 8312,-8112,4611,.15
000561      000      8321,-4565,8210,.1, 8322,-4515,8208,.1, 8323,-4525,8211,.15
000562      000      8324,-4535,8209,.1, 8325,-4545,8207,.1, 8326,-4555,8232,.15
000563      000      8327,-4565,8230,.1, 8328,-4575,8228,.1, 8329,-4585,8231,.15
000564      000      8330,-4595,8229,.1, 8331,-4605,8227,.1, 8332,-4615,8212,.15
000565      000      REM      LIQUID SUPPLY AND RETURN CONNECTIONS TO CHAMBER (BLUE CIRCUIT)
000566      NEW 001      9301,-9210,4705,.1, 9302,-9208,4715,.1, 9303,-9211,4725,.15
000567      NEW 001      9304,-9209,4735,.1, 9305,-9207,4745,.1, 9306,-9232,4755,.15
000568      NEW 001      9307,-9230,4765,.1, 9308,-9228,4775,.1, 9309,-9231,4785,.15
000569      NEW 001      9310,-9229,4795,.1, 9311,-9227,4805,.1, 9312,-9212,4815,.15
000570      NEW 001      9321,-4701,9110,.1, 9322,-4711,9108,.1, 9323,-4721,9111,.15
000571      NEW 001      9324,-4731,9109,.1, 9325,-4741,9107,.1, 9326,-4751,9132,.15
000572      NEW 001      9327,-4761,9130,.1, 9328,-4771,9128,.1, 9329,-4781,9131,.15
000573      NEW 001      9330,-4791,9129,.1, 9331,-4801,9127,.1, 9332,-4811,9112,.15
000574      -08 000      REM
000575      000      REM INSULATION TO AIR CONDUCTORS
000576      000      REM
000577      000      12001,2001,1.0,0045, 12002,2002,1.0,009, 12003,2003,1.0,0095
000578      000      12004,2004,1.0,009, 12005,2005,1.0,0045
000579      000      GEN 12011,5.1,2011,1.1,0.1,.1,0.009,1.
000580      000      GEN 12021,5.1,2021,1.1,0.1,.1,0.009,1.5
000581      000      12041,2041,1.0,0045
000582      000      GEN 12042,3.1,2042,1.1,0.1,.1,0.009,1.
000583      000      12045,2045,1.0,0045
000584      000      GEN 14001,5.1,4001,1.1,0.1,.1,0.01,1.5
000585      000      GEN 14011,5.1,4011,1.1,0.1,.1,0.01,1.
000586      000      GEN 14021,5.1,4021,1.1,0.1,.1,0.01,1.5
000587      000      GEN 14031,5.1,4031,1.1,0.1,.1,0.01,1.
000588      000      GEN 14041,5.1,4041,1.1,0.015
000589      000      GEN 14051,5.1,4051,1.1,0.015
000590      000      GEN 14061,5.1,4061,1.1,0.015
000591      000      GEN 14071,5.1,4071,1.1,0.015
000592      000      GEN 14081,5.1,4081,1.1,0.015
000593      000      GEN 14091,5.1,4091,1.1,0.015
000594      000      GEN 14101,5.1,4101,1.1,0.015
000595      000      GEN 14111,5.1,4111,1.1,0.015
000596      000      16001,6001,1.0,0045, 16002,6002,1.0,009, 16003,6003,1.0,0095
000597      000      16004,6004,1.0,009, 16005,6005,1.0,0045
000598      000      GEN 16011,5.0,6011,1.1,0.0095
000599      000      GEN 16021,5.0,6021,1.1,0.0095
000600      000      GEN 16031,5.0,6031,1.1,0.0095
000601      000      16041,6041,1.0,0045, 16045,6045,1.0,0045
000602      000      GEN 16042,3.0,6042,1.1,0.0095
000603      000      END
000604      000      BCD 3CONSTANTS DATA
000605      NEW 001      TIMEND,1000.
000606      *01 000      OUTPUT=.655
000607      000      DRFXCA=.01, ARLXCA=.01, NLOOP=105
000608      000      ITEST=3, LTEST=05
000609      000      MTEST,0 5 MTEST=0 FOR MOSES MTEST=1 FOR ANALYTICAL
000610      000      1=2.25GALLONS PER MINUTE
000611      NEW 001      5,0.00      SLOCATION FOR SPECIFIC HEAT
000612      NEW 001      6,0.4      SLOCATION FOR RHO
000613      NEW 001      7,0.024      SLOCATION FOR RHOC
000614      NEW 001      8,68.0      TEMPERATURE

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000615 NEW 001 9.100 SGPM FLO RATE
000616 NEW 001 10.0.00223 SGPM K=FT3/HR
000617 NEW 001 11.0.96 STOTAL CP TO SYSTEM
000618 NEW 001 12.0.125 SPROPORTIONAL FLOW FACTOR FOR TOP,BOTTOM DISCHEX
000619 NEW 001 13.0.25 SPROPORTIONAL FLOW FACTOR FOR BOTTOM, TOP CYLINDER HEX
000620 NEW 001 15, SLOCATION FOR FLOW CONDUCTORS TO NODES 3599,3699,5599,5699
000621 NEW 001 16, SLOCATION FOR FLOW CONDUCTORS TO 8099,9199
000622 NEW 001 17, SLOCATION FOR 1/15 FLOW CONDUCTORS DISC HEX
000623 NEW 001 18, SLOCATION FOR 1/5 FLOW CONDUCTOR DISC HEX
000624 NEW 001 19, SLOCATION FOR 1/12 FLOW CONDUCTORS FOR CYLINDER HEX
000625 NEW 001 20, SK16(.5)
000626 NEW 001 21, SK20(.5)
000627 NEW 001 22, SK21(.5)
000628 NEW 001 23, SK22(.333)
000629 NEW 001 37=955 NO. OF ITEMS ON MISC FILE
000630 NEW 001 38=25 SLOGICAL UNIT
000631 NEW 001 39=3005NO. OF LOCATIONS
000632 NEW 001 101=95 SNUMBER OF ITEMS ON MIS. FILE
000633 NEW 001 102=25 SLGICAL UNIT OF FILE CONT. TEMP. AND TEST DATA
000634 -11 000 END
000635 000 BCD 3ARRAY DATA
000636 000 REM TEMPERATURE ARRAY FOR ORONITE FLOCOOL 100 FLUID
000637 000 1,-50,-30,-10,10,30,50,70,90,110,130,ENDS
000638 000 REM ORONITE FLOCOOL 100 THERMAL CONDUCTIVITY, -50 TO 130 DEG. F 20 DEG.
000639 000 REM INCREMENTS BTU/(HR., FT. DEG. F)
000640 000 2.06325,.06275,.06225,.06175,.06125,.06075,.06025,.05975,.05925
000641 000 .05875,ENDS
000642 000 REM ORONITE FLOCOOL 100 SPECIFIC HEAT, -50. TO 130. DEG F IN 20.DEG.
000643 000 REM INCREMENTS BTU/(LB., DEG. F)
000644 000 3,.395,.405,.415,.425,.435,.445,.455,.465,.475,.485,ENDS
000645 000 REM ORONITE FLOCOOL 100 DENSITY -50. TO 130. DEG. F IN 20. DEG. INCREMENT
000646 000 REM DENSITY UNITS ARE LB/FT.**3
000647 000 4.59.25,58.75,58.25,57.75,57.25,56.75,56.25,55.75,55.25,54.75,ENDSE.
000648 000 REM ORONITE FLOCOOL 100 VISCOSITY, FT**2/SEC. IN 20.DEG INCREMENTS
000649 000 REM KINEMATIC VISCOSITY (MUST GET CORRECT UNITS IN SUBROUTINE FILM)
000650 000 5.000121,.000104,.000086,.00007,.000053,.000036,.000027,.000026
000651 000 .000020,ENDS
000652 000 REM LOCATIONS ARE RESERVED ONLY FOR REPRESENTATIVE NODES IN TOP AND BOTTO
000653 000 REM H/ES, CHAMBER, SUPPLY, AND RETURN SINCE TEMP. VARIES SO LITTLE
000654 000 REM (EVEN THE NO. LISTED BELOW MAY BE TWW TOO MANY)
000655 000 REM 1=3503 2=3513 3=3531 4=3535 5=3553 6=3563 7=4501
000656 000 REM 8=4502 9=4503 10=4504 11=4505 12=4513 13=4522 14=1000
000657 000 REM 15=8102 16=8122 17=8202 18=8222 19=9102 20=9122 21=9202
000658 000 REM 22=9222 23=5503 24=5515 25=5531 26=5535 27=5553 28=5563
000659 000 REM SEVERAL NOS. LISTED APPLIES TO TWO LIQUID NODES (CORRESPONDENCE IS
000660 000 REM 35XX TO 37XX, 45XX TO 47XX, OTHER LOCATIONS ARE FOR SINGLE LOCATIONS)
000661 000 REM ALSO SOME ARE REPRESENTATIVE OF MANY FOR EXAMPLE 4503 OR 4513 FOR
000662 000 REM ALL COLS. WITHOUT WINDOWS, 4511 APPLIES TO ALL COLS. WITH WINDOWS
000663 000 GEN 20,SPACE, 50,ENDS ARRAY TO STORE CALCULATED CONDUCTIVITIES OF FLUID
000664 000 GEN 30,SPACE, 50,ENDS DENSITY LB/FT.**3 (SAME NODE CORESPONDENCE AS 401
000665 000 GEN 40,SPACE, 50,ENDS VISCOSITY LB/FTSEC (SAME NODE CORESPONDENCE AS 401
000666 000 GEN 50,SPACE, 50,ENDS CP BTU/LB,DEG. F (SAME NODE CORESPONDENCE AS 401
000667 000 REM 11 CONTAINS LENGTHS IN INCHES (CONVERT TO FEET) RED CIRCUIT TOP HE
000668 000 REM 1=3501 2=3502 3=3503 4=3504 5=3505 6=3511 7=3512
000669 000 REM 8=3513 9=3514 10=3515 11=3521 12=3522 13=3526 14=3527
000670 000 REM 15=3531 16=3532 17=3535 18=3536 19=3541 20=3542 21=3546

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000671 COO
000672 COO
000673 COO
000674 NEW COI
000675 NEW COI
000676 -02 COO
000677 COO
000678 COO
000679 COO
000680 COO
000681 COO
000682 COO
000683 COO
000684 NEW COI
000685 NEW COI
000686 -02 COO
000687 COO
000688 COO
000689 COO
000690 COO
000691 COO
000692 COO
000693 COO
000694 COO
000695 COO
000696 COO
000697 COO
000698 COO
000699 COO
000700 COO
000701 COO
000702 COO
000703 COO
000704 COO
000705 COO
000706 COO
000707 COO
000708 COO
000709 COO
000710 COO
000711 COO
000712 COO
000713 COO
000714 COO
000715 COO
000716 COO
000717 COO
000718 COO
000719 COO
000720 COO
000721 COO
000722 COO
000723 COO
000724 COO
000725 COO
000726 COO

REM 22=3547 23=3551 24=3552 25=3553 26=3554 27=3555 28=3561
REM 29=3562 30=3563 31=3564 32=3565 ALSO GOOD FOR EQUIVALENT NOS.
REM ON BOTTOM 1=5501 2=5502 ETC.
11..9..3..2..19..3..9..3..1..3..2..27..3..3..1..3..7..4.
4..3..7..2..74..2..64..2..52..2..76..3..7..4..4..3..7..3..1..3.
3..3..3..1..9..3..3..3..9..ENDS
REM 12 CONTAINS LENGTH IN INCHES (CONVERT TO FEET) BLUE CIRCUIT TOP HE
REM 1=3701 2=3702 3=3703 4=3704 5=3705 6=3711 7=3712
REM 8=3713 9=3714 10=3715 11=3721 12=3722 13=3726 14=3727
REM 15=3731 16=3732 17=3735 18=3736 19=3741 20=3742 21=3746
REM 22=3747 23=3751 24=3752 25=3753 26=3754 27=3755 28=3761
REM 29=3762 30=3763 31=3764 32=3765 ALSO GOOD FOR EQUIVALENT
REM NUMBERS ON THE BOTTOM 1=5701 2=5702 ETC.
12..1..435..3..2..19..3..1..435..3..35..3..2..27..3..3..35..3..8..4.
4..3..8..2..74..2..64..2..52..2..76..3..8..4..4..3..8..3..35..3.
3..3..3..35..1..435..3..3..3..1..435..ENDS
REM 13 CONTAINS LENGTH IN INCHES (CONVERT TO FEET) RED CIRCUIT THEN BLUE
REM A TYPICAL COLUMN FOR A WINDOWLESS ROW IS GIVEN AND THEN ONE FOR A COL
REM CONTAINING A WINDOW
REM 1=4501 2=4502 3=4503 4=4504 5=4505 6=4521 7=4522
REM 8=4524 9=4525 10=4705 11=4704 12=4703 13=4702 14=4701
REM 15=4725 16=4724 17=4722 18=4721 (45XX ARE RED CIRCUIT 47XX BLUE)
13..776..2..196..2..196..2..196..1..735..776..2..196..2..196..1..735
776..2..196..2..196..2..196..1..735..776..2..196..2..196..1..735..ENDS
REM 21 CONTAINS DIAMETERS IN INCHES (CONVERT TO FEET)
REM 1=3501,3505,3561,3565 (AND 55XX)
REM 2=3502 TO 3504,3512 TO 3514, 3552 TO 3554,3562 TO 3564
REM (AND 37XX,55XX,57XX)
REM 3=3521,3527,3541,3547 (AND 55XX)
REM 4=3522,3526,3542,3546 (AND 37XX,55XX,57XX)
REM 5=3531,3536,3731,3736,3721,3727,3741,3747 (AND 55XX,57XX)
REM 6=3532,3535 (AND 37XX,55XX,57XX)
REM 7=3511,3515,3551,3555 (AND 55XX)
REM 8=3711,3715,3751,3755 (AND 57XX)
REM 9=3701,3705,3761,3765 (AND 57XX)
REM 10=4501 TO 4505,4511 TO 4515,4561 TO 4565,4571 TO 4575
REM 4581 TO 4585,4591 TO 4595,4601 TO 4605,4711 TO 4715
REM 4731 TO 4735,4741 TO 4745,4771 TO 4775,4781 TO 4785
REM 4801 TO 4805
REM 4701 TO 4705,4761 TO 4765,4531 TO 4535
REM 12=4791 TO 4795
REM 13=4521,4522,4524,4525,4551,4552,4554,4555,4611,4612
REM 4614,4615,4721,4722,4724,4725,4771,4772,4774,4775
REM 4811,4812,4814,4815
21..4110..6250..1383..1250..1250..1250..1386..1376..1702..1250
1250..1250..1250..ENDS DIAMETERS, INCHES (4R)
22..3079..2443..1508..1410..1410..1410..2616..2604..2304..2821
2443..3154..3154..ENDS DIAMETER, INCHES (DEQ)
REM 23 CONTAINS AREAS (SAME CORRESPONDENCE AS ARRAY 21)
23..07451..004688..01786..01562..01562..05375..05324
07163..06250..004688..07812..07812..ENDS AREAS IN IN..*2
REM 24 CONTAINS VOLUMES IN IN..*3
REM 1 THRU 9 HAVE SAME CORRESPONDENCE AS ARRY 21
REM 10=4501,4511,4541,4561,4571,4581,4591,4601
REM 4715,4735,4745,4775,4785,4805
REM 11=4502 TO 4504,4512 TO 4514,4542 TO 4544,4562 TO 4564

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000727 000 REM 4572 TO 4574,4582 TO 4584,4592 TO 4594,4602 TO 4604
000728 000 REM 4712 TO 4714,4732 TO 4734,4742 TO 4744,4772 TO 4774
000729 000 REM 4782 TO 4784,4802 TO 4804
000730 000 REM 12=4505,4515,4545,4565,4575,4585,4595,4605
000731 000 REM 4711,4731,4741,4771,4781,4801
000732 000 REM 13=4531,4705,4765
000733 000 REM 14=4532 TO 4534,4702 TO 4704,4762 TO 4764
000734 000 REM 15=4535,4701,4761
000735 000 REM 16,4795
000736 000 REM 17=4792 TO 4794
000737 000 REM 18=4791
000738 000 REM 19,4521,4551,4611,4725,4775,4815
000739 000 REM 20=4522,4524,4552,4554,4612,4614,4722,4724
000740 000 REM 4722,4774,4812,4814
000741 000 REM 21=4525,4555,4615,4715,4721,4771,4811
000742 000 24,.06705,.14062,.06610,.06250,.05938
000743 000 .05156,.16662,.17834,.10278,.04788
000744 000 .13725,.10844,.03591,.10294,.08133
000745 000 .05984,.17156,.13555,.05984,.19484
000746 000 .13555,ENDSVOLUMES IN IN.003
000747 000 GEN 80,SPACE,50,ENDS VELOCITIES IN FT/ SEC.
000748 000 -985 GRAPH TITLE
000749 000 BCD 6CLOUD PHYSICS CHAMBER THERMAL TEST
000750 000 BCD 6CORRELATION ANALYSIS
000751 000 ENDS
000752 000 -995 YLABEL ARRAY FOR PLOTS
000753 000 BCD 6 TEMPERATURE IN DEGREES CENTIGRADE
000754 000 BCD 6
000755 000 ENDS
000756 000 REM ARRAY 100 IS THE MASTER SPACE ARRAY FOR ALL PLOTS LENGTH MUST
000757 000 REM BE EQUAL TO NO. OF CURVES+1 TIMES NO. OF OUTPUTS. THE LENGTH
000758 000 REM CHOSEN WAS 500OUTPUTS * (5CURVES+1)=3000 LOCATIONS
000759 000 GEN -100,SPACE,3000,ENDS MASTER SPACE ARRAY
000760 000 -101
000761 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000762 000 BCD 615 1 TO 3 = 4003,4004, SENSOR 1
000763 000 END
000764 000 -102
000765 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000766 000 BCD 615 1 TO 3 = 4013,4014, SENSOR 2
000767 000 END
000768 000 -103
000769 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000770 000 BCD 615 1 TO 3 = 4023,4024, SENSOR 3
000771 000 END
000772 000 -104
000773 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000774 000 BCD 615 1 TO 3 = 4033,4034, SENSOR 4
000775 000 END
000776 000 -105
000777 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000778 000 BCD 615 1 TO 3 = 4043,4044, SENSOR 5
000779 000 END
000780 000 -106
000781 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000782 000 BCD 615 1 TO 3 = 4053,4054, SENSOR 6

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000783	000	END
000784	000	-107
000785	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000786	000	BCD 6IS 1 TO 3 = 4063,4064, SENSOR 7
000787	000	END
000788	000	-108
000789	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000790	000	BCD 6IS 1 TO 3 = 4073,4074, SENSOR 8
000791	000	END
000792	000	-109
000793	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000794	000	BCD 6IS 1 TO 3 = 4083,4084, SENSOR 9
000795	000	END
000796	000	-110
000797	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000798	000	BCD 6IS 1 TO 3 = 4093,4094, SENSOR 10
000799	000	END
000800	000	-111
000801	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000802	000	BCD 6IS 1 TO 3 = 4103,4104, SENSOR 11
000803	000	END
000804	000	-112
000805	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000806	000	BCD 6IS 1 TO 3 = 4113,4114, SENSOR 12
000807	000	END
000808	000	-113
000809	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000810	000	BCD 6IS 1 TO 4 = 4004, SENSOR 13, 4003, SENSOR 14
000811	000	END
000812	000	-114
000813	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000814	000	BCD 6IS 1 TO 3 = 4002,4003, SENSOR 15
000815	000	END
000816	000	-115
000817	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000818	000	BCD 6IS 1 TO 4 = 4002, SENSOR 16, 4001, SENSOR 17
000819	000	END
000820	000	-116
000821	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000822	000	BCD 6IS 1 TO 4 = 4001, SENSOR 19, 4064, SENSOR 19
000823	000	END
000824	000	-117
000825	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000826	000	BCD 6IS 1 TO 2 = 4063, SENSOR 20
000827	000	END
000828	000	-118
000829	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000830	000	BCD 6IS 1 TO 3 = 4062,4063, SENSOR 21
000831	000	END
000832	000	-119
000833	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000834	000	BCD 6IS 1 TO 4 = 4062, SENSOR 22, 4061, SENSOR 23
000835	000	END
000836	000	-120
000837	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000838	000	BCD 6IS 1 TO 4 = 4061, SENSOR 24, 4013, SENSOR 25

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000839	000	END
000840	000	-121
000841	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000842	000	BCD 6IS IT04=4012,SENSOR26,4012,SENSOR27
000843	000	END
000844	000	-122
000845	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000846	000	BCD 6IS IT04=4022,SENSOR28,3035,SENSOR29
000847	000	END
000848	000	-123
000849	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000850	000	BCD 6IS IT04=3035,SENSOR30,3036,SENSOR31
000851	000	END
000852	000	-124
000853	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000854	000	BCD 6IS IT04=3036,SENSOR32,3013,SENSOR33
000855	000	END
000856	000	-125
000857	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000858	000	BCD 6IS IT04=3013,SENSOR34,3003,SENSOR35
000859	000	END
000860	000	-126
000861	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000862	000	BCD 6IS IT04=3003,SENSOR36,3032,SENSOR37
000863	000	END
000864	000	-127
000865	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000866	000	BCD 6IS IT04=3032,SENSOR38,3031,SENSOR39
000867	000	END
000868	000	-128
000869	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000870	000	BCD 6IS IT04=3031,SENSOR40,5035,SENSOR41
000871	000	END
000872	000	-129
000873	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000874	000	BCD 6IS IT04=5035,SENSOR42,5036,SENSOR43
000875	000	END
000876	000	-130
000877	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000878	000	BCD 6IS IT04=5036,SENSOR44,5013,SENSOR45
000879	000	END
000880	000	-131
000881	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000882	000	BCD 6IS IT04=5013,SENSOR46,5003,SENSOR47
000883	000	END
000884	000	-132
000885	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000886	000	BCD 6IS IT04=5003,SENSOR48,5032,SENSOR49
000887	000	END
000888	000	-133
000889	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000890	000	BCD 6IS IT04=5032,SENSOR50,5031,SENSOR51
000891	000	END
000892	000	-134
000893	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000894	000	BCD 6IS IT04=5031,SENSOR52,1000,SENSOR53

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000895 000      END
000896 000      -135
000897 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000898 000      BCD 6IS IT04=3600,SENSOR54,7002,SENSOR55
000899 000      END
000900 000      -136
000901 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000902 000      BCD 6IS IT04=5600,SENSOR56,7004,SENSOR57
000903 000      END
000904 000      -137
000905 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000906 000      BCD 6IS IT04=3700,SENSOR58,7001,SENSOR59
000907 000      END
000908 000      -138
000909 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000910 000      BCD 6IS IT04=5700,SENSOR60,7003,SENSOR61
000911 000      END
000912 000      -139
000913 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000914 000      BCD 6IS IT04=8102,SENSOR62,9122,SENSOR63
000915 000      END
000916 000      -140
000917 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000918 000      BCD 6IS IT04=9222,SENSOR64,8222,SENSOR65
000919 000      END
000920 000      -141
000921 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000922 000      BCD 6IS IT04=8122,SENSOR66,9102,SENSOR67
000923 000      END
000924 000      -142
000925 000      BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000926 000      BCD 6IS IT04=9202,SENSOR69,8202,SENSOR70
000927 000      END
000928 000      1000.0,68.5,-22.200,-21.500,-20.1000,-15.,END
000929 NEW 001      200.0,68.1,60.1,60.1,65.1,60.1,110.1,001.140.2,180.1,1.8
000930 NEW 001      250.1,9.350.1,9.400.1,9.500.1,9.2.550.1,9.750.1,9.950.1,94
000931 NEW 001      1100.1,94.1250.1,95,END      TOTAL GPM
000932 NEW 001      2010.66.4,60.66.2,65.66.6,110.66.6,140.66.6,180.66.6,250.66.6
000933 NEW 001      300.1,4.400.1,4.500.1,4.6,550.1,4.9,750.1,7.6,950.1,12.1
000934 NEW 001      1000.1,-11.2,1100.1,-10.3,1250.1,3.6,1500.1,26.6,1925.1,58.9
000935 NEW 001      2225.1,68.1,2500.1,75.2,END      TEMPERATURE VS TIME
000936 000      END
000937 000      BCD 3EXECUTION
000938 000      COMMON /NOHEAD/ LENGTH
000939 NEW 001      F DIMENSION X(10000)
000940 NEW 001      F NDIM=10000
000941 -02 000      F NTH=0
000942 000      F LENGTH=0
000943 000      F REWIND 25
000944 000      TORDER
000945 000      C
000946 000      C** INITIALIZATION
000947 000      C INITIALIZE ALL TEMPS.
000948 NEW 001      M CALL SYFSQS(64.4,NNT,T2001)
000949 -01 000      M CALL ARYDIV(NGT,G2001,3600.,G2001)
000950 000      M CALL ARYDIV(A2,A(2+1),3600.,A(2+1))

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000951 000 M CALL STFSQS(.5,A80,A(80+1))
000952 000 M CALL ARYDIV(A11,A(11+1),12.,A(11+1))
000953 000 M CALL ARYDIV(A12,A(12+1),12.,A(12+1))
000954 000 M CALL ARYDIV(A13,A(13+1),12.,A(13+1))
000955 000 M CALL ARYDIV(A21,A(21+1),12.,A(21+1))
000956 000 M CALL ARYDIV(A23,A(23+1),144.,A(23+1))
000957 000 M CALL ARYDIV(A24,A(24+1),1728.,A(24+1))
000958 000 STSEPR(80.,T1)SAIR TEMPERATURE
000959 000 C CALCULATE VELOCITIES IN FT/SEC
000960 -05 000 CNFR40
000961 NEW 001 M CALL FFPRT2(LENGTH,NNT,K101,A100,10,25)
000962 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A101,A99,4003,4004,
000963 NEW 001 M S -2,0,0,8)
000964 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A102,A99,4013,4014,
000965 NEW 001 M S -3,0,0,1)
000966 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A103,A99,4023,4024,
000967 NEW 001 M S -4,0,0,1)
000968 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A104,A99,4033,4034,
000969 NEW 001 M S -5,0,0,1)
000970 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A105,A99,4043,4044,
000971 NEW 001 M S -6,0,0,1)
000972 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A106,A99,4053,4054,
000973 NEW 001 M S -7,0,0,1)
000974 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A107,A99,4063,4064,
000975 NEW 001 M S -8,0,0,1)
000976 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A108,A99,4073,4074,
000977 NEW 001 M S -9,0,0,1)
000978 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A109,A99,4083,4084,
000979 NEW 001 M S -10,0,0,1)
000980 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A110,A99,4093,4094,
000981 NEW 001 M S -11,0,0,1)
000982 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A111,A99,4103,4104,
000983 NEW 001 M S -12,0,0,1)
000984 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A112,A99,4113,4114,
000985 NEW 001 M S -13,0,0,1)
000986 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A113,A99,4004,-14,
000987 NEW 001 M S 4003,-15,0,1)
000988 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A114,A99,4002,4003,
000989 NEW 001 M S -16,0,0,1)
000990 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A115,A99,4002,-17,
000991 NEW 001 M S 4001,-18,0,1)
000992 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A116,A99,4001,-19,
000993 NEW 001 M S 4064,-20,0,1)
000994 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A117,A99,4063,-21,
000995 NEW 001 M S 0,0,0,1)
000996 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A118,A99,4062,-22,
000997 NEW 001 M S -22,0,0,1)
000998 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A119,A99,4062,-23,
000999 NEW 001 M S 4061,-24,0,1)
001000 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A120,A99,4061,-25,
001001 NEW 001 M S 4013,-26,0,1)
001002 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A121,A99,4012,-27,
001003 NEW 001 M S 4012,-28,0,1)
001004 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A122,A99,4022,-29,
001005 NEW 001 M S 3035,-30,0,1)
001006 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A123,A99,3035,-31,

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001007 NEW 001 M S 3036,-32,0,1)
001008 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A124,A99,3036,-33,
001009 NEW 001 M S 3013,-34,0,1)
001010 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A125,A99,3013,-35,
001011 NEW 001 M S 3003,-36,0,1)
001012 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A126,A99,3003,-37,
001013 NEW 001 M S 3032,-38,0,1)
001014 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A127,A99,3032,-39,
001015 NEW 001 M S 3031,-40,0,1)
001016 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A128,A99,3031,-41,
001017 NEW 001 M S 5035,-42,0,1)
001018 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A129,A99,5035,-43,
001019 NEW 001 M S 5036,-44,0,1)
001020 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A130,A99,5036,-45,
001021 NEW 001 M S 5013,-46,0,1)
001022 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A131,A99,5013,-47,
001023 NEW 001 M S 5003,-48,0,1)
001024 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A132,A99,5003,-49,
001025 NEW 001 M S 5032,-50,0,1)
001026 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A133,A99,5032,-51,
001027 NEW 001 M S 5031,-52,0,1)
001028 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A134,A99,5031,-53,
001029 NEW 001 M S 1000,-62,0,1)
001030 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A135,A99,3600,-63,
001031 NEW 001 M S 7002,-64,0,1)
001032 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A136,A99,5600,-65,
001033 NEW 001 M S 7004,-66,0,1)
001034 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A137,A99,3700,-67,
001035 NEW 001 M S 7001,-68,0,1)
001036 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A138,A99,5700,-69,
001037 NEW 001 M S 7003,-70,0,1)
001038 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A139,A99,8102,-71,
001039 NEW 001 M S 9122,-72,0,1)
001040 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A140,A99,9222,-73,
001041 NEW 001 M S 8222,-74,0,1)
001042 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A141,A99,8122,-75,
001043 NEW 001 M S 9102,-76,0,1)
001044 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A142,A99,9202,-78,
001045 NEW 001 M S 8202,-79,0,9)
001046 -63 G00 END
001047 G00 BCD 3VARIABLES I
001048 G00 REM SUPPLY BOUNDARY TEMPERATURE
001049 NEW 001 DIDEGI(TIMEM,A200,K1)
001050 NEW 001 DIDEGI(TIMEM,A201,K8)
001051 NEW 001 STFSEP(K8,T1000)
001052 NEW 001 DIDIDA(K8,A1,A3,K5)
001053 NEW 001 DIDIDA(K8,A1,A4,K6)
001054 NEW 001 DIDEGI(TIMEM,A200,K9)
001055 NEW 001 MLTPLY(K9,K10,K5,K6,K12,K15)
001056 NEW 001 MLTPLY(K9,K10,K5,K6,K13,K16)
001057 NEW 001 DIVIDE(K15,15.,K17)
001058 NEW 001 MLTPLY(K17,3.,K18)
001059 NEW 001 DIVIDE(K16,12.,K19)
001060 NEW 001 MLTPLY(K16,1.,K20)
001061 NEW 001 MLTPLY(K20,.5,K21)
001062 NEW 001 MLTPLY(K21,.5,K22)

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1051, 1051

001063 NEW 001 MLTPLY(K22,0333,K23)
 001064 NEW 001 STFSEP(K15,G3600,G3601,G3800,G3801)
 001065 NEW 001 STFSQS(K18,4,G3602) \$ SUPPLY TOP HEX
 001066 NEW 001 STFSQS(K18,4,G3612)
 001067 NEW 001 STFSQS(K17,6,G3606)
 001068 NEW 001 STFSQS(K18,4,G3802)
 001069 NEW 001 STFSQS(K18,4,G3812)
 001070 NEW 001 STFSQS(K17,6,G3806)
 001071 NEW 001 STFSQS(K17,6,G3855) STOP HEX RETURN
 001072 NEW 001 STFSQS(K18,4,G3851)
 001073 NEW 001 STFSQS(K18,4,G3861)
 001074 NEW 001 STFSQS(K17,6,G3855)
 001075 NEW 001 STFSQS(K18,4,G3851)
 001076 NEW 001 STFSQS(K18,4,G3861)
 001077 NEW 001 STFSEP(K15,G5600,G5601,G5800,G5801)
 001078 NEW 001 STFSQS(K18,4,G5602) \$ SUPPLY BOTTOM HEX
 001079 NEW 001 STFSQS(K18,4,G5612)
 001080 NEW 001 STFSQS(K17,6,G5606)
 001081 NEW 001 STFSQS(K18,4,G5802)
 001082 NEW 001 STFSQS(K18,4,G5812)
 001083 NEW 001 STFSQS(K17,6,G5806)
 001084 NEW 001 STFSQS(K17,6,G5855) \$ BOTTOM HEX RETURN
 001085 NEW 001 STFSQS(K18,4,G5851)
 001086 NEW 001 STFSQS(K18,4,G5861)
 001087 NEW 001 STFSQS(K17,6,G5855)
 001088 NEW 001 STFSQS(K18,4,G5851)
 001089 NEW 001 STFSQS(K18,4,G5861)
 001090 NEW 001 STFSQS(K23,4,G4501) SCHAMBER FLOW DOWN
 001091 NEW 001 STFSQS(K23,4,G4511)
 001092 NEW 001 STFSQS(K23,3,G4521)
 001093 NEW 001 STFSQS(K23,4,G4531)
 001094 NEW 001 STFSQS(K23,4,G4541)
 001095 NEW 001 STFSQS(K23,3,G4551)
 001096 NEW 001 STFSQS(K23,4,G4561)
 001097 NEW 001 STFSQS(K23,4,G4571)
 001098 NEW 001 STFSQS(K23,4,G4581)
 001099 NEW 001 STFSQS(K23,4,G4591)
 001100 NEW 001 STFSQS(K23,4,G4601)
 001101 NEW 001 STFSQS(K23,3,G4611)
 001102 NEW 001 STFSQS(K23,4,G4702)
 001103 NEW 001 STFSQS(K23,4,G4712)
 001104 NEW 001 STFSQS(K23,3,G4722)
 001105 NEW 001 STFSQS(K23,4,G4732)
 001106 NEW 001 STFSQS(K23,4,G4742)
 001107 NEW 001 STFSQS(K23,3,G4752)
 001108 NEW 001 STFSQS(K23,4,G4762)
 001109 NEW 001 STFSQS(K23,4,G4772)
 001110 NEW 001 STFSQS(K23,4,G4782)
 001111 NEW 001 STFSQS(K23,4,G4792)
 001112 NEW 001 STFSQS(K23,4,G4802)
 001113 NEW 001 STFSQS(K23,3,G4812)
 001114 NEW 001 STFSEP(K20,G8099,G8100) SUPPER CYL MANIFOLD
 001115 NEW 001 STFSEP(K21,G8121,G8122,G8101,G8102)
 001116 NEW 001 STFSEP(K22,G8103,G8104,G8108,G8109)
 001117 NEW 001 STFSEP(K22,G8123,G8124,G8128,G8129)
 001118 NEW 001 STFSQS(K23,3,G8130)

001119	NEW 001	STFSQS(K23,3,G8306)
001120	NEW 001	STFSQS(K23,3,G8309)
001121	NEW 001	STFSQS(K23,3,G8125)
001122	NEW 001	STFSEP(K23,G8302,G8301,G8312)
001123	NEW 001	STFSQS(K23,3,G8110)
001124	NEW 001	STFSQS(K23,3,G8303)
001125	NEW 001	STFSQS(K23,3,G8105)
001126	NEW 001	STFSEP(K20,G8234,G8233)
001127	NEW 001	STFSEP(K21,G8232,G8231,G8212,G8211)
001128	NEW 001	STFSEP(K22,G8230,G8229,G8225,G8224)
001129	NEW 001	STFSEP(K22,G8210,G8209,G8205,G8204)
001130	NEW 001	STFSQS(K23,3,G8226)
001131	NEW 001	STFSQS(K23,3,G8326)
001132	NEW 001	STFSQS(K23,3,G8221)
001133	NEW 001	STFSQS(K23,3,G8329)
001134	NEW 001	STFSQS(K23,3,G8206)
001135	NEW 001	STFSEP(K23,G8332,G8321,G8322)
001136	NEW 001	STFSQS(K23,3,G8201)
001137	NEW 001	STFSQS(K23,3,G8323)
001138	NEW 001	STFSEP(K20,G9099,G9233) SLOWER CYL MANIFOLD
001139	NEW 001	STFSEP(K21,G9212,G9211,G9232,G9231)
001140	NEW 001	STFSEP(K22,G9225,G9224,G9230,G9229)
001141	NEW 001	STFSEP(K22,G9205,G9204,G9210,G9209)
001142	NEW 001	STFSQS(K23,3,G9226)
001143	NEW 001	STFSQS(K23,3,G9306)
001144	NEW 001	STFSQS(K23,3,G9221)
001145	NEW 001	STFSQS(K23,3,G9309)
001146	NEW 001	STFSQS(K23,3,G9206)
001147	NEW 001	STFSEP(K23,G9301,G9302,G9312)
001148	NEW 001	STFSQS(K23,3,G9201)
001149	NEW 001	STFSQS(K23,3,G9303)
001150	NEW 001	STFSQS(K23,3,G9326)
001151	NEW 001	STFSQS(K23,3,G9130)
001152	NEW 001	STFSQS(K23,3,G9329)
001153	NEW 001	STFSQS(K23,3,G9125)
001154	NEW 001	STFSEP(K23,G9321,G9322,G9332)
001155	NEW 001	STFSQS(K23,3,G9110)
001156	NEW 001	STFSQS(K23,3,G9323)
001157	NEW 001	STFSQS(K23,3,G9105)
001158	NEW 001	STFSEP(K22,G9129,G9128,G9124,G9123)
001159	NEW 001	STFSEP(K22,G9109,G9108,G9104,G9103)
001160	NEW 001	STFSEP(K21,G9122,G9121,G9101,G9102)
001161	NEW 001	STFSEP(K20,G9100,G9234)
001162	NEW 001	STFSQS(K18,4,G3501)
001163	NEW 001	STFSQS(K18,4,G3511)
001164	NEW 001	STFSQS(K18,4,G3551)
001165	NEW 001	STFSQS(K18,4,G3561)
001166	NEW 001	STFSEP(K17,G3521,G3522,G3526)
001167	NEW 001	STFSEP(K17,G3531,G3532,G3535)
001168	NEW 001	STFSEP(K17,G3541,G3542,G3546)
001169	NEW 001	STFSQS(K18,4,G3702)
001170	NEW 001	STFSQS(K18,4,G3712)
001171	NEW 001	STFSQS(K18,4,G3752)
001172	NEW 001	STFSQS(K18,4,G3762)
001173	NEW 001	STFSEP(K17,G3722,G3726,G3727)
001174	NEW 001	STFSEP(K17,G3732,G3736,G3736)

001175 NEW 001 STFSEP(K17,G3742,G3746,G3747)
 001176 NEW 001 STFSQS(K18,4,G5501)
 001177 NEW 001 STFSQS(K18,4,G5511)
 001178 NEW 001 STFSQS(K18,4,G5551)
 001179 NEW 001 STFSQS(K18,4,G5561)
 001180 NEW 001 STFSEP(K17,G5521,G5522,G5526)
 001181 NEW 001 STFSEP(K17,G5531,G5532,G5535)
 001182 NEW 001 STFSEP(K17,G5541,G5542,G5546)
 001183 NEW 001 STFSQS(K18,4,G5702)
 001184 NEW 001 STFSQS(K18,4,G5712)
 001185 NEW 001 STFSQS(K18,4,G5752)
 001186 NEW 001 STFSQS(K18,4,G5762)
 001187 NEW 001 STFSEP(K17,G5722,G5726,G5727)
 001188 NEW 001 STFSEP(K17,G5732,G5735,G5736)
 001189 NEW 001 STFSEP(K17,G5742,G5746,G5747)

001190 -01 000 REM
 001191 000 REM PAGES 23 TO 26
 001192 000 REM
 001193 000 M CALL SIDIDA(-1,T3503,A1,A2,A(20+1))
 001194 000 M CALL SIDIDA(+1,T3503,A1,A3,A(30+1))
 001195 000 M CALL SIDIDA(+1,T3503,A1,A4,A(40+1))
 001196 000 M CALL SIDIDA(+1,T3503,A1,A5,A(50+1))
 001197 000 M CALL SIDIDA(-1,T3515,A1,A2,A(20+2))
 001198 000 M CALL SIDIDA(+1,T3515,A1,A3,A(30+2))
 001199 000 M CALL SIDIDA(+1,T3515,A1,A4,A(40+2))
 001200 000 M CALL SIDIDA(+1,T3515,A1,A5,A(50+2))
 001201 000 M CALL SIDIDA(-1,T3531,A1,A2,A(20+3))
 001202 000 M CALL SIDIDA(+1,T3531,A1,A3,A(30+3))
 001203 000 M CALL SIDIDA(+1,T3531,A1,A4,A(40+3))
 001204 000 M CALL SIDIDA(+1,T3531,A1,A5,A(50+3))
 001205 000 M CALL SIDIDA(-1,T3535,A1,A2,A(20+4))
 001206 000 M CALL SIDIDA(+1,T3535,A1,A3,A(30+4))
 001207 000 M CALL SIDIDA(+1,T3535,A1,A4,A(40+4))
 001208 000 M CALL SIDIDA(+1,T3535,A1,A5,A(50+4))
 001209 000 M CALL SIDIDA(-1,T3553,A1,A2,A(20+5))
 001210 000 M CALL SIDIDA(+1,T3553,A1,A3,A(30+5))
 001211 000 M CALL SIDIDA(+1,T3553,A1,A4,A(40+5))
 001212 000 M CALL SIDIDA(+1,T3553,A1,A5,A(50+5))
 001213 000 M CALL SIDIDA(-1,T3563,A1,A2,A(20+6))
 001214 000 M CALL SIDIDA(+1,T3563,A1,A3,A(30+6))
 001215 000 M CALL SIDIDA(+1,T3563,A1,A4,A(40+6))
 001216 000 M CALL SIDIDA(+1,T3563,A1,A5,A(50+6))
 001217 000 M CALL SIDIDA(-1,T4501,A1,A2,A(20+7))
 001218 000 M CALL SIDIDA(+1,T4501,A1,A3,A(30+7))
 001219 000 M CALL SIDIDA(+1,T4501,A1,A4,A(40+7))
 001220 000 M CALL SIDIDA(+1,T4501,A1,A5,A(50+7))
 001221 000 M CALL SIDIDA(-1,T4502,A1,A2,A(20+8))
 001222 000 M CALL SIDIDA(+1,T4502,A1,A3,A(30+8))
 001223 000 M CALL SIDIDA(+1,T4502,A1,A4,A(40+8))
 001224 000 M CALL SIDIDA(+1,T4502,A1,A5,A(50+8))
 001225 000 M CALL SIDIDA(-1,T4503,A1,A2,A(20+9))
 001226 000 M CALL SIDIDA(+1,T4503,A1,A3,A(30+9))
 001227 000 M CALL SIDIDA(+1,T4503,A1,A4,A(40+9))
 001228 000 M CALL SIDIDA(+1,T4503,A1,A5,A(50+9))
 001229 000 M CALL SIDIDA(-1,T4504,A1,A2,A(20+10))
 001230 000 M CALL SIDIDA(+1,T4504,A1,A3,A(30+10))

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001231	000	M	CALL SIDIDA(+1,T4504,A1,A4,A(40+10))
001232	000	M	CALL SIDIDA(+1,T4504,A1,A5,A(50+10))
001233	000	M	CALL SIDIDA(-1,T4505,A1,A2,A(20+11))
001234	000	M	CALL SIDIDA(+1,T4505,A1,A3,A(30+11))
001235	000	M	CALL SIDIDA(+1,T4505,A1,A4,A(40+11))
001236	000	M	CALL SIDIDA(+1,T4505,A1,A5,A(50+11))
001237	000	M	CALL SIDIDA(-1,T4513,A1,A2,A(20+12))
001238	000	M	CALL SIDIDA(+1,T4513,A1,A3,A(30+12))
001239	000	M	CALL SIDIDA(+1,T4513,A1,A4,A(40+12))
001240	000	M	CALL SIDIDA(+1,T4513,A1,A5,A(50+12))
001241	000	M	CALL SIDIDA(-1,T4522,A1,A2,A(20+13))
001242	000	M	CALL SIDIDA(+1,T4522,A1,A3,A(30+13))
001243	000	M	CALL SIDIDA(+1,T4522,A1,A4,A(40+13))
001244	000	M	CALL SIDIDA(+1,T4522,A1,A5,A(50+13))
001245	000	M	CALL SIDIDA(-1,T1000,A1,A2,A(20+14))
001246	000	M	CALL SIDIDA(+1,T1000,A1,A3,A(30+14))
001247	000	M	CALL SIDIDA(+1,T1000,A1,A4,A(40+14))
001248	000	M	CALL SIDIDA(+1,T1000,A1,A5,A(50+14))
001249	000	M	CALL SIDIDA(-1,T8102,A1,A2,A(20+15))
001250	000	M	CALL SIDIDA(+1,T8102,A1,A3,A(30+15))
001251	000	M	CALL SIDIDA(+1,T8102,A1,A4,A(40+15))
001252	000	M	CALL SIDIDA(+1,T8102,A1,A5,A(50+15))
001253	000	M	CALL SIDIDA(-1,T8122,A1,A2,A(20+16))
001254	000	M	CALL SIDIDA(+1,T8122,A1,A3,A(30+16))
001255	000	M	CALL SIDIDA(+1,T8122,A1,A4,A(40+16))
001256	000	M	CALL SIDIDA(+1,T8122,A1,A5,A(50+16))
001257	000	M	CALL SIDIDA(-1,T8202,A1,A2,A(20+17))
001258	000	M	CALL SIDIDA(+1,T8202,A1,A3,A(30+17))
001259	000	M	CALL SIDIDA(+1,T8202,A1,A4,A(40+17))
001260	000	M	CALL SIDIDA(+1,T8202,A1,A5,A(50+17))
001261	000	M	CALL SIDIDA(-1,T8222,A1,A2,A(20+18))
001262	000	M	CALL SIDIDA(+1,T8222,A1,A3,A(30+18))
001263	000	M	CALL SIDIDA(+1,T8222,A1,A4,A(40+18))
001264	000	M	CALL SIDIDA(+1,T8222,A1,A5,A(50+18))
001265	000	M	CALL SIDIDA(-1,T9102,A1,A2,A(20+19))
001266	000	M	CALL SIDIDA(+1,T9102,A1,A3,A(30+19))
001267	000	M	CALL SIDIDA(+1,T9102,A1,A4,A(40+19))
001268	000	M	CALL SIDIDA(+1,T9102,A1,A5,A(50+19))
001269	000	M	CALL SIDIDA(-1,T9122,A1,A2,A(20+20))
001270	000	M	CALL SIDIDA(+1,T9122,A1,A3,A(30+20))
001271	000	M	CALL SIDIDA(+1,T9122,A1,A4,A(40+20))
001272	000	M	CALL SIDIDA(+1,T9122,A1,A5,A(50+20))
001273	000	M	CALL SIDIDA(-1,T9202,A1,A2,A(20+21))
001274	000	M	CALL SIDIDA(+1,T9202,A1,A3,A(30+21))
001275	000	M	CALL SIDIDA(+1,T9202,A1,A4,A(40+21))
001276	000	M	CALL SIDIDA(+1,T9202,A1,A5,A(50+21))
001277	000	M	CALL SIDIDA(-1,T9222,A1,A2,A(20+22))
001278	000	M	CALL SIDIDA(+1,T9222,A1,A3,A(30+22))
001279	000	M	CALL SIDIDA(+1,T9222,A1,A4,A(40+22))
001280	000	M	CALL SIDIDA(+1,T9222,A1,A5,A(50+22))
001281	000	M	CALL SIDIDA(-1,T5503,A1,A2,A(20+23))
001282	000	M	CALL SIDIDA(+1,T5503,A1,A3,A(30+23))
001283	000	M	CALL SIDIDA(+1,T5503,A1,A4,A(40+23))
001284	000	M	CALL SIDIDA(+1,T5503,A1,A5,A(50+23))
001285	000	M	CALL SIDIDA(-1,T5515,A1,A2,A(20+24))
001286	000	M	CALL SIDIDA(+1,T5515,A1,A3,A(30+24))

001287	000	M	CALL SIDIDA(+1,T5515,A1,A4,A(40+24))
001288	000	M	CALL SIDIDA(+1,T5515,A1,A5,A(50+24))
001289	000	M	CALL SIDIDA(-1,T5531,A1,A2,A(20+25))
001290	000	M	CALL SIDIDA(+1,T5531,A1,A3,A(30+25))
001291	000	M	CALL SIDIDA(+1,T5531,A1,A4,A(40+25))
001292	000	H	CALL SIDIDA(+1,T5531,A1,A5,A(50+25))
001293	000	M	CALL SIDIDA(-1,T5535,A1,A2,A(20+26))
001294	000	M	CALL SIDIDA(+1,T5535,A1,A3,A(30+26))
001295	000	M	CALL SIDIDA(+1,T5535,A1,A4,A(40+26))
001296	000	M	CALL SIDIDA(+1,T5535,A1,A5,A(50+26))
001297	000	M	CALL SIDIDA(-1,T5553,A1,A2,A(20+27))
001298	000	M	CALL SIDIDA(+1,T5553,A1,A3,A(30+27))
001299	000	M	CALL SIDIDA(+1,T5553,A1,A4,A(40+27))
001300	000	M	CALL SIDIDA(+1,T5553,A1,A5,A(50+27))
001301	000	M	CALL SIDIDA(-1,T5563,A1,A2,A(20+28))
001302	000	M	CALL SIDIDA(+1,T5563,A1,A3,A(30+28))
001303	000	M	CALL SIDIDA(+1,T5563,A1,A4,A(40+28))
001304	000	M	CALL SIDIDA(+1,T5563,A1,A5,A(50+28))
001305	000		REM
001306	000		REM PAGES 27 TO 29.3
001307	000		REM
001308	000		FILM(A11+ 1,A21+1,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3201
001309	000		MTEST,A22+1)S
001310	000		FILM(A11+ 2,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3202
001311	000		MTEST,A22+2)S
001312	000		FILM(A11+ 3,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3203
001313	000		MTEST,A22+2)S
001314	000		FILM(A11+ 4,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3204
001315	000		MTEST,A22+2)S
001316	000		FILM(A11+ 5,A21+1,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3205
001317	000		MTEST,A22+1)S
001318	000		FILM(A11+ 6,A21+7,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3211
001319	000		MTEST,A22+7)S
001320	000		FILM(A11+ 7,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3212
001321	000		MTEST,A22+2)S
001322	000		FILM(A11+ 8,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3213
001323	000		MTEST,A22+2)S
001324	000		FILM(A11+ 9,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3214
001325	000		MTEST,A22+2)S
001326	000		FILM(A11+10,A21+7,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3215
001327	000		MTEST,A22+7)S
001328	000		FILM(A11+11,A21+3,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3221
001329	000		MTEST,A22+3)S
001330	000		FILM(A11+12,A21+4,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3222
001331	000		MTEST,A22+4)S
001332	000		FILM(A11+13,A21+4,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3226
001333	000		MTEST,A22+4)S
001334	000		FILM(A11+14,A21+3,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3227
001335	000		MTEST,A22+3)S
001336	000		FILM(A11+15,A21+5,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3231
001337	000		MTEST,A22+5)S
001338	000		FILM(A11+16,A21+6,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3232
001339	000		MTEST,A22+6)S
001340	000		FILM(A11+17,A21+6,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3235
001341	000		MTEST,A22+6)S
001342	000		FILM(A11+18,A21+5,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3236

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001343	000	MTEST,A22+5)S
001344	000	FILM(A11+19,A21+3,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3241
001345	000	MTEST,A22+3)S
001346	000	FILM(A11+20,A21+4,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3242
001347	000	MTEST,A22+4)S
001348	000	FILM(A11+21,A21+4,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3246
001349	000	MTEST,A22+4)S
001350	000	FILM(A11+22,A21+3,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3247
001351	000	MTEST,A22+3)S
001352	000	FILM(A11+23,A21+7,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3251
001353	000	MTEST,A22+7)S
001354	000	FILM(A11+24,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3252
001355	000	MTEST,A22+2)S
001356	000	FILM(A11+25,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3253
001357	000	MTEST,A22+2)S
001358	000	FILM(A11+26,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3254
001359	000	MTEST,A22+2)S
001360	000	FILM(A11+27,A21+7,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3255
001361	000	MTEST,A22+7)S
001362	000	FILM(A11+28,A21+1,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3261
001363	000	MTEST,A22+1)S
001364	000	FILM(A11+29,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3262
001365	000	MTEST,A22+2)S
001366	000	FILM(A11+30,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3263
001367	000	MTEST,A22+2)S
001368	000	FILM(A11+31,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3264
001369	000	MTEST,A22+2)S
001370	000	FILM(A11+32,A21+1,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3265
001371	000	MTEST,A22+1)S
001372	000	FILM(A12+1,A21+9,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3301
001373	000	MTEST,A22+9)S
001374	000	FILM(A12+ 2,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3302
001375	000	MTEST,A22+2)S
001376	000	FILM(A12+ 3,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3303
001377	000	MTEST,A22+2)S
001378	000	FILM(A12+ 4,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3304
001379	000	MTEST,A22+2)S
001380	000	FILM(A12+ 5,A21+9,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3305
001381	000	MTEST,A22+9)S
001382	000	FILM(A12+ 6,A21+8,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3311
001383	000	MTEST,A22+8)S
001384	000	FILM(A12+ 7,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3312
001385	000	MTEST,A22+2)S
001386	000	FILM(A12+ 8,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3313
001387	000	MTEST,A22+2)S
001388	000	FILM(A12+ 9,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3314
001389	000	MTEST,A22+2)S
001390	000	FILM(A12+10,A21+8,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3315
001391	000	MTEST,A22+8)S
001392	000	FILM(A12+11,A21+5,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3321
001393	000	MTEST,A22+5)S
001394	000	FILM(A12+12,A21+4,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3322
001395	000	MTEST,A22+4)S
001396	000	FILM(A12+13,A21+4,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3326
001397	000	MTEST,A22+4)S
001398	000	FILM(A12+14,A21+5,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3327

001399	000	MTEST,A22+5)S
001400	000	FILM(A12+15,A21+5,A20+3,A30+3,A50+3,A40+3,A80+2,G3331
001401	000	MTEST,A22+5)S
001402	000	FILM(A12+16,A21+6,A20+3,A30+3,A50+3,A40+3,A80+2,G3332
001403	000	MTEST,A22+6)S
001404	000	FILM(A12+17,A21+6,A20+4,A30+4,A50+4,A40+4,A80+2,G3335
001405	000	MTEST,A22+6)S
001406	000	FILM(A12+18,A21+5,A20+4,A30+4,A50+4,A40+4,A80+2,G3336
001407	000	MTEST,A22+5)S
001408	000	FILM(A12+19,A21+5,A20+3,A30+3,A50+3,A40+3,A80+2,G3341
001409	000	MTEST,A22+5)S
001410	000	FILM(A12+20,A21+4,A20+3,A30+3,A50+3,A40+3,A80+2,G3342
001411	000	MTEST,A22+4)S
001412	000	FILM(A12+21,A21+4,A20+4,A30+4,A50+4,A40+4,A80+2,G3346
001413	000	MTEST,A22+4)S
001414	000	FILM(A12+22,A21+5,A20+4,A30+4,A50+4,A40+4,A80+2,G3347
001415	000	MTEST,A22+5)S
001416	000	FILM(A12+23,A21+8,A20+5,A30+5,A50+5,A40+5,A80+1,G3351
001417	000	MTEST,A22+8)S
001418	000	FILM(A12+24,A21+2,A20+5,A30+5,A50+5,A40+5,A80+1,G3352
001419	000	MTEST,A22+2)S
001420	000	FILM(A12+25,A21+2,A20+5,A30+5,A50+5,A40+5,A80+1,G3353
001421	000	MTEST,A22+2)S
001422	000	FILM(A12+26,A21+2,A20+5,A30+5,A50+5,A40+5,A80+1,G3354
001423	000	MTEST,A22+2)S
001424	000	FILM(A12+27,A21+8,A20+5,A30+5,A50+5,A40+5,A80+1,G3355
001425	000	MTEST,A22+8)S
001426	000	FILM(A12+28,A21+9,A20+6,A30+6,A50+6,A40+6,A80+1,G3361
001427	000	MTEST,A22+9)S
001428	000	FILM(A12+29,A21+2,A20+6,A30+6,A50+6,A40+6,A80+1,G3362
001429	000	MTEST,A22+2)S
001430	000	FILM(A12+30,A21+2,A20+6,A30+6,A50+6,A40+6,A80+1,G3363
001431	000	MTEST,A22+2)S
001432	000	FILM(A12+31,A21+2,A20+6,A30+6,A50+6,A40+6,A80+1,G3364
001433	000	MTEST,A22+2)S
001434	000	FILM(A12+32,A21+9,A20+6,A30+6,A50+6,A40+6,A80+1,G3365
001435	000	MTEST,A22+9)S
001436	000	FILM(A11+1,A21+1,A20+23,A30+23,A50+23,A40+23,A80+1,G5201
001437	000	MTEST,A22+1)S
001438	000	FILM(A11+2,A21+2,A20+23,A30+23,A50+23,A40+23,A80+1,G5202
001439	000	MTEST,A22+2)S
001440	000	FILM(A11+3,A21+2,A20+23,A30+23,A50+23,A40+23,A80+1,G5203
001441	000	MTEST,A22+2)S
001442	000	FILM(A11+4,A21+2,A20+23,A30+23,A50+23,A40+23,A80+1,G5204
001443	000	MTEST,A22+2)S
001444	000	FILM(A11+5,A21+1,A20+23,A30+23,A50+23,A40+23,A80+1,G5205
001445	000	MTEST,A22+1)S
001446	000	FILM(A11+6,A21+7,A20+24,A30+24,A50+24,A40+24,A80+1,G5211
001447	000	MTEST,A22+7)S
001448	000	FILM(A11+7,A21+2,A20+24,A30+24,A50+24,A40+24,A80+1,G5212
001449	000	MTEST,A22+2)S
001450	000	FILM(A11+8,A21+2,A20+24,A30+24,A50+24,A40+24,A80+1,G5213
001451	000	MTEST,A22+2)S
001452	000	FILM(A11+9,A21+2,A20+24,A30+24,A50+24,A40+24,A80+1,G5214
001453	000	MTEST,A22+2)S
001454	000	FILM(A11+10,A21+7,A20+24,A30+24,A50+24,A40+24,A80+1,G5215

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CC1455	000	MTEST,A22+7)S
CC1456	000	FILM(A11+11,A21+3,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5221
CC1457	000	MTEST,A22+3)S
CC1458	000	FILM(A11+12,A21+4,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5222
CC1459	000	MTEST,A22+4)S
CC1460	000	FILM(A11+13,A21+4,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5226
CC1461	000	MTEST,A22+4)S
CC1462	000	FILM(A11+14,A21+3,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5227
CC1463	000	MTEST,A22+3)S
CC1464	000	FILM(A11+15,A21+5,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5231
CC1465	000	MTEST,A22+5)S
CC1466	000	FILM(A11+16,A21+6,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5232
CC1467	000	MTEST,A22+6)S
CC1468	000	FILM(A11+17,A21+6,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5235
CC1469	000	MTEST,A22+6)S
CC1470	000	FILM(A11+18,A21+5,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5236
CC1471	000	MTEST,A22+5)S
CC1472	000	FILM(A11+19,A21+3,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5241
CC1473	000	MTEST,A22+3)S
CC1474	000	FILM(A11+20,A21+4,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5242
CC1475	000	MTEST,A22+4)S
CC1476	000	FILM(A11+21,A21+4,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5246
CC1477	000	MTEST,A22+4)S
CC1478	000	FILM(A11+22,A21+3,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5247
CC1479	000	MTEST,A22+3)S
CC1480	000	FILM(A11+23,A21+7,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5251
CC1481	000	MTEST,A22+7)S
CC1482	000	FILM(A11+24,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5252
CC1483	000	MTEST,A22+2)S
CC1484	000	FILM(A11+25,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5253
CC1485	000	MTEST,A22+2)S
CC1486	000	FILM(A11+26,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5254
CC1487	000	MTEST,A22+2)S
CC1488	000	FILM(A11+27,A21+7,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5255
CC1489	000	MTEST,A22+7)S
CC1490	000	FILM(A11+28,A21+1,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5261
CC1491	000	MTEST,A22+1)S
CC1492	000	FILM(A11+29,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5262
CC1493	000	MTEST,A22+2)S
CC1494	000	FILM(A11+30,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5263
CC1495	000	MTEST,A22+2)S
CC1496	000	FILM(A11+31,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5264
CC1497	000	MTEST,A22+2)S
CC1498	000	FILM(A11+32,A21+1,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5265
CC1499	000	MTEST,A22+1)S
CC1500	000	FILM(A12+ 1,A21+9,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5301
CC1501	000	MTEST,A22+9)S
CC1502	000	FILM(A12+ 2,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5302
CC1503	000	MTEST,A22+2)S
CC1504	000	FILM(A12+ 3,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5303
CC1505	000	MTEST,A22+2)S
CC1506	000	FILM(A12+ 4,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5304
CC1507	000	MTEST,A22+2)S
CC1508	000	FILM(A12+ 5,A21+9,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5305
CC1509	000	MTEST,A22+9)S
CC1510	000	FILM(A12+ 6,A21+8,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5311

001511	000	MTEST,A22+8)5
001512	000	FILM(A12+ 7,A21+2,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5312
001513	000	MTEST,A22+2)5
001514	000	FILM(A12+ 8,A21+2,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5313
001515	000	MTEST,A22+2)5
001516	000	FILM(A12+ 9,A21+2,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5314
001517	000	MTEST,A22+2)5
001518	000	FILM(A12+10,A21+8,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5315
001519	000	MTEST,A22+8)5
001520	000	FILM(A12+11,A21+5,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5321
001521	000	MTEST,A22+5)5
001522	000	FILM(A12+12,A21+4,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5322
001523	000	MTEST,A22+4)5
001524	000	FILM(A12+13,A21+4,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5326
001525	000	MTEST,A22+4)5
001526	000	FILM(A12+14,A21+5,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5327
001527	000	MTEST,A22+5)5
001528	000	FILM(A12+15,A21+5,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5331
001529	000	MTEST,A22+5)5
001530	000	FILM(A12+16,A21+6,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5332
001531	000	MTEST,A22+6)5
001532	000	FILM(A12+17,A21+6,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5335
001533	000	MTEST,A22+6)5
001534	000	FILM(A12+18,A21+6,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5336
001535	000	MTEST,A22+5)5
001536	000	FILM(A12+19,A21+6,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5341
001537	000	MTEST,A22+5)5
001538	000	FILM(A12+20,A21+4,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5342
001539	000	MTEST,A22+4)5
001540	000	FILM(A12+21,A21+4,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5346
001541	000	MTEST,A22+4)5
001542	000	FILM(A12+22,A21+5,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5347
001543	000	MTEST,A22+5)5
001544	000	FILM(A12+23,A21+8,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5351
001545	000	MTEST,A22+8)5
001546	000	FILM(A12+24,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5352
001547	000	MTEST,A22+2)5
001548	000	FILM(A12+25,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5353
001549	000	MTEST,A22+2)5
001550	000	FILM(A12+26,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5354
001551	000	MTEST,A22+2)5
001552	000	FILM(A12+27,A21+8,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5355
001553	000	MTEST,A22+8)5
001554	000	FILM(A12+28,A21+9,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5361
001555	000	MTEST,A22+9)5
001556	000	FILM(A12+29,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5362
001557	000	MTEST,A22+2)5
001558	000	FILM(A12+30,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5363
001559	000	MTEST,A22+2)5
001560	000	FILM(A12+31,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5364
001561	000	MTEST,A22+2)5
001562	000	FILM(A12+32,A21+9,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5365
001563	000	MTEST,A22+9)5
001564	000	END
001565	000	BCD 3VARIABLES 2
001566	000	END

001561 000
001562 000
001563 000
001564 000
001565 000
001566 000

MTEST,A22+2
FILM(A12+32,A21+9,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5365
MTEST,A22+9)5

END
BCD 3VARIABLES 2
END

001567 000 BCD 3OUTPUT CALLS
001568 000 M IF((LTEST/200)*200).NE.LTEST) GO TO 100
001569 000 C MAKE OUTPUT= 10 EVERY 10 SEC. SAME AS DATA OUTPUT ON THE TEST DATA
001570 000 C PROVISION MAY HAVE TO BE MADE LATER FOR MISSING DATA POINTS.
001571 000 C IF ANY ON THE TEST DATA TAPE.
001572 000 STSEP(K101,KTEST)5
001573 NEW 001 M READ(26) (A(100+1-1),1=1,K1EST)
001574 -01 000 C IF ANY OTHER MISCELLANEOUS VALUES NEED TO BE PLOTTED, THEY CAN BE
001575 000 E ADDED IN AT THIS POINT LATER ON. FOR EXAMPLE,
001576 000 C M IN COLUMN 1 A(100+K101+1)= FIRST EXTRA DATA VALUE
001577 000 C M IN COLUMN 1 A(100+K101+2)= SECOND EXTRA DATA VALUE ETC.
001578 000 C THESE EXTRA SAVE CALLS MUST BE PLACED BEFORE THE SAVWOR CALL
001579 -01 000 M CALL ARYSUB(NNT,T2001,32.,T2001)
001580 000 M CALL ARYMPY(NNT,T2001,5.,T2001)
001581 000 M CALL ARYDIV(NNT,T2001,9.,T2001)
001582 NEW 001 M CALL SAVWOR(TIME0,T2001,NNT,A100,K101,TIMEND,25)
001583 000 TORDER
001584 NEW 001 M CALL ARYMPY(NNT,T2001,1.8,T2001)
001585 NEW 001 M CALL ARYADD(NNT,T2001,32.,T2001)
001586 -02 000 M100 LTEST=LTEST+1
001587 000 END
001588 000 BCD 3END OF DATA

END ELT.

WASG,T THERMALL,T,SAVE05 . COPYG HDENS

WUSE 5,THERMALL

REWIND C.
FURPUR 27H3 RL71-3 04/12/77 03:16:35

BCOPY,M C.,S.,2
9 BLOCKS COPIED.
EOF ENCOUNTERED ON INPUT TAPE
100 BLOCKS COPIED.
EOF ENCOUNTERED ON INPUT TAPE

WASG,T ABB,F///600

ORIGINAL PAGE IS
OF POOR QUALITY

ACPL TEST NO. 25 WITH A CONTROLLER MODEL LISTING

WRUN CLOUD1,1HEP45460047,LANCESBIN209,030,2000

WMSG,N REMOVE AT CARD READER 05-25-77 CLOCK NO 4870

WASG,T C.T.35312

WREWIND C.
FURPUR 27H3 RL71-3 05/25/77 18:56:08

WCOPY,G C.VTFFS.
LANCESBIN209*A(0) COPIED ON 02/12/77 AT 04:15:37
8 BLOCKS COPIED.
EOF ENCOUNTERED ON INPUT TAPE

WADD,P .ASSIGNA

WASG,T A.F///200

WREWIND C.
FURPUR 27H3 RL91-3 05/25/77 18:57:14

WCOPY,G C..A.
LANCESBIN209*A(0) COPIED ON 02/12/77 AT 04:15:37
8 BLOCKS COPIED.
EOF ENCOUNTERED ON INPUT TAPE

WREWIND C.

WADD,P A.NSINDA

WADD,P A.OLDORNEWSIN

WMSG,N ALL TAPE ASSIGNMENTS MUST BE MADE BY THE USER.

WMSG,N FILE 25 IS ALLOCATED AUTOMATICALLY IN CASE THE

WMSG,N USER WOULD LIKE TO USE SOME OF THE SPECIAL PRINT.

ORIGINAL PAGE IS
OF POOR QUALITY

MSG,N OPTIONS SUCH AS FFPRT2,CFPRT2, AND, CCPRT2.

MSG,N **CAUTION** IF TAPE IS TO BE USED, THEN USE A

MSG,N DIFFERENT UNIT THAN 25.

MSG,T 25.F///1000 . FOR PRINT ROUTINES

QADD,P A.ASSIGNTPF

WFREE TPFS.

MSG,T TPFS..F///500

REWIND C.
FORPUR 27H3 RL71-3 06/25/77 18:57:21

WUSE 10:1CONT

LEVEL 1.2
FORPUR 27H3 RL71-3 06/25/77 18:57:24

WERS
END ERS.

WCOPI.G C..TPFS.
LANCE6IN209*AB8(0) COPIED ON 04/12/77 AT 03:18:22
189 BLOCKS COPIED.
COF ENCOUNTERED ON INPUT TAPE

MSG,T DATATAP.T,14497

WUSE 26,DATATAP

ORIGINAL PAGE IS
OF POOR QUALITY

WELT,LU .CLD&CASI

ELT007 RL1870 DE/25-18158:07-(0,1)

000001	000	
000002	000	BCD 3THERMAL SPCS
000003	000	BCD 9CLOUD PHYSICS TEST CORRELATION
000004	000	END
000005	000	BCD 3NODE DATA
000006	000	N, 2001...0315, 2002...0819, 2003...0964, 2004...0819, 2005...0315 RAYH
000007	000	2011...0819, 2012...0761, 2013...0761, 2014...0761, 2015...0819 RAYH
000008	000	2021...0964, 2022...0761, 2023...0259, 2024...0761, 2025...0964 RAYH
000009	000	2031...0819, 2032...0761, 2033...0761, 2034...0761, 2035...0819 RAYH
000010	000	2041...0315, 2042...0819, 2043...0964, 2044...0819, 2045...0315 RAYH
000011	000	3001...0315, 3002...0819, 3003...0964, 3004...0819, 3005...0315 RAYH
000012	000	3011...0819, 3012...0761, 3013...0761, 3014...0761, 3015...0819 RAYH
000013	000	3021...0321, 3022...0254, 3026...0254, 3027...0321, 3031...0322 RAYH
000014	000	3032...0254, 3033...1195, 3035...0254, 3036...0322, 3041...0321 RAYH
000015	000	3042...0254, 3046...0254, 3047...0321, 3051...0819, 3052...0761 RAYH
000016	000	3053...0761, 3054...0761, 3055...0819, 3061...0315, 3062...0819 RAYH
000017	000	3063...0964, 3064...0819, 3065...0315, 3101...0640, 3102...0520 RAYH
000018	000	3103...0582, 3104...0520, 3105...0640, 3115...0520, 3136...0582 RAYH
000019	000	3155...0520, 3165...0640, 3164...0520, 3163...0582, 3162...0520 RAYH
000020	000	3161...0640, 3151...0520, 3131...0582, 3111...0520, 4011...0796 RAYH
000021	000	4012...0796, 4013...088, 4014...0796, 4015...0796, 4021...0796 RAYH
000022	000	4022...0796, 4023...081, 4024...0796, 4025...0796, 4041...0796 RAYH
000023	000	4042...0796, 4043...088, 4044...0796, 4045...0796, 4051...0796 RAYH
000024	000	4052...0796, 4053...081, 4054...0796, 4055...0796, 4101...0796 RAYH
000025	000	4102...0796, 4103...088, 4104...0796, 4105...0796, 4111...0796 RAYH
000026	000	4112...0796, 4113...081, 4114...0796, 4115...0796, 5001...0315 RAYH
000027	000	5002...0819, 5003...0964, 5004...0819, 5005...0315, 5011...0819 RAYH
000028	000	5012...0761, 5013...0761, 5014...0761, 5015...0819, 5021...0321 RAYH
000029	000	5022...0254, 5026...0254, 5027...0321, 5031...0322, 5032...0254 RAYH
000030	000	5033...1195, 5035...0254, 5036...0322, 5041...0321, 5042...0254 RAYH
000031	000	5046...0254, 5047...0321, 5051...0819, 5052...0761, 5053...0761 RAYH
000032	000	5054...0761, 5055...0819, 5056...0315, 5057...0761, 5058...0761 RAYH
000033	000	5151...0520, 5131...0582, 5111...0520, 6001...0315, 6002...0819 RAYH
000034	000	6003...0964, 6004...0819, 6005...0315, 6011...0819, 6012...0761 RAYH
000035	000	6013...0761, 6014...0761, 6015...0819, 6021...0964, 6022...0761 RAYH
000036	000	6023...0259, 6024...0761, 6025...0964, 6031...0819, 6032...0761 RAYH
000037	000	6033...0761, 6034...0761, 6035...0819, 6041...0315, 6042...0819 RAYH
000038	000	6043...0964, 6044...0819, 6045...0315 RAYH
000039	000	
000040	000	GEN 4001,5,1,70...0796 S
000041	000	GEN 4031,5,1,70...0796 S
000042	000	GEN 4061,5,1,70...0796 S
000043	000	GEN 4071,5,1,70...0796 S
000044	000	GEN 4081,5,1,70...0796 S
000045	000	GEN 4091,5,1,70...0796 S
000046	000	
000047	000	REM
000048	000	REM PG 1
000049	000	
000050	000	REM
000051	000	3501...-1, 3502...-1, 3503...01, 3504...-1, 3505...-1 S
000052	000	3511...-1, 3512...-1, 3513...01, 3514...-1, 3515...-1 S
000053	000	3521...-1, 3522...-1, 3523...-1, 3524...-1, 3525...-1 S
000054	000	3531...01, 3532...-01, 3533...-01, 3534...-01, 3535...-01 S

ORIGINAL PAGE IS
OF POOR QUALITY

000055	000	3541...-1.. 3542...-1.. 3546...-1.. 3547...-1..	\$
000056	000	3551...-01. 3552...-01. 3553...01. 3554...-01. 3555...-01\$	
000057	000	3561...-01. 3562...-01. 3563...01. 3564...-01. 3565...-01\$	
000058	000	3701...-1.. 3702...-1.. 3703...01. 3704...-1.. 3706...-1.\$	
000059	000	3711...-1.. 3712...-1.. 3713...01. 3714...-1.. 3715...-1.\$	
000060	000	3721...-1.. 3722...-1.. 3726...-1.. 3727...-1..	\$
000061	000	3731...01. 3732...-01. 3735...-01. 3736...-01	\$
000062	000	3741...-01. 3742...-01. 3746...-1.. 3747...-01	\$
000063	000	3751...-01. 3752...-01. 3753...01. 3754...-01. 3755...-01\$	
000064	000	3761...-01. 3762...-01. 3763...01. 3764...-01. 3765...-01\$	
000065	000	5501...-1.. 5502...-1.. 5503...01. 5504...-1.. 5505...-1.\$	
000066	000	5511...-1.. 5512...-1.. 5513...01. 5514...-1.. 5515...-1.\$	
000067	000	5521...-1.. 5522...-1.. 5526...-1.. 5527...-1..	\$
000068	000	5531...01. 5532...-01. 5535...-01. 5536...-01	\$
000069	000	5541...-01. 5542...-01. 5546...-1.. 5547...-01	\$
000070	000	5551...-01. 5552...-01. 5553...01. 5554...-01. 5555...-01\$	
000071	000	5561...-01. 5562...-01. 5563...01. 5564...-01. 5565...-01\$	
000072	000	5701...-1.. 5702...-1.. 5703...01. 5704...-1.. 5705...-1.\$	
000073	000	5711...-1.. 5712...-1.. 5713...01. 5714...-1.. 5715...-1.\$	
000074	000	5721...-1.. 5722...-1.. 5726...-1.. 5727...-1..	\$
000075	000	5731...01. 5732...-01. 5735...-01. 5736...-01	\$
000076	000	5741...-01. 5742...-01. 5746...-1.. 5747...-01	\$
000077	000	5751...-01. 5752...-01. 5753...01. 5754...-01. 5755...-01\$	
000078	000	5761...-01. 5762...-01. 5763...01. 5764...-01. 5765...-01\$	

REM

REM PG 1.1

REM

LIQUID NODES (SUPPLY TO AND RETURN FROM TOP H/E) RED CIRCUIT

-1000...-22..0. \$ SUPPLY BOUNDARY NODE

3599...04. 3600...-1.. 3601...04 \$
 3611...04. 3621...04. 3631...04. 3641...04 \$
 3651...04. 3661...04. 3605...04. 3615...04 \$
 3627...04. 3636...04. 3647...04. 3655...04 \$
 3665...04. 7001...-1.\$

REM LIQUID NODES (SUPPLY TO AND RETURN FROM TOP H/E) BLUE CIRCUIT

3699...04. 3700...-1.. 3805...04. 3815...04 \$
 3827...04. 3836...04. 3847...04. 3855...04 \$
 3865...04. 3801...04. 3811...04. 3821...04 \$
 3831...04. 3841...04. 3851...04. 3861...04. 7002...-1.\$

REM LIQUID NODES (SUPPLY TO AND RETURN FROM BOTTOM H/E) RED CIRCUIT

5599...04. 5600...-1.. 5601...04. 5611...04 \$
 5621...04. 5631...04. 5641...04. 5651...04 \$
 5661...04. 5605...04. 5615...04. 5627...04 \$
 5636...04. 5647...04. 5655...04. 5665...04. 7003...-1.\$

REM LIQUID NODES (SUPPLY TO AND RETURN FROM BOTTOM H/E) BLUE CIRCUIT

5699...04. 5700...-1.. 5805...04. 5815...04 \$
 5827...04. 5836...04. 5847...04. 5855...04 \$
 5865...04. 5801...04. 5811...04. 5821...04 \$
 5831...04. 5841...04. 5851...04. 5861...04. 7004...-1.\$

REM

REM PG 7.8.9

REM

LIQUID NODES FOR CHAMBER (RED CIRCUIT)

4501...-1.. 4502...-1.. 4503...04. 4504...-1.. 4505...-1.\$
 4511...-1.. 4512...-1.. 4513...04. 4514...-1.. 4515...-1.\$
 4521...-04. 4522...04. 4524...-1.. 4525...-04


```

000111 000 4531...-1., 4532...-1., 4533...04, 4534...-1., 4535...-1.5
000112 000 4541...-1., 4542...-1., 4543...04, 4544...-1., 4545...-1.5
000113 000 4551...-04, 4552...04, 4553...-1., 4554...-04 8
000114 000 4561...-1., 4562...-1., 4563...04, 4564...-1., 4565...-1.5
000115 000 4571...-1., 4572...-1., 4573...04, 4574...-1., 4575...-1.5
000116 000 4581...-1., 4582...-1., 4583...04, 4584...-1., 4585...-1.5
000117 000 4591...-1., 4592...-1., 4593...04, 4594...-1., 4595...-1.5
000118 000 4601...-1., 4602...-1., 4603...04, 4604...-1., 4605...-1.5
000119 000 4611...-1., 4612...04, 4614...-1., 4615...-1.5
000120 000 REM LIQUID NODES FOR CHAMBER (BLUE CIRCUIT)
000121 000 4701...-1., 4702...-1., 4703...04, 4704...-1., 4705...-1.5
000122 000 4711...-1., 4712...-1., 4713...04, 4714...-1., 4715...-1.5
000123 000 4721...-1., 4722...-04, 4724...04, 4725...-1.5
000124 000 4731...-1., 4732...-1., 4733...04, 4734...-1., 4735...-1.5
000125 000 4741...-1., 4742...-1., 4743...04, 4744...-1., 4745...-1.5
000126 000 4751...-1., 4752...-04, 4754...04, 4755...-1.5
000127 000 4761...-1., 4762...-1., 4763...04, 4764...-1., 4765...-1.5
000128 000 4771...-1., 4772...-1., 4773...04, 4774...-1., 4775...-1.5
000129 000 4781...-1., 4782...-1., 4783...04, 4784...-1., 4785...-1.5
000130 000 4791...-1., 4792...-1., 4793...04, 4794...-1., 4795...-1.5
000131 000 4801...-1., 4802...-1., 4803...04, 4804...-1., 4805...-1.5
000132 000 4811...-1., 4812...-1., 4814...04, 4815...-1.5
000133 000 REM
000134 000 REM PG 11.04. 13
000135 000 REM
000136 000 REM LIQUID SUPPLY TO CHAMBER (RED CIRCUIT)
000137 000 8099...04, 8100...-1., 8101...04, 8102...-1., 8103...045
000138 000 8104...04, 8105...-1., 8106...-1., 8107...04, 8108...045
000139 000 8109...04, 8110...04, 8111...04, 8112...04, 8121...045
000140 000 8122...-04, 8123...04, 8124...04, 8125...-1., 8126...-1.5
000141 000 8127...04, 8128...04, 8129...04, 8130...04, 8131...045
000142 000 8132...045
000143 000 REM LIQUID RETURN FROM CHAMBER (RED CIRCUIT)
000144 000 8199...04, 8200...-1., 8201...04, 8202...-1., 8203...045
000145 000 8204...04, 8205...-1., 8206...-1., 8207...04, 8208...045
000146 000 8209...04, 8210...04, 8211...04, 8212...04, 8221...045
000147 000 8222...-04, 8223...04, 8224...04, 8225...-1., 8226...-1.5
000148 000 8227...04, 8228...04, 8229...04, 8230...04, 8231...045
000149 000 8232...045
000150 000 900...-045
000151 000 REM LIQUID SUPPLY TO CHAMBER (BLUE CIRCUIT)
000152 000 9099...04, 9100...-1., 9101...04, 9102...-1., 9103...045
000153 000 9104...04, 9105...-1., 9106...-1., 9107...04, 9108...045
000154 000 9109...04, 9110...04, 9111...04, 9112...04, 9121...045
000155 000 9122...-04, 9123...04, 9124...04, 9125...-1., 9126...-1.5
000156 000 9127...04, 9128...04, 9129...04, 9130...04, 9131...045
000157 000 9132...045
000158 000 REM LIQUID RETURN FROM CHAMBER (BLUE CIRCUIT)
000159 000 9199...04, 9200...-1., 9201...04, 9202...-1., 9203...045
000160 000 9204...04, 9205...-1., 9206...-1., 9207...04, 9208...045
000161 000 9209...04, 9210...04, 9211...04, 9212...04, 9221...045
000162 000 9222...-04, 9223...04, 9224...04, 9225...-1., 9226...-1.5
000163 000 9227...04, 9228...04, 9229...04, 9230...04, 9231...045
000164 000 9232...045
000165 000 -100.60...1.5 LIQUID SUPPLY (MORE MUST BE ADDED LATER)
000166 000 -1.70...1.5 AMBIENT AIR TEMPERATURE

```

000167	000	END	
000168	000	BCD	3CONDUCTOR DATA
000169	000	N	2001,2001,2002,2.864, 2002,2002,2003,3.446, 2003,2003,2004,3.446\$RAYH
000170	000		2004,2004,2005,2.864, 2005,2011,2012,2.685, 2006,2012,2013,2.797\$RAYH
000171	000		2007,2013,2014,2.797, 2008,2014,2015,2.685, 2009,2021,2022,2.468\$RAYH
000172	000		2010,2022,2023,5.176, 2011,2023,2024,5.176, 2012,2024,2025,2.468\$RAYH
000173	000		2013,2031,2032,2.685, 2014,2032,2033,2.797, 2015,2033,2034,2.797\$RAYH
000174	000		2016,2034,2035,2.685, 2017,2041,2042,2.864, 2018,2042,2043,3.446\$RAYH
000175	000		2019,2043,2044,3.446, 2020,2044,2045,2.864, 2021,2001,2011,2.864\$RAYH
000176	000		2022,2011,2021,3.446, 2023,2021,2031,3.446, 2024,2031,2041,2.864\$RAYH
000177	000		2025,2002,2012,2.685, 2026,2012,2022,2.797, 2027,2022,2032,2.797\$RAYH
000178	000		2028,2032,2042,2.685, 2029,2003,2013,2.468, 2030,2013,2023,5.176\$RAYH
000179	000		2031,2023,2033,5.176, 2032,2033,2043,2.468, 2033,2004,2014,2.685\$RAYH
000180	000		2034,2014,2024,2.797, 2035,2024,2034,2.797, 2036,2034,2044,2.685\$RAYH
000181	000		2037,2005,2015,2.864, 2038,2015,2025,3.446, 2039,2025,2035,3.446\$RAYH
000182	000		2040,2035,2045,2.864, 2041,2001,3101,0.281, 2042,2002,3102,0.264\$RAYH
000183	000		2043,2003,3103,0.249, 2044,2004,3104,0.264, 2045,2005,3105,0.281\$RAYH
000184	000		2046,2015,3115,0.264, 2047,2025,3136,0.249, 2048,2035,3155,0.264\$RAYH
000185	000		2049,2045,3165,0.281, 2050,2044,3164,0.264, 2051,2043,3163,0.249\$RAYH
000186	000		2052,2042,3162,0.264, 2053,2041,3161,0.281, 2054,2031,3151,0.264\$RAYH
000187	000		2055,2021,3131,0.249, 2056,2011,3111,0.264, 2057,3101,3102,1.7 \$RAYH
000188	000		2058,3102,3103,1.611, 2059,3103,3104,1.611, 2060,3104,3105,1.7 \$RAYH
000189	000		2061,3105,3115,1.7 , 2062,3115,3136,1.611, 2063,3136,3155,1.611\$RAYH
000190	000		2064,3155,3165,1.7 , 2065,3165,3164,1.7 , 2066,3164,3163,1.611\$RAYH
000191	000		2067,3163,3162,1.611, 2068,3162,3161,1.7 , 2069,3161,3151,1.7 \$RAYH
000192	000		2070,3151,3131,1.611, 2071,3131,3111,1.611, 2072,3111,3101,1.7 \$RAYH
000193	000		3001,3001,3002,2.864, 3002,3002,3003,3.446, 3003,3003,3004,3.446\$RAYH
000194	000		3004,3004,3005,2.864, 3005,3011,3012,2.685, 3006,3012,3013,2.797\$RAYH
000195	000		3007,3013,3014,2.797, 3008,3014,3015,2.685, 3009,3021,3022,0.823\$RAYH
000196	000		3010,3022,3033,1.725, 3011,3033,3026,1.752, 3012,3026,3027,0.823\$RAYH
000197	000		3013,3031,3032,0.822, 3014,3032,3033,1.726, 3015,3033,3035,1.726\$RAYH
000198	000		3016,3035,3036,0.822, 3017,3041,3042,0.823, 3018,3042,3033,1.725\$RAYH
000199	000		3019,3033,3046,1.725, 3020,3046,3047,0.823, 3021,3051,3052,2.685\$RAYH
000200	000		3022,3052,3053,2.797, 3023,3053,3054,2.797, 3024,3054,3055,2.685\$RAYH
000201	000		3025,3061,3062,2.864, 3026,3062,3063,3.446, 3027,3063,3064,3.446\$RAYH
000202	000	E	3028,3064,3065,2.864, 3029,3001,3011,2.864, 3030,3011,3021,5.168\$RAYH
000203	000		3031,3021,3031,10.33, 3032,3031,3041,10.33, 3033,3041,3051,5.168\$RAYH
000204	000	N	3034,3051,3061,2.864, 3035,3002,3012,2.685, 3036,3012,3022,4.195\$RAYH
000205	000		3037,3022,3032,8.389, 3038,3032,3042,8.389, 3039,3042,3052,4.195\$RAYH
000206	000		3040,3052,3062,2.685, 3041,3003,3013,2.468, 3042,3013,3033,5.176\$RAYH
000207	000		3043,3033,3053,5.176, 3044,3053,3063,2.468, 3045,3004,3014,2.685\$RAYH
000208	000		3046,3014,3026,4.195, 3047,3026,3035,8.389, 3048,3035,3046,8.389\$RAYH
000209	000	E	3049,3046,3054,4.195, 3050,3054,3064,2.685, 3051,3005,3015,2.864\$RAYH
000210	000		3052,3015,3027,5.168, 3053,3027,3036,10.33, 3054,3036,3047,10.33\$RAYH
000211	000		3055,3047,3055,5.168, 3056,3055,3065,2.864, 3057,3001,3101,5.666\$
000212	000		3058,3002,3102,3.357, 3059,3003,3103,2.974, 3060,3004,3104,3.357\$
000213	000		3061,3005,3105,5.666, 3062,3015,3115,3.357, 3063,3027,3136,0.992\$
000214	000		3064,3036,3136,0.99 , 3065,3047,3136,0.992, 3066,3055,3155,3.357\$RAYH
000215	000		3067,3065,3165,5.666, 3068,3064,3164,3.357, 3069,3063,3163,2.974\$RAYH
000216	000		3070,3062,3162,3.357, 3071,3061,3161,5.666, 3072,3051,3151,3.357\$RAYH
000217	000		3073,3041,3131,0.992, 3074,3031,3131,0.99 , 3075,3021,3131,0.992\$RAYH
000218	000		3076,3011,3111,3.357, 3077,3033,2023,1.263, 3078,3004,4001,.161 \$RAYH
000219	000		3079,3005,4001,.057 , 3080,3002,4011,.054 , 3081,3003,4011,.149 \$RAYH
000220	000		3082,3001,4021,.114 , 3083,3002,4021,.107 , 3084,3001,4031,.057 \$RAYH
000221	000		3085,3011,4031,.161 , 3086,3021,4041,.05 , 3087,3031,4041,.05 \$RAYH
000222	000		3088,3041,4041,.05 , 3089,3051,4041,.054 , 3090,3051,4051,.107 \$RAYH

000223	000	3091.3061.4051..114	3092.3061.4061..057	3093.3062.4061..161	SRAYH
000224	000	3094.3063.4071..149	3095.3064.4071..054	3096.3064.4081..107	SRAYH
000225	000	3097.3065.4081..114	3098.3065.4091..161	3099.3065.4091..057	SRAYH
000226	000	3100.3015.4101..054	3101.3027.4101..05	3102.3036.4101..05	SRAYH
000227	000	3103.3047.4101..05	3104.3005.4111..114	3105.3015.4111..107	SRAYH
000228	000	4005.4011.4012.5.461	4006.4012.4013.3.867	4007.4013.4014.3.867	SRAYH
000229	000	4008.4014.4015.5.461	4009.4021.4022.5.461	4010.4022.4023.4.529	SRAYH
000230	000	4011.4023.4024.4.529	4012.4024.4025.5.461	4017.4041.4042.5.461	SRAYH
000231	000	4018.4042.4043.3.867	4019.4043.4044.3.867	4020.4044.4045.5.461	SRAYH
000232	000	4021.4051.4052.5.461	4022.4052.4053.4.529	4023.4053.4054.4.529	SRAYH
000233	000	4024.4054.4055.5.461	4041.4101.4102.5.461	4042.4102.4103.3.867	SRAYH
000234	000	4043.4103.4104.3.867	4044.4104.4105.5.461	4045.4111.4112.5.461	SRAYH
000235	000	4046.4112.4113.4.529	4047.4113.4114.4.529	4048.4114.4115.5.461	SRAYH
000236	000	4060.4111.4001.1.433	4072.4112.4002.1.433	4073.4003.4013.1.433	SRAYH
000237	000	4074.4013.4023.1.29	4075.4023.4033.1.516	4076.4033.4043.1.433	SRAYH
000238	000	4077.4043.4053.1.29	4078.4053.4063.1.516	4079.4063.4073.1.433	SRAYH
000239	000	4080.4073.4083.1.433	4081.4083.4093.1.433	4082.4093.4103.1.433	SRAYH
000240	000	4083.4103.4113.1.29	4084.4113.4003.1.516	4096.4114.4004.1.433	SRAYH
000241	000	4108.4115.4005.1.433	5001.5001.5002.2.864	5002.5002.5003.3.446	SRAYH
000242	000	5003.5003.5004.3.446	5004.5004.5005.2.864	5005.5011.5012.2.685	SRAYH
000243	000	5006.5012.5013.2.797	5007.5013.5014.2.797	5008.5014.5015.2.685	SRAYH
000244	000	5009.5021.5022.0.823	5010.5022.5033.1.725	5011.5033.5026.1.752	SRAYH
000245	000	5012.5026.5027.0.823	5013.5031.5032.0.822	5014.5032.5033.1.726	SRAYH
000246	000	5015.5033.5035.1.726	5016.5035.5036.0.822	5017.5041.5042.0.823	SRAYH
000247	000	5018.5042.5033.1.725	5019.5033.5046.1.725	5020.5046.5047.0.823	SRAYH
000248	000	5021.5051.5052.2.685	5022.5052.5053.2.797	5023.5053.5054.2.797	SRAYH
000249	000	5024.5054.5055.2.685	5025.5061.5062.2.864	5026.5062.5063.3.446	SRAYH
000250	000	5027.5063.5064.3.446	5028.5064.5065.2.864	5029.5001.5011.2.864	SRAYH
000251	000	5030.5011.5021.5.168	5031.5021.5031.10.33	5032.5031.5041.10.33	SRAYH
000252	000	5033.5041.5051.5.168	5034.5051.5061.2.864	5035.5002.5012.2.685	SRAYH
000253	000	5036.5012.5022.4.195	5037.5022.5032.8.389	5038.5032.5042.8.389	SRAYH
000254	000	5039.5042.5052.4.195	5040.5052.5062.2.685	5041.5003.5013.2.468	SRAYH
000255	000	5042.5013.5033.5.176	5043.5033.5053.5.176	5044.5053.5063.2.468	SRAYH
000256	000	5045.5004.5014.2.685	5046.5014.5026.4.195	5047.5026.5035.8.389	SRAYH
000257	000	5048.5035.5046.8.389	5049.5046.5054.4.195	5050.5054.5064.2.685	SRAYH
000258	000	5051.5005.5015.2.864	5052.5015.5027.5.168	5053.5027.5036.10.33	SRAYH
000259	000	5054.5036.5047.10.33	5055.5047.5055.5.168	5056.5055.5065.2.864	SRAYH
000260	000	5057.5001.5101.5.666	5058.5002.5102.3.357	5059.5003.5103.2.974	SRAYH
000261	000	5060.5004.5104.3.357	5061.5005.5105.5.666	5062.5015.5115.3.357	SRAYH
000262	000	5063.5027.5136.0.992	5064.5036.5136.0.99	5065.5047.5136.0.992	SRAYH
000263	000	5066.5055.5155.3.357	5067.5065.5165.5.666	5068.5064.5164.3.357	SRAYH
000264	000	5069.5063.5163.2.974	5070.5062.5162.3.357	5071.5061.5161.5.666	SRAYH
000265	000	5072.5051.5151.3.357	5073.5041.5131.0.992	5074.5031.5131.0.99	SRAYH
000266	000	5075.5021.5131.0.992	5076.5011.5111.3.357	5077.5033.6023.1.263	SRAYH
000267	000	5078.5004.4005..161	5079.5005.4005..057	5080.5002.4015..054	SRAYH
000268	000	5081.5003.4015..149	5082.5001.4025..114	5083.5002.4025..107	SRAYH
000269	000	5084.5001.4035..057	5085.5011.4035..161	5086.5021.4045..05	SRAYH
000270	000	5087.5031.4045..05	5088.5041.4045..05	5089.5051.4045..054	SRAYH
000271	000	5090.5051.4055..107	5091.5061.4055..114	5092.5061.4065..057	SRAYH
000272	000	5093.5062.4065..161	5094.5063.4075..149	5095.5064.4075..054	SRAYH
000273	000	5096.5064.4085..107	5097.5065.4085..114	5098.5055.4095..161	SRAYH
000274	000	5099.5065.4095..057	5100.5015.4105..054	5101.5027.4105..05	SRAYH
000275	000	5102.5036.4105..05	5103.5047.4105..05	5104.5005.4115..114	SRAYH
000276	000	5105.5015.4115..107	6001.6001.6002.2.864	6002.6002.6003.3.446	SRAYH
000277	000	6003.6003.6004.3.446	6004.6004.6005.2.864	6005.6011.6012.2.685	SRAYH
000278	000	6006.6012.6013.2.797	6007.6013.6014.2.797	6008.6014.6015.2.685	SRAYH

000279	000	6009,6021,6022,2.468, 6010,6022,6023,5.176, 6031,6023,6024,5.176	SRAYH
000280	000	6012,6024,6025,2.468, 6013,6031,6032,2.685, 6014,6032,6033,2.797	SRAYH
000281	000	6015,6033,6034,2.797, 6016,6034,6035,2.685, 6017,6041,6042,2.864	SRAYH
000282	000	6018,6042,6043,3.446, 6019,6043,6044,3.446, 6020,6044,6045,2.864	SRAYH
000283	000	6021,6001,6011,2.864, 6022,6011,6021,3.446, 6023,6021,6031,3.446	SRAYH
000284	000	6024,6031,6041,2.864, 6025,6002,6012,2.685, 6026,6012,6022,2.797	SRAYH
000285	000	6027,6022,6032,2.797, 6028,6032,6042,2.685, 6029,6003,6013,2.468	SRAYH
000286	000	6030,6013,6023,5.176, 6031,6023,6033,5.176, 6032,6033,6043,2.468	SRAYH
000287	000	6033,6004,6014,2.685, 6034,6014,6024,2.797, 6035,6024,6034,2.797	SRAYH
000288	000	6036,6034,6044,2.685, 6037,6005,6015,2.864, 6038,6015,6025,3.446	SRAYH
000289	000	6039,6025,6035,3.446, 6040,6035,6045,2.864, 6041,6001,5101,0.281	SRAYH
000290	000	6042,6002,5102,0.264, 6043,6003,5103,0.249, 6044,6004,5104,0.264	SRAYH
000291	000	6045,6005,5105,0.281, 6046,6015,5115,0.264, 6047,6025,5136,0.249	SRAYH
000292	000	6048,6035,5155,0.264, 6049,6045,5165,0.281, 6050,6044,5164,0.264	SRAYH
000293	000	6051,6043,5163,0.249, 6052,6042,5162,0.264, 6053,6041,5161,0.281	SRAYH
000294	000	6054,6031,5151,0.264, 6055,6021,5131,0.249, 6056,6011,5111,0.264	SRAYH
000295	000	6057,5101,5102,1.7, 6058,5102,5103,1.611, 6059,5103,5104,1.611	SRAYH
000296	000	6060,5104,5105,1.7, 6061,5105,5115,1.7, 6062,5115,5136,1.611	SRAYH
000297	000	6063,5136,5155,1.611, 6064,5155,5165,1.7, 6065,5165,5164,1.7	SRAYH
000298	000	6066,5164,5163,1.611, 6067,5163,5162,1.611, 6068,5162,5161,1.7	SRAYH
000299	000	6069,5161,5151,1.7, 6070,5151,5131,1.611, 6071,5131,5111,1.611	SRAYH
000300	000	6072,5111,5101,1.7	S
000301	000	GEN 4001,4,1,4001,1,4002,1,5.461, 4013,4,1,4031,1,4032,1,5.461	RAYH
000302	000	GEN 4025,4,1,4061,1,4062,1,5.461, 4029,4,1,4071,1,4072,1,5.461	RAYH
000303	000	GEN 4033,4,1,4081,1,4082,1,5.461, 4037,4,1,4091,1,4092,1,5.461	RAYH
000304	000	GEN 4049,11,1,4001,10,4011,10,1.433, 4061,11,1,4002,10,4012,10,1.433	SRAYH
000305	000	GEN 4085,11,1,4004,10,4014,10,1.433, 4097,11,1,4005,10,4015,10,1.433	SRAYH
000306	000	REM	
000307	000	REM PAGE 30	
000308	000	REM	
000309	000	REM LIQUID TO SOLID NODES TOP HE (RED AND BLUE CIRCUIT)	
000310	000	N 3201,3501,3001,1, 3205,3505,3005,1, 3214,3514,3014,1	S
000311	000	3202,3502,3002,1, 3203,3503,3003,1, 3204,3504,3004,1	S
000312	000	3211,3511,3011,1, 3212,3512,3012,1, 3213,3513,3013,1	S
000313	000	3215,3515,3015,1, 3221,3521,3021,1, 3222,3522,3022,1	S
000314	000	3226,3526,3026,1, 3235,3535,3035,1, 3246,3546,3046,1	S
000315	000	3227,3527,3027,1, 3231,3531,3031,1, 3232,3532,3032,1	S
000316	000	3236,3536,3036,1, 3241,3541,3041,1, 3242,3542,3042,1	S
000317	000	3247,3547,3047,1, 3251,3551,3051,1, 3252,3552,3052,1	S
000318	000	3253,3553,3053,1, 3262,3562,3062,1, 3301,3701,3001,1	S
000319	000	3254,3554,3054,1, 3255,3555,3055,1, 3261,3561,3061,1	S
000320	000	3263,3563,3063,1, 3264,3564,3064,1, 3265,3565,3065,1	S
000321	000	3302,3702,3002,1, 3303,3703,3003,1, 3304,3704,3004,1	S
000322	000	3305,3705,3005,1, 3314,3714,3014,1, 3326,3726,3026,1	S
000323	000	3311,3711,3011,1, 3312,3712,3012,1, 3313,3713,3013,1	S
000324	000	3315,3715,3015,1, 3321,3721,3021,1, 3322,3722,3022,1	S
000325	000	3327,3727,3027,1, 3331,3731,3031,1, 3332,3732,3032,1	S
000326	000	3335,3735,3035,1, 3346,3746,3046,1, 3353,3753,3053,1	S
000327	000	3336,3736,3036,1, 3341,3741,3041,1, 3342,3742,3042,1	S
000328	000	3347,3747,3047,1, 3351,3751,3051,1, 3352,3752,3052,1	S
000329	000	3354,3754,3054,1, 3355,3755,3055,1, 3361,3761,3061,1	S
000330	000	E 3363,3763,3063,1, 3364,3764,3064,1, 3365,3765,3065,1	S
000331	000	3362,3762,3062,1	S
000332	000	REM LIQUID TO SOLID NODES BOTTOM HE (RED AND BLUE CIRCUITS)	
000333	000	N 5201,5501,5001,1, 5205,5505,5005,1, 5214,5514,5014,1	S
000334	000	5202,5502,5002,1, 5203,5503,5003,1, 5204,5504,5004,1	S

000335	000		5211,5511,5011,1,1	5212,5512,5012,1,1	5213,5513,5013,1,1
000336	000		5215,5515,5015,1,1	5221,5521,5021,1,1	5222,5522,5022,1,1
000337	000		5226,5526,5026,1,1	5235,5535,5035,1,1	5246,5546,5046,1,1
000338	000		5227,5527,5027,1,1	5231,5531,5031,1,1	5232,5532,5032,1,1
000339	000		5236,5536,5036,1,1	5241,5541,5041,1,1	5242,5542,5042,1,1
000340	000		5247,5547,5047,1,1	5251,5551,5051,1,1	5252,5552,5052,1,1
000341	000		5253,5553,5053,1,1	5262,5562,5062,1,1	5301,5701,5001,1,1
000342	000		5254,5554,5054,1,1	5255,5555,5055,1,1	5261,5561,5061,1,1
000343	000		5263,5563,5063,1,1	5264,5564,5064,1,1	5265,5565,5065,1,1
000344	000		5302,5702,5002,1,1	5303,5703,5003,1,1	5304,5704,5004,1,1
000345	000		5305,5705,5005,1,1	5314,5714,5014,1,1	5326,5726,5026,1,1
000346	000		5311,5711,5011,1,1	5312,5712,5012,1,1	5313,5713,5013,1,1
000347	000		5315,5715,5015,1,1	5321,5721,5021,1,1	5322,5722,5022,1,1
000348	000		5327,5727,5027,1,1	5331,5731,5031,1,1	5332,5732,5032,1,1
000349	000		5335,5735,5035,1,1	5346,5746,5046,1,1	5353,5753,5053,1,1
000350	000		5336,5736,5036,1,1	5341,5741,5041,1,1	5342,5742,5042,1,1
000351	000		5347,5747,5047,1,1	5351,5751,5051,1,1	5352,5752,5052,1,1
000352	000		5354,5754,5054,1,1	5355,5755,5055,1,1	5361,5761,5061,1,1
000353	000	E	5363,5763,5063,1,1	5364,5764,5064,1,1	5365,5765,5065,1,1
000354	000		5362,5762,5062,1,1		
000355	000	REM			
000356	000	REM	PAGE 31		
000357	000	REM			
000358	000	REM	LIQUID TO SOLID NODES CHAMBER (RED CIRCUIT)		
000359	000	GEN	401,5,1,4001,1,4501,1,3,411,5,1,4011,1,4511,1,2,45		
000360	000	GEN	431,5,1,4031,1,4531,1,2,175,441,5,1,4041,1,4541,1,2,775		
000361	NEW 001	GEN	461,5,1,4061,1,4561,1,0,50,471,5,1,4071,1,4571,1,505		
000362	NEW 001	GEN	481,5,1,4081,1,4581,1,0,50,491,5,1,4091,1,4591,1,505		
000363	NEW 001	GEN	501,5,1,4101,1,4601,1,505		
000364	-03 000	N	421,4021,4521,3,451,4051,4551,3,513,4111,4611,3,5		
000365	000		422,4022,4522,3,423,4024,4524,3,424,4025,4525,3,5		
000366	000		452,4052,4552,3,453,4054,4554,3,454,4055,4555,3,5		
000367	000	E	512,4112,4612,3,513,4114,4614,3,514,4115,4615,3,5		
000368	000	REM	LIQUID TO SOLID NODES CHAMBER (BLUE CIRCUIT)		
000369	000	GEN	601,5,1,4001,1,4701,1,3,611,5,1,4011,1,4711,1,2,4		
000370	000	GEN	631,5,1,4031,1,4731,1,2,175,641,5,1,4041,1,4741,1,2,775		
000371	NEW 001	GEN	661,5,1,4061,1,4761,1,0,50,671,5,1,4071,1,4771,1,505		
000372	NEW 001	GEN	681,5,1,4081,1,4781,1,0,50,691,5,1,4091,1,4791,1,505		
000373	NEW 001	GEN	701,5,1,4101,1,4801,1,505		
000374	-03 000	N	621,4021,4721,3,651,4051,4751,3,713,4111,4811,3,5		
000375	000		622,4022,4722,3,623,4024,4724,3,624,4025,4725,3,5		
000376	000		652,4052,4752,3,653,4054,4754,3,654,4055,4755,3,5		
000377	000	E	712,4112,4812,3,713,4114,4814,3,714,4115,4815,3,5		
000378	000	REM	LIQUID CONDUCTORS FOR MAIN SUPPLY TO TOTAL SYSTEM (FROM RESERVOIR)		
000379	000		100,100,1000,1,5		
000380	000	REM			
000381	000	REM	PG 2		
000382	000	REM			
000383	000	REM	LIQUID CONDUCTORS		
000384	000	N	3501,-3501,3502,1,3502,-3502,3503,1,3503,-3503,3504,1,5		
000385	000		3504,-3504,3505,1,3511,-3511,3512,1,3512,-3512,3513,1,5		
000386	000		3513,-3513,3514,1,3514,-3514,3515,1,3521,-3521,3522,1,5		
000387	000		3522,-3522,3526,1,3526,-3526,3527,1,3531,-3531,3532,1,5		
000388	000		3532,-3532,3535,1,3535,-3535,3536,1,3541,-3541,3542,1,5		
000389	000		3542,-3542,3546,1,3546,-3546,3547,1,3551,-3551,3552,1,5		
000390	000	E	3552,-3552,3553,1,3553,-3553,3554,1,3554,-3554,3555,1,5		

000391	000	3561.-3561,3562,1.1.	3562.-3562,3563,1.1.	3563.-3563,3564,1.1.	S
000392	000	3564.-3564,3565,1.1.			
000393	000	N			
000394	000	3705.-3705,3704,1.1.	3704.-3704,3703,1.1.	3703.-3703,3702,1.1.	S
000395	000	3702.-3702,3701,1.1.	3715.-3715,3714,1.1.	3714.-3714,3713,1.1.	S
000396	000	3713.-3713,3712,1.1.	3712.-3712,3711,1.1.	3727.-3727,3726,1.1.	S
000397	000	3726.-3726,3722,1.1.	3722.-3722,3721,1.1.	3736.-3736,3735,1.1.	S
000398	000	3735.-3735,3732,1.1.	3732.-3732,3731,1.1.	3747.-3747,3746,1.1.	S
000399	000	3746.-3746,3742,1.1.	3742.-3742,3741,1.1.	3755.-3755,3754,1.1.	S
000400	000	3754.-3754,3753,1.1.	3753.-3753,3752,1.1.	3752.-3752,3751,1.1.	S
000401	000	E	3765.-3765,3764,1.1.	3764.-3764,3763,1.1.	3763.-3763,3762,1.1.
000402	000	N	3762.-3762,3761,1.1.		
000403	000	5501.-5501,5502,1.1.	5502.-5502,5503,1.1.	5503.-5503,5504,1.1.	S
000404	000	5504.-5504,5505,1.1.	5511.-5511,5512,1.1.	5512.-5512,5513,1.1.	S
000405	000	5513.-5513,5514,1.1.	5514.-5514,5515,1.1.	5521.-5521,5522,1.1.	S
000406	000	5522.-5522,5526,1.1.	5526.-5526,5527,1.1.	5531.-5531,5532,1.1.	S
000407	000	5532.-5532,5535,1.1.	5535.-5535,5536,1.1.	5541.-5541,5542,1.1.	S
000408	000	5542.-5542,5546,1.1.	5546.-5546,5547,1.1.	5551.-5551,5552,1.1.	S
000409	000	E	5552.-5552,5553,1.1.	5553.-5553,5554,1.1.	5554.-5554,5555,1.1.
000410	000	N	5561.-5561,5562,1.1.	5562.-5562,5563,1.1.	5563.-5563,5564,1.1.
000411	000	5564.-5564,5565,1.1.			
000412	000	5705.-5705,5704,1.1.	5704.-5704,5703,1.1.	5703.-5703,5702,1.1.	S
000413	000	5702.-5702,5701,1.1.	5715.-5715,5714,1.1.	5714.-5714,5713,1.1.	S
000414	000	5713.-5713,5712,1.1.	5712.-5712,5711,1.1.	5727.-5727,5726,1.1.	S
000415	000	5726.-5726,5722,1.1.	5722.-5722,5721,1.1.	5736.-5736,5735,1.1.	S
000416	000	5735.-5735,5732,1.1.	5732.-5732,5731,1.1.	5747.-5747,5746,1.1.	S
000417	000	5746.-5746,5742,1.1.	5742.-5742,5741,1.1.	5755.-5755,5754,1.1.	S
000418	000	E	5754.-5754,5753,1.1.	5753.-5753,5752,1.1.	5752.-5752,5751,1.1.
000419	000	5765.-5765,5764,1.1.	5764.-5764,5763,1.1.	5763.-5763,5762,1.1.	S
000420	000	5762.-5762,5761,1.1.			
000421	000	REM			
000422	000	REM PG 3,4			
000423	000	REM			
000424	000	REM			
000425	000	N	LIQUID CONDUCTORS (SUPPLY FOR TOP H/E) RED CIRCUIT		
000426	000	3600.-3600,3599,1.1.	3601.-3599,3600,1.1.	3602.-3600,3601,1.1.	S
000427	000	3603.-3601,3501,1.1.	3604.-3600,3611,1.1.	3605.-3611,3511,1.1.	S
000428	000	3606.-3600,3621,1.1.	3607.-3621,3521,1.1.	3608.-3600,3631,1.1.	S
000429	000	E	3609.-3631,3531,1.1.	3610.-3600,3641,1.1.	3611.-3641,3541,1.1.
000430	000	3612.-3600,3651,1.1.	3613.-3651,3551,1.1.	3614.-3600,3661,1.1.	S
000431	000	3615.-3661,3561,1.1.			
000432	000	N	REM		
000433	000	3651.-3505,3605,1.1.	3652.-3605,7001,1.1.	3653.-3515,3615,1.1.	S
000434	000	3664.-3615,7001,1.1.	3655.-3527,3627,1.1.	3656.-3627,7001,1.1.	S
000435	000	E	3657.-3536,3636,1.1.	3658.-3636,7001,1.1.	3659.-3547,3647,1.1.
000436	000	3660.-3647,7001,1.1.	3661.-3555,3655,1.1.	3662.-3655,7001,1.1.	S
000437	000	3663.-3565,3665,1.1.	3664.-3665,7001,1.1.		
000438	000	N	REM		
000439	000	3800.-3800,3699,1.1.	3801.-3699,3700,1.1.	3802.-3700,3805,1.1.	S
000440	000	3803.-3805,3705,1.1.	3804.-3700,3815,1.1.	3805.-3815,3715,1.1.	S
000441	000	3806.-3700,3827,1.1.	3807.-3827,3727,1.1.	3808.-3700,3836,1.1.	S
000442	000	E	3809.-3836,3736,1.1.	3810.-3700,3847,1.1.	3811.-3847,3747,1.1.
000443	000	3812.-3700,3855,1.1.	3813.-3855,3755,1.1.	3814.-3700,3865,1.1.	S
000444	000	3815.-3865,3765,1.1.			
000445	000	N	REM		
000446	000	LIQUID CONDUCTORS (RETURN FOR TOP H/E) BLUE CIRCUIT			
		3851.-3701,3801,1.1.	3852.-3801,7002,1.1.	3853.-3711,3811,1.1.	S
		3854.-3811,7002,1.1.	3855.-3721,3821,1.1.	3856.-3821,7002,1.1.	S
		3857.-3731,3831,1.1.	3858.-3831,7002,1.1.	3859.-3741,3841,1.1.	S

000447	000	E	3860.-3841.7002.1..	3861.-3751.3851.1..	3862.-3851.7002.1..
000448	000		3863.-3761.3861.1..	3864.-3861.7002.1..	S
000449	000	REM	LIQUID CONDUCTORS (SUPPLY FOR BOTTOM H/E) RED CIRCUIT		
000450	000	N	5600.-1000.5599.1..	5601.-5599.5600.1..	5602.-5600.5601.1..
000451	000		5603.-5601.5501.1..	5604.-5600.5611.1..	5605.-5611.5511.1..
000452	000		5606.-5600.5621.1..	5607.-5621.5521.1..	5608.-5600.5631.1..
000453	000		5609.-5631.5531.1..	5610.-5600.5641.1..	5611.-5641.5541.1..
000454	000	E	5612.-5600.5651.1..	5613.-5651.5551.1..	5614.-5600.5661.1..
000455	000		5615.-5661.5561.1..	S	
000456	000	REM	LIQUID CONDUCTORS (RETURN FOR BOTTOM H/E) RED CIRCUIT		
000457	000	N	5651.-5505.5605.1..	5652.-5605.7003.1..	5653.-5515.5615.1..
000458	000		5654.-5615.7003.1..	5655.-5527.5627.1..	5656.-5627.7003.1..
000459	000		5657.-5536.5636.1..	5658.-5636.7003.1..	5659.-5547.5647.1..
000460	000	E	5660.-5647.7003.1..	5661.-5555.5655.1..	5662.-5655.7003.1..
000461	000		5663.-5565.5665.1..	5664.-5665.7003.1..	S
000462	000	REM	LIQUID CONDUCTORS (SUPPLY FOR BOTTOM H/E) BLUE CIRCUIT		
000463	000	N	5800.-1000.5699.1..	5801.-5699.5700.1..	5802.-5700.5805.1..
000464	000		5803.-5805.5705.1..	5804.-5700.5815.1..	5805.-5815.5715.1..
000465	000		5806.-5700.5827.1..	5807.-5827.5727.1..	5808.-5700.5836.1..
000466	000		5809.-5836.5736.1..	5810.-5700.5847.1..	5811.-5847.5747.1..
000467	000	E	5812.-5700.5855.1..	5813.-5855.5755.1..	5814.-5700.5865.1..
000468	000		5815.-5865.5765.1..	S	
000469	000	REM	LIQUID CONDUCTORS (RETURN FOR BOTTOM H/E) BLUE CIRCUIT		
000470	000	N	5851.-5701.5801.1..	5852.-5801.7004.1..	5853.-5711.5811.1..
000471	000		5854.-5811.7004.1..	5855.-5721.5821.1..	5856.-5821.7004.1..
000472	000		5857.-5731.5831.1..	5858.-5831.7004.1..	5859.-5741.5841.1..
000473	000	E	5860.-5841.7004.1..	5861.-5751.5851.1..	5862.-5851.7004.1..
000474	000		5863.-5761.5861.1..	5864.-5861.7004.1..	S
000475	000	REM			
000476	000	REM	PG 7,8,9		
000477	000	REM			
000478	000	REM	LIQUID CONDUCTORS FOR CHAMBER (RED CIRCUIT-DOWN)		
000479	000	N	4501.-4501.4502.1..	4502.-4502.4503.1..	4503.-4503.4504.1..
000480	000		4504.-4504.4505.1..	4511.-4511.4512.1..	4512.-4512.4513.1..
000481	000		4513.-4513.4514.1..	4514.-4514.4515.1..	4521.-4521.4522.1..
000482	000		4522.-4522.4524.1..	4524.-4524.4525.1..	4531.-4531.4532.1..
000483	000		4532.-4532.4533.1..	4533.-4533.4534.1..	4534.-4534.4535.1..
000484	000		4541.-4541.4542.1..	4542.-4542.4543.1..	4543.-4543.4544.1..
000485	000		4544.-4544.4545.1..	4551.-4551.4552.1..	4552.-4552.4554.1..
000486	000		4554.-4554.4555.1..	4561.-4561.4562.1..	4562.-4562.4563.1..
000487	000		4563.-4563.4564.1..	4564.-4564.4565.1..	4571.-4571.4572.1..
000488	000		4572.-4572.4573.1..	4573.-4573.4574.1..	4574.-4574.4575.1..
000489	000		4581.-4581.4582.1..	4582.-4582.4583.1..	4583.-4583.4584.1..
000490	000		4584.-4584.4585.1..	4591.-4591.4592.1..	4592.-4592.4593.1..
000491	000		4593.-4593.4594.1..	4594.-4594.4595.1..	4601.-4601.4602.1..
000492	000		4602.-4602.4603.1..	4603.-4603.4604.1..	4604.-4604.4605.1..
000493	000	E	4611.-4611.4612.1..	4612.-4612.4614.1..	4614.-4614.4615.1..
000494	000	REM	LIQUID CONDUCTORS FOR CHAMBER (BLUE CIRCUIT-UP)		
000495	000	N	4705.-4705.4704.1..	4704.-4704.4703.1..	4703.-4703.4702.1..
000496	000		4702.-4702.4701.1..	4715.-4715.4714.1..	4714.-4714.4713.1..
000497	000		4713.-4713.4712.1..	4712.-4712.4711.1..	4725.-4725.4724.1..
000498	000		4724.-4724.4722.1..	4722.-4722.4721.1..	4735.-4735.4734.1..
000499	000		4734.-4734.4733.1..	4733.-4733.4732.1..	4732.-4732.4731.1..
000500	000		4745.-4745.4744.1..	4744.-4744.4743.1..	4743.-4743.4742.1..
000501	000		4742.-4742.4741.1..	4755.-4755.4754.1..	4754.-4754.4752.1..
000502	000		4752.-4752.4751.1..	4765.-4765.4764.1..	4764.-4764.4763.1..

000503	000		4763,-4763,4762,.1, 4762,-4762,4761,.1, 4775,-4775,4774,.15
000504	000		4774,-4774,4773,.1, 4773,-4773,4772,.1, 4772,-4772,4771,.15
000505	000		4785,-4785,4784,.1, 4784,-4784,4783,.1, 4783,-4783,4782,.15
000506	000		4782,-4782,4781,.1, 4795,-4795,4794,.1, 4794,-4794,4793,.15
000507	000		4793,-4793,4792,.1, 4792,-4792,4791,.1, 4805,-4805,4804,.15
000508	000		4804,-4804,4803,.1, 4803,-4803,4802,.1, 4802,-4802,4801,.15
000509	000	E	4815,-4815,4814,.1, 4814,-4814,4812,.1, 4812,-4812,4811,.15
000510	000		
000511	000	REM	
000512	000	REM	PG 11.1, 13
000513	000	REM	
000514	000	REM	LIQUID SUPPLY TO CHAMBER (RED CIRCUIT)
000515	000	N	8099,-1000,8099,.1, 8100,-8099,8100,.1, 8101,-8100,8101,.15
000516	000		8102,-8101,8102,.1, 8103,-8102,8103,.1, 8104,-8103,8105,.15
000517	000		8105,-8105,8107,.1, 8106,-8105,8109,.1, 8107,-8105,8111,.15
000518	000		8108,-8102,8104,.1, 8109,-8104,8106,.1, 8110,-8106,8108,.15
000519	000		8111,-8106,8110,.1, 8112,-8106,8112,.1, 8121,-8100,8121,.15
000520	000		8122,-8121,8122,.1, 8123,-8122,8123,.1, 8124,-8123,8125,.15
000521	000		8125,-8125,8127,.1, 8126,-8125,8129,.1, 8127,-8125,8131,.15
000522	000	E	8128,-8122,8124,.1, 8129,-8124,8126,.1, 8130,-8126,8128,.15
000523	000	REM	8131,-8126,8130,.1, 8132,-8126,8132,.15
000524	000	N	LIQUID RETURN FROM CHAMBER (RED CIRCUIT)
000525	000		8201,-8207,8205,.1, 8202,-8209,8205,.1, 8203,-8211,8205,.15
000526	000		8204,-8205,8203,.1, 8205,-8203,8202,.1, 8206,-8208,8206,.15
000527	000		8207,-8210,8206,.1, 8208,-8212,8206,.1, 8209,-8206,8204,.15
000528	000		8210,-8204,8202,.1, 8211,-8202,8201,.1, 8212,-8201,8200,.15
000529	000		8221,-8227,8225,.1, 8222,-8229,8225,.1, 8223,-8231,8225,.15
000530	000		8224,-8225,8223,.1, 8225,-8223,8222,.1, 8226,-8228,8226,.15
000531	000	E	8227,-8230,8226,.1, 8228,-8232,8226,.1, 8229,-8226,8224,.15
000532	000		8230,-8224,8222,.1, 8231,-8222,8221,.1, 8232,-8221,8200,.15
000533	000	REM	8233,-8200,8199,.1, 8234,-8199,900,.15
000534	000		LIQUID SUPPLY TO CHAMBER (BLUE CIRCUIT)
000535	000		9099,-1000,9199,.1, 9100,-9100,9099,.1, 9101,-9101,9100,.15
000536	000		9102,-9102,9101,.1, 9103,-9103,9102,.1, 9104,-9105,9103,.15
000537	000		9105,-9107,9105,.1, 9106,-9109,9105,.1, 9107,-9111,9105,.15
000538	000		9108,-9104,9102,.1, 9109,-9106,9104,.1, 9110,-9108,9106,.15
000539	000		9111,-9110,9106,.1, 9112,-9112,9106,.1, 9121,-9121,9100,.15
000540	000		9122,-9122,9121,.1, 9123,-9123,9122,.1, 9124,-9125,9123,.15
000541	000		9125,-9127,9125,.1, 9126,-9129,9125,.1, 9127,-9131,9125,.15
000542	000		9128,-9124,9122,.1, 9129,-9126,9124,.1, 9130,-9128,9126,.15
000543	000	REM	9131,-9130,9126,.1, 9132,-9132,9126,.15
000544	000		LIQUID RETURN FROM CHAMBER (BLUE CIRCUIT)
000545	000		9201,-9205,9207,.1, 9202,-9205,9209,.1, 9203,-9205,9211,.15
000546	000		9204,-9203,9205,.1, 9205,-9202,9203,.1, 9206,-9206,9208,.15
000547	000		9207,-9206,9210,.1, 9208,-9206,9212,.1, 9209,-9204,9206,.15
000548	000		9210,-9202,9204,.1, 9211,-9201,9202,.1, 9212,-9200,9201,.15
000549	000		9221,-9225,9227,.1, 9222,-9225,9229,.1, 9223,-9225,9231,.15
000550	000		9224,-9223,9225,.1, 9225,-9222,9223,.1, 9226,-9226,9228,.15
000551	000		9227,-9226,9230,.1, 9228,-9226,9232,.1, 9229,-9224,9226,.15
000552	000		9230,-9222,9224,.1, 9231,-9221,9222,.1, 9232,-9200,9221,.15
000553	000	REM	9233,-9199,9200,.1, 9234,-900,9099,.15
000554	000	REM	PG 15
000555	000	REM	
000556	000	REM	LIQUID SUPPLY AND RETURN CONNECTIONS TO CHAMBER (RED CIRCUIT)
000557	000	N	8301,-8110,4501,.1, 8302,-8108,4511,.1, 8303,-8111,4521,.15
000558	000		8304,-8109,4531,.1, 8305,-8107,4541,.1, 8306,-8132,4551,.15


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000559 000      8307,-8130,4561,.1, 8308,-8128,4571,.1, 8309,-8131,4581,.15
000560 000      8310,-8129,4591,.1, 8311,-8127,4601,.1, 8312,-8112,4611,.15
000561 000      8321,-4505,8210,.1, 8322,-4515,8208,.1, 8323,-4525,8211,.15
000562 000      8324,-4535,8209,.1, 8325,-4545,8207,.1, 8326,-4555,8232,.15
000563 000      8327,-4565,8230,.1, 8328,-4575,8228,.1, 8329,-4585,8231,.15
000564 000      8330,-4595,8229,.1, 8331,-4605,8227,.1, 8332,-4615,8212,.15
000565 000      REM LIQUID SUPPLY AND RETURN CONNECTIONS TO CHAMBER (BLUE CIRCUIT)
000566 000      9301,-9210,4705,.1, 9302,-9208,4715,.1, 9303,-9211,4725,.15
000567 000      9304,-9209,4735,.1, 9305,-9207,4745,.1, 9306,-9232,4755,.15
000568 000      9307,-9230,4765,.1, 9308,-9228,4775,.1, 9309,-9231,4785,.15
000569 000      9310,-9229,4795,.1, 9311,-9227,4805,.1, 9312,-9212,4815,.15
000570 000      9321,-4701,9110,.1, 9322,-4711,9108,.1, 9323,-4721,9111,.15
000571 000      9324,-4731,9109,.1, 9325,-4741,9107,.1, 9326,-4751,9132,.15
000572 000      9327,-4761,9130,.1, 9328,-4771,9128,.1, 9329,-4781,9131,.15
000573 000      9330,-4791,9129,.1, 9331,-4801,9127,.1, 9332,-4811,9112,.15
000574 000      REM
000575 000      REM INSULATION TO AIR CONDUCTORS
000576 000      REM
000577 000      12001,2001,1,0,0045, 12002,2002,1,0,009, 12003,2003,1,0,0095
000578 000      12004,2004,1,0,009, 12005,2005,1,0,0045
000579 000      GEN 12011,5,1,2011,1,1,0,1,1,0,009,1,
000580 000      GEN 12021,5,1,2021,1,1,0,1,1,0,009,1,5
000581 000      12041,2041,1,0,0045
000582 000      GEN 12042,3,1,2042,1,1,0,1,1,0,009,1,
000583 000      12045,2045,1,0,0045
000584 000      GEN 14001,5,1,4001,1,1,0,1,1,0,0,01,1,5
000585 000      GEN 14011,5,1,4011,1,1,0,1,1,0,0,01,1,
000586 000      GEN 14021,5,1,4021,1,1,0,1,1,0,0,01,1,5
000587 000      GEN 14031,5,1,4031,1,1,0,1,1,0,0,01,1,
000588 000      GEN 14041,5,1,4041,1,1,0,0,015
000589 000      GEN 14051,5,1,4051,1,1,0,0,015
000590 000      GEN 14061,5,1,4061,1,1,0,0,015
000591 000      GEN 14071,5,1,4071,1,1,0,0,015
000592 000      GEN 14081,5,1,4081,1,1,0,0,015
000593 000      GEN 14091,5,1,4091,1,1,0,0,015
000594 000      GEN 14101,5,1,4101,1,1,0,0,015
000595 000      GEN 14111,5,1,4111,1,1,0,0,015
000596 000      16001,6001,1,0,0045, 16002,6002,1,0,009, 16003,6003,1,0,0095
000597 000      16004,6004,1,0,009, 16005,6005,1,0,0045
000598 000      GEN 16011,5,0,6011,1,1,0,0,0095
000599 000      GEN 16021,5,0,6021,1,1,0,0,0095
000600 000      GEN 16031,5,0,6031,1,1,0,0,0095
000601 000      16041,6041,1,0,0045, 16045,6045,1,0,0045
000602 000      GEN 16042,3,0,6042,1,1,0,0,0095
000603 000      END
000604 000      BCD
000605 NEW 001      3CONSTANTS DATA
000606 NEW 001      TIMEND,500.
000607 -02 000      OUTPUT,0.2
000608 000      DRLXCA=.01, ARLXCA=.01, NLOOP=105
000609 000      ITEST=0, LTEST=05
000610 000      MTEST,0 5 MTEST=0 FOR MOSES MTEST=3 FOR ANALYTICAL
000611 000      1=2.25GALLONS PER MINUTE
000612 000      5,0.06 $LOCATION FOR SPECIFIC HEAT
000613 000      6,0.4 $LOCATION FOR RHO
000614 000      7,0.024 $LOCATION FOR RHCC
000615 000      8,66.0 $TEMPERATURE

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000615 000 9.1.0 SGPM FLO RATE
000616 000 10.0.00223 SGPM K=FT3/HR
000617 000 11.0.96 STOTAL CP TO SYSTEM
000618 000 12.0.125 SPROPORTIONAL FLOW FACTOR FOR TOP,BOTTOM DISCHEX
000619 000 13.0.25 SPROPORTIONAL FLOW FACTOR FOR BOTTOM, TOP CYLINDER HEX
000620 000 15. SLOCATION FOR FLOW CONDUCTORS TO NODES 3599,3699,5599,5699
000621 000 16. SLOCATION FOR FLOW CONDUCTORS TO 8099,9199
000622 000 17. SLOCATION FOR 1/15 FLOW CONDUCTORS DISC HEX
000623 000 18. SLOCATION FOR 1/5 FLOW CONDUCTOR DISC HEX
000624 000 19. SLOCATION FOR 1/12 FLOW CONDUCTORS FOR CYLINDER HEX
000625 000 20. SK16(.5)
000626 000 21. SK20(.5)
000627 000 22. SK21(.5)
000628 000 23. SK22(.333)
000629 000 37=955 NO. OF ITEMS ON MISC FILE
000630 000 38=25 SLOGICAL UNIT
000631 000 39=30005NO. OF LOCATIONS
000632 000 101=95 SNUMBER OF ITEMS ON MIS. FILE
000633 000 102=25 SLGICAL UNIT OF FILE CONT. TEMP. AND TEST DATA
000634 NEW 001 110. SSPACE FOR T IN
000635 NEW 001 111. SSPACE FOR CONTRL VOLTAGE
000636 NEW 001 112. SSPACE FOR PLANT VOLTAGE
000637 NEW 001 113. SDIFFERENTIAL CONTROL VOLTAGE
000638 NEW 001 200.0.0 S TOTAL HOT FLOW
000639 NEW 001 201.0.0 S TOTAL COLD FLOW
000640 NEW 001 202.82.8 S HOT RESERVOIR TEMP
000641 NEW 001 203.23.4 S COLD RESERVOIR TEMP
000642 NEW 001 1000.0
000643 000 END
000644 000 BCD JARRAY DATA
000645 000 REM TEMPERATURE ARRAY FOR ORONITE FLOCOOL 100 FLUID
000646 000 1.-50.-30.-10.-10.-30.-50.-70.-90.-110.-130.-ENDS
000647 000 REM ORONITE FLOCOOL 100 THERMAL CONDUCTIVITY, -50 TO 130 DEG. F 20 DEG.
000648 000 REM INCREMENTS BTU/(HR., FT. DEG. F)
000649 000 2..06325..06275..06225..06175..06125..06075..06025..05975..05925
000650 000 .05875.ENDS
000651 000 REM ORONITE FLOCOOL 100 SPECIFIC HEAT, -50. TO 130. DEG F IN 20.DEG.
000652 000 REM INCREMENTS BTU/(LB., DEG. F)
000653 000 3..395..405..415..425..435..445..455..465..475..485.ENDS
000654 000 REM ORONITE FLOCOOL 100 DENSITY -50. TO 130. DEG. F IN 20. DEG. INCREMENT
000655 000 REM DENSITY UNITS ARE LB/FT..3
000656 000 4.59.25.58.75.58.25.57.75.57.25.56.75.56.25.55.75.55.25.54.75.ENDSE
000657 000 REM ORONITE FLOCOOL 100 VISCOSITY, FT**2/SEC. IN 20.DEG INCREMENTS
000658 000 REM KINEMATIC VISCOSITY (MUST GET CORRECT UNITS IN SUBROUTINE FILM)
000659 000 5..000121..000104..000086..00007..000053..000036..000027..000026
000660 000 .000026.ENDS
000661 000 REM LOCATIONS ARE RESERVED ONLY FOR REPRESENTATIVE NODES IN TOP AND BOTTO
000662 000 REM H/ES, CHAMBER, SUPPLY, AND RETURN SINCE TEMP. VARIES SO LITTLE
000663 000 REM (EVEN THE NO. LISTED BELOW MAY BE TWW TOO MANY)
000664 000 REM 1=3503 2=3513 3=3531 4=3535 5=3553 6=3563 7=4501
000665 000 REM 8=4502 9=4503 10=4504 11=4505 12=4513 13=4522 14=1000
000666 000 REM 15=8102 16=8122 17=8202 18=8222 19=9102 20=9122 21=9202
000667 000 REM 22=9222 23=5503 24=5515 25=5531 26=5535 27=5553 28=5563
000668 000 REM SEVERAL NOS. LISTED APPLIES TO TWO LIQUID NODES (CORRESPONDENCE IS
000669 000 REM 35XX TO 37XX, 45XX TO 47XX, OTHER LOCATIONS ARE FOR SINGLE LOCATIONS)
000670 000 REM ALSO SOME ARE REPRESENTATIVE OF MANY FOR EXAMPLE 4503 OR 4513 FOR

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000671 000 REM ALL COLS. WITHOUT WINDOWS. 4511 APPLIES TO ALL COLS. WITH WINDOWS
000672 000 GEN 20,SPACE. 50,ENDS ARRAY TO STORE CALCULATED CONDUCTIVITIES OF FLUID
000673 000 GEN 30,SPACE. 50,ENDS DENSITY LB/FT**3 (SAME NODE CORRESPONDENCE AS 401
000674 000 GEN 40,SPACE. 50,ENDSVISCOSITY LB/FTSEC(SAME NODE CORRESPONDENCE AS 401
000675 000 GEN 50,SPACE. 50,ENDS CP BTU/LB,DEG. F (SAME NODE CORRESPONDENCE AS 401
000676 000 REM 11 CONTAINS LENGTHS IN INCHES (CONVERT TO FEET) RED CIRCUIT TOP HE
000677 000 REM 1=3501 2=3502 3=3503 4=3504 5=3505 6=3511 7=3512
000678 000 REM 8=3513 9=3514 10=3515 11=3521 12=3522 13=3526 14=3527
000679 000 REM 15=3531 16=3532 17=3535 18=3536 19=3541 20=3542 21=3546
000680 000 REM 22=3547 23=3551 24=3552 25=3553 26=3554 27=3555 28=3561
000681 000 REM 29=3562 30=3563 31=3564 32=3565 ALSO GOOD FOR EQUIVALENT NOS.
000682 000 REM ON BOTTOM 1=5501 2=5502 ETC.
000683 000 11..9.3..2.19.3...9.3.1.3..2.27.3..3.1.3.7.4.
000684 000 4..3.7.2.74.2.64.2.52.2.76.3.7.4..4..3.7.3.1.3.
000685 000 3.. 3.. 3.1. .9. 3.. 3.. 3.. .9,ENDS
000686 000 REM 12 CONTAINS LENGTH IN INCHES (CONVERT TO FEET) BLUE CIRCUIT TOP HE
000687 000 REM 1=3701 2=3702 3=3703 4=3704 5=3705 6=3711 7=3712
000688 000 REM 8=3713 9=3714 10=3715 11=3721 12=3722 13=3726 14=3727
000689 000 REM 15=3731 16=3732 17=3735 18=3736 19=3741 20=3742 21=3746
000690 000 REM 22=3747 23=3751 24=3752 25=3753 26=3754 27=3755 28=3761
000691 000 REM 29=3762 30=3763 31=3764 32=3765 ALSO GOOD FOR EQUIVALENT
000692 000 REM NUMBERS ON THE BOTTOM 1=5701 2=5702 ETC.
000693 000 12.1.435.3..2.19.3..1.435.3.35.3..2.27.3..3.35.3.8.4.
000694 000 4..3.8.2.74.2.64.2.52.2.76.3.8.4..4..3.8.3.35.3.
000695 000 3.. 3.. 3.35.1.435.3.. 3.. 3.. 1.435,ENDS
000696 000 REM 13 CONTAINS LENGTH IN INCHES (CONVERT TO FEET) RED CIRCUIT THEN BLUE
000697 000 REM A TYPICAL COLUMN FOR A WINDOWLESS ROW IS GIVEN AND THEN ONE FOR A COL
000698 000 REM CONTAINING A WINDOW
000699 000 REM 1=4501 2=4502 3=4503 4=4504 5=4505 6=4521 7=4522
000700 000 REM 8=4524 9=4525 10=4705 11=4704 12=4703 13=4702 14=4701
000701 000 REM 15=4725 16=4724 17=4722 18=4721(45XX ARE RED CIRCUIT 47XX BLUE)
000702 000 13..776.2.196.2.196. 2.196. 1.735. .766. 2.196. 2.196. 1.735
000703 000 .776.2.196.2.196. 2.196. 1.735. .766. 2.196. 2.196. 1.735,ENDS
000704 000 REM 21 CONTAINS DIAMETERS IN INCHES (CONVERT TO FEET)
000705 000 REM 1=3501,3505,3561,3565(AND 55XX)
000706 000 REM 2=3502 TO 3504,3512 TO 3514. 3552 TO 3554,3562 TO 3564.
000707 000 REM (AND 37XX,55XX,57XX.
000708 000 REM 3=3521,3527,3541,3547(AND 55XX.
000709 000 REM 4=3522,3526,3542,3546(AND 37XX,55XX,57XX)
000710 000 REM 5=3531,3536,3731,3736,3721,3727,3741,3747(AND 55XX,57XX)
000711 000 REM 6=3532,3535(AND 37XX,55XX,57XX)
000712 000 REM 7=3511,3515,3551,3555(AND 55XX)
000713 000 REM 8=3711,3715,3751,3755(AND 57XX)
000714 000 REM 9=3701,3705,3761,3765(AND 57XX)
000715 000 REM 10=4501 TO 4505,4511 TO 4515,4561 TO 4565,4571 TO 4575
000716 000 REM 4581 TO 4585,4591 TO 4595,4601 TO 4605,4711 TO 4715
000717 000 REM 4731 TO 4735,4741 TO 4745,4771 TO 4775,4781 TO 4785
000718 000 REM 4801 TO 4805
000719 000 REM 4701 TO 4705,4761 TO 4765,4531 TO 4535
000720 000 REM 12=4791 TO 4795
000721 000 REM 13=4521,4522,4524,4525,4551,4552,4554,4555,4611,4612
000722 000 REM 4614,4615,4721,4722,4724,4725,4771,4772,4774,4775
000723 000 REM 4811,4812,4814,4815
000724 000 21..4110..6250..1383..1250..1250..1250..1386..1376..1702..1250
000725 000 .1250..1250..1250,ENDSDIAMETERS,INCHES (4R)
000726 000 22..3079..2443..1508..1410..1410..1410..2616..2604..2304..2821

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000727 000 .2443,.3154,.3154,END$DIAMETER,INCHES (DEQ)
000728 000 REM 23-CONTAINS AREAS (SAME CORRESPONDENCE AS ARRAY 21)
000729 000 23,.07451,.04688,.01786,.01562,.01562,.01562,.05375,.05324
000730 000 .07163,.06250,.04688,.07812,.07812,END$AREAS IN IN.**2
000731 000 REM 24CONTAINS VOLUMES IN IN.**3
000732 000 REM 1 THRU 9 HAVE SAME CORRESPONDENCE AS ARRAY 21
000733 000 REM 10=4501,4511,4541,4561,4571,4581,4591,4601:
000734 000 REM 4715,4735,4745,4775,4785,4805
000735 000 REM 11=4502 TO 4504,4512 TO 4514,4542 TO 4544,4562 TO 4564
000736 000 REM 4572 TO 4574,4582 TO 4584,4592 TO 4594,4602 TO 4604
000737 000 REM 4712 TO 4714,4732 TO 4734,4742 TO 4744,4772 TO 4774
000738 000 REM 4782 TO 4784,4802 TO 4804
000739 000 REM 12=4505,4515,4545,4565,4575,4585,4595,4605
000740 000 REM 4711,4731,4741,4771,4781,4801
000741 000 REM 13=4531,4705,4765
000742 000 REM 14=4532 TO 4534,4702 TO 4704,4762 TO 4764
000743 000 REM 15=4535,4701,4761
000744 000 REM 16,4795
000745 000 REM 17=4792 TO 4794
000746 000 REM 18=4791
000747 000 REM 19,4521,4551,4611,4725,4775,4815
000748 000 REM 20=4522,4524,4552,4554,4612,4614,4722,4724
000749 000 REM 4722,4774,4812,4814
000750 000 REM 21=4525,4555,4615,4715,4721,4771,4811
000751 000 24,.06705,.14062,.06610,.06250,.05938
000752 000 .05156,.16662,.17834,.10278,.04788
000753 000 .13725,.10844,.03591,.10294,.08133
000754 000 .05984,.17156,.13555,.05984,.19484
000755 000 .13555,END$VOLUMES IN IN.**3
000756 000 GEN 80,SPACE,50,END$ VELOCITIES IN FT./SEC.
000757 000 -98$ GRAPH TITLE
000758 000 BCD 6CLOUD PHYSICS CHAMBER THERMAL TEST
000759 000 BCD 6CORRELATION ANALYSIS
000760 000 ENDS
000761 000 -99$ YLABEL ARRAY FOR PLOTS
000762 000 BCD 6 TEMPERATURE IN DEGREES CENTIGRADE
000763 000 BCD 6
000764 000 ENDS
000765 000 REM ARRAY 100 IS THE MASTER SPACE ARRAY FOR ALL PLOTS LENGTH MUST
000766 000 REM BE EQUAL TO NO. OF CURVES+1 TIMES NO. OF OUTPUTS. THE LENGTH
000767 000 REM CHOSEN WAS 500OUTPUTS * (5CURVES+1)=3000 LOCATIONS
000768 000 GEN -100,SPACE,3000,END$ MASTER SPACE ARRAY
000769 000 -101
000770 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000771 000 BCD 61S 1 TO 3 = 4003,4004, SENSOR 1
000772 000 END
000773 000 -102
000774 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000775 000 BCD 61S 1 TO 3 = 4013,4014, SENSOR 2
000776 000 END
000777 000 -103
000778 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000779 000 BCD 61S 1 TO 3 = 4023,4024, SENSOR 3
000780 000 END
000781 000 -104
000782 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE

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000783	000	BCD 61S 1 TO 3 = 4033,4034, SENSOR 4
000784	000	END
000785	000	-105
000786	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000787	000	BCD 61S 1 TO 3 = 4043,4044, SENSOR 5
000788	000	END
000789	000	-106
000790	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000791	000	BCD 61S 1 TO 3 = 4053,4054, SENSOR 6
000792	000	END
000793	000	-107
000794	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000795	000	BCD 61S 1 TO 3 = 4063,4064, SENSOR 7
000796	000	END
000797	000	-108
000798	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000799	000	BCD 61S 1 TO 3 = 4073,4074, SENSOR 8
000800	000	END
000801	000	-109
000802	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000803	000	BCD 61S 1 TO 3 = 4083,4084, SENSOR 9
000804	000	END
000805	000	-110
000806	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000807	000	BCD 61S 1 TO 3 = 4093,4094, SENSOR 10
000808	000	END
000809	000	-111
000810	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000811	000	BCD 61S 1 TO 3 = 4103,4104, SENSOR 11
000812	000	END
000813	000	-112
000814	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000815	000	BCD 61S 1 TO 3 = 4113,4114, SENSOR 12
000816	000	END
000817	000	-113
000818	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000819	000	BCD 61S 1 TO 4 = 4004, SENSOR 13, 4003, SENSOR 14
000820	000	END
000821	000	-114
000822	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000823	000	BCD 61S 1 TO 3 = 4002,4003, SENSOR 15
000824	000	END
000825	000	-115
000826	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000827	000	BCD 61S 1 TO 4 = 4002, SENSOR 16, 4001, SENSOR 17
000828	000	END
000829	000	-116
000830	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000831	000	BCD 61S 1 TO 4 = 4001, SENSOR 18, 4064, SENSOR 19
000832	000	END
000833	000	-117
000834	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000835	000	BCD 61S 1 TO 2 = 4063, SENSOR 20
000836	000	END
000837	000	-118
000838	000	BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE


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000895 000 BCD 61S 1T04=5003,SENSOR48,5032,SENSOR49
000896 000 END
000897 000 -133
000898 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000899 000 BCD 61S 1T04=5032,SENSOR50,5031,SENSOR51
000900 000 END
000901 000 -134
000902 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000903 000 BCD 61S 1T04=5031,SENSOR52,1000,SENSOR53
000904 000 END
000905 000 -135
000906 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000907 000 BCD 61S 1T04=3600,SENSOR54,7002,SENSOR55
000908 000 END
000909 000 -136
000910 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000911 000 BCD 61S 1T04=5600,SENSOR56,7004,SENSOR57
000912 000 END
000913 000 -137
000914 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000915 000 BCD 61S 1T04=3700,SENSOR58,7001,SENSOR59
000916 000 END
000917 000 -138
000918 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000919 000 BCD 61S 1T04=5700,SENSOR60,7003,SENSOR61
000920 000 END
000921 000 -139
000922 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000923 000 BCD 61S 1T04=8102,SENSOR62,9122,SENSOR63
000924 000 END
000925 000 -140
000926 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000927 000 BCD 61S 1T04=9222,SENSOR64,8222,SENSOR65
000928 000 END
000929 000 -141
000930 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000931 000 BCD 61S 1T04=8122,SENSOR66,9102,SENSOR67
000932 000 END
000933 000 -142
000934 000 BCD 6SYSTEM TIME SECONDS, CORRESPONDENCE
000935 000 BCD 61S 1T04=9202,SENSOR69,8202,SENSOR70
000936 000 END
000937 000 1000.0,.68,.5,-22,.200,-21,.500,-20,.1000,-15,-END
000938 NEW 001 200.0,.0.001,9.99,0.001,10,.2.2,1000,.2.2,END
000939 -03 000 201.0,.66.4.60,.66.2.65,.66.6.110,.66.6.140,-3.1,180,-3.8,250,-.4
000940 000 300.1.4.400,-.4.500,-2.6.550,-4.9.750,-7.6.950,-12.1
000941 000 1000,-11.2,1100,-10.3,1250,.3.6,1500,.26.6,1925,.58.9
000942 000 2225,.68,.2500,.75.2,END TEMPERATURE VS TIME
000943 NEW 001 66.0,.68.9.10,.68.9.383,.32,.1000,.32,END
000944 NEW 001 88.-1000,-11.2,-250.-11.2,250.71.6,1000.71.6,ENDS CONTROL INPUT
000945 000 END
000946 000 BCD 3EXECUTION
000947 000 F COMMON /NOREAD/ LENGTH
000948 000 F DIMENSION X(10000)
000949 000 F NOIM=10000
000950 000 F NTH=0

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000951 000 F LENGTH=0
000952 000 F REWIND 25
000953 000 TORDER
000954 000 C
000955 000 C** INITIALIZATION
000956 000 C INITIALIZE ALL TEMPS.
000957 NEW 001 M CALL STFSQS(69.8,NNT,T2001)
000958 -01 000 M CALL ARYDIV(NGT,G2001,3600.,G2001)
000959 000 M CALL ARYDIV(A2,A(2+1),3600.,A(2+1))
000960 000 M CALL STFSQS(.5,A80,A(80+1))
000961 000 M CALL ARYDIV(A11,A(11+1),12.,A(11+1))
000962 000 M CALL ARYDIV(A12,A(12+1),12.,A(12+1))
000963 000 M CALL ARYDIV(A13,A(13+1),12.,A(13+1))
000964 000 M CALL ARYDIV(A21,A(21+1),12.,A(21+1))
000965 000 M CALL ARYDIV(A23,A(23+1),144.,A(23+1))
000966 000 M CALL ARYDIV(A24,A(24+1),1728.,A(24+1))
000967 000 STSEP(80.,T1)SAIR TEMPERATURE
000968 000 C CALCULATE VELOCITIES IN FT/SEC
000969 000 CNFRWD
000970 000 M CALL FFPRTZ(LENGTH,NNT,K101,A100,10,25)
000971 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A101,A99,4003,4004,
000972 NEW 001 M $ 0.0,0.1)
000973 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A102,A99,4013,4014,
000974 NEW 001 M $ 0.0,0.1)
000975 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A103,A99,4023,4024,
000976 NEW 001 M $ 0.0,0.1)
000977 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A104,A99,4033,4034,
000978 NEW 001 M $ 0.0,0.1)
000979 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A105,A99,4043,4044,
000980 NEW 001 M $ 0.0,0.1)
000981 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A106,A99,4053,4054,
000982 NEW 001 M $ 0.0,0.1)
000983 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A107,A99,4063,4064,
000984 NEW 001 M $ 0.0,0.1)
000985 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A108,A99,4073,4074,
000986 NEW 001 M $ 0.0,0.1)
000987 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A109,A99,4083,4084,
000988 NEW 001 M $ 0.0,0.1)
000989 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A110,A99,4093,4094,
000990 NEW 001 M $ 0.0,0.1)
000991 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A111,A99,4103,4104,
000992 NEW 001 M $ 0.0,0.1)
000993 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A112,A99,4113,4114,
000994 NEW 001 M $ 0.0,0.1)
000995 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A113,A99,4004,0,
000996 NEW 001 M $ 4003,0.0,1)
000997 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A114,A99,4002,4003,
000998 NEW 001 M $ 0.0,0.1)
000999 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A115,A99,4002,0,
001000 NEW 001 M $ 4001,0.0,1)
001001 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A116,A99,4001,0,
001002 NEW 001 M $ 4064,0.0,1)
001003 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A117,A99,4063,0,
001004 NEW 001 M $ 0.0,0.1)
001005 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A118,A99,4062,0,
001006 NEW 001 M $ 0.0,0.1)

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001007 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A119,A99,4062,0,
001008 NEW 001 M $ 4061,0,0,1)
001009 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A120,A99,4061,0,
001010 NEW 001 M $ 4013,0,0,1)
001011 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A121,A99,4012,0,
001012 NEW 001 M $ 4012,0,0,1)
001013 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A122,A99,4022,0,
001014 NEW 001 M $ 3035,0,0,1)
001015 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A123,A99,3035,0,
001016 NEW 001 M $ 3036,0,0,1)
001017 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A124,A99,3036,0,
001018 NEW 001 M $ 3013,0,0,1)
001019 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A125,A99,3013,0,
001020 NEW 001 M $ 3003,0,0,1)
001021 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A126,A99,3003,0,
001022 NEW 001 M $ 3032,0,0,1)
001023 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A127,A99,3032,0,
001024 NEW 001 M $ 3031,0,0,1)
001025 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A128,A99,3031,0,
001026 NEW 001 M $ 5035,0,0,1)
001027 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A129,A99,5035,0,
001028 NEW 001 M $ 5036,0,0,1)
001029 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A130,A99,5036,0,
001030 NEW 001 M $ 5013,0,0,1)
001031 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A131,A99,5013,0,
001032 NEW 001 M $ 5003,0,0,1)
001033 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A132,A99,5003,0,
001034 NEW 001 M $ 5032,0,0,1)
001035 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A133,A99,5032,0,
001036 NEW 001 M $ 5031,0,0,1)
001037 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A134,A99,5031,0,
001038 NEW 001 M $ 1000,0,0,1)
001039 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A135,A99,3600,0,
001040 NEW 001 M $ 7002,0,0,1)
001041 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A136,A99,5600,0,
001042 NEW 001 M $ 7004,0,0,1)
001043 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A137,A99,3700,0,
001044 NEW 001 M $ 7001,0,0,1)
001045 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A138,A99,5700,0,
001046 NEW 001 M $ 7003,0,0,1)
001047 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A139,A99,8102,0,
001048 NEW 001 M $ 9122,0,0,1)
001049 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A140,A99,9222,0,
001050 NEW 001 M $ 8222,0,0,1)
001051 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A141,A99,8122,0,
001052 NEW 001 M $ 9102,0,0,1)
001053 NEW 001 M CALL FLOT12(51,121,NNT,K37,K38,K39,A100,A98,A142,A99,9202,0,
001054 NEW 001 M $ 8202,0,0,9)
001055 -63 000 END
001056 000 BCD 3VARIABLES I
001057 000 REM SUPPLY BOUNDARY TEMPERATURE
001058 000 D1DEG1(TIMEM,A200,K1)
001059 NEW 001 M IF(TIMEM.LT.10.) GO TO 301
001060 NEW 001 D1DEG1(TIMEM,A66,K110)
001061 NEW 001 MLTPY(K110,.5,K111)
001062 NEW 001 MLTPY(T4061,0.5,K112)

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001063 NEW 001 SUB(K1,1,K112,K113)
001064 NEW 001 M E1N=XK(113)/1.8
001065 NEW 001 M IF(XK(1000).GT.0) GO TO 300
001066 NEW 001 M XK(1000)= 1
001067 NEW 001 M B1= 0.2
001068 NEW 001 M B2= 100.
001069 NEW 001 M B3= 20.
001070 NEW 001 M B4= 1.
001071 NEW 001 M B5= 0.25
001072 NEW 001 M B6= 1.
001073 NEW 001 M B7= 1.
001074 NEW 001 M TSP= DTIMEU
001075 NEW 001 M TSP2= TSP/2.
001076 NEW 001 M TSP12= TSP*.2/12.
001077 NEW 001 M D1= B1*TSP2
001078 NEW 001 M D2= B5+B6*TSP2+B7*TSP12
001079 NEW 001 M D3= -2.*B5+B7*TSP12*10.
001080 NEW 001 M D4= B5-B6*TSP2+B7*TSP12
001081 NEW 001 M D5=B2+B3*TSP2+B4*TSP12
001082 NEW 001 M D6= -2.*B2+B4*TSP12*10.
001083 NEW 001 M D7= B2-B3*TSP2+B4*TSP12
001084 NEW 001 M E1N1= E1N
001085 NEW 001 M O1N1= 0.0
001086 NEW 001 M E2N1= 0.0
001087 NEW 001 M E2N2= 0.0
001088 NEW 001 M O2N1= 0.0
001089 NEW 001 M O2N2= 0.0
001090 NEW 001 M 300 CONTINUE
001091 NEW 001 M O1N= O1N1+D1*(E1N+E1N1)
001092 NEW 001 M E2N=ABS(O1N)*0.75*O1N
001093 NEW 001 M O2N= (D5*E2N+D6*E2N1+D7*E2N2-D3*O2N1-D4*O2N2)/D2
001094 NEW 001 M E1N1= E1N
001095 NEW 001 M O1N1= O1N
001096 NEW 001 M E2N2= E2N1
001097 NEW 001 M E2N1= E2N
001098 NEW 001 M O2N2= O2N1
001099 NEW 001 M O2N1= O2N
001100 NEW 001 M STEST=O2N
001101 NEW 001 MLTPLY(STEST,1000.,STEST)
001102 NEW 001 D1DEG1(STEST,A88,K8)
001103 NEW 001 M 301 CONTINUE
001104 -01 000 STFSEP(K8,T1000)
001105 000 D1D1DA(K8,A1,A3,K5)
001106 000 D1D1DA(K8,A1,A4,K6)
001107 000 D1DEG1(TIMEH,A200,K9)
001108 NEW 001 M COLFLO=XK(9)*((XK(8)-XK(202))/(XK(203)-XK(202)))
001109 NEW 001 M XK(200)=XK(200)+DTIMEU*(XK(9)-COLFLO)
001110 NEW 001 M XK(201)=XK(201)+DTIMEU*COLFLO
001111 000 MLTPLY(K9,K10,K5,K6,K12,K15)
001112 000 MLTPLY(K9,K10,K5,K6,K13,K16)
001113 000 DIVIDE(K15,15.,K17)
001114 000 MLTPLY(K17,3.,K18)
001115 000 DIVIDE(K16,12.,K19)
001116 000 MLTPLY(K16,1.,K20)
001117 000 MLTPLY(K20,.5,K21)
001118 000 MLTPLY(K21,.5,K22)

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001119	000	MLTPLY(K22,,3333,K23)
001120	000	STFSEP(K15,G3600,G3601,G3800,G3801)
001121	000	STFSQS(K18,4,G3602) 5 SUPPLY TOP HEX
001122	000	STFSQS(K18,4,G3612)
001123	000	STFSQS(K17,6,G3606)
001124	000	STFSQS(K18,4,G3802)
001125	000	STFSQS(K18,4,G3812)
001126	000	STFSQS(K17,6,G3806)
001127	000	STFSQS(K17,6,G3855) STOP HEX RETURN
001128	000	STFSQS(K18,4,G3851)
001129	000	STFSQS(K18,4,G3861)
001130	000	STFSQS(K17,6,G3655)
001131	000	STFSQS(K18,4,G3651)
001132	000	STFSQS(K18,4,G3661)
001133	000	STFSEP(K15,G5600,G5601,G5800,G5801)
001134	000	STFSQS(K18,4,G5602) 5 SUPPLY BOTTOM HEX
001135	000	STFSQS(K18,4,G5612)
001136	000	STFSQS(K17,6,G5606)
001137	000	STFSQS(K18,4,G5802)
001138	000	STFSQS(K18,4,G5812)
001139	000	STFSQS(K17,4,G5806)
001140	000	STFSQS(K17,6,G5855) 5 BOTTOM HEX RETURN
001141	000	STFSQS(K18,4,G5851)
001142	000	STFSQS(K18,4,G5861)
001143	000	STFSQS(K17,6,G5655)
001144	000	STFSQS(K18,4,G5651)
001145	000	STFSQS(K18,4,G5661)
001146	000	STFSQS(K23,4,G4501) 5 CHAMBER FLOW DOWN
001147	000	STFSQS(K23,4,G4511)
001148	000	STFSQS(K23,3,G4521)
001149	000	STFSQS(K23,4,G4531)
001150	000	STFSQS(K23,4,G4541)
001151	000	STFSQS(K23,3,G4551)
001152	000	STFSQS(K23,4,G4561)
001153	000	STFSQS(K23,4,G4571)
001154	000	STFSQS(K23,4,G4581)
001155	000	STFSQS(K23,4,G4591)
001156	000	STFSQS(K23,4,G4601)
001157	000	STFSQS(K23,3,G4611)
001158	000	STFSQS(K23,4,G4702)
001159	000	STFSQS(K23,4,G4712)
001160	000	STFSQS(K23,3,G4722)
001161	000	STFSQS(K23,4,G4732)
001162	000	STFSQS(K23,4,G4742)
001163	000	STFSQS(K23,3,G4752)
001164	000	STFSQS(K23,4,G4762)
001165	000	STFSQS(K23,4,G4772)
001166	000	STFSQS(K23,4,G4782)
001167	000	STFSQS(K23,4,G4792)
001168	000	STFSQS(K23,4,G4802)
001169	000	STFSQS(K23,3,G4812)
001170	000	STFSEP(K20,G8099,G8100) 5 UPPER CYL MANIFOLD
001171	000	STFSEP(K21,G8121,G8122,G8101,G8102)
001172	000	STFSEP(K22,G8103,G8104,G8108,G8109)
001173	000	STFSEP(K22,G8123,G8124,G8128,G8129)
001174	000	STFSQS(K23,3,G8130)

001175	000	STFSQS(K23,3,G8306)
001176	000	STFSQS(K23,3,G8309)
001177	000	STFSQS(K23,3,G8125)
001178	000	STFSEP(K23,G8302,G8301,G8312)
001179	000	STFSQS(K23,3,G8110)
001180	000	STFSQS(K23,3,G8303)
001181	000	STFSQS(K23,3,G8105)
001182	000	STFSEP(K20,G8234,G8233)
001183	000	STFSEP(K21,G8232,G8231,G8212,G8211)
001184	000	STFSEP(K22,G8230,G8229,G8225,G8224)
001185	000	STFSEP(K22,G8210,G8209,G8205,G8204)
001186	000	STFSQS(K23,3,G8226)
001187	000	STFSQS(K23,3,G8326)
001188	000	STFSQS(K23,3,G8221)
001189	000	STFSQS(K23,3,G8329)
001190	000	STFSQS(K23,3,G8206)
001191	000	STFSEP(K23,G8332,G8321,G8322)
001192	000	STFSQS(K23,3,G8201)
001193	000	STFSQS(K23,3,G8323)
001194	000	STFSEP(K20,G9099,G9233) SLOWER CYL MANIFOLD
001195	000	STFSEP(K21,G9212,G9211,G9232,G9231)
001196	000	STFSEP(K22,G9225,G9224,G9230,G9229)
001197	000	STFSEP(K22,G9205,G9204,G9210,G9209)
001198	000	STFSQS(K23,3,G9226)
001199	000	STFSQS(K23,3,G9306)
001200	000	STFSQS(K23,3,G9221)
001201	000	STFSQS(K23,3,G9309)
001202	000	STFSQS(K23,3,G9206)
001203	000	STFSEP(K23,G9301,G9302,G9312)
001204	000	STFSQS(K23,3,G9201)
001205	000	STFSQS(K23,3,G9303)
001206	000	STFSQS(K23,3,G9326)
001207	000	STFSQS(K23,3,G9130)
001208	000	STFSQS(K23,3,G9329)
001209	000	STFSQS(K23,3,G9125)
001210	000	STFSEP(K23,G9321,G9322,G9323)
001211	000	STFSQS(K23,3,G9110)
001212	000	STFSQS(K23,3,G9123)
001213	000	STFSQS(K23,3,G9109)
001214	000	STFSEP(K22,G9129,G9120,G9124,G9123)
001215	000	STFSEP(K22,G9109,G9108,G9104,G9103)
001216	000	STFSEP(K21,G9122,G9121,G9101,G9102)
001217	000	STFSEP(K20,G9100,G9234)
001218	000	STFSQS(K18,4,G3501)
001219	000	STFSQS(K18,4,G3511)
001220	000	STFSQS(K18,4,G3551)
001221	000	STFSQS(K18,4,G3561)
001222	000	STFSEP(K17,G3521,G3522,G3526)
001223	000	STFSEP(K17,G3531,G3532,G3535)
001224	000	STFSEP(K17,G3541,G3542,G3546)
001225	000	STFSQS(K18,4,G3702)
001226	000	STFSQS(K18,4,G3712)
001227	000	STFSQS(K18,4,G3752)
001228	000	STFSQS(K18,4,G3762)
001229	000	STFSEP(K17,G3722,G3726,G3727)
001230	000	STFSEP(K17,G3732,G3736,G3736)

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001231	000	STFSEP(K17,G3742,G3746,G3747)
001232	000	STFSQS(K18,4,G5501)
001233	000	STFSQS(K18,4,G5511)
001234	000	STFSQS(K18,4,G5551)
001235	000	STFSQS(K18,4,G5561)
001236	000	STFSEP(K17,G5521,G5522,G5526)
001237	000	STFSEP(K17,G5531,G5532,G5535)
001238	000	STFSEP(K17,G5541,G5542,G5546)
001239	000	STFSQS(K18,4,G5702)
001240	000	STFSQS(K18,4,G5712)
001241	000	STFSQS(K18,4,G5752)
001242	000	STFSQS(K18,4,G5762)
001243	000	STFSEP(K17,G5722,G5726,G5727)
001244	000	STFSEP(K17,G5732,G5735,G5736)
001245	000	STFSEP(K17,G5742,G5746,G5747)
001246	000	REM
001247	000	REM PAGES 23 TO 26
001248	000	REM
001249	000	M CALL SIDIDA(-1,T3503,A1,A2,A(20+1))
001250	000	M CALL SIDIDA(+1,T3503,A1,A3,A(30+1))
001251	000	M CALL SIDIDA(+1,T3503,A1,A4,A(40+1))
001252	000	M CALL SIDIDA(+1,T3503,A1,A5,A(50+1))
001253	000	M CALL SIDIDA(-1,T3515,A1,A2,A(20+2))
001254	000	M CALL SIDIDA(+1,T3515,A1,A3,A(30+2))
001255	000	M CALL SIDIDA(+1,T3515,A1,A4,A(40+2))
001256	000	M CALL SIDIDA(+1,T3515,A1,A5,A(50+2))
001257	000	M CALL SIDIDA(-1,T3531,A1,A2,A(20+3))
001258	000	M CALL SIDIDA(+1,T3531,A1,A3,A(30+3))
001259	000	M CALL SIDIDA(+1,T3531,A1,A4,A(40+3))
001260	000	M CALL SIDIDA(+1,T3531,A1,A5,A(50+3))
001261	000	M CALL SIDIDA(-1,T3535,A1,A2,A(20+4))
001262	000	M CALL SIDIDA(+1,T3535,A1,A3,A(30+4))
001263	000	M CALL SIDIDA(+1,T3535,A1,A4,A(40+4))
001264	000	M CALL SIDIDA(+1,T3535,A1,A5,A(50+4))
001265	000	M CALL SIDIDA(-1,T3553,A1,A2,A(20+5))
001266	000	M CALL SIDIDA(+1,T3553,A1,A3,A(30+5))
001267	000	M CALL SIDIDA(+1,T3553,A1,A4,A(40+5))
001268	000	M CALL SIDIDA(+1,T3553,A1,A5,A(50+5))
001269	000	M CALL SIDIDA(-1,T3563,A1,A2,A(20+6))
001270	000	M CALL SIDIDA(+1,T3563,A1,A3,A(30+6))
001271	000	M CALL SIDIDA(+1,T3563,A1,A4,A(40+6))
001272	000	M CALL SIDIDA(+1,T3563,A1,A5,A(50+6))
001273	000	M CALL SIDIDA(-1,T4501,A1,A2,A(20+7))
001274	000	M CALL SIDIDA(+1,T4501,A1,A3,A(30+7))
001275	000	M CALL SIDIDA(+1,T4501,A1,A4,A(40+7))
001276	000	M CALL SIDIDA(+1,T4501,A1,A5,A(50+7))
001277	000	M CALL SIDIDA(-1,T4502,A1,A2,A(20+8))
001278	000	M CALL SIDIDA(+1,T4502,A1,A3,A(30+8))
001279	000	M CALL SIDIDA(+1,T4502,A1,A4,A(40+8))
001280	000	M CALL SIDIDA(+1,T4502,A1,A5,A(50+8))
001281	000	M CALL SIDIDA(-1,T4503,A1,A2,A(20+9))
001282	000	M CALL SIDIDA(+1,T4503,A1,A3,A(30+9))
001283	000	M CALL SIDIDA(+1,T4503,A1,A4,A(40+9))
001284	000	M CALL SIDIDA(+1,T4503,A1,A5,A(50+9))
001285	000	M CALL SIDIDA(-1,T4504,A1,A2,A(20+10))
001286	000	M CALL SIDIDA(+1,T4504,A1,A3,A(30+10))

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001287	000	M	CALL SID10A(+1,T4504,A1,A4,A(40+10))
001288	000	M	CALL SID10A(+1,T4504,A1,A5,A(50+10))
001289	000	M	CALL SID10A(-1,T4505,A1,A2,A(20+11))
001290	000	M	CALL SID10A(+1,T4505,A1,A3,A(30+11))
001291	000	M	CALL SID10A(+1,T4505,A1,A4,A(40+11))
001292	000	M	CALL SID10A(+1,T4505,A1,A5,A(50+11))
001293	000	M	CALL SID10A(-1,T4513,A1,A2,A(20+12))
001294	000	M	CALL SID10A(+1,T4513,A1,A3,A(30+12))
001295	000	M	CALL SID10A(+1,T4513,A1,A4,A(40+12))
001296	000	M	CALL SID10A(+1,T4513,A1,A5,A(50+12))
001297	000	M	CALL SID10A(-1,T4522,A1,A2,A(20+13))
001298	000	M	CALL SID10A(+1,T4522,A1,A3,A(30+13))
001299	000	M	CALL SID10A(+1,T4522,A1,A4,A(40+13))
001300	000	M	CALL SID10A(+1,T4522,A1,A5,A(50+13))
001301	000	M	CALL SID10A(-1,T1000,A1,A2,A(20+14))
001302	000	M	CALL SID10A(+1,T1000,A1,A3,A(30+14))
001303	000	M	CALL SID10A(+1,T1000,A1,A4,A(40+14))
001304	000	M	CALL SID10A(+1,T1000,A1,A5,A(50+14))
001305	000	M	CALL SID10A(-1,T8102,A1,A2,A(20+15))
001306	000	M	CALL SID10A(+1,T8102,A1,A3,A(30+15))
001307	000	M	CALL SID10A(+1,T8102,A1,A4,A(40+15))
001308	000	M	CALL SID10A(+1,T8102,A1,A5,A(50+15))
001309	000	M	CALL SID10A(-1,T8122,A1,A2,A(20+16))
001310	000	M	CALL SID10A(+1,T8122,A1,A3,A(30+16))
001311	000	M	CALL SID10A(+1,T8122,A1,A4,A(40+16))
001312	000	M	CALL SID10A(+1,T8122,A1,A5,A(50+16))
001313	000	M	CALL SID10A(-1,T8202,A1,A2,A(20+17))
001314	000	M	CALL SID10A(+1,T8202,A1,A3,A(30+17))
001315	000	M	CALL SID10A(+1,T8202,A1,A4,A(40+17))
001316	000	M	CALL SID10A(+1,T8202,A1,A5,A(50+17))
001317	000	M	CALL SID10A(-1,T8222,A1,A2,A(20+18))
001318	000	M	CALL SID10A(+1,T8222,A1,A3,A(30+18))
001319	000	M	CALL SID10A(+1,T8222,A1,A4,A(40+18))
001320	000	M	CALL SID10A(+1,T8222,A1,A5,A(50+18))
001321	000	M	CALL SID10A(-1,T9102,A1,A2,A(20+19))
001322	000	M	CALL SID10A(+1,T9102,A1,A3,A(30+19))
001323	000	M	CALL SID10A(+1,T9102,A1,A4,A(40+19))
001324	000	M	CALL SID10A(+1,T9102,A1,A5,A(50+19))
001325	000	M	CALL SID10A(-1,T9122,A1,A2,A(20+20))
001326	000	M	CALL SID10A(+1,T9122,A1,A3,A(30+20))
001327	000	M	CALL SID10A(+1,T9122,A1,A4,A(40+20))
001328	000	M	CALL SID10A(+1,T9122,A1,A5,A(50+20))
001329	000	M	CALL SID10A(-1,T9202,A1,A2,A(20+21))
001330	000	M	CALL SID10A(+1,T9202,A1,A3,A(30+21))
001331	000	M	CALL SID10A(+1,T9202,A1,A4,A(40+21))
001332	000	M	CALL SID10A(+1,T9202,A1,A5,A(50+21))
001333	000	M	CALL SID10A(-1,T9222,A1,A2,A(20+22))
001334	000	M	CALL SID10A(+1,T9222,A1,A3,A(30+22))
001335	000	M	CALL SID10A(+1,T9222,A1,A4,A(40+22))
001336	000	M	CALL SID10A(+1,T9222,A1,A5,A(50+22))
001337	000	M	CALL SID10A(-1,T5503,A1,A2,A(20+23))
001338	000	M	CALL SID10A(+1,T5503,A1,A3,A(30+23))
001339	000	M	CALL SID10A(+1,T5503,A1,A4,A(40+23))
001340	000	M	CALL SID10A(+1,T5503,A1,A5,A(50+23))
001341	000	M	CALL SID10A(-1,T5515,A1,A2,A(20+24))
001342	000	M	CALL SID10A(+1,T5515,A1,A3,A(30+24))

001343	000	M	CALL SIDIDA(+1,T5515,A1,A4,A(40+24))
001344	000	M	CALL SIDIDA(+1,T5515,A1,A5,A(50+24))
001345	000	M	CALL SIDIDA(-1,T5531,A1,A2,A(20+25))
001346	000	M	CALL SIDIDA(+1,T5531,A1,A3,A(30+25))
001347	000	M	CALL SIDIDA(+1,T5531,A1,A4,A(40+25))
001348	000	M	CALL SIDIDA(+1,T5531,A1,A5,A(50+25))
001349	000	M	CALL SIDIDA(-1,T5535,A1,A2,A(20+26))
001350	000	M	CALL SIDIDA(+1,T5535,A1,A3,A(30+26))
001351	000	M	CALL SIDIDA(+1,T5535,A1,A4,A(40+26))
001352	000	M	CALL SIDIDA(+1,T5535,A1,A5,A(50+26))
001353	000	M	CALL SIDIDA(-1,T5553,A1,A2,A(20+27))
001354	000	M	CALL SIDIDA(+1,T5553,A1,A3,A(30+27))
001355	000	M	CALL SIDIDA(+1,T5553,A1,A4,A(40+27))
001356	000	M	CALL SIDIDA(+1,T5553,A1,A5,A(50+27))
001357	000	M	CALL SIDIDA(-1,T5563,A1,A2,A(20+28))
001358	000	M	CALL SIDIDA(+1,T5563,A1,A3,A(30+28))
001359	000	M	CALL SIDIDA(+1,T5563,A1,A4,A(40+28))
001360	000	M	CALL SIDIDA(+1,T5563,A1,A5,A(50+28))
001361	000	REM	
001362	000	REM	PAGES 27 TO 29.3
001363	000	REM	
001364	000		FILM(A11+1,A21+1,A20+1,A30+1,A50+1,A40+1,A80+1,G3201
001365	000		MTEST,A22+1)S
001366	000		FILM(A11+2,A21+2,A20+1,A30+1,A50+1,A40+1,A80+1,G3202
001367	000		MTEST,A22+2)S
001368	000		FILM(A11+3,A21+2,A20+1,A30+1,A50+1,A40+1,A80+1,G3203
001369	000		MTEST,A22+2)S
001370	000		FILM(A11+4,A21+2,A20+1,A30+1,A50+1,A40+1,A80+1,G3204
001371	000		MTEST,A22+2)S
001372	000		FILM(A11+5,A21+1,A20+1,A30+1,A50+1,A40+1,A80+1,G3205
001373	000		MTEST,A22+1)S
001374	000		FILM(A11+6,A21+7,A20+2,A30+2,A50+2,A40+2,A80+1,G3211
001375	000		MTEST,A22+7)S
001376	000		FILM(A11+7,A21+2,A20+2,A30+2,A50+2,A40+2,A80+1,G3212
001377	000		MTEST,A22+2)S
001378	000		FILM(A11+8,A21+2,A20+2,A30+2,A50+2,A40+2,A80+1,G3213
001379	000		MTEST,A22+2)S
001380	000		FILM(A11+9,A21+2,A20+2,A30+2,A50+2,A40+2,A80+1,G3214
001381	000		MTEST,A22+2)S
001382	000		FILM(A11+10,A21+7,A20+2,A30+2,A50+2,A40+2,A80+1,G3215
001383	000		MTEST,A22+7)S
001384	000		FILM(A11+11,A21+3,A20+3,A30+3,A50+3,A40+3,A80+2,G3221
001385	000		MTEST,A22+3)S
001386	000		FILM(A11+12,A21+4,A20+3,A30+3,A50+3,A40+3,A80+2,G3222
001387	000		MTEST,A22+4)S
001388	000		FILM(A11+13,A21+4,A20+4,A30+4,A50+4,A40+4,A80+2,G3226
001389	000		MTEST,A22+4)S
001390	000		FILM(A11+14,A21+3,A20+4,A30+4,A50+4,A40+4,A80+2,G3227
001391	000		MTEST,A22+3)S
001392	000		FILM(A11+15,A21+5,A20+3,A30+3,A50+3,A40+3,A80+2,G3231
001393	000		MTEST,A22+5)S
001394	000		FILM(A11+16,A21+6,A20+3,A30+3,A50+3,A40+3,A80+2,G3232
001395	000		MTEST,A22+6)S
001396	000		FILM(A11+17,A21+6,A20+4,A30+4,A50+4,A40+4,A80+2,G3235
001397	000		MTEST,A22+6)S
001398	000		FILM(A11+18,A21+5,A20+4,A30+4,A50+4,A40+4,A80+2,G3236

001399	000	MTEST,A22+5)S
001400	000	FILM(A11+19,A21+3,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3241
001401	000	MTEST,A22+3)S
001402	000	FILM(A11+20,A21+4,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3242
001403	000	MTEST,A22+4)S
001404	000	FILM(A11+21,A21+4,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3246
001405	000	MTEST,A22+4)S
001406	000	FILM(A11+22,A21+3,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3247
001407	000	MTEST,A22+3)S
001408	000	FILM(A11+23,A21+7,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3251
001409	000	MTEST,A22+7)S
001410	000	FILM(A11+24,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3252
001411	000	MTEST,A22+2)S
001412	000	FILM(A11+25,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3253
001413	000	MTEST,A22+2)S
001414	000	FILM(A11+26,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3254
001415	000	MTEST,A22+2)S
001416	000	FILM(A11+27,A21+7,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3255
001417	000	MTEST,A22+7)S
001418	000	FILM(A11+28,A21+1,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3261
001419	000	MTEST,A22+1)S
001420	000	FILM(A11+29,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3262
001421	000	MTEST,A22+2)S
001422	000	FILM(A11+30,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3263
001423	000	MTEST,A22+2)S
001424	000	FILM(A11+31,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3264
001425	000	MTEST,A22+2)S
001426	000	FILM(A11+32,A21+1,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3265
001427	000	MTEST,A22+1)S
001428	000	FILM(A12+1,A21+9,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3301
001429	000	MTEST,A22+9)S
001430	000	FILM(A12+ 2,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3302
001431	000	MTEST,A22+2)S
001432	000	FILM(A12+ 3,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3303
001433	000	MTEST,A22+2)S
001434	000	FILM(A12+ 4,A21+2,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3304
001435	000	MTEST,A22+2)S
001436	000	FILM(A12+ 5,A21+9,A20+ 1,A30+ 1,A50+ 1,A40+ 1,A80+ 1,G3305
001437	000	MTEST,A22+9)S
001438	000	FILM(A12+ 6,A21+8,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3311
001439	000	MTEST,A22+8)S
001440	000	FILM(A12+ 7,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3312
001441	000	MTEST,A22+2)S
001442	000	FILM(A12+ 8,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3313
001443	000	MTEST,A22+2)S
001444	000	FILM(A12+ 9,A21+2,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3314
001445	000	MTEST,A22+2)S
001446	000	FILM(A12+10,A21+8,A20+ 2,A30+ 2,A50+ 2,A40+ 2,A80+ 1,G3315
001447	000	MTEST,A22+8)S
001448	000	FILM(A12+11,A21+5,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3321
001449	000	MTEST,A22+5)S
001450	000	FILM(A12+12,A21+4,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3322
001451	000	MTEST,A22+4)S
001452	000	FILM(A12+13,A21+4,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3326
001453	000	MTEST,A22+4)S
001454	000	FILM(A12+14,A21+5,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3327

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001455	000	MTEST,A22+5)S
001456	000	FILM(A12+15,A21+5,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3331
001457	000	MTEST,A22+5)S
001458	000	FILM(A12+16,A21+6,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3332
001459	000	MTEST,A22+6)S
001460	000	FILM(A12+17,A21+6,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3335
001461	000	MTEST,A22+6)S
001462	000	FILM(A12+18,A21+5,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3336
001463	000	MTEST,A22+5)S
001464	000	FILM(A12+19,A21+5,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3341
001465	000	MTEST,A22+5)S
001466	000	FILM(A12+20,A21+4,A20+ 3,A30+ 3,A50+ 3,A40+ 3,A80+ 2,G3342
001467	000	MTEST,A22+4)S
001468	000	FILM(A12+21,A21+4,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3346
001469	000	MTEST,A22+4)S
001470	000	FILM(A12+22,A21+5,A20+ 4,A30+ 4,A50+ 4,A40+ 4,A80+ 2,G3347
001471	000	MTEST,A22+5)S
001472	000	FILM(A12+23,A21+8,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3351
001473	000	MTEST,A22+8)S
001474	000	FILM(A12+24,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3352
001475	000	MTEST,A22+2)S
001476	000	FILM(A12+25,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3353
001477	000	MTEST,A22+2)S
001478	000	FILM(A12+26,A21+2,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3354
001479	000	MTEST,A22+2)S
001480	000	FILM(A12+27,A21+8,A20+ 5,A30+ 5,A50+ 5,A40+ 5,A80+ 1,G3355
001481	000	MTEST,A22+8)S
001482	000	FILM(A12+28,A21+9,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3361
001483	000	MTEST,A22+9)S
001484	000	FILM(A12+29,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3362
001485	000	MTEST,A22+2)S
001486	000	FILM(A12+30,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3363
001487	000	MTEST,A22+2)S
001488	000	FILM(A12+31,A21+2,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3364
001489	000	MTEST,A22+2)S
001490	000	FILM(A12+32,A21+9,A20+ 6,A30+ 6,A50+ 6,A40+ 6,A80+ 1,G3365
001491	000	MTEST,A22+9)S
001492	000	FILM(A11+ 1,A21+1,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5201
001493	000	MTEST,A22+1)S
001494	000	FILM(A11+ 2,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5202
001495	000	MTEST,A22+2)S
001496	000	FILM(A11+ 3,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5203
001497	000	MTEST,A22+2)S
001498	000	FILM(A11+ 4,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5204
001499	000	MTEST,A22+2)S
001500	000	FILM(A11+ 5,A21+1,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5205
001501	000	MTEST,A22+1)S
001502	000	FILM(A11+ 6,A21+7,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5211
001503	000	MTEST,A22+7)S
001504	000	FILM(A11+ 7,A21+2,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5212
001505	000	MTEST,A22+2)S
001506	000	FILM(A11+ 8,A21+2,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5213
001507	000	MTEST,A22+2)S
001508	000	FILM(A11+ 9,A21+2,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5214
001509	000	MTEST,A22+2)S
001510	000	FILM(A11+10,A21+7,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5215

001511	000	MTEST,A22+7)S
001512	000	FILM(A11+11,A21+3,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5221
001513	000	MTEST,A22+3)S
001514	000	FILM(A11+12,A21+4,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5222
001515	000	MTEST,A22+4)S
001516	000	FILM(A11+13,A21+4,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5226
001517	000	MTEST,A22+4)S
001518	000	FILM(A11+14,A21+3,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5227
001519	000	MTEST,A22+3)S
001520	000	FILM(A11+15,A21+5,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5231
001521	000	MTEST,A22+5)S
001522	000	FILM(A11+16,A21+6,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5232
001523	000	MTEST,A22+6)S
001524	000	FILM(A11+17,A21+6,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5235
001525	000	MTEST,A22+6)S
001526	000	FILM(A11+18,A21+5,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5236
001527	000	MTEST,A22+5)S
001528	000	FILM(A11+19,A21+3,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5241
001529	000	MTEST,A22+3)S
001530	000	FILM(A11+20,A21+4,A20+25,A30+25,A50+25,A40+25,A80+ 2,G5242
001531	000	MTEST,A22+4)S
001532	000	FILM(A11+21,A21+4,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5246
001533	000	MTEST,A22+4)S
001534	000	FILM(A11+22,A21+3,A20+26,A30+26,A50+26,A40+26,A80+ 2,G5247
001535	000	MTEST,A22+3)S
001536	000	FILM(A11+23,A21+7,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5251
001537	000	MTEST,A22+7)S
001538	000	FILM(A11+24,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5252
001539	000	MTEST,A22+2)S
001540	000	FILM(A11+25,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5253
001541	000	MTEST,A22+2)S
001542	000	FILM(A11+26,A21+2,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5254
001543	000	MTEST,A22+2)S
001544	000	FILM(A11+27,A21+7,A20+27,A30+27,A50+27,A40+27,A80+ 1,G5255
001545	000	MTEST,A22+7)S
001546	000	FILM(A11+28,A21+1,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5261
001547	000	MTEST,A22+1)S
001548	000	FILM(A11+29,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5262
001549	000	MTEST,A22+2)S
001550	000	FILM(A11+30,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5263
001551	000	MTEST,A22+2)S
001552	000	FILM(A11+31,A21+2,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5264
001553	000	MTEST,A22+2)S
001554	000	FILM(A11+32,A21+1,A20+28,A30+28,A50+28,A40+28,A80+ 1,G5265
001555	000	MTEST,A22+1)S
001556	000	FILM(A12+ 1,A21+9,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5301
001557	000	MTEST,A22+9)S
001558	000	FILM(A12+ 2,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5302
001559	000	MTEST,A22+2)S
001560	000	FILM(A12+ 3,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5303
001561	000	MTEST,A22+2)S
001562	000	FILM(A12+ 4,A21+2,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5304
001563	000	MTEST,A22+2)S
001564	000	FILM(A12+ 5,A21+9,A20+23,A30+23,A50+23,A40+23,A80+ 1,G5305
001565	000	MTEST,A22+9)S
001566	000	FILM(A12+ 6,A21+8,A20+24,A30+24,A50+24,A40+24,A80+ 1,G5311

001567	000	MTEST,A22+8)S
001568	000	FILM(A12+7,A21+2,A20+24,A30+24,A50+24,A40+24,A80+1,G5312
001569	000	MTEST,A22+2)S
001570	000	FILM(A12+8,A21+2,A20+24,A30+24,A50+24,A40+24,A80+1,G5313
001571	000	MTEST,A22+2)S
001572	000	FILM(A12+9,A21+2,A20+24,A30+24,A50+24,A40+24,A80+1,G5314
001573	000	MTEST,A22+2)S
001574	000	FILM(A12+10,A21+8,A20+24,A30+24,A50+24,A40+24,A80+1,G5315
001575	000	MTEST,A22+8)S
001576	000	FILM(A12+11,A21+5,A20+25,A30+25,A50+25,A40+25,A80+2,G5321
001577	000	MTEST,A22+5)S
001578	000	FILM(A12+12,A21+4,A20+25,A30+25,A50+25,A40+25,A80+2,G5322
001579	000	MTEST,A22+4)S
001580	000	FILM(A12+13,A21+4,A20+26,A30+26,A50+26,A40+26,A80+2,G5326
001581	000	MTEST,A22+4)S
001582	000	FILM(A12+14,A21+5,A20+26,A30+26,A50+26,A40+26,A80+2,G5327
001583	000	MTEST,A22+5)S
001584	000	FILM(A12+15,A21+5,A20+25,A30+25,A50+25,A40+25,A80+2,G5331
001585	000	MTEST,A22+5)S
001586	000	FILM(A12+16,A21+6,A20+25,A30+25,A50+25,A40+25,A80+2,G5332
001587	000	MTEST,A22+6)S
001588	000	FILM(A12+17,A21+6,A20+26,A30+26,A50+26,A40+26,A80+2,G5335
001589	000	MTEST,A22+6)S
001590	000	FILM(A12+18,A21+5,A20+26,A30+26,A50+26,A40+26,A80+2,G5336
001591	000	MTEST,A22+5)S
001592	000	FILM(A12+19,A21+5,A20+25,A30+25,A50+25,A40+25,A80+2,G5341
001593	000	MTEST,A22+5)S
001594	000	FILM(A12+20,A21+4,A20+25,A30+25,A50+25,A40+25,A80+2,G5342
001595	000	MTEST,A22+4)S
001596	000	FILM(A12+21,A21+4,A20+26,A30+26,A50+26,A40+26,A80+2,G5346
001597	000	MTEST,A22+4)S
001598	000	FILM(A12+22,A21+5,A20+26,A30+26,A50+26,A40+26,A80+2,G5347
001599	000	MTEST,A22+5)S
001600	000	FILM(A12+23,A21+8,A20+27,A30+27,A50+27,A40+27,A80+1,G5351
001601	000	MTEST,A22+8)S
001602	000	FILM(A12+24,A21+2,A20+27,A30+27,A50+27,A40+27,A80+1,G5352
001603	000	MTEST,A22+2)S
001604	000	FILM(A12+25,A21+2,A20+27,A30+27,A50+27,A40+27,A80+1,G5353
001605	000	MTEST,A22+2)S
001606	000	FILM(A12+26,A21+2,A20+27,A30+27,A50+27,A40+27,A80+1,G5354
001607	000	MTEST,A22+2)S
001608	000	FILM(A12+27,A21+8,A20+27,A30+27,A50+27,A40+27,A80+1,G5355
001609	000	MTEST,A22+8)S
001610	000	FILM(A12+28,A21+9,A20+28,A30+28,A50+28,A40+28,A80+1,G5361
001611	000	MTEST,A22+9)S
001612	000	FILM(A12+29,A21+2,A20+28,A30+28,A50+28,A40+28,A80+1,G5362
001613	000	MTEST,A22+2)S
001614	000	FILM(A12+30,A21+2,A20+28,A30+28,A50+28,A40+28,A80+1,G5363
001615	000	MTEST,A22+2)S
001616	000	FILM(A12+31,A21+2,A20+28,A30+28,A50+28,A40+28,A80+1,G5364
001617	000	MTEST,A22+2)S
001618	000	FILM(A12+32,A21+9,A20+28,A30+28,A50+28,A40+28,A80+1,G5365
001619	000	MTEST,A22+9)S
001620	000	END
001621	000	BCD 3VARIABLES 2
001622	000	END


```

001620 000      TEST,AZZ,5
001621 000      END
001622 000      BCD 3VARIABLES 2
001622 000      END

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001623 000      BCD 3OUTPUT CALLS
001624 NEW 001 M  IF((LTEST/50)*50).NE.LTEST) GO TO 100
001625 -01 000 C  MAKE OUTPUT= TO EVERY 10 SEC. SAME AS DATA OUTPUT ON THE TEST DATA
001626 000 C  PROVISION MAY HAVE TO BE MADE LATER FOR MISSING DATA POINTS.
001627 000 C  IF ANY ON THE TEST DATA TAPE.
001628 NEW 001      PRINTA(4HCONS,K200,4,200)

```

ADD,P A.CC2INZFREC

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001629 000      STFSEP(K101,KTEST)S
001630 000 M  READ(26) (A(100+I-1),I=1,KTEST)
001631 000 C  IF ANY OTHER MISCELLANEOUS VALUES NEED TO BE PLOTTED, THEY CAN BE
001632 000 C  ADDED IN AT THIS POINT LATER ON. FOR EXAMPLE,
001633 000 C M IN COLUMN 1      A(100+K101+1)= FIRST EXTRA DATA VALUE
001634 000 C M IN COLUMN 1      A(100+K101+2)= SECOND EXTRA DATA VALUE ETC.
001635 000 C  THESE EXTRA SAVE CALLS MUST BE PLACED BEFORE THE SAVWOR CALL.
001636 000 M  CALL ARYSUB(NNT,T2001,32.,T2001)
001637 000 M  CALL ARYMPY(NNT,T2001,5.,T2001)
001638 000 M  CALL ARYDIV(NNT,T2001,9.,T2001)
001639 000 M  CALL SAVWOR(TIME0,T2001,NNT,A100,K101,TIMEND,25)
001640 000      TORDER
001641 000 M  CALL ARYMPY(NNT,T2001,1.8,T2001)
001642 000 M  CALL ARYADD(NNT,T2001,32.,T2001)
001643 000 MID0 LTEST=LTEST+1
001644 000      END
001645 000      BCD 3END OF DATA

```

END ELT.

ASG,T X,F///900

COPY,G C..X.

FURPUR 27H3 RL71-3 06/25/77 18:58:46
 LANCESB(IN209*TPFS(0) COPIED ON 02/10/77 AT 02:19:20
 207 BLOCKS COPIED.
 EOF ENCOUNTERED ON INPUT TAPE

COPY,P X..TPFS.
 312 SYM 294 REL

ERS X.
 END ERS.

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