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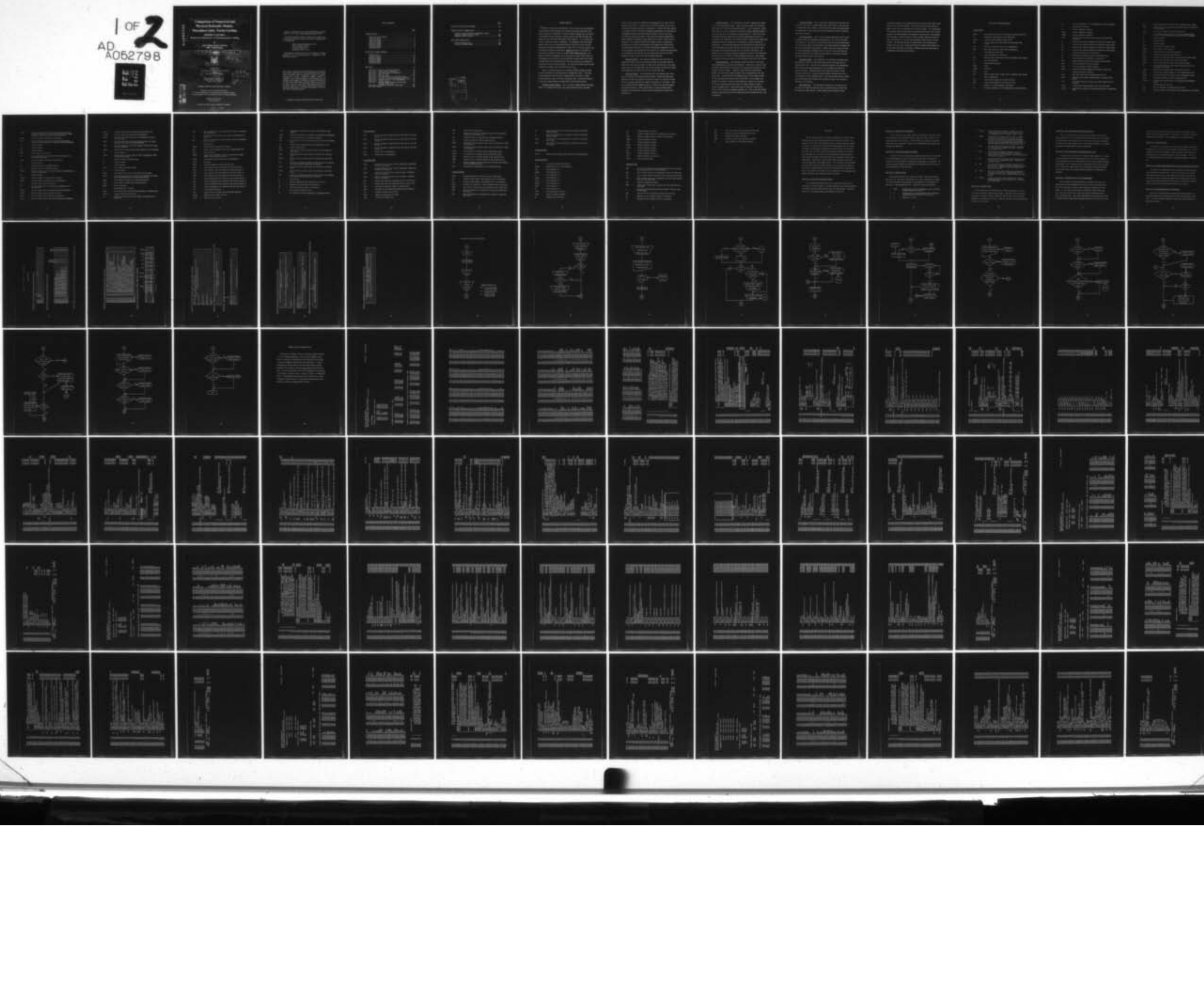

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Comparison of Numerical and Physical Hydraulic Models, Masonboro Inlet, North Carolina

(2)

APPENDIX 2, VOLUME 2

Numerical Simulation of Hydrodynamics (WRE)

by

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(9) Final rept.

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PROGRAM STRUCTURE

HYDTID is constructed and formulated in such a manner that the sequential flow of program control necessary for solution using high speed digital computers can be easily understood. The basic computer language used is Fortran V and the model has been successfully applied using the CDC 6600 and 6400, the UNIVAC 1108 and 1106 and the RCA Spectra 70/45 computers. In its present form HYDTID is essentially machine independent. The computation time and storage depend on the size of the system being modeled, the mesh size and time step being used, the number of computational or water cells in the grid network, and the length of simulation time desired. Recent applications of the model to Texas bays have required as much as 150,000 words of memory and from 2 to 6 minutes of UNIVAC 1108 computer time to simulate one 25 hour tidal cycle. For the Masonboro Inlet problem, the coarse grid model required about four minutes of UNIVAC 1108 time to simulate one 12.5 hour tidal cycle and to generate the input flows for the fine grid sub-model. The fine grid sub-model required about 40 minutes of computer time to simulate one cycle.

Basically the model consists of an executive control program and eight subroutine packages for performing specific computational tasks. Input data to the program are read from cards or magnetic tape, and output is either printed, punched on cards, or written on magnetic tape. Detailed descriptions of the basic program elements are presented in the following sections.

Executive Control Program. This is the basic command element of Program HYDTID. All program control data, real system description data, and model operation data required for computing tidal hydrodynamics are input into the program by this routine. Variables are initialized, constants are set, and a portion of the basic input data is printed out. At every time step, control is transferred from this routine to appropriate subroutines for calculation of instantaneous values of tidal amplitudes and flows, as well as net flows, net velocities and mean velocities. Input data are processed appropriately based on whether the program is being applied to the fine or coarse grid configuration. This element of HYDTID also transfers control to appropriate subroutines for printing tidal amplitudes and discharges for selected cells at specified time intervals, for storing instantaneous hydrodynamics for all cells on magnetic tape at specified time intervals, for storing tidal amplitudes for selected cells for plotting, and for storing final values of the basic variables on cards or tape at the end of program execution.

Subroutine CALTID. This subroutine computes at every time step the appropriate values of the four exciting tides that are specified around the periphery of the coarse grid model to impart tidal fluctuations in the system. Hourly values of tidal amplitudes read into the program from cards are interpolated appropriately to obtain tidal values at every time step.

Subroutine PRINTI. This subroutine prints the remaining basic input data not printed in the Executive Control Routine. Appropriate descriptive headings and titles are printed with the data so that it is possible to check that all prototype conditions are properly accounted for in the model. Print out of program control parameters serves as a check to see that the program has operated correctly. Proper specification of certain program control parameters can cause control to pass over this subroutine or execute only a portion of it.

Subroutine CALCQH. This subroutine is the basic computational element of the tidal hydrodynamics model. Control must pass through this subroutine during each time step of the computation process. In this subroutine, control moves from cell to cell according to a previously defined sequencing scheme so that only water cells are considered in the calculations. Based on the type of boundary condition required by a particular computational grid cell as specified by its identifying "flag" value, control is transferred to appropriate statements within this subroutine for calculation of certain constants and coefficients. Utilizing these constants and coefficients and known values of tidal amplitudes and flows from the previous time step, new values of these quantities are then determined explicitly at the end of the routine. One execution of this subroutine provides a complete new array of tidal amplitudes and flows per foot of width in the two coordinate directions. Water depths are computed from the new values of tidal amplitude at the end of this routine.

Subroutine PRINTO. This subroutine outputs the results of the basic model computations at specified time intervals. Specifically, values of tidal amplitudes and discharges are printed out for twenty pre-specified grid cells located in the grid system. Ordinally, hourly values are printed out, however, any desired time interval greater than the computational time step can be used. In the event that the complete array of final computed values of tidal amplitudes and flows per foot of width for all grid elements are required to be saved at the end of model operation, control can be transferred to this subroutine where these values are either punched on cards or written on magnetic tape. These ending values of the basic variables are used as initial values for subsequent computer runs. Also at the end of model operation, hourly velocities for the above 20 cells are punched for the x- and y-directions.

Subroutine NETVQD. This is an optional subroutine that calculates net velocities, net flows, or average depths which occur during a tidal cycle for all computational grid elements. Net velocities and flows and average depths are printed for all grid cells and can also be punched on cards or stored on tape by this routine.

Subroutine STRVEL. This is also an optional subroutine, and it stores on magnetic tape the instantaneous hydrodynamics for all cells at specified time intervals. This routine is particularly useful for storing hydrodynamics at times of ebb, flood, and slack tides so that flow conditions throughout the system can be analyzed at these times. Another use of this routine has been to store instantaneous hydrodynamics for all cells at short time intervals and to use these data in a marker particle program to trace paths traversed by water particles during a tidal period.

Subroutine PLOTHS. This subroutine is an optional plot package which when executed, results in verification type plots of tidal amplitude for specified grid cells. Both the tidal amplitude computed by the hydrodynamic model and the tidal amplitude measured in the prototype are plotted for specific locations. Appropriate descriptive labels and titles are also included on the plots. As many as twenty different locations (grid cells) can be chosen for tidal amplitude plots. By obtaining these plots for several locations throughout the system being simulated, an idea of the accuracy of the model can be obtained.

Subroutine RITAP. This subroutine is used only in the operation of the coarse grid model and compiles arrays of selected flows and tides from the coarse grid model results. These selected flows and tides are then interpolated temporally and distributed spatially to obtain the boundary input flows for the fine grid sub-model. The fine grid flows are then stored on magnetic tape for use in operating the fine grid sub-model. For the Masonboro Inlet problem, there are two versions of Subroutine RITAP which must be interchanged in the HYDTID program deck depending on the particular inlet geometry being simulated. Version I applies to the pre-project condition without the jetty, and Version II is used for the post-project condition with the jetty in place. Two different versions are needed because the configuration of boundary flow cells used to excite the fine grid sub-model are different for the two inlet conditions, and therefore different coarse grid flows must be interpolated and distributed accordingly.

DEFINITION OF PROGRAM VARIABLES

Program HYDTID

ANGCOR	-	Angle between north and x-axis measured clockwise from north.
CB	-	Submerged or overtopping barrier coefficient.
CELSID	-	Literal description equal to SIDE or TOP.
CODE	-	Literal, (CARD, TAPE, NONE, BOTH) which designates mode of I/O.
CON1	-	Base value counter for tidal curve interpolation.
CON2	-	Base value counter for tidal curve interpolation.
CT	-	Tidal discharge coefficient.
D	-	Total water depth in a given cell.
DATA	-	General purpose input variable used for temporary data storage.
DS	-	Cell side dimension.
DT	-	Computational time step.
DTODS	-	DT/DS.
DTO2DS	-	DT/(2•DS).
DT2	-	DT/2.
DUM	-	General purpose input variable used for temporary data storage.
E	-	Rate of evaporation.
ENDF	-	Literal which denotes end of input data file.
ENDT	-	Literal which denotes end of input title file.
F	-	Manning's "n" bottom roughness coefficient.
FX	-	Function of Manning's "n" for computations in the x-direction.

FY	-	Function of Manning's "n" for computations in the y-direction.
G	-	Acceleration of gravity.
GC	-	Internal computation constant.
GCDT04	-	Internal computation constant.
GDTODS	-	Internal computation constant.
GTIDE	-	Current value of exciting tide for one of four input tidal conditions.
G1	-	Exciting tidal elevation temporarily stored for printed output.
G41	-	Exciting tidal elevation temporarily stored for printed output.
G42	-	Exciting tidal elevation temporarily stored for printed output.
G43	-	Exciting tidal elevation temporarily stored for printed output.
H	-	Current tidal elevation in a given cell.
HF	-	Prototype tidal elevation used in verification plots.
HN	-	Newly computed tidal elevation in a given cell.
HPLT	-	Storage variable equal to tidal elevation to be plotted.
HPRT	-	Print out variable for tidal elevation.
HPRTA	-	Print out variable for tidal elevation.
HSHIFT	-	Elevation difference between MSL and datum of input data.
I	-	Standard grid column indicator.
IBAR	-	Grid column indicator for submerged barrier cells.
IBASIC	-	Internal variable which indicates number of program options desired.
ICLL	-	Grid column indicator for water cells where computations are required.
IDCARD	-	Variable which indicates mode of basic cell data input.
IDTIDE	-	Identification number which assigns exciting tide to appropriate cells.

IDUM	-	General purpose input variable used for temporary data storage.
IFLAG	-	Computational cell flag number which denotes type of calculations to be performed.
IFLOW	-	Grid column indicator for external inflow cells.
IHKP	-	Grid column indicator for cells in coarse grid where ending H-values are to be punched for input into fine grid sub-model.
IK	-	Internal counter.
ILB	-	Internal counter.
ILF	-	Internal counter.
IMAX	-	Total number of columns in grid.
IMXJMX	-	Total number of cells in grid.
INETFL	-	Variable which specifies net flow option.
INEW	-	Internal variable used to facilitate I/O.
IODISP	-	Variable which specifies mode of dispersion coefficient output.
IONFLO	-	Variable which specifies mode of net flow output.
IONVEL	-	Variable which specifies mode of net velocity output.
IP	-	Grid column indicator for cells where tides and flows are to be periodically printed.
IPDATA	-	Variable which denotes extent of input data print out.
IQHIN	-	Variable which specifies mode of initial hydrodynamics input.
ISAVQH	-	Variable which specifies model of final hydrodynamics output.
ITIDE	-	Grid column indicator for tidal excitation cells.
IVLTAP	-	Variable which specifies mode of instantaneous hydrodynamics output.
J	-	Standard grid row indicator.
JBAR	-	Grid row indicator for submerged barrier cells.
JCLL	-	Grid row indicator for water cells where computations are required.

JFLAG	-	Two digit cell flag which specifies the particular finite difference formulation of the convective acceleration cross-product term that is to be used for a given cell.
JFLOW	-	Grid row indicator for external inflow cells.
JHKP	-	Grid row indicator for cells in coarse grid where ending H-values are to be punched for input into fine grid sub-model.
JK	-	Internal counter.
JLB	-	Internal counter.
JLF	-	Internal counter.
JMAX	-	Total number of rows in grid.
JP	-	Grid row indicator for cells where tides and flows are to be periodically printed.
JTIDE	-	Grid row indicator for tidal excitation cells.
K	-	Internal counter.
KB	-	Temporary counter for submerged barriers.
KD	-	Temporary counter for external inflows.
KEPSAV	-	Temporary variable used to indicate storage of hydrodynamics at end of one tidal cycle.
KG	-	Internal counter.
KINDAT	-	Tape unit number for reading basic cell data.
KINIQH	-	Tape unit number for reading initial hydrodynamics.
KK	-	Internal counter used in data input.
KQ	-	Internal counter used in printing basic hydrodynamics for selected cells.
KODISP	-	Tape unit number used for storing dispersion coefficients.
KONETF	-	Tape unit number used for storing net flows.
KONETV	-	Tape unit number used for storing net velocities.
KOTVEL	-	Tape unit number used for storing instantaneous hydrodynamics.

KOUNT	-	Internal counter used to designate specific water cells.
KOUTDA	-	Tape unit number for storing final hydrodynamics.
KPRINT	-	Variable which controls punching of hydrodynamics at end of one tidal cycle.
KQCTP	-	Tape unit number used for storing selected flows from coarse grid model for input to fine grid sub-model.
KQFTP	-	Tape unit number used for storing external inflows for exciting fine grid sub-model.
KRSOFN	-	Variable which indicates type of model operation to be performed.
KT	-	Internal counter.
LINMAX	-	Variable which indicates number of sets of hydrodynamic output to be punched per page.
M	-	Internal counter for plotting tides.
MA	-	Internal counter.
N	-	Internal counter.
NFLOW	-	Total number of external inflows.
NN	-	Internal counter.
NPLOT	-	Total number of cells where tidal plots are to be made.
NPRPLT	-	Variable which designates the order of 20 specified cells where basic hydrodynamics are to be periodically printed.
NREEF	-	Total number of submerged and overtopping barriers.
NTIDE	-	Total number of external tidal excitation cells.
OMEGA	-	Coriolis parameter.
PI	-	Constant equal to π (3.1416).
PTIME	-	Time interval for printing basic hydrodynamics at selected cells.
QINFLO	-	External inflow for a given cell.
QX	-	Current value of flow per foot of width in x-direction for a given cell.

QXN	-	Newly computed value of flow per foot of width in x-direction for a given cell.
QY	-	Current value of flow per foot of width in y-direction for a given cell.
QYN	-	Newly computed value of flow per foot of width in y-direction for a given cell.
R	-	Rainfall rate.
REMARK	-	Variable used for storing title inputs.
SIDE	-	Literal used to designate right side of computational cell.
SQTG	-	Square root of G.
STATON	-	Literal used to identify specific cells where basic hydrodynamics are periodically printed.
TCOUNT	-	Time counter used for printing basic hydrodynamics.
THETA	-	Wind angle.
THETA1	-	Wind angle temporarily stored for print out.
TIDE1	-	Tidal elevation read into program for Exciting Tide No. 1.
TIDE2	-	Tidal elevation read into program for Exciting Tide No. 2.
TIDE3	-	Tidal elevation read into program for Exciting Tide No. 3.
TIDE4	-	Tidal elevation read into program for Exciting Tide No. 4.
TID1	-	Current interpolated tidal elevation from Exciting Tide No. 1.
TID2	-	Current interpolated tidal elevation from Exciting Tide No. 2.
TID3	-	Current interpolated tidal elevation from Exciting Tide No. 3.
TID4	-	Current interpolated tidal elevation from Exciting Tide No. 4.
TIM	-	Time stored for plotting.
TIME	-	Current value of simulated time during model operation.
TIMEIN	-	Beginning time of model operation.
TIMTOT	-	Total time to be simulated.

TIMVEL	-	Specified time interval for storage of instantaneous hydrodynamics.
TMARK	-	Internal time counter for storage of instantaneous hydrodynamics.
TMAX	-	Final value of time at end of model operation.
TNET	-	Value of time at which computations for net flows and velocities begin.
TOP	-	Literal used to designate top side of computational cell.
TPER	-	Period of tidal cycle.
TPLOT	-	Value of time at which storage of hourly H-values begins for tidal plots.
UAPRT	-	Variable used for printing flows in x-direction at specified cells.
UAPRTA	-	Variable used for printing flows in y-direction at specified cells.
UPLT	-	Velocity in x-direction punched at PTIME intervals for selected cells where velocity comparisons are desired.
VAPRT	-	Variable used for printing flows in y-direction at specified cells.
VAPRTA	-	Variable used for printing flows in y-direction at specified cells.
VPLT	-	Velocity in y-direction punched at PTIME intervals for selected cells where velocity comparisons are desired.
W	-	Wind velocity.
W2	-	Temporary storage variable generally set equal to W.
XW	-	Effective wind stress term for x-direction.
YW	-	Effective wind stress term for y-direction.
Z	-	MSL elevation of bottom of cell.
ZB	-	MSL elevation of crest of submerged or overtopping barrier.

Subroutine CALTID

DELT1	-	Current incremental change during one time step for Exciting Tide No. 1.
DELT2	-	Current incremental change during one time step for Exciting Tide No. 2.
DELT3	-	Current incremental change during one time step for Exciting Tide No. 3.
DELT4	-	Current incremental change during one time step for Exciting Tide No. 4.
NTID	-	Counter used in interpolation.
NTIDP1	-	Counter used in interpolation.

Subroutine CALCQH

COEFX	-	Computed coefficient used in basic hydrodynamic computations of flow in x-direction.
COEFY	-	Computed coefficient used in basic hydrodynamic computations of flow in y-direction.
DBARX	-	Internally computed variable involving depths in adjacent cells in x-direction.
DBARY	-	Internally computed variable involving depths in adjacent cells in y-direction.
DBX	-	Average water depth over submerged barrier on side of cell.
DBY	-	Average water depth over submerged barrier on top of cell.
DCON	-	Reciprocal of average of depths in adjacent cells.
HMAX	-	The greater of two adjacent MSL water surface elevations.
IFL	-	Temporary variable equal to IFLAG.
IFLG	-	Temporary variable equal to IFLAG.
JAFL	-	First digit of JFLAG value.

JBFL	-	Second digit of JFLAG value.
JFL	-	Temporary variable used to indicate type of flow calculations required at a particular cell.
KBT	-	Temporary counter for submerged and overtopping barriers.
KTT	-	Temporary counter for tidal excitation cells.
QBARX	-	Magnitude of actual velocity vector used in calculation of flows in x-direction.
QBARY	-	Magnitude of actual velocity vector used in calculation of flows in y-direction.
QDIFXS	-	Flow gradient in y-direction used to approximate $\partial q_x/\partial y$.
QDIFYS	-	Flow gradient in x-direction used to approximate $\partial q_y/\partial x$.
QXBAR	-	Average flow in x-direction defined at same location as q_y.
QYBAR	-	Average flow in y-direction defined at same location as q_x.
SIGN	-	Temporary algebraic sign variable which indicates flow direction across overtopping barriers.
ZMAX	-	The greater of two adjacent cell MSL bottom elevations.

Subroutine NETVQD

DEPTH	-	Average water depth in a given cell over a tidal cycle.
DXA	-	Average of water depths in two adjacent cells in x-direction.
DYA	-	Average of water depths in two adjacent cells in y-direction.
QNETX	-	Net flow for a given cell in the x-direction over a tidal cycle.
QNETY	-	Net flow for a given cell in the y-direction over a tidal cycle.
UAVE	-	Mean tidal velocity in x-direction for a given cell during one tidal cycle.
VAVE	-	Mean tidal velocity in y-direction for a given cell during one tidal cycle.

DX - Dispersion coefficient in x-direction computed using Random Process Analogy.

DY - Dispersion coefficient in y-direction computed using Random Process Analogy.

VNETX - Net velocity in the x-direction for a given cell during one tidal cycle.

VNETY - Net velocity in the y-direction for a given cell during one tidal cycle.

Subroutine STRVEL

TAPTIM - Current value of time written on tape for checking purposes.

Subroutine PLOTHS

A - A processor variable for plotting.

ACOLMN - Storage vehicle for a plot character.

ADOT - Print character "X".

AEQUAL - Print character "=".

AI - Print character "I".

AMINUS - Print character "-".

APLUS - Print character "+".

ASTRSK - Print character "*".

BLANK - Print character "^".

CO - Print character "O".

DIFHF - Internal processor variable.

DIFHP - Internal processor variable.

HF - Prototype tidal elevation.

ICC	-	Internal processor variable.
IHF	-	Temporary integer storage for prototype tidal elevation.
IHPLT	-	Temporary integer storage for model tidal elevation.
ITCONT	-	Internal processor variable.
ITID	-	Internal processor variable.
ITIDM1	-	Internal processor variable.
ITIDPR	-	Internal processor variable.
MM1	-	Internal processor variable.
TIDPRT	-	Internal processor variable.
TITEL	-	Specified literal title of plot.
TITELY	-	Literal ordinate label.

Subroutine RITAP

DTOT	-	Sum of k water depths used as a proportioning base to distribute one coarse grid flow to k fine grid cells.
HOLD	-	Value of water elevation for beginning of coarse grid time step.
HTP	-	Value of water surface elevation at end of coarse grid time step.
HTPU	-	Water surface elevation at intermediate time level used to determine fine grid input flows.
KCT	-	Internal interpolating counter.
KCTM	-	Interpolation factor equal to (coarse grid time step/fine grid time step).
Q	-	Interpolated and distributed value of external inflow for fine grid sub-model.
QOLD	-	Coarse grid flow at beginning of coarse grid time step.
QS	-	Computed fine grid external inflow in x-direction.
QT	-	Computed fine grid external inflow in y-direction.

QTP	-	Coarse grid flow at end of coarse grid time step.
QTPU	-	Coarse grid flow at intermediate time level.
TIME	-	Internal time counter (seconds).
TMAX	-	Total real time of model operation (seconds).
ZT	-	Input variable of cell bottom elevations.

DATA INPUT

The data input structure for HYDTID is dependent on the mode of model operation and the various program options the user wishes to employ. For purposes of this study, three different types of operation modes are defined as follows: (1) Coarse Grid Production Run meaning operation of the coarse grid model for the purpose of generating the input flows to the fine grid sub-model; (2) Fine Grid Production Run meaning any operation of the fine grid sub-model; and (3) Coarse Grid Non-Production Run meaning operation of the coarse grid model for purposes other than to generate fine grid sub-model inputs. Input data is read from both cards and magnetic tape, with some data specified in the program itself. In all there are eleven different card data files which can be read, however only six of these are necessary for coarse grid model operation, and five are required by the fine grid sub-model. The contents of the eleven files are described in the subsequent paragraphs followed by their appropriate format structures.

Title File - Titles for First Page of Output

Four separate 68 character titles can be specified using this file. They appear on the first page of the edited output and can be used to describe the various conditions under which the model is being operated. The entire Title File is also echo printed at the beginning of each run.

Data File A - Program Control Parameters

The I/O mode for various types of data in the model are specified in this file by assigning the appropriate literal, CARD, TAPE, BOTH, or NONE, in the proper space on the File A cards. If TAPE or BOTH are assigned, the tape unit number must also be specified. Based on this information, HYDTID performs the necessary I/O operations.

Data File B - Basic Model Operation Parameters

Included in the file are the basic parameters which are used in the model. All of the parameters are read as floating point variables from columns 74 through 80 and then assigned to appropriate variable names in the program. The various parameters required are described on the format forms which follow and the required units are also specified.

Data File C - Basic Cell Data

One data card for grid cell included in a model is read by the program from this file. Each card is identified with I and J coordinates and includes all of the descriptive data necessary for hydrodynamics to be determined for every cell in the computational grid. These data include the following:

1. IFLAG - Computational cell flag determined from the individual boundary conditions at the cell .
2. Z - Average bottom or ground elevation (feet) referred to same datum specified in Data File B, Card 20.
3. F - Manning's "n" value.

4. IDTIDE - Tidal identification number ($1 \leq$ IDTIDE ≤ 4) which assigns appropriate exciting tide to the cell if it is flagged accordingly. Otherwise IDTIDE is zero.

5. QINFLO - External inflow magnitude (cfs) if cell is flagged accordingly. Otherwise QINFLO set equal to zero. Sign must be specified to be consistent with coordinate axes. For fine grid sub-model, this quantity does not need to be specified since external flows are read from tape for each of the exciting flow cells.

6. CBX - Discharge coefficient assigned to barriers parallel to x-axis when cell flagged accordingly. Otherwise CBX set equal to zero.

7. ZBX - Crest elevation assigned to barriers parallel to x-axis when cell flagged accordingly. Otherwise ZBX set equal to zero. Referred to same datum specified in Data File B, Card 20.

8. CBY - Discharge coefficient assigned to barriers parallel to y-axis when cell flagged accordingly. Otherwise CBY set equal to zero.

9. ZBY - Crest elevation assigned to barriers parallel to y-axis when cell flagged accordingly. Otherwise ZBY set equal to zero. Referred to same datum specified in Data File B, Card 20.

10. NPRPLT - Print/Plot order number assigned to 20 selected cells for periodic output of basic hydrodynamics and for plotting tidal elevations. Otherwise NPRPLT set equal to zero.

11. STATON - Literal station name used as heading when printing basic hydrodynamics for 20 selected cells. Otherwise STATON left blank.

Data File D - Exciting Tides

As the coarse and fine grid models are currently structured, this data file is only required by the coarse grid model. For each of the four exciting tides used in the model, 26 hourly values of tides (2 tidal cycles) are read preceded by an appropriate title card. Datum for the tides is the same specified in Data File B, Card 20.

Data File E - Cell Identification for Storing H-Values

This is an optional data file used only for production runs with the coarse grid model. I and J coordinates are read for those cells in the coarse grid model where tidal elevations at the end of one tidal cycle are required to establish the initial water levels in the fine grid sub-model. As currently structured the program reads 32 sets of coordinates.

Data File F - Two-Digit Convective Acceleration Cell Flags

This data file is required for all modes of model operation. For those cells that require finite difference approximations of the flow gradients in the cross-product terms that are different from the normal centered difference formulations, I and J coordinates and an appropriate two-digit flag are read from a single card. When a blank card is encountered, the program assumes that the end of this file has been reached and control is transferred accordingly.

Data File G - Complete Array of Initial Hydrodynamics

Once the models have been operated for a complete tidal cycle, the ending values of the hydrodynamics for every cell can be saved and used as the initial conditions at which to begin subsequent simulations with the models. In this manner, simulations can be made with several short one tidal cycle runs rather than a single long run which might take several hours of computer time. These ending hydrodynamics can be obtained on cards or magnetic tape by specifying the appropriate option in Data File A for the initial run, and can then be read into the models for subsequent runs as Data File G again using the option in Data File A. In the event no initial conditions are available, initial hydrodynamics are set equal to zero.

Data File H - Initial H-Values

This data file is used only with the fine grid sub-model when initial hydrodynamics for all cells are not available from previous runs. For this situation, all flows are set equal to zero, but initial water levels are established from those computed using the coarse grid model. Data File H is punched when the coarse grid model is operated under Mode 1, Production Run.

Data File I - Selected Bottom Elevations for Fine Grid Sub-Model Inflow Cells

This data file is required only for the operation of the coarse grid model under Mode 1, Production Run. Data File I consists of the bottom elevations at those fine grid cells where exciting inflows are specified. These data are used in spatially distributing the computed flows from the coarse grid model to obtain the fine grid inputs. The datum for these elevations is the same as that specified in Data File B, Card 20.

Data File J - Prototype HF-Values for Tidal Plots

When tidal verification plots are desired using either model, the measured prototype tidal elevations must be read into the program as Data File J. The datum for these elevations is the same as that specified in Data File B, Card 20.

DATA INPUT FORMATS

Program HYDTID

Title File - Titles for First Page of Output (5 cards)

	13*
TITLE 01	17A4
TITLE 02	
TITLE 03	
TITLE 04	
ENDTITLE	

Data File A - Program Control Parameters (10 cards)

	59 Card / Tape / Both / None		76 Tape Unit No.
FILE A 01 READ BASIC CELL DATA FROM	A4		I2
FILE A 02 READ INITIAL HYDRODYNAMICS FROM			
FILE A 03 COMPUTE AND SAVE NET VELOCITIES ON			
FILE A 04 COMPUTE AND SAVE NET FLOWS ON			
FILE A 05 COMPUTE AND SAVE DISPERSION COEF. ON			
FILE A 06 STORE ENDING VALUES OF HYDRODYNAMICS ON			
FILE A 07 STORE INSTANTANEOUS HYDRODYNAMICS ON			
FILE A 08 WRITE/READ INPUTS FOR FINE GRID MODEL ON			
FILE A 09 STORE COARSE GRID DATA FOR FINE GRID ON			
ENDFILE A			

* Small numbers above each file refer to corresponding columns on an 80 column computer card.

Data File B - Basic Model Operation Parameters (21 cards)

			74
FILE B	01	TYPE OF MODEL(1=COARSE PROD,2=FINE PROD,3=COARSE NON-PROD)	F7.0
FILE B	02	PRINT INPUT DATA (1=NO PRINT,2=W/MANN. N,3=W/O MANN. N)	
FILE B	03	NUMBER OF STATIONS FOR WHICH PLOTS ARE DESIRED	
FILE B	04	TOTAL REAL TIME FOR OPERATION OF MODEL (HOURS)	
FILE B	05	START REAL TIME FOR OPERATION OF MODEL (HOURS)	
FILE B	06	REAL TIME INTERV. FOR STORING INSTANT. HYDRO. (MINUTES)	
FILE B	07	REAL TIME PERIOD OF TIDAL CYCLE (HOURS)	
FILE B	08	INITIAL WIND MAGNITUDE (KNOTS)	
FILE B	09	DIRECTION FROM WHICH INITIAL WIND BLOWS(DEG. CW FROM N)	
FILE B	10	AVERAGE PRECIPITATION RATE (INCHES/DAY)	
FILE B	11	AVERAGE EVAPORATION RATE (INCHES/DAY)	
FILE B	12	ANGLE BETWEEN NORTH AND X-AXIS (DEG. CW FROM N)	
FILE B	13	TOTAL NUMBER OF COMPUTATIONAL ELEMENTS IN X-DIRECTION	
FILE B	14	TOTAL NUMBER OF COMPUTATIONAL ELEMENTS IN Y-DIRECTION	
FILE B	15	GRID SIZE OF COMPUTATIONAL ELEMENTS (FEET)	
FILE B	16	PROGRAM COMPUTATIONAL TIME STEP (SECONDS)	
FILE B	17	LATITUDE OF ESTUARINE SYSTEM (DEGREES)	
FILE B	18	NUMBER OF OUTPUT SETS (HOURS) PRINTED PER PAGE	
FILE B	19	COMPUTE NET FLOWS BUT DO NOT STORE (1=YES,2=NO)	
FILE B	20	DIFFERENCE BETWEEN MSL AND DATA INPUT DATUM (FEET)	
ENDFILE B			

Data File C - Basic Cell Data (IMAX x JMAX cards + ENDFILE)

	I	J	IFLAG	Z	F	IDTIDE	QINFLO		CBX	ZBX	CBY	ZBY	NPRPLT	STATON
	17	20	23	26	31	37	40	48	54	59	65	70	73	
BASIC CELL DATA	I2	I2	I2	F4.0	F5.3	I2	F7.0		F5.3	F4.1	F5.3	F4.1	I2	2A4
[One BASIC CELL DATA card for each cell in grid system]														
ENDFILE C														
	16	19	22	25	30	36	39	47	53	58	64	69	72	

Data File D (Coarse Grid Model Only) - Exciting Tides (13 cards)

INPUT TIDE NO. 1 - GAGE O, MASONBORO INLET
[26 hourly values (2 semi-diurnal cycles) of MLW tides
punched sequentially, 16F5.2]
INPUT TIDE NO. 2
INPUT TIDE NO. 3
INPUT TIDE NO. 4
ENDFILE D

Data File E (Optional, Coarse Grid Model Only) - Cell Identifications for Storing Ending H-Values

[I and J coordinates punched sequentially, 40I2]
[Repeat as Necessary]

Data File F - Two-Digit Convective Acceleration Cell Flags

I (1)	J (5)	JFLAG (9)	
I4	I4	I4	[1 card for each computational cell where JFLAG ≠ 11]
			[Last card should be blank]

Data File G (Optional) - Complete Array of Initial Hydrodynamics

[H values punched sequentially for each row in grid, 8F10.5]
[Repeat as necessary]
[Sets of QX and QY values punched sequentially for each row in grid, 8F10.4]
[Repeat as necessary]
ENDFILE G

Data File H (Optional Fine Grid Sub-Model Only) - Initial H-Values

I (1)	J (5)	H (9)	
I4	I4	F10.3	
[One card for each water cell in fine grid sub-model. Input only for first tidal cycle run.]			
[Last card should be blank]			

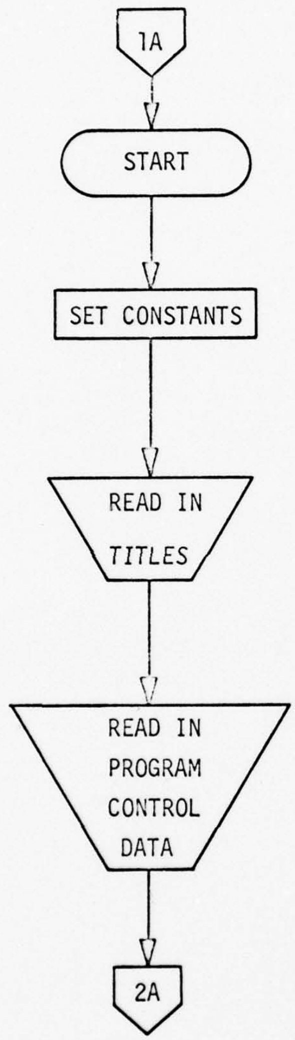
Data File I (Optional Coarse Grid Model Only) - Selected Bottom Elevations for Fine Grid Sub-Model Cells

	26	
	F4.0	
[One card for each boundary inflow cell in fine grid sub-model]		

Data File J (Optional) - Prototype HF-Values for Tidal Plots

[Title card identifying gage number and period of recorded tide]
[26 hourly values (2 semi-diurnal cycles) of MLW tides punched
sequentially, 16F5.2]
[Repeat title card and tide data cards for each plot to be made]

FLOW CHART FOR MAIN HYDTID PROGRAM

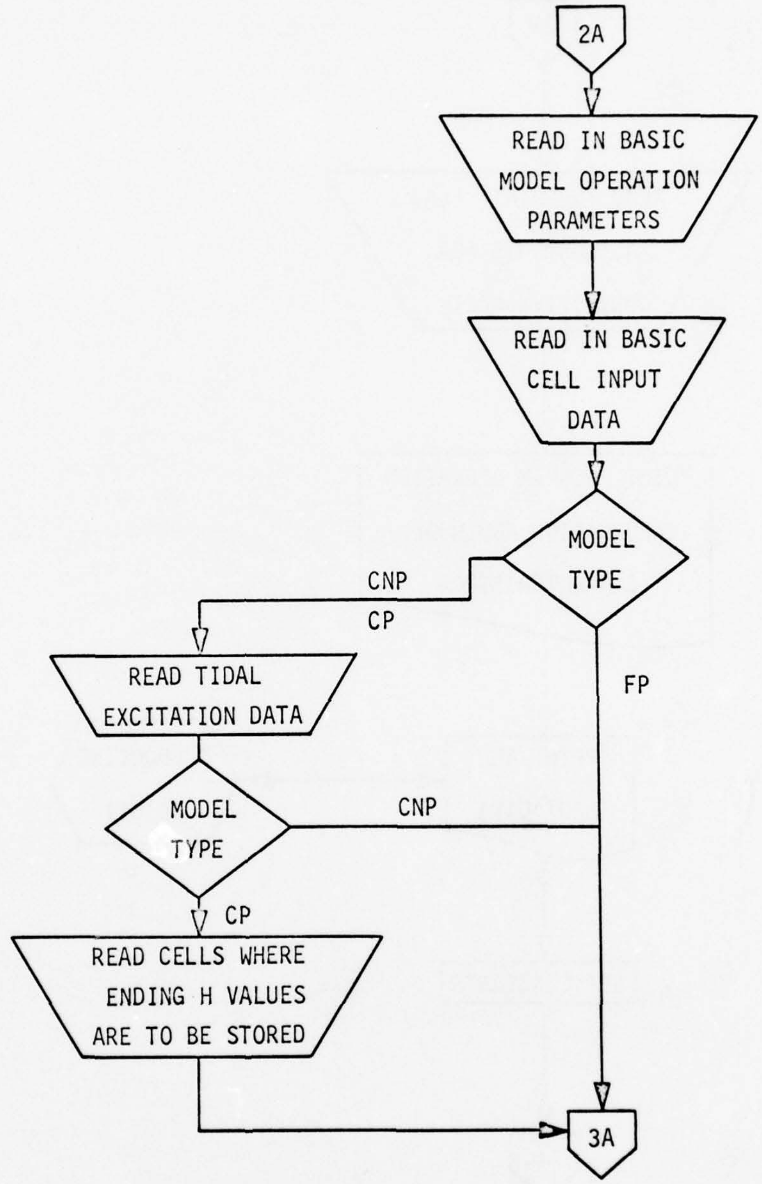


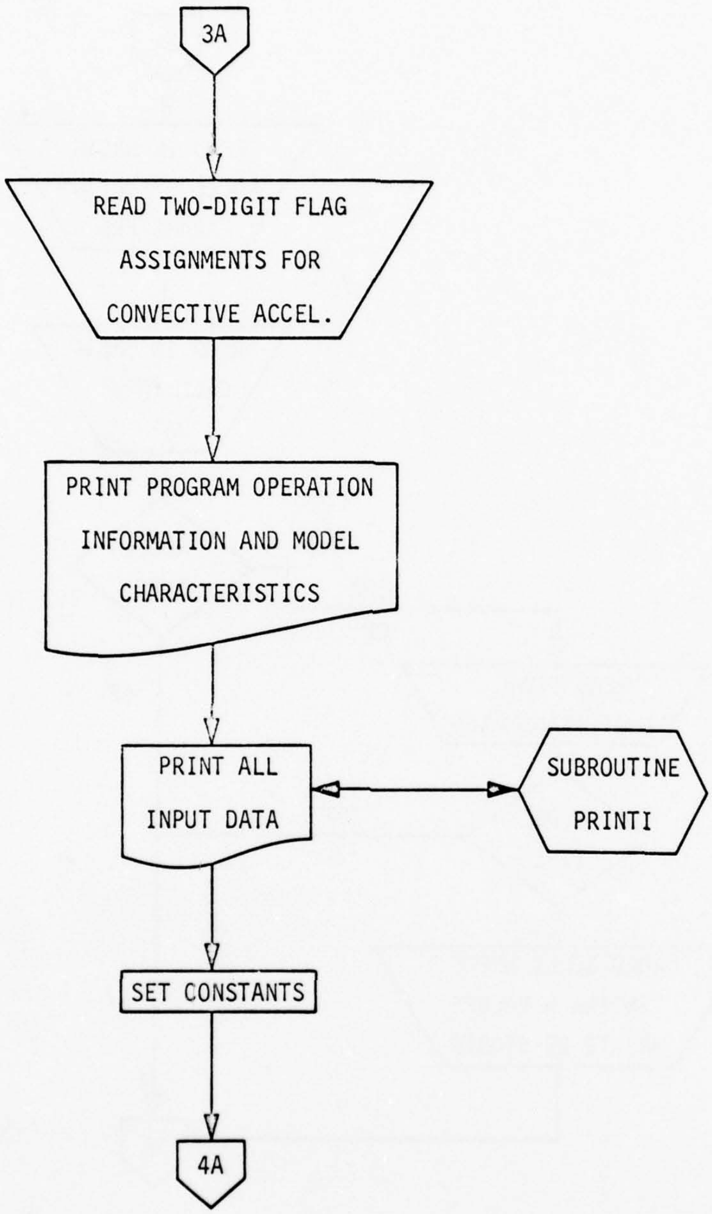
Legend for Model Type

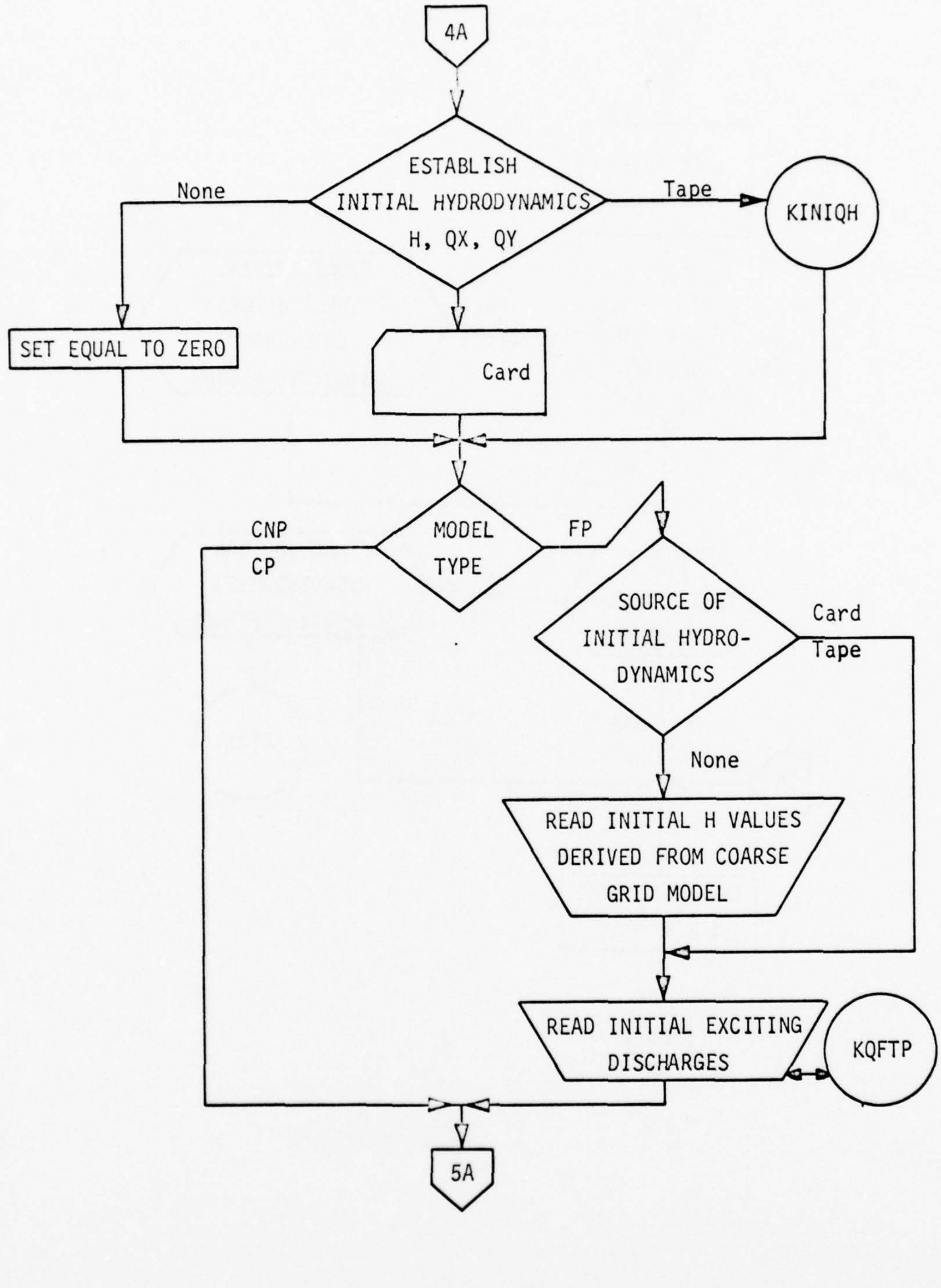
CNP - Coarse Grid Model, Non-Production Run

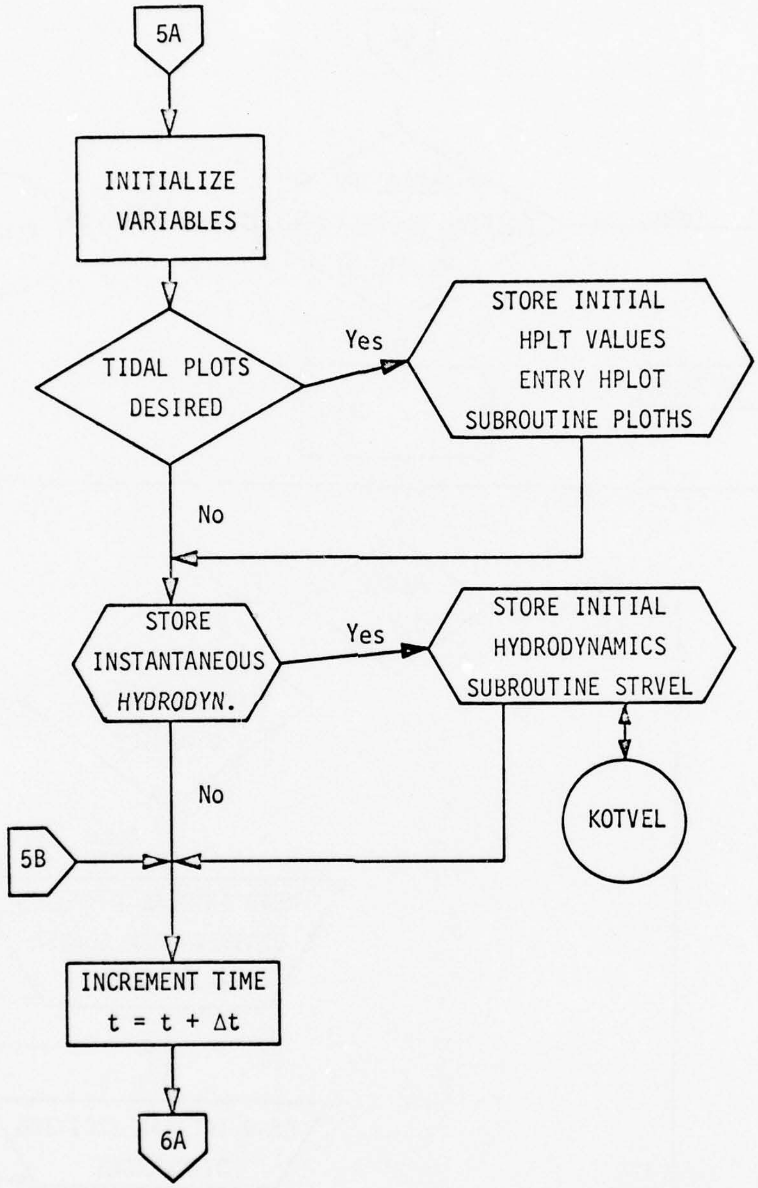
CP - Coarse Grid Model, Production Run

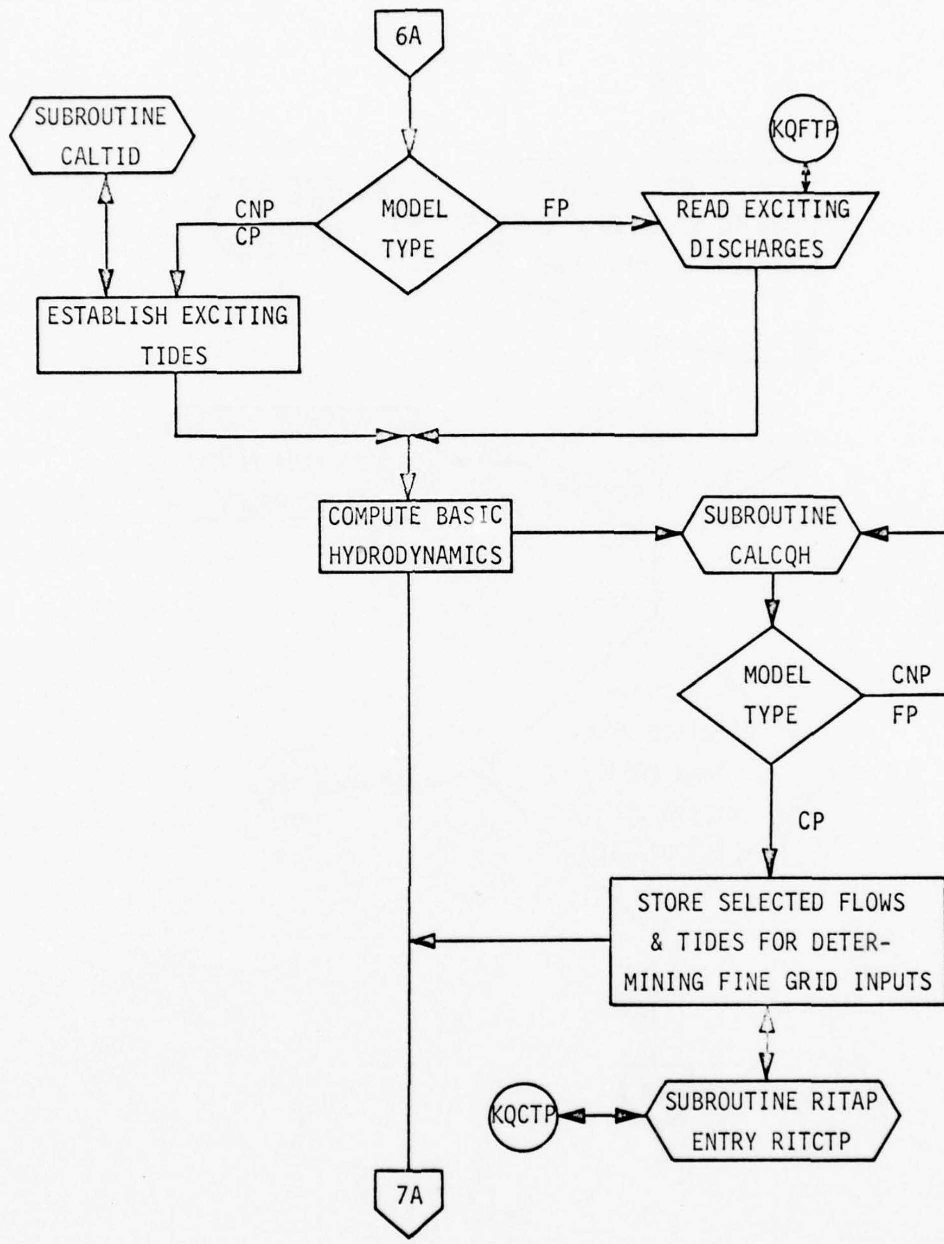
FP - Fine Grid Model Production Run

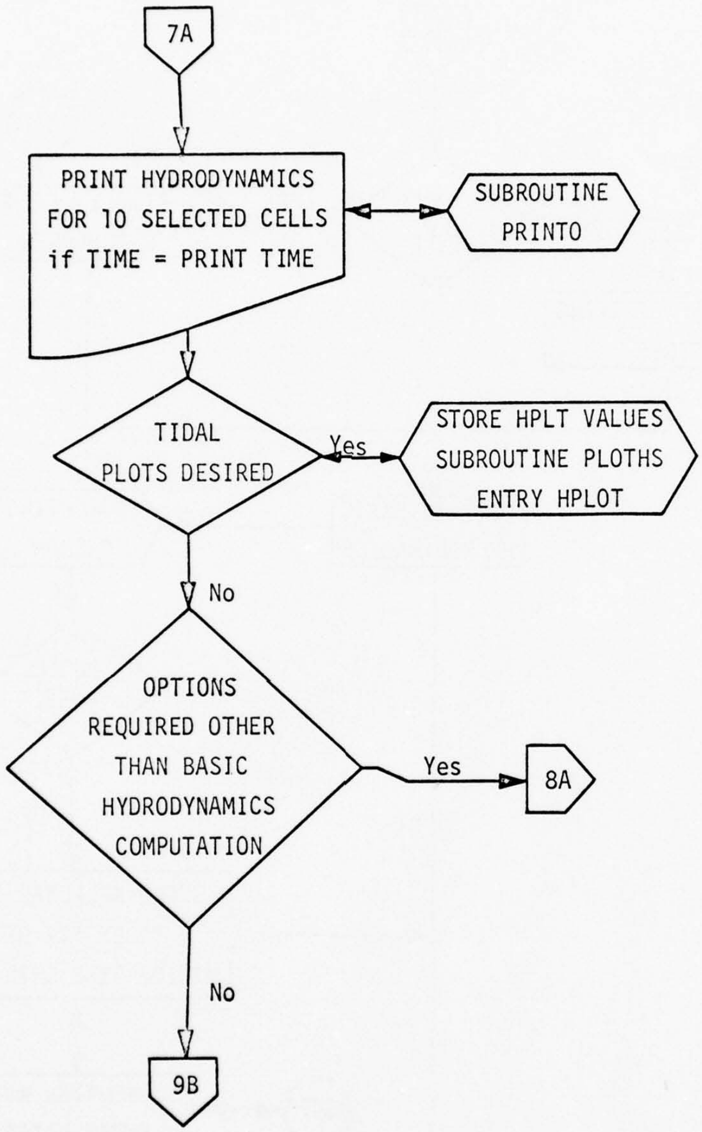

2A
READ IN BASIC MODEL OPERATION PARAMETERS
READ IN BASIC CELL INPUT DATA
MODEL TYPE
CNP
CP
FP
READ TIDAL EXCITATION DATA
MODEL TYPE
CNP
CP
READ CELLS WHERE ENDING H VALUES ARE TO BE STORED
3A

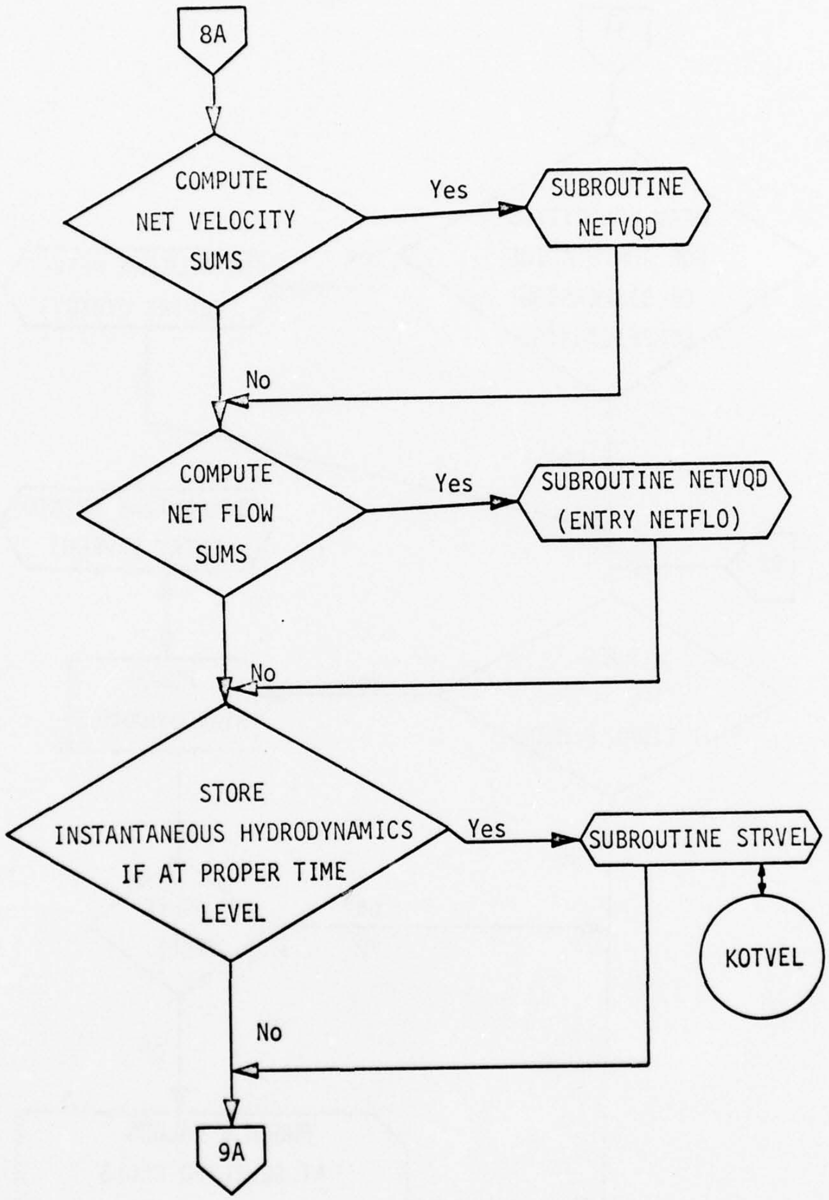

3A
READ TWO-DIGIT FLAG ASSIGNMENTS FOR CONVECTIVE ACCEL.
PRINT PROGRAM OPERATION INFORMATION AND MODEL CHARACTERISTICS
PRINT ALL INPUT DATA
SUBROUTINE PRINTI
SET CONSTANTS
4A

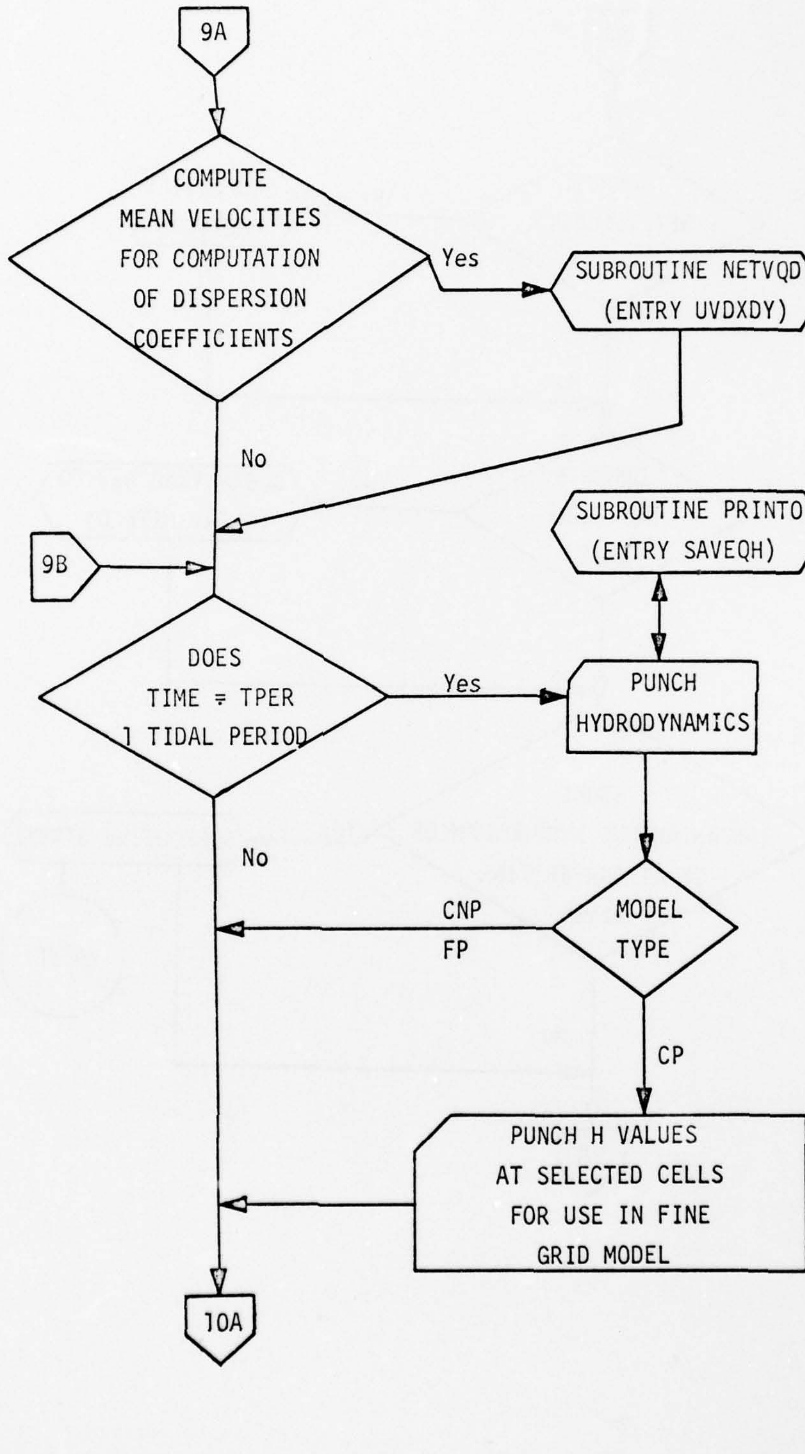

4A
ESTABLISH
INITIAL HYDRODYNAMICS
H, QX, QY
None
Tape
KINIQH
SET EQUAL TO ZERO
Card
MODEL
TYPE
CNP
CP
FP
SOURCE OF
INITIAL HYDRO-
DYNAMICS
Card
Tape
None
READ INITIAL H VALUES
DERIVED FROM COARSE
GRID MODEL
READ INITIAL EXCITING
DISCHARGES
KQFTP
5A

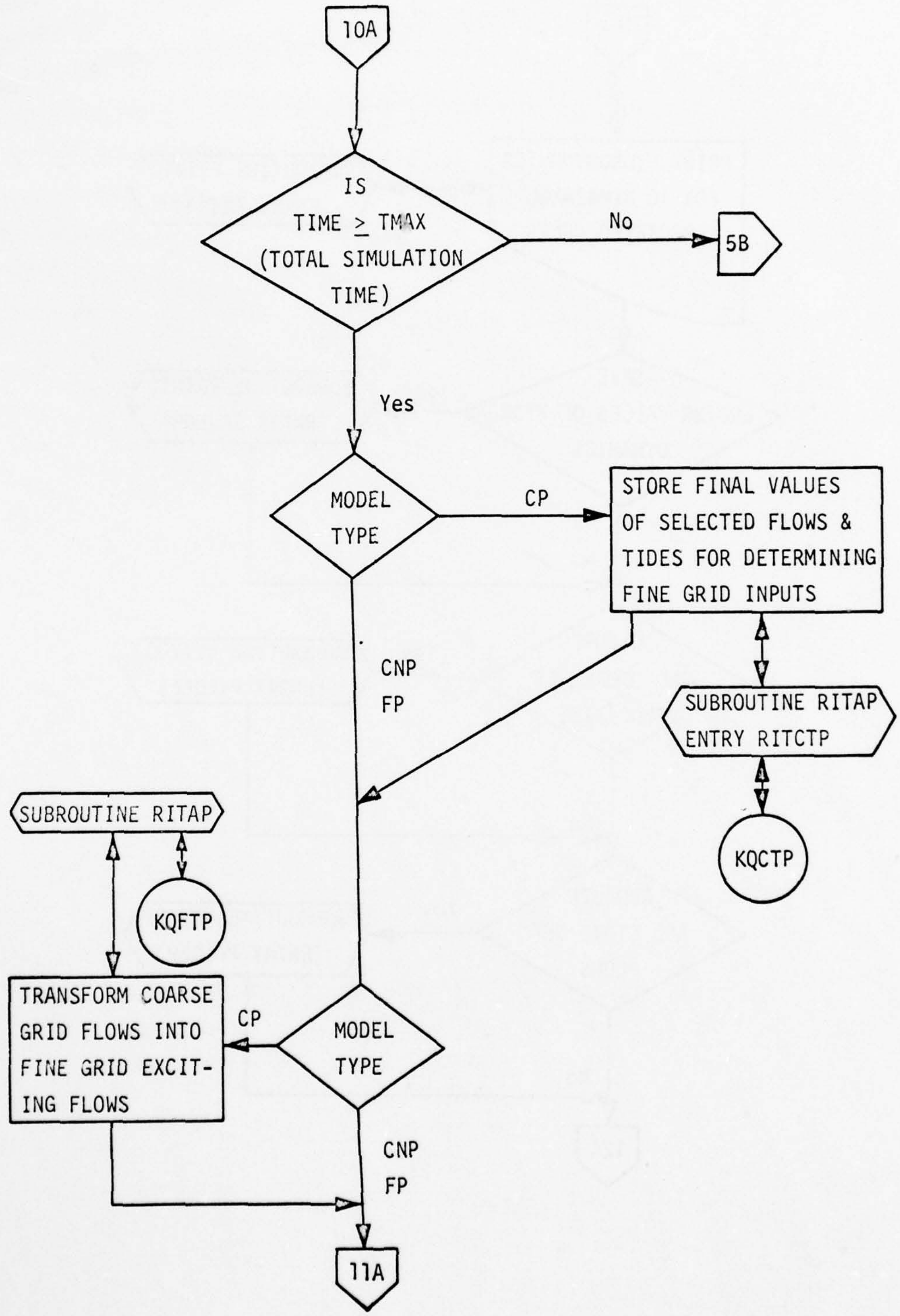

5A
INITIALIZE VARIABLES
TIDAL PLOTS DESIRED
Yes
STORE INITIAL HPLT VALUES ENTRY HPLOT SUBROUTINE PLOTHS
No
STORE INSTANTANEOUS HYDRODYN.
Yes
STORE INITIAL HYDRODYNAMICS SUBROUTINE STRVEL
KOTVEL
No
5B
INCREMENT TIME t = t + Δt
6A

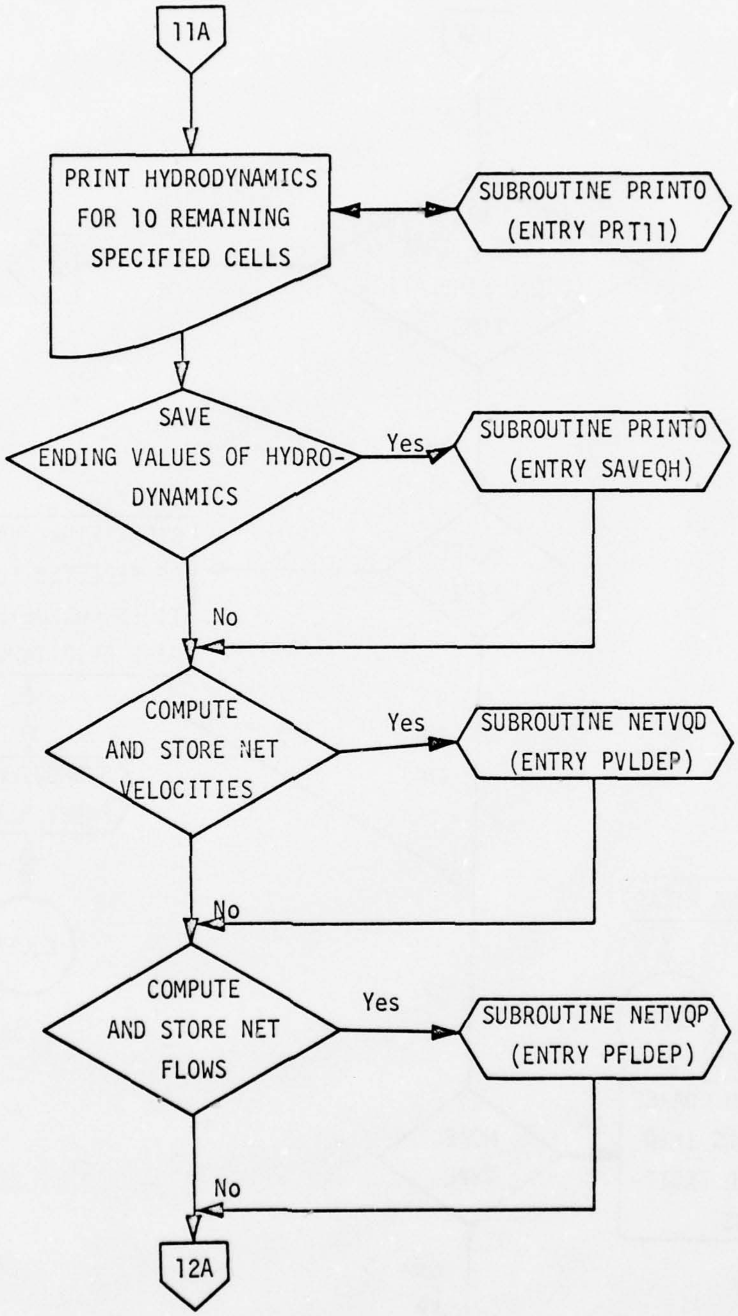

6A
SUBROUTINE
CALTID
MODEL
TYPE
CNP
CP
FP
KQFTP
READ EXCITING
DISCHARGES
ESTABLISH EXCITING
TIDES
COMPUTE BASIC
HYDRODYNAMICS
SUBROUTINE
CALCQH
MODEL
TYPE
CNP
FP
CP
STORE SELECTED FLOWS
& TIDES FOR DETER-
MINING FINE GRID INPUTS
KQCTP
SUBROUTINE RITAP
ENTRY RITCTP
7A

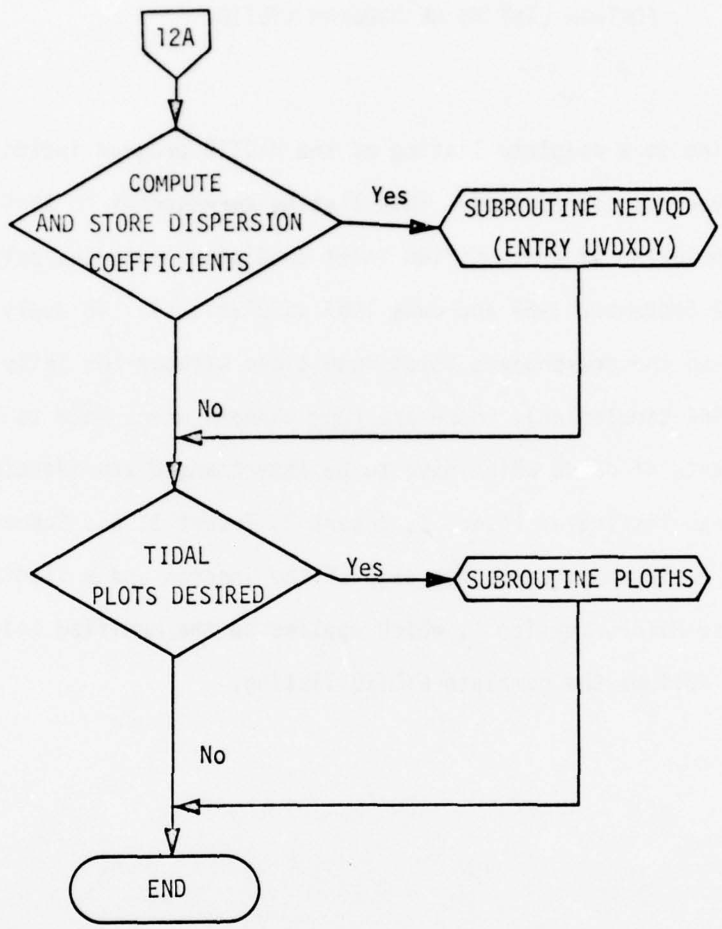

7A
PRINT HYDRODYNAMICS
FOR 10 SELECTED CELLS
if TIME = PRINT TIME
SUBROUTINE
PRINTO
TIDAL
PLOTS DESIRED
Yes
STORE HPLT VALUES
SUBROUTINE PLOTHS
ENTRY HPLOT
No
OPTIONS
REQUIRED OTHER
THAN BASIC
HYDRODYNAMICS
COMPUTATION
Yes
8A
No
9B


8A
COMPUTE NET VELOCITY SUMS
Yes
SUBROUTINE NETVQD
No
COMPUTE NET FLOW SUMS
Yes
SUBROUTINE NETVQD (ENTRY NETFLO)
No
STORE INSTANTANEOUS HYDRODYNAMICS IF AT PROPER TIME LEVEL
Yes
SUBROUTINE STRVEL
KOTVEL
No
9A


9A
COMPUTE
MEAN VELOCITIES
FOR COMPUTATION
OF DISPERSION
COEFFICIENTS
Yes
SUBROUTINE NETVQD
(ENTRY UVDXDY)
No
9B
SUBROUTINE PRINTO
(ENTRY SAVEQH)
DOES
TIME ∓ TPER
1 TIDAL PERIOD
Yes
PUNCH
HYDRODYNAMICS
No
CNP
FP
MODEL
TYPE
CP
PUNCH H VALUES
AT SELECTED CELLS
FOR USE IN FINE
GRID MODEL
10A


10A
IS
TIME ≥ TMAX
(TOTAL SIMULATION
TIME)
No
5B
Yes
MODEL
TYPE
CP
STORE FINAL VALUES
OF SELECTED FLOWS &
TIDES FOR DETERMINING
FINE GRID INPUTS
CNP
FP
SUBROUTINE RITAP
ENTRY RITCTP
KQCTP
SUBROUTINE RITAP
KQFTP
TRANSFORM COARSE
GRID FLOWS INTO
FINE GRID EXCIT-
ING FLOWS
CP
MODEL
TYPE
CNP
FP
11A


11A
PRINT HYDRODYNAMICS FOR 10 REMAINING SPECIFIED CELLS
SUBROUTINE PRINTO (ENTRY PRT11)
SAVE ENDING VALUES OF HYDRO-DYNAMICS
Yes
SUBROUTINE PRINTO (ENTRY SAVEQH)
No
COMPUTE AND STORE NET VELOCITIES
Yes
SUBROUTINE NETVQD (ENTRY PVLDEP)
No
COMPUTE AND STORE NET FLOWS
Yes
SUBROUTINE NETVQP (ENTRY PFLDEP)
No
12A


12A
COMPUTE AND STORE DISPERSION COEFFICIENTS
Yes
SUBROUTINE NETVQD (ENTRY UVDXDY)
No
TIDAL PLOTS DESIRED
Yes
SUBROUTINE PLOTHS
No
END

FORTRAN LISTING OF PROGRAM HYDTID

Following is a complete listing of the HYDTID program including all of its various subroutines. This listing corresponds to that used for simulation of the modified inlet conditions with the jetty in place (12 September 1969 and June 1967 simulations). To apply the program to the pre-project inlet conditions without the jetty (November 1964 simulation), there are four changes which have to be made. The sets of cards which have to be interchanged are identified in the program listing as Insert 1, Insert 2, Insert 3, and Subroutine RITAP. The replacement cards for each of the inserts and a listing of Subroutine RITAP, Version I, which applies to the modified inlet conditions, follows the complete HYDTID listing.

```
@I FOR,* HYDTID,HYDTID                                                                        05 FEB 73    12:06:27.041
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:27

  MAIN PROGRAM

  STORAGE USED (BLOCK, NAME, LENGTH)

       0001  *CODE   004252
       0000  *DATA   001551
       0002  *BLANK  032477
       0003  MQ      010544
       0004  ALL     007133
       0005  MRQ     000003
       0006  MPRC    000002
       0007  MQPI    002311
       0010  PUN     004622


  EXTERNAL REFERENCES (BLOCK, NAME)

    0011  PRINTI         0012  ZEROS          0013  PRINTT         0014  HPLOT          0015  STRVEL
    0016  CALTID         0017  CALCQH         0020  PRINTO         0021  NETVQD         0022  NETFLO
    0023  UVDXDY         0024  SAVEQH         0025  RITCTP         0026  RITAP          0027  PRT11
    0030  PVLDEP         0031  PFLDEP         0032  UVDOUT         0033  PLOTHS         0034  SQRT
    0035  NRDU$          0036  NIO1$          0037  NIO2$          0040  NWDU$          0041  NERR2$
    0042  NREW$          0043  NRDC$          0044  NPRT$          0045  COS            0046  SIN
    0047  NRBU$          0050  NWDC$          0051  NSTOP$


  STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0001   001714 1047G      0001   001725 1055G      0001   001735 1063G      0001   001746 1071G
   0001   001756 1077G      0001   001322 110L       0001   001767 1105G      0001   001777 1113G
   0001   002010 1121G      0001   002024 1131G      0001   002040 1141G      0001   002052 1151G
   0001   002111 1171G      0001   002131 1200G      0001   002132 1203G      0001   002167 1226G
   0001   002174 1232G      0000   001473 142F       0001   000023 143G       0001   004065 143L
   0000   001475 144F       0001   000030 147G       0001   003002 1547G      0001   003006 1553G
   0001   003020 1563G      0001   003024 1567G      0001   003045 1603G      0001   003061 1613G
   0001   000050 162G       0001   003113 1625G      0001   003114 1627G      0001   003131 1636G
```

0001	003132	1640G	0001	003161	1652G	0001	003162	1655G	0001	003264	1710G
0001	003272	1715G	0001	003301	1722G	0001	003307	1727G	0001	003315	1734G
0001	003323	1741G	0001	003330	1746G	0001	003336	1753G	0001	000072	176G
0001	003405	1775G	0000	000624	199F	0001	003406	2000G	0001	002223	201L
0000	000633	202F	0001	000105	203G	0001	002230	203L	0000	000643	204F
0001	002251	205L	0001	003551	2052G	0000	000621	2055F	0000	000655	206F
0001	003564	2061G	0001	002243	207L	0001	002255	208L	0000	000665	209F
0001	003674	2095L	0001	004071	2096L	0001	004113	2097L	0000	000677	210F
0001	000113	210G	0001	002277	213L	0000	000710	214F	0001	003750	2144G
0001	003760	2147G	0001	002273	215L	0001	002513	216L	0001	004033	2161G
0001	004036	2164G	0000	000726	217F	0001	002306	218L	0000	000765	2180F
0000	000746	219F	0001	000137	223G	0001	002555	226L	0001	002535	227L
0001	002543	228L	0000	001234	229F	0001	002561	230L	0000	001247	231F
0000	001264	232F	0001	000152	232G	0001	002405	233L	0001	002412	234L
0001	002416	235L	0001	000162	236G	0001	002423	236L	0000	001053	237F
0000	001063	238F	0000	001077	239F	0001	002345	240L	0001	002352	241L
0001	002356	242L	0001	002363	243L	0000	001016	244F	0000	001025	245F
0000	001037	246F	0001	000204	246G	0001	002513	247L	0000	001212	248F
0001	002445	249L	0001	002452	250L	0001	002456	251L	0001	000211	252G
0001	002463	252L	0000	001115	253F	0000	001136	254F	0000	001156	255F
0000	001276	257F	0000	001314	258F	0000	001344	259F	0000	001355	260F
0001	000231	265G	0001	002500	271L	0001	002505	272L	0000	001200	273F
0000	001003	274F	0001	002323	275L	0001	000253	277G	0001	001007	3001L
0001	001012	3002L	0001	001021	3003L	0001	001030	3004L	0001	001033	3005L
0001	001040	3006L	0001	001043	3007L	0001	001052	3008L	0001	000732	3011L
0001	000741	3012L	0001	000750	3013L	0001	000757	3014L	0001	000762	3015L
0001	000765	3016L	0001	000770	3017L	0001	000773	3018L	0001	000776	3019L
0001	001001	3020L	0001	001063	3021L	0001	001004	3022L	0000	000475	3025F
0000	000562	3026F	0000	000503	3027F	0000	000307	3032F	0000	000317	3033F
0000	000376	3035F	0000	000313	3043F	0000	000316	3044F	0000	000402	3045F
0000	000467	3046F	0001	000274	305G	0000	000410	3057F	0001	000422	3061L
0001	000433	3062L	0001	000444	3063L	0001	000455	3064L	0001	000466	3065L
0001	000477	3066L	0001	000510	3067L	0001	000536	3068L	0000	000614	3076F
0000	000570	3077F	0001	004246	310L	0001	000302	312G	0001	002266	316L
0001	000330	326G	0001	002530	329L	0001	000342	335G	0001	002400	337L
0001	000373	343G	0001	002340	347L	0000	000616	350F	0001	002440	352L
0001	001132	3666L	0001	003072	37L	0001	001117	3777L	0001	002767	38L
0001	003147	39L	0001	000542	405G	0001	000547	411G	0001	000567	424G
0001	000611	436G	0000	001467	443F	0001	000624	443G	0000	001465	444F
0001	003613	45L	0001	000632	450G	0001	003560	453L	0001	000656	463G
0001	000670	472G	0001	003373	5000L	0001	001241	5150L	0000	000577	516F
0001	001216	5160L	0001	001540	518L	0001	001561	519L	0001	001616	520L
0001	001653	521L	0001	001375	522L	0001	001264	5515L	0001	003457	599L

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0001   003421 60L      0001   003473 600L     0001   001163 604G     0001   001203 612G
0001   003626 661L     0001   003643 662L     0001   003652 667L     0000   001471 700F
0001   003230 701L     0000   000620 708F     0001   002161 709L     0001   002141 710L
0001   001404 714G     0001   001405 717G     0001   003254 720L     0001   001061 730L
0001   000362 732L     0001   001441 733G     0001   000521 733L     0001   000530 734L
0001   001710 738L     0001   002604 740L     0001   002612 741L     0001   002617 742L
0001   001455 743G     0001   003211 744L     0001   003214 745L     0001   003556 746L
0001   003737 747L     0001   004111 748L     0001   004133 750L     0001   004135 751L
0001   001467 752G     0001   001670 760L     0001   001673 761L     0001   001677 762L
0000   001330 763F     0000   001336 764F     0001   003542 770L     0001   003200 771L
0001   004140 772L     0001   004160 773L     0001   003217 774L     0001   003663 777L
0001   001166 780L     0000   000622 87F      0001   003674 888L     0001   002116 901L
0001   003523 99L      0001   004246 9999L    0000 R 000242 ANGCOR   0002   032436 A0
0002 R 021443 CB       0002 R 021777 CELSID   0000 R 000000 CODE     0002 R 032434 CON1
0002 R 032435 CON2     0002 R 021063 CT       0002   032442 C1       0002   032446 C2
0002   032452 C3       0002 R 000000 D        0000 R 000240 DATA     0002 R 032361 DS
0002 R 032365 DT       0002 R 032404 DTODS    0002 R 032432 DTO2DS   0002 R 032366 DT2
0000 R 000274 DUM      0000 R 000270 DUMDAT   0000 R 000267 DUMMY    0000 R 000252 DUMMY1
0000 R 000253 DUMMY2   0000 R 000255 DUMMY4   0000 R 000256 DUMMY5   0000 R 000257 DUMMY6
0000 R 000260 DUMMY7   0000 R 000261 DUMMY8   0000 R 000263 DUMMY9   0000 R 000264 DUMY10
0000 R 000227 DUM1     0000 R 000230 DUM2     0002 R 032427 E        0000 R 000220 ENDF
0000 R 000221 ENDT     0002 R 013755 F        0003 R 000000 FX       0003 R 002311 FY
0002 R 032362 G        0000 R 000223 GC       0002 R 032363 GCDT04   0002 R 032364 GDTODS
0002   021347 GTIDE    0002   031103 G1       0002   031223 G41      0002   031343 G42
0002   031463 G43      0004 R 004622 H        0002   023677 HF       0000 R 000306 HKP
0002 R 004622 HN       0002   022667 HPLT     0002   022655 HPRT     0002   023763 HPRTA
0006 R 000000 HSHIFT   0000 I 000225 I        0002 I 022155 IBAR     0000 I 000246 IBASIC
0003 I 004624 ICLL     0000 I 000235 IDCARD   0002 I 031603 IDTIDE   0000 I 000271 IDUM
0000 I 000251 IDUMY1   0000 I 000262 IDUMY2   0000 I 000254 IDUMY3   0002 I 016266 IFLAG
0002 I 020673 IFLOW    0000 I 000107 IHKP     0000 I 000304 IK       0000 I 000300 ILB
0000 I 000301 ILF      0002 I 032357 IMAX     0000 I 000243 IMXJMX   0002 I 032421 INETFL
0000 I 000250 INEW     0002 I 032431 IODISP   0002 I 032424 IONFLO   0002 I 032423 IONVEL
0002 I 022561 IP       0002 I 032422 IPDATA   0000 I 000236 IQHIN    0002 I 032430 ISAVQH
0002 I 021157 ITIDE    0000 I 000237 IVLTAP   0000 I 000217 I$       0000 I 000226 J
0002 I 022333 JBAR     0003 I 006574 JCLL     0007 I 000000 JFLAG    0002 I 020767 JFLOW
0000 I 000152 JHKP     0000 I 000305 JK       0000 I 000302 JLB      0000 I 000303 JLF
0002 I 032360 JMAX     0002 I 022605 JP       0002 I 021253 JTIDE    0000 I 000231 K
0000 I 000244 KB       0000 I 000245 KD       0000 I 000276 KEPSAV   0000 I 000277 KG
0002 I 032412 KINDAT   0002 I 032413 KINIQH   0000 I 000232 KK       0002 I 032433 KO
0002 I 032420 KODISP   0002 I 032416 KONETF   0002 I 032415 KONETV   0002 I 032417 KOTVEL
0003 I 004623 KOUNT    0002   032410 KOUTCD   0002 I 032414 KOUTDA   0002   032411 KOUTPP
0000 I 000222 KPRINT   0005 I 000001 KQCTP    0005 I 000002 KQFTP    0005 I 000000 KRSOFN
0000 I 000233 KT       0002 I 032472 LINMAX   0002 I 032407 M        0000 I 000275 MA
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0000 I 000266 N          0002 I 032402 NFLOW      0000 I 000234 NN         0002 I 032425 NPLOT
0000 I 000265 NPRPLT     0002 I 032401 NREEF      0002 I 032403 NTIDE      0002 R 032373 OMEGA
0002 R 032374 PHI        0002   032456 PHI1       0002   032462 PHI2       0002   032466 PHI3
0000 R 000224 PI         0002 R 032372 PTIME      0002 R 020577 QINFLO     0004 R 000000 QX
0002 R 007133 QXN        0004 R 002311 QY         0002 R 011444 QYN        0002 R 032426 R
0000 R 000003 REMARK     0000 R 000215 SIDE       0003 R 004622 SQTG       0002 R 022511 STATON
0002 R 032370 TCOUNT     0002 R 032376 THETA      0002   030643 THETA1     0002   030523 TI
0002 R 031677 TIDE1      0002 R 032013 TIDE2      0002 R 032127 TIDE3      0002 R 032243 TIDE4
0002 R 032473 TID1       0002 R 032474 TID2       0002 R 032475 TID3       0002 R 032476 TID4
0002 R 023731 TIM        0002 R 032367 TIME       0000 R 000241 TIMEIN     0006 R 000001 TIMTOT
0002 R 032406 TIMVEL     0002 R 032405 TMARK      0000 R 000247 TMAX       0000 R 000272 TNET
0000 R 000216 TOP        0002 R 032371 TPER       0000 R 000273 TPLOT      0002   022631 UAPRT
0002   025423 UAPRTA     0010   000000 UPLT       0002   022643 VAPRT      0002   027063 VAPRTA
0010   002311 VPLT       0002 R 032375 W          0002 R 030763 W2         0002 R 032377 XW
0002 R 032400 YW         0002 R 002311 Z          0002 R 021621 ZB


00100      1*   C                                                             HYD 0002
00100      2*   C          EXECUTIVE CONTROL ROUTINE (HYDTID)                       *NEW
00100      3*   C             THIS IS THE BASIC CONTROL ELEMENT OF THE PROGRAM.  HYD 0004**-1
00100      4*   C          ALL PROGRAM CONTROL DATA, REAL SYSTEM DATA, AND MODEL  HYD 0005
00100      5*   C          DESCRIPTION DATA REQUIRED FOR COMPUTING TIDAL HYDRO-   HYD 0006
00100      6*   C          DYNAMICS ARE INPUT INTO THE PROGRAM BY THIS ROUTINE.
00100      7*   C          VARIABLES ARE INITIALIZED, CONSTANTS ARE SET, AND      HYD 0008
00100      8*   C          A PORTION OF THE BASIC INPUT DATA ARE ECHO-PRINTED.    HYD 0009
00100      9*   C          AT EVERY TIME STEP DURING THE SIMULATION PERIOD, CONTROL HYD 0010
00100     10*   C          IS TRANSFERRED FROM THIS ROUTINE TO APPROPRIATE SUB-   HYD 0011
00100     11*   C          ROUTINES FOR CALCULATION OF INSTANTANEOUS TIDAL        HYD 0012
00100     12*   C          AMPLITUDES AND FLOWS PER UNIT WIDTH THROUGHOUT THE BAY HYD 0013
00100     13*   C          SYSTEM. AT THE OPTION OF THE USER CONTROL CAN ALSO     HYD 0014
00100     14*   C          BE TRANSFERRED TO THE APPROPRIATE SUBROUTINES FOR      HYD 0015
00100     15*   C          CALCULATION OF NET FLOWS, NET VELOCITIES, MEAN           *NEW
00100     16*   C          VELOCITIES, OR DISPERSION COEFFICIENTS.                  *NEW
00100     17*   C                                                             HYD 0018**-2
00101     18*         COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),     *NEW
00101     19*        1F(35,35),IFLAG(35,35)                                         *NEW
00103     20*         COMMON QINFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),  *NEW
00103     21*        *       GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),  **-3
00103     22*        *       STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00103     23*        *       HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00103     24*        *       VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
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00103        *     G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
00103        *     TIDE4(76)
00104         COMMON IMAX,JMAX,DS,G,GCDTO4,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 0028
00104        *     OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,       HYD 0029
00104        *     TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF,  HYD 0030
00104        *     KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00104        *     ISAVQH,IODISP,DTO2DS,KO                                     HYD 0032
00105         COMMON CON1,CON2,A0(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00106         COMMON LINMAX,TID1,TID2,TID3,TID4
00107         COMMON/MQ/FX(35,35),FY(35,35),SQTG,KOUNT,ICLL(1000),JCLL(1000)          *NEW
00110         COMMON/ALL/QX(35,35),QY(35,35),H(35,35)                                 *NEW
00111         COMMON/MRQ/KRSOFN,KQCTP,KQFTP                                           *NEW
00112         COMMON/MPRC/HSHIFT,TIMTOT                                               *NEW
00113         COMMON/MQPI/JFLAG(35,35)                                                *NEW
00114         COMMON/PUN/UPLT(35,35),VPLT(35,35)                                      *NEW
00115         DIMENSION CODE(3), REMARK(4,17)                                    HYD 0037
00116         DIMENSION IHKP(35),JHKP(35)                                             *NEW
00117         DATA SIDE/4HSIDE/, TOP/4HTOP /                                     HYD 0041**-4
00122         DATA CODE/4HCARD,4HTAPE,4HBOTH/, ENDF/4HENDF/, ENDT/4HENDT/        HYD 0042
00126         DATA IFLOW/9,10,11,12,13,14,15,16,17,18,19,8*8,3*21,4*1,32,4,32,        *NEW
00126       14,32,4,20,29,31,32,32,20,20,12,13,14,15,16,3*20,13*0/                    *NEW
00130         DATA JFLOW/11*4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,22,23,23,       *NEW
00130       124,24,6*25,26,27,6*28,29,30,13*0/                                        *NEW
00130      C                                                                     HYD 0043
00130      C                             STEP-01                                 HYD 0044
00130      C                             SET CONSTANTS.                          HYD 0045
00130      C                                                                     HYD 0046
00132         KOUNT=0                                                                 *NEW
00133         KPRINT=1.0                                                              *NEW
00134         PTIME = 60.0                                                       CORR0029
00135         OMEGA = 7.29E-05                                                   CORR0028
00136         G = 32.1725 * 3600.0                                               CORR0030
00137         SQTG=SQRT(G)                                                            *NEW
00140         GC = 32.1725 / 2.21                                                CORR0031
00141         PI = 3.1416                                                        CORR0032
00141      C                                                                     HYD 0066**-1
00141      C                             STEP-02                                 HYD 0067
00141      C                             READ TITLE CARDS.                       HYD 0068
00141      C                                                                     HYD 0069
00142         DO 3031 I = 1, 4                                                   HYD 0070
00145         READ (5,3032) (D(I,J),J=1,20)                                      HYD 0071
00153    3032 FORMAT (2A4,1X,F2.0,1X,17A4)                                       HYD 0072
00154    3031 CONTINUE                                                           HYD 0073
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INSERT 1

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00156    68*        READ (5,3044) DUM1,DUM2,(W2(I), I=1,15)
00166    69*   3043 FORMAT (15X,17A4,///)
00167    70*   3044 FORMAT (20A4)
00170    71*        WRITE (6,2055)                                                  HYD 0075
00172    72*        WRITE (6,3033)                                                  HYD 0076
00174    73*   3033 FORMAT (15X,40H CARD   CARD                              ,      HYD 0077
00174    74*       *            40HDESCRIPTION                               ,/,    HYD 0078
00174    75*       *        15X,40H TYPE    NO                          ALPH,       HYD 0079
00174    76*       *            40HANUMERIC TITLE                            ,/,    HYD 0080
00174    77*       *        15X,40H ----   ----                         ----,       HYD 0081
00174    78*       *            40H--------------                        )          HYD 0082
00175    79*        DO 3034 I = 1, 4                                                HYD 0083
00200    80*        K = D(I,3)                                                      HYD 0084
00201    81*        WRITE (6,3035) (D(I,J),J=1,2), K, (D(I,J),J=4,20)               HYD 0085
00214    82*   3035 FORMAT (15X,2A4,1X,I2,1X,17A4)                                  HYD 0086
00215    83*   3034 CONTINUE                                                        HYD 0087
00217    84*        WRITE (6,3043) DUM1,DUM2,(W2(I), I=1,15)
00227 *DIAGNOSTIC*  THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
00227    85*        IF (DUM1.NE.ENDT) GO TO 3777                                    HYD 0089
00231    86*        DO 3036 I = 1, 4                                                HYD 0090
00234    87*        K = D(I,3)                                                      HYD 0091
00235    88*        DO 3036 J = 4, 20                                               HYD 0092
00240    89*        KK = J - 3                                                      HYD 0093
00241    90*        REMARK(K,KK) = D(I,J)                                           HYD 0094
00242    91*   3036 CONTINUE                                                        HYD 0095
00242    92*  C                                                                     HYD 0096
00242    93*  C                            STEP-03                                  HYD 0097
00242    94*  C                            READ PROGRAM CONTROL DATA.               HYD 0098
00242    95*  C                                                                     HYD 0099
00245    96*        DO 3042 I=1,9                                                       *NEW
00250    97*        READ (5,3045) (D(I,J),J=1,15)                                   HYD 0101**-1
00256    98*   3045 FORMAT (2A4,1X,F2.0,1X,10A4,6X,A4,13X,F2.0)                     CORR0007
00257    99*   3042 CONTINUE
00261   100*        READ (5,3044) DUM1,DUM2,(W2(I), I=1,15)
00271   101*        WRITE (6,2055)                                                  HYD 0105
00273   102*        WRITE (6,3057)                                                  HYD 0106
00275   103*   3057 FORMAT (15X,40H CARD   CARD              DESCRIPTION   ,        HYD 0107
00275   104*       *            40H        TYPE OF INPUT/OUTPUT   TAPE   ,/,        HYD 0108
00275   105*       *        15X,40H TYPE   NO                            ,          HYD 0109
00275   106*       *            40H        CARD,TAPE,BOTH, OR NONE   NO  ,/,        HYD 0110
00275   107*       *        15X,40H ----   ----              ----------- ,          HYD 0111
00275   108*       *            40H        ---------------------  ----   )          HYD 0112
00276   109*        DO 3058 I=1,9                                                       *NEW
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00301    110*           K = D(I,3)                                                              HYD 0114**-1
00302    111*           KK = D(I,15)                                                            HYD 0115
00303    112*           WRITE (6,3046) (D(I,J),J=1,2), K, (D(I,J),J=4,14), KK                   HYD 0116
00317    113*      3058 CONTINUE                                                                HYD 0117
00321    114*      3046 FORMAT (15X,2A4,1X,I2,1X,10A4,6X,A4,12X,I2)                             HYD 0118
00322    115*           WRITE (6,3043) DUM1,DUM2,(W2(I), I=1,15)
00332  *DIAGNOSTIC*     THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
00332    116*           IF (DUM1.NE.ENDF) GO TO 3777                                            HYD 0120
00334    117*           DO 3068 I=1,9                                                                *NEW
00337    118*           GO TO (732,732,732,732,732,732,732,733,734),I                                *NEW
00340    119*       732 K=D(I,3)                                                                     *NEW
00341    120*           KT = 0                                                                  HYD 0123**-2
00342    121*           DO 3056 NN = 1, 3                                                       HYD 0124
00345  *DIAGNOSTIC*     THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
00345    122*           IF (D(I,14).EQ.CODE(NN))KT = KT + NN                                    HYD 0125
00347    123*      3056 CONTINUE                                                                HYD 0126
00351    124*           GO TO (3061, 3062, 3063, 3064, 3065, 3066, 3067), K                     HYD 0127
00352    125*      3061 IDCARD = KT                                                             HYD 0128
00353    126*           KINDAT = D(I,15)                                                        HYD 0129
00354    127*           GO TO 3068                                                              HYD 0130
00355    128*      3062 IQHIN = KT                                                              HYD 0131
00356    129*           KINIQH = D(I,15)                                                        HYD 0132
00357    130*           GO TO 3068                                                              HYD 0133
00360    131*      3063 IONVEL = KT                                                             HYD 0134
00361    132*           KONETV = D(I,15)                                                        HYD 0135
00362    133*           GO TO 3068                                                              HYD 0136
00363    134*      3064 IONFLO = KT                                                             HYD 0137
00364    135*           KONETF = D(I,15)                                                        HYD 0138
00365    136*           GO TO 3068                                                              HYD 0139
00366    137*      3065 IODISP = KT                                                             HYD 0140
00367    138*           KODISP = D(I,15)                                                        HYD 0141
00370    139*           GO TO 3068                                                              HYD 0142
00371    140*      3066 ISAVQH = KT                                                             HYD 0143
00372    141*           KOUTDA = D(I,15)                                                        HYD 0144
00373    142*           GO TO 3068                                                              HYD 0145
00374    143*      3067 IVLTAP = KT
00375    144*           KOTVEL = D(I,15)                                                        HYD 0147
00376    145*           GO TO 3068                                                                   *NEW
00377    146*       733 KQFTP=D(I,15)                                                                *NEW
00400    147*           GO TO 3068                                                                   *NEW
00401    148*       734 KQCTP=D(I,15)                                                                *NEW
00401    149*     C                                                                                  *NEW
00401    150*     C       KQFTP COMPILED FROM KQCTP IN COARSE GRID MODEL.                            *NEW
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00401      C       KQFTP READ AND KQCTP UNUSED IN FINE GRID MODEL.                                *NEW
00401      C                                                                                      *NEW
00402       3068 CONTINUE                                                                  HYD 0148
00402      C                                                                               HYD 0149
00402      C                                     STEP-04                                   HYD 0150
00402      C                                     READ BASIC MODEL OPERATION                HYD 0151
00402      C                                     PARAMETERS.                               HYD 0152
00402      C                                                                               HYD 0153
00404            DO 3024 I=1,20                                                                   *NEW
00407            READ (5,3025) (D(I,J),J=1,19)                                             HYD 0155**-1
00415       3025 FORMAT (2A4,2X,F2.0,2X,A1,14A4,2X,F7.0)                                   HYD 0156
00416       3024 CONTINUE                                                                  HYD 0157
00420            READ (5,3044) DUM1,DUM2,(W2(I), I=1,15)
00430            WRITE (6,2055)                                                            HYD 0159
00432            WRITE (6,3027)                                                            HYD 0160
00434       3027 FORMAT (15X,40H CARD   CARD                            DESCR,             HYD 0161
00434          *                40HIPTION                              VALUE,/,            HYD 0162
00434          *          15X,40H TYPE    NO                                               CORR0009
00434          *               ,40H                                          ,/,           HYD 0164
00434          *            15X,40H ----   ----                         -----,             HYD 0165
00434          *                40H------                               -----)             HYD 0166
00435            DO 3028 I=1,20                                                                   *NEW
00440            K = D(I,3)                                                                HYD 0168**-1
00441            WRITE (6,3026) (D(I,J),J=1,2), K, (D(I,J),J=4,19)                         HYD 0169
00454       3026 FORMAT (15X,2A4,2X,I2,2X,A1,14A4,2X,F7.1)                                 HYD 0170
00455       3028 CONTINUE                                                                  HYD 0171
00457            WRITE (6,3043) DUM1,DUM2,(W2(I), I=1,15)
00467 *DIAGNOSTIC*  THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
00467            IF (DUM1.NE.ENDF) GO TO 3777                                              HYD 0173
00471            DO 3021 I=1,20                                                                   *NEW
00474            K = D(I,3)                                                                HYD 0175**-1
00475            DATA = D(I,19)                                                            HYD 0176
00476            GO TO (3011, 3012, 3013, 3014, 3015, 3016, 3017, 3018, 3022,              HYD 0177
00476          *        3019, 3020, 3001, 3002, 3003, 3004, 3005, 3006, 3007,
00476          *      3008,730),K                                                                 *NEW
00477       3011 KRSOFN=DATA                                                                      *NEW
00477      C                                                                                      *NEW
00477      C       KRSOFN = 1 FOR COARSE GRID PRODUCTION RUN.                                     *NEW
00477      C       KRSOFN = 2 FOR FINE GRID PRODUCTION RUN.                                       *NEW
00477      C       KRSOFN = 3 FOR COARSE GRID NON-PRODUCTION RUN.                                 *NEW
00477      C                                                                                      *NEW
00500            GO TO 3021                                                                HYD 0180**-2
00501       3012 IPDATA = DATA                                                             HYD 0181
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00502    193*          GO TO 3021                                                  HYD 0182
00503    194*     3013 NPLOT  = DATA                                               HYD 0183
00504    195*          GO TO 3021                                                  HYD 0184
00505    196*     3014 TIMTOT = DATA                                               HYD 0185
00506    197*          GO TO 3021                                                  HYD 0186
00507    198*     3015 TIMEIN = DATA                                               HYD 0187
00510    199*          GO TO 3021                                                  HYD 0188
00511    200*     3016 TIMVEL = DATA                                               HYD 0189
00512    201*          GO TO 3021                                                  HYD 0190
00513    202*     3017 TPER   = DATA                                               HYD 0191
00514    203*          GO TO 3021                                                  HYD 0192
00515    204*     3018 W      = DATA                                               HYD 0193
00516    205*          GO TO 3021                                                  HYD 0194
00517    206*     3019 R      = DATA                                               HYD 0195
00520    207*          GO TO 3021                                                  HYD 0196
00521    208*     3020 E      = DATA                                               HYD 0197
00522    209*          GO TO 3021                                                  HYD 0198
00523    210*     3022 THETA  = DATA                                               HYD 0199
00524    211*          GO TO 3021                                                  CORR0013
00525    212*     3001 ANGCOR = DATA                                               CORR0014
00526    213*          GO TO 3021                                                  CORR0015
00527    214*     3002 IMAX   = DATA                                               CORR0016
00530    215*          GO TO 3021                                                  CORR0017
00531    216*     3003 JMAX   = DATA                                               CORR0018
00532    217*          GO TO 3021                                                  CORR0019
00533    218*     3004 DS     = DATA                                               CORR0020
00534    219*          GO TO 3021                                                  CORR0021
00535    220*     3005 DT     = DATA                                               CORR0022
00536    221*          DT=DT/60.                                                       *NEW
00537    222*          GO TO 3021                                                  CORR0023
00540    223*     3006 PHI    = DATA                                               CORR0024
00541    224*          GO TO 3021
00542    225*     3007 LINMAX = DATA
00543    226*          GO TO 3021
00544    227*     3008 INETFL = DATA
00545    228*          GO TO 3021                                                      *NEW
00546    229*      730 HSHIFT=DATA                                                     *NEW
00547    230*     3021 CONTINUE                                                    HYD 0200
00551    231*          IMXJMX = IMAX * JMAX                                        CORR0025
00552    232*          KB = 0
00553    233*          KT = 0                                                      CORR0026
00554    234*          KD = 0                                                      CORR0027
00555    235*          GCDT04 = 1.26 * GC * DT                                     CORR0033
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00556          GDTODS = G * DT / (2.0 * DS)                                  CORR0034
00557          DTODS = DT / DS                                               CORR0035
00560          DTO2DS = DTODS / 2.0                                          CORR0036
00561          DT2 = DT / 2.0                                                CORR0037
00562          KO = 0                                                        CORR0038
00563          GO TO 3666                                                    HYD 0201
00564     3777 WRITE (6,2055)                                                HYD 0202
00566          WRITE (6,3077)                                                HYD 0203
00570     3077 FORMAT (15X,29H*** THERE WAS A DATA BUST ***)                 HYD 0204
00571          GO TO 9999                                                    CORR0039
00572     3666 CONTINUE                                                      HYD 0205
00573    497   CONTINUE                                                      HYD 0218*-12
00574          IBASIC = IONFLO + INETFL + IONVEL + IODISP + IVLTAP
00575          TMAX = TIMEIN+TIMTOT                                          HYD 0222
00575    C                                                                   HYD 0223
00575    C                             STEP-05                               HYD 0224
00575    C                             READ BASIC CELL DATA.                 HYD 0225
00575    C                                                                   HYD 0226
00576          IF (IDCARD.EQ.2) REWIND KINDAT                                CORR0040
00600          INEW = IDCARD+1                                               HYD 0228
00601          IF(KRSOFN.EQ.2)GO TO 780                                          *NEW
00603          DO 781 M=1,60                                                     *NEW
00606          IFLOW(M)=0                                                        *NEW
00607      781 JFLOW(M)=0                                                        *NEW
00611      780 DO 517 K=1,IMXJMX                                                 *NEW
00614          GO TO (3777,5160,5150,3777), INEW                             CORR0041**-1
00615    5160  READ 516,I,J,IDUMY1,DUMMY1,DUMMY2,IDUMY3,DUMMY4,DUMMY5,DUMMY6,  HYD 0231
00615         *DUMMY7,DUMMY8,IDUMY2,DUMMY9,DUMY10                            HYD 0232
00635      516 FORMAT (16X,3(I2,1X),F4.0,1X,F5.3,1X,I2,1X,F7.0,                  *NEW
00635         *       1X,2(F5.3,1X,F4.1,1X),I2,1X,2A4)                           **-1
00636          GO TO 5515                                                    HYD 0235
00637    5150  READ (KINDAT,516) I,J,IDUMY1,DUMMY1,DUMMY2,IDUMY3,DUMMY4,DUMMY5, HYD 0236
00637         *DUMMY6,DUMMY7,DUMMY8,IDUMY2,DUMMY9,DUMY10                     HYD 0237
00657    5515  IFLAG(I,J) = IDUMY1                                           HYD 0238
00660          Z(I,J)= DUMMY1                                                HYD 0239
00661          Z(I,J) = Z(I,J)-HSHIFT                                            *NEW
00662          IF (IFLAG(I,J).EQ.1) Z(I,J) = 9999.                               *NEW
00664          IF(IFLAG(I,J).EQ.1)GO TO 110                                      *NEW
00666          KOUNT=KOUNT+1                                                     *NEW
00667          ICLL(KOUNT)=I                                                     *NEW
00670          JCLL(KOUNT)=J                                                     *NEW
00671      110 CONTINUE                                                          *NEW
00672          F(I,J) = DUMMY2                                               HYD 0240
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00673   279*          H(I,J) = IDUMY3                                                  HYD 0241
00674   280*          HN(I,J) = DUMMY4                                                 HYD 0242
00675   281*          QX(I,J) = DUMMY5                                                 HYD 0243
00676   282*          QXN(I,J) = DUMMY6                                                HYD 0244
00677   283*          QY(I,J) = DUMMY7                                                 HYD 0245
00700   284*          QYN(I,J) = DUMMY8                                                HYD 0246
00701   285*          IF (IDUMY2.LE.0.OR.IDUMY2.GT.20)GO TO 522                                 *NEW
00703   286*          NPRPLT = IDUMY2                                                  HYD 0248**-1
00704   287*          STATON(1,NPRPLT) = DUMMY9                                        HYD 0249
00705   288*          STATON(2,NPRPLT) = DUMY10                                        HYD 0250
00706   289*          IP(NPRPLT) = I                                                   HYD 0251
00707   290*          JP(NPRPLT) = J                                                   HYD 0252
00710   291*     522  CONTINUE                                                         HYD 0253
00711   292*     517  CONTINUE                                                         HYD 0254
00713   293*          DO 856 J=1,JMAX                                                           *NEW
00716   294*          DO 856 I=1,IMAX                                                           *NEW
00721   295*          FX(I,J)=(F(I,J)+F(I+1,J))**2                                              *NEW
00722   296*      856 FY(I,J)=(F(I,J)+F(I,J+1))**2                                              *NEW
00725   297*          IF (IDCARD.EQ.2) REWIND KINDAT                                   CORR0043
00727   298*          READ (5,3044) DUM1,DUM2,(W2(I), I=1,15)
00737   299*          WRITE (6,3043) DUM1,DUM2,(W2(I), I=1,15)
00747   *DIAGNOSTIC*  THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
00747   300*          IF (DUM1.NE.ENDF) GO TO 3777                                     CORR0048
00751   301*          DO 450 N=1,KOUNT                                                          *NEW
00754   302*          I=ICLL(N)                                                                 *NEW
00755   303*          J=JCLL(N)                                                                 *NEW
00756   304*          IDUMY3 = H(I,J)                                                  HYD 0258**-2
00757   305*          DUMMY4 = HN(I,J)                                                 HYD 0259
00760   306*          DUMMY5 = QX(I,J)                                                 HYD 0260
00761   307*          DUMMY6 = QXN(I,J)                                                HYD 0261
00762   308*          DUMMY7 = QY(I,J)                                                 HYD 0262
00763   309*          DUMMY8 = QYN(I,J)                                                HYD 0263
00764   310*          IF (IDUMY3.LE.0.0000001) GO TO 518                               HYD 0265
00766   311*          KT = KT+1                                                        HYD 0266
00767   312*          ITIDE(KT) = I                                                    HYD 0267
00770   313*          JTIDE(KT) = J                                                    HYD 0268
00771   314*          IDTIDE(KT) = IDUMY3                                              HYD 0269
00772   315*          CT(KT) = 2.0                                                              *NEW
00773   316*     518  CONTINUE                                                         HYD 0271**-1
00774   317*          DUMMY = ABS(DUMMY4)                                              HYD 0272
00775   318*          IF (DUMMY.LE.0.001) GO TO 519                                    HYD 0273
00777   319*          KD = KD+1                                                        HYD 0274
01000   320*          IFLOW(KD) = I                                                    HYD 0275
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01001    321*          JFLOW(KD) = J                                                      HYD 0276
01002    322*          QINFLO(KD) = DUMMY4                                                HYD 0277
01003    323*    519   CONTINUE                                                           HYD 0278
01004    324*          IF (DUMMY5.LE.0.000001) GO TO 520                                  HYD 0279
01006    325*          KB = KB+1                                                          HYD 0280
01007    326*          IBAR(KB) = I                                                       HYD 0281
01010    327*          JBAR(KB) = J                                                       HYD 0282
01011    328*          CELSID(KB) = SIDE                                                  HYD 0283
01012    329*          CB(KB) = DUMMY5                                                    HYD 0284
01013    330*          ZB(KB)=DUMMY6                                                          *NEW
01014    331*          ZB(KB) = ZB(KB)-HSHIFT                                                 *NEW
01015    332*          IF(ZB(KB).GT.0.)CB(KB)=0.5                                             *NEW
01017    333*    520   CONTINUE                                                           HYD 0286**-1
01020    334*          IF (DUMMY7.LE.0.000001) GO TO 521                                  HYD 0287
01022    335*          KB = KB+1                                                          HYD 0288
01023    336*          IBAR(KB) = I                                                       HYD 0289
01024    337*          JBAR(KB)=J                                                         HYD 0290
01025    338*          CELSID(KB) = TOP                                                   HYD 0291
01026    339*          CB(KB) = DUMMY7                                                    HYD 0292
01027    340*          ZB(KB)=DUMMY8                                                          *NEW
01030    341*          ZB(KB) = ZB(KB)-HSHIFT                                                 *NEW
01031    342*          IF(ZB(KB).GT.0.)CB(KB)=0.5                                             *NEW
01033    343*    521   CONTINUE                                                           HYD 0294**-1
01034    344*    450   CONTINUE                                                           HYD 0295
01036    345*          NREEF=KB                                                           HYD 0296
01037    346*          GO TO (761,760,761),KRSOFN                                             *NEW
01037    347*    C                                                                            *NEW
01037    348*    C     NFLOW MUST BE ASSIGNED ANOTHER VALUE FOR OTHER CONFIGURATIONS.         *NEW
01037    349*    C                                                                            *NEW
01040    350*      760 NFLOW=47            INSERT 2                                           *NEW
01041    351*          GO TO 762                                                              *NEW
01042    352*      761 NFLOW=KD                                                               *NEW
01043    353*          NTIDE=KT                                                               *NEW
01044    354*      762 GO TO (738,901,738),KRSOFN                                             *NEW
01044    355*    C                                                                    HYD 0299**-2
01044    356*    C                           STEP-06                                  HYD 0300
01044    357*    C                           READ EXCITATION TIDE DATA.               HYD 0301
01044    358*    C                           FOR COARSE GRID MODELS ONLY.                 *NEW
01044    359*    C                                                                    HYD 0302
01045    360*      738 READ 3044,(DUMDAT,I=1,3)                                               *NEW
01053    361*          READ 3076, (TIDE1(I), I=1,26)                                          **-1
01061    362*          READ 3044, (DUMDAT, I=1,3)
01067    363*          READ 3076, (TIDE2(I), I=1,26)
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01075     364*             READ 3044, (DUMDAT, I=1,3)
01103     365*             READ 3076, (TIDE3(I), I=1,26)
01111     366*             READ 3044,(DUMDAT,I=1,3)                                              *NEW
01117     367*             READ 3076,(TIDE4(I),I=1,26)                                           *NEW
01125     368*             READ (5,3044) DUM1,DUM2,(W2(I), I=1,15)
01135     369*             WRITE (6,3043) DUM1,DUM2,(W2(I), I=1,15)
01145    *DIAGNOSTIC*      THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
01145     370*             IF (DUM1.NE.ENDF) GO TO 3777
01147     371*        3076 FORMAT (16F5.2)
01150     372*             DO 301 I=1,26                                                         *NEW
01153     373*             TIDE1(I) = TIDE1(I)-HSHIFT                                            *NEW
01154     374*             TIDE2(I) = TIDE2(I)-HSHIFT                                            *NEW
01155     375*             TIDE3(I) = TIDE3(I)-HSHIFT                                            *NEW
01156     376*             TIDE4(I)=TIDE4(I)-HSHIFT                                              *NEW
01157     377*         301 CONTINUE                                                              *NEW
01161     378*             TID1 = TIDE1(1)
01162     379*             TID2 = TIDE2(1)
01163     380*             TID3 = TIDE3(1)
01164     381*             TID4=TIDE4(1)                                                         *NEW
01164     382*      C                                                                            *NEW
01164     383*      C                           STEP 07                                          *NEW
01164     384*      C                           CELL IDENTIFICATION FOR STORING H-VALUES         *NEW
01164     385*      C                           COARSE GRID PRODUCTION.                          *NEW
01164     386*      C                                                                            *NEW
01165     387*             IF(KRSOFN.EQ.3)GO TO 901                                              *NEW
01167     388*             READ(5,350)(IHKP(N),JHKP(N),N=1,32)                                   *NEW
01176     389*         350 FORMAT(20(2I2))                                                       *NEW
01176     390*      C                                                                     HYD 0313**-1
01176     391*      C                           STEP 08                                          *NEW
01176     392*      C                           INPUT TWO-DIGIT FLAGS FOR CONVECTION.            *NEW
01176     393*      C                                                                     HYD 0317**-2
01177     394*         901 DO 711 I=1,IMAX                                                       *NEW
01202     395*             DO 711 J=1,JMAX                                                       *NEW
01205     396*         711 JFLAG(I,J)=11                                                         *NEW
01210     397*         710 READ(5,708)I,J,IDUM                                                   *NEW
01215     398*             IF(I.EQ.0)GO TO 709                                                   *NEW
01217     399*             JFLAG(I,J)=IDUM                                                       *NEW
01220     400*             GO TO 710                                                             *NEW
01221     401*         708 FORMAT(3I4)                                                           *NEW
01221     402*      C                                                                            *NEW
01221     403*      C                           STEP 09                                          *NEW
01221     404*      C                           PRINT PROGRAM CONTROL INFORMATION.               *NEW
01221     405*      C                                                                            *NEW
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01222   406*     709 PRINT 2055                                                          *NEW
01224   407*    2055 FORMAT(1H1)                                                  HYD 0322**-1
01225   408*         DO 3039 I = 1, 4                                             HYD 0327
01230   409*         WRITE (6,87) (REMARK(I,J),J=1,17)                            HYD 0328
01236   410*      87 FORMAT (15X,17A4,/)                                          HYD 0329
01237   411*    3039 CONTINUE                                                     HYD 0330
01241   412*         PRINT 2055                                                   HYD 0331
01243   413*         PRINT 199                                                    HYD 0332
01245   414*    199  FORMAT (10X,27HMODEL-OPERATION INFORMATION,/)                HYD 0333
01246   415*         IF(IDCARD.EQ.0) GO TO 201                                    HYD 0336**-1
01250   416*         PRINT 202                                                    HYD 0337
01252   417*    202  FORMAT(15X,37HBASIC CELL INPUT DATA READ FROM CARDS,/)       HYD 0338
01253   418*         GO TO 203                                                    HYD 0339
01254   419*    201  PRINT 204,KINDAT                                             HYD 0340
01257   420*    204  FORMAT(15X,46HBASIC CELL INPUT DATA READ FROM TAPE UNIT NO. ,I2,/)HYD 0341
01260   421*    203  CONTINUE                                                     HYD 0342
01261   422*         IF(IQHIN.EQ.0)GO TO 205                                      HYD 0343
01263   423*         IF(IQHIN.EQ.2)GO TO 207                                      HYD 0344
01265   424*         PRINT 206                                                    HYD 0345
01267   425*    206  FORMAT(15X,37HINITIAL HYDRODYNAMICS READ FROM CARDS,/)       HYD 0346
01270   426*         GO TO 208                                                    HYD 0347
01271   427*    207  PRINT 209,KINIQH                                             HYD 0348
01274   428*    209  FORMAT(15X,46HINITIAL HYDRODYNAMICS READ FORM TAPE UNIT NO. ,I2,/)HYD 0349
01275   429*         GO TO 208                                                    HYD 0350
01276   430*    205  PRINT 210                                                    HYD 0351
01300   431*    210  FORMAT(15X,39HINITIAL HYDRODYNAMICS SET EQUAL TO ZERO,/)     HYD 0352
01301   432*    208  CONTINUE                                                     HYD 0353
01302   433*         GO TO (213, 316, 215), IPDATA                                CORR0076
01303   434*     316 PRINT 214                                                    CORR0077
01305   435*    214  FORMAT(15X,68HALL INPUT DATA (EXCLUDING INITIAL HYDRODYNAMICS) PRIHYD 0357
01305   436*        .NTED AND LABELED,/)                                          HYD 0358
01306   437*         GO TO 213                                                    HYD 0359
01307   438*    215  PRINT 217                                                    HYD 0360
01311   439*    217  FORMAT(15X,83HALL INPUT DATA (EXCLUDING INITIAL HYDRODYNAMICS AND HYD 0361
01311   440*        .MANNINGS N) PRINTED AND LABELED,/)                           HYD 0362
01312   441*    213  CONTINUE                                                     HYD 0363
01313   442*         IF (IBASIC.NE.0) GO TO 218                                   CORR0078
01315   443*         PRINT 219                                                    HYD 0365
01317   444*    219  FORMAT(15X,76HONLY TIDAL AMPLITUDES AND FLOWS WERE COMPUTED AND PRHYD 0366
01317   445*        .INTED FOR SELECTED CELLS,/)                                  HYD 0367
01320   446*         GO TO 216                                                    HYD 0368
01321   447*    218  PRINT 2180                                                   HYD 0369
01323   448*    2180 FORMAT(15X,71HTIDAL AMPLITUDES AND FLOWS WERE COMPUTED AND PRINTEDHYD 0370
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01323           . FOR SELECTED CELLS,/)                                              HYD 0371
01324            IF (INETFL.NE.1) GO TO 275
01326            PRINT 274
01330       274 FORMAT (15X,52HNET FLOWS WERE COMPUTED FOR ALL CELLS BUT NOT STORE
01330           *D,/)
01331            GO TO 243
01332       275 CONTINUE
01333            INEW = IONFLO + 1                                                   CORR0079
01334            GO TO (240, 347, 242, 241), INEW                                    CORR0080
01335       347 PRINT 245                                                            CORR0081
01337            GO TO 243                                                           HYD 0380
01340    240     PRINT 244                                                           HYD 0381
01342       244 FORMAT (15X,27HNET FLOWS WERE NOT COMPUTED,/)
01343            GO TO 243                                                           HYD 0384
01344    241     PRINT 245                                                           HYD 0385
01346    245     FORMAT(15X,45HNET FLOWS FOR ALL CELLS WERE PUNCHED ON CARDS,/)      HYD 0386
01347    242     PRINT 246,KONETF                                                    HYD 0388
01352    246     FORMAT(15X,53HNET FLOWS FOR ALL CELLS WERE STORED ON TAPE UNIT NO.HYD 0389
01352           . ,I2,/)                                                             HYD 0390
01353    243     CONTINUE                                                            HYD 0391
01354            INEW = IONVEL + 1                                                   CORR0082
01355            GO TO (233, 337, 235, 234), INEW                                    CORR0083
01356       337 PRINT 238                                                            CORR0084
01360            GO TO 236                                                           HYD 0401
01361    233     PRINT 237                                                           HYD 0402
01363       237 FORMAT (15X,32HNET VELOCITIES WERE NOT COMPUTED,/)
01364            GO TO 236                                                           HYD 0405
01365    234     PRINT 238                                                           HYD 0406
01367    238     FORMAT (15X,61HNET VELOCITIES AND DEPTHS FOR ALL CELLS WERE PUNCHEHYD 0407
01367           *D ON CARDS,/)                                                       HYD 0408
01370    235     PRINT 239,KONETV                                                    HYD 0410
01373    239     FORMAT (15X,69HNET VELOCITIES AND DEPTHS FOR ALL CELLS WERE STOREDHYD 0411
01373           * ON TAPE UNIT NO. ,I2,/)                                            HYD 0412
01374    236     CONTINUE                                                            HYD 0413
01375            INEW = IODISP + 1
01376            GO TO (249,352, 251, 250), INEW                                     CORR0086
01377       352 PRINT 254                                                            CORR0087
01401            GO TO  252                                                          HYD 0423
01402    249     PRINT 253                                                           HYD 0424
01404    253     FORMAT (15X,90HAVERAGE VELOCITIES AND DISPERSION COEFFICIENTS WEREHYD 0425
01404           * NOT PUNCHED ON CARDS OR STORED ON TAPE,/)                          HYD 0426
01405            GO TO 252                                                           HYD 0427
01406    250     PRINT 254                                                           HYD 0428
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01410   254   FORMAT (15X,82HAVERAGE VELOCITIES AND DISPERSION COEFFICIENTS FOR HYD 0429
01410        *ALL CELLS WERE PUNCHED ON CARDS,/)                                  HYD 0430
01411   251   PRINT  255,KODISP                                                   HYD 0432
01414   255   FORMAT (15X,90HAVERAGE VELOCITIES AND DISPERSION COEFFICIENTS FOR HYD 0433
01414        *ALL CELLS WERE STORED ON TAPE UNIT NO. ,I2,/)                       HYD 0434
01415   252   CONTINUE                                                            HYD 0435
01416         INEW = IVLTAP + 1
01417         GO TO (271,271,272,271),INEW                                             *NEW
01420     271 PRINT 273                                                                **-1
01422     273 FORMAT (15X,48HINSTANTANEOUS VELOCITIES WERE NOT STORED ON TAPE,/)
01423         GO TO 247
01424     272 PRINT 248, KOTVEL,TIMVEL
01430   248   FORMAT(15X,54HINSTANTANEOUS VELOCITIES WERE STORED ON TAPE UNIT NOHYD 0459
01430        .. ,I2,4H AT ,F5.1,22H MINUTE TIME INTERVALS,/)                      HYD 0460
01431     247 CONTINUE
01432   216   CONTINUE                                                            HYD 0436
01433         INEW = ISAVQH + 1                                                   CORR0088
01434         GO TO (226, 329, 227, 228), INEW                                    CORR0089
01435     329 PRINT 229                                                           CORR0090
01437   229   FORMAT(15X,52HENDING VALUES OF HYDRODYNAMICS WERE PUNCHED ON CARDSHYD 0441
01437        .,/)                                                                 HYD 0442
01440         GO TO 230                                                           HYD 0443
01441   227   PRINT 231,KOUTDA                                                    HYD 0444
01444   231   FORMAT(15X,60HENDING VALUES OF HYDRODYNAMICS WERE STORED ON TAPE UHYD 0445
01444        .NIT NO. ,I2,/)                                                      HYD 0446
01445         GO TO 230                                                           HYD 0447
01446   228   PRINT 229                                                           HYD 0448
01450         PRINT 231,KOUTDA                                                    HYD 0449
01453         GO TO 230                                                           HYD 0450
01454   226   PRINT 232                                                           HYD 0451
01456   232   FORMAT(15X,45HENDING VALUES OF HYDRODYNAMICS WERE NOT SAVED,/)      HYD 0452
01457   230   CONTINUE                                                            HYD 0453
01460         PRINT 257,NPLOT                                                     HYD 0454
01463   257   FORMAT(15X,36HTIDAL AMPLITUDE PLOTS WERE MADE FOR ,I2,25H SELECTEDHYD 0455
01463        . STATIONS IN BAY,/)                                                 HYD 0456
01464         PRINT 258,TIMTOT                                                    HYD 0462
01467     258 FORMAT(15X,31HMODEL WAS OPERATED TO SIMULATE ,F5.1,19H HOURS OF RE       *NEW
01467        .AL TIME,/)                                                          HYD 0464**-1
01470         GO TO (740,741,742),KRSOFN                                               *NEW
01471     740 WRITE(6,763)                                                             *NEW
01473         GO TO 742                                                                *NEW
01474     763 FORMAT(//,15X,'COARSE GRID MODEL',//)                                    *NEW
01475     741 WRITE(6,764)                                                             *NEW
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01477        764 FORMAT(//,15X,'FINE GRID MODEL',//)                                    *NEW
01500        742 PRINT 259                                                              *NEW
01502     259    FORMAT (/,  10X,36HMODEL DIMENSIONS AND CHARACTERISTICS,/)        HYD 0466**-1
01503            PRINT 260,IMAX,JMAX,IMXJMX,DS,NTIDE,NREEF,NFLOW,DT,TPER           HYD 0467
01516     260    FORMAT(15X,33HNUMBER OF CELLS IN X-DIRECTION = ,I2,//,15X,33HNUMBEHYD 0468
01516           .R OF CELLS IN Y-DIRECTION = ,I2,//,15X,33HTOTAL NUMBER OF CELLS INHYD 0469
01516           . MODEL = ,I4,//,15X,21HWIDTH OF EACH CELL = ,F6.1,5H FEET,//,15X,3HYD 0470
01516           .5HNUMBER OF TIDAL EXCITATION CELLS = ,I2,//,15X,31HNUMBER OF SUBMEHYD 0471
01516           .RGED BARRIERS = ,I3,//,15X,34HNUMBER OF EXTERNAL FLOW SOURCES = ,IHYD 0472
01516           .2,//15X,31HCOMPUTATIONAL TIME INCREMENT = ,F5.3,8H MINUTES,//,15X,HYD 0473
01516           .24HPERIOD OF TIDAL CYCLE = , F4.1,6H HOURS)                       HYD 0474
01517            IF (IPDATA.NE.1) CALL PRINTI
01521            THETA = 180.0-THETA+ANGCOR
01522            THETA = THETA*PI/180.0                                            HYD 0476
01523            XW = 0.0185*COS(THETA)*W**2
01524            YW = 0.0185*SIN(THETA)*W**2
01525            PHI = PHI*PI/180.0                                                HYD 0479
01526            OMEGA = 2.0*OMEGA*SIN(PHI)*60.0                                   HYD 0480
01527            R = R/17280.0
01530            E = E/17280.0
01531            TMAX = TMAX*60.0                                                  HYD 0485**-3
01532            TPER = TPER*60.0                                                  HYD 0486
01533            TNET = TMAX-TPER+DT2                                              HYD 0487
01534            TPLOT = TMAX-TPER-DT2                                             HYD 0488
01535            TPLOT = TIMEIN*60.0-DT2                                                *NEW
01536            M = 0                                                             HYD 0489
01536     C                                                                        HYD 0490
01536     C                                    STEP 10                                  *NEW
01536     C                                    READ IN OR SET INITIAL CONDITIONS.  HYD 0492**-1
01536     C                                                                        HYD 0493
01537            TIM(1) = 0.0                                                      HYD 0494
01540            TCOUNT = DT2                                                      HYD 0495
01541            TMARK=TIMVEL                                                      HYD 0496
01542            TIMVEL = TIMVEL-DT2
01543            TIME = TIMEIN*60.0                                                HYD 0497
01544            INEW = IQHIN + 1                                                  CORR0091
01545            GO TO (39, 38, 37, 3777), INEW                                    CORR0092
01546         38 DO 445 J = 1, JMAX                                                CORR0093
01551            READ 444, (H(I,J),I=1,IMAX)                                       HYD 0500
01557        445  CONTINUE                                                         HYD 0501
01561        444 FORMAT (8F10.5)
01562            DO 446  J=1,JMAX                                                  HYD 0502
01565            READ 443, (QX(I,J),QY(I,J), I=1,IMAX)
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01574   578*      446  CONTINUE                                              HYD 0504
01576   579*      443 FORMAT (8F10.4)
01577   580*          READ (5,3044) DUM1,DUM2,(W2(I), I=1,15)
01607   581*          WRITE (6,3043) DUM1,DUM2,(W2(I), I=1,15)
01617  *DIAGNOSTIC*   THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
01617   582*          IF (DUM1.NE.ENDF) GO TO 3777
01621   583*          GO TO 771                                                       *NEW
01622   584*       37 REWIND KINIQH                                          CORR0094**-1
01623   585*          READ (KINIQH) ((H(I,J),I=1,IMAX),J=1,JMAX)             HYD 0509
01634   586*          READ (KINIQH) ((QX(I,J),QY(I,J),I=1,IMAX),J=1,JMAX)    HYD 0510
01646   587*          REWIND KINIQH                                          HYD 0511
01647   588*          GO TO 771                                                       *NEW
01650   589*       39 CONTINUE                                               HYD 0513**-1
01651   590*          DO 5005 J=1,JMAX                                       HYD 0514
01654   591*          DO 5005 I=1,IMAX                                       HYD 0515
01657   592*          H(I,J) = 0.0                                           HYD 0516
01660   593*          IF(Z(I,J).GT.0.)H(I,J)=Z(I,J)                                   *NEW
01662   594*          QX(I,J) = 0.0                                          HYD 0517
01663   595*     5005 QY(I,J) = 0.0                                          HYD 0518
01666   596*      771 GO TO (744,745,774),KRSOFN                                      *NEW
01667   597*      744 REWIND KQCTP                                                    *NEW
01670   598*      745 REWIND KQFTP                                                    *NEW
01671   599*      774 GO TO (5000,701,5000),KRSOFN                                    *NEW
01672   600*      701 IF(INEW.NE.1)GO TO 720                                          *NEW
01674   601*          READ(5,700)I,J,DUM                                              *NEW
01701   602*          IF(I.EQ.0)GO TO 720                                             *NEW
01703   603*          H(I,J)=DUM                                                      *NEW
01704   604*          GO TO 701                                                       *NEW
01705   605*      700 FORMAT(2I4,F10.3)                                               *NEW
01706   606*      720 READ(KQFTP)(QINFLO(MA),MA=1,NFLOW)                              *NEW
01714   607*          DO 61 MA=1,NFLOW                                                *NEW
01717   608*       61 QINFLO(MA)=QINFLO(MA)*60./DS                                    *NEW
01721   609*          DO 702 I=9,19                                                   *NEW
01724   610*      702 QY(I,4)=QINFLO(I-8)                                             *NEW
01726   611*          DO 703 J=5,12                                                   *NEW
01731   612*      703 QX(8,J)=QINFLO(J+7)                                             *NEW
01733   613*          DO 704 J=13,15                                                  *NEW
01736   614*      704 QX(21,J)=QINFLO(J+7)                                            *NEW
01740   615*          DO 705 J=16,19                                                  *NEW
01743   616*      705 QX(1,J)=QINFLO(J+7)                                             *NEW
01745   617*          DO 706 I=12,16                                                  *NEW
01750   618*      706 QY(I,28)=QINFLO(I+28)                                           *NEW
01752   619*          DO 707 J=28,30                                                  *NEW
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01755     707 QX(20,J)=QINFLO(J+17)                                                  *NEW
01757         QX(32,22)=QINFLO(27)                                                   *NEW
01760         QX(4,23)=QINFLO(28)                                                    *NEW
01761         QX(32,23)=QINFLO(29)                                                   *NEW
01762         QX(4,24)=QINFLO(30)                                                    *NEW
01763         QX(32,24)=QINFLO(31)                                                   *NEW
01764         QX(4,25)=QINFLO(32)                                                    *NEW
01765         QX(20,25)=QINFLO(33)                                                   *NEW
01766         QY(29,25)=QINFLO(34)                                                   *NEW
01767         QY(31,25)=QINFLO(35)                                                   *NEW
01770         QX(32,25)=QINFLO(36)                                                   *NEW
01771         QY(32,25)=QINFLO(37)                                                   *NEW
01772         QX(20,26)=QINFLO(38)                                                   *NEW
01773         QX(20,27)=QINFLO(39)                                                   *NEW
01774    5000 DO 36 J=1,JMAX                                               HYD 0519
01777         DO 36 I=1,IMAX                                               HYD 0520
02002         D(I,J) = H(I,J)-Z(I,J)                                       HYD 0522**-1
02003         IF (D(I,J).GT.0.0) GO TO 60                                            *NEW
02005         D(I,J) = 0.1                                                           *NEW
02006         H(I,J) = Z(I,J)                                                        *NEW
02007      60 CONTINUE                                                               *NEW
02010         QXN(I,J) = 0.0                                               HYD 0523
02011         QYN(I,J) = 0.0                                               HYD 0524
02012         HN(I,J) = 0.0                                                HYD 0525
02013         IF(Z(I,J).GT.0.)HN(I,J)=Z(I,J)                                         *NEW
02015      36 CONTINUE                                                     HYD 0535
02020         CALL ZEROS
02021         CON1 = DT2+TPER                                                        **-7
02022         CON2 = 0.0
02023         CALL PRINTT                                                  HYD 0540
02024         IF (NPLOT.EQ.0) GO TO 599                                    HYD 0541
02026         IF (TIME.GT.TPLOT) CALL HPLOT                                HYD 0542
02030    599  CONTINUE                                                     HYD 0543
02031         IF ( IVLTAP.EQ.0)GO TO 600                                   HYD 0544
02033         REWIND KOTVEL                                                          *NEW
02034         IF(TIME.GT.TPLOT)CALL STRVEL                                           *NEW
02036     600 CONTINUE                                                     HYD 0547**-2
02037         IF (IONVEL.GT.1) REWIND KONETV                               HYD 0548
02041         IF (IONFLO.GT.1) REWIND KONETF                               HYD 0549
02043         IF (IODISP.GT.1) REWIND KODISP                               HYD 0550
02043    C                                                                 HYD 0551**-5
02043    C                                   STEP 11                                 *NEW
02043    C                                   CALCULATE TEMPORAL VARIATION OF   HYD 0553**-1
```

```
02043   C                                          HYDRODYNAMICS THROUGHOUT BAY.        HYD 0554
02043   C                                                                               HYD 0555
02045      99 TIME=TIME+DT                                                              HYD 0556
02046         TCOUNT=TCOUNT+DT                                                              *NEW
02047         GO TO (746,770,746),KRSOFN                                                    *NEW
02050     770 READ(KQFTP)(QINFLO(MA),MA=1,NFLOW)                                            *NEW
02056         GO TO 453                                                                     *NEW
02057     746 CALL CALTID                                                                   *NEW
02060     453 DO 29 MA=1,NFLOW                                                              *NEW
02063      29 QINFLO(MA)=QINFLO(MA)*60./DS                                                  *NEW
02065         CALL CALCQH                                                       HYD 0559**-2
02066         IF (TCOUNT.LT.PTIME) GO TO 45                                     HYD 0560**-7
02066   C                                                                       HYD 0571*-12
02066   C                                  STEP 12                                          *NEW
02066   C                                  WRITE TIDAL AMPLITUDES AND VELOCITIESHYD 0573**-1
02066   C                                  FOR SPECIFIED STATIONS IN BAY.       HYD 0574
02066   C                                                                       HYD 0575
02070         CALL PRINTO                                                       HYD 0576
02071         IF (NPLOT.EQ.0) GO TO 45                                          HYD 0577
02073         IF (TIME.GT.TPLOT) CALL HPLOT                                     HYD 0578
02075      45 IF (IBASIC.EQ.0) GO TO 2095                                       CORR0096
02075   C                                                                       HYD 0580
02075   C                                  STEP 13                                          *NEW
02075   C                                  CALCULATE NET VELOCITIES OR NET      HYD 0582**-1
02075   C                                  FLOWS FOR ALL CELLS IF DESIRED.      HYD 0583
02075   C                                                                       HYD 0584
02077         IF (IONVEL.EQ.0) GO TO 661
02101         IF (TIME.GT.TNET) CALL NETVQD                                     HYD 0586
02103     661 IF (IONFLO.GT.0.OR.INETFL.EQ.1) GO TO 662
02105         GO TO 667
02106     662 IF (TIME.GT.TNET) CALL NETFLO
02110     667 CONTINUE                                                          HYD 0589
02110   C                                                                       HYD 0590
02110   C                                  STEP 14                                          *NEW
02110   C                                  STORE INSTANTANEOUS VELOCITIES AT    HYD 0592**-1
02110   C                                  SPECIFIED TIME INTERVALS IF DESIRED. HYD 0593
02110   C                                                                       HYD 0594
02111         IF (IVLTAP.EQ.0) GO TO 777                                        HYD 0595
02113         IF(TIME.GT.TPLOT)CALL STRVEL                                                  *NEW
02115   777   CONTINUE                                                          HYD 0597**-1
02115   C                                                                       HYD 0598
02115   C                                  STEP 15                                          *NEW
02115   C                                  CALCULATE AND STORE MEAN VELOCITIES  HYD 0600**-1
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02115    C                                 AND DISPERSION COEFFICIENTS IF        HYD 0601
02115    C                                 DESIRED.                              HYD 0602
02115    C                                                                       HYD 0603
02116          IF (IODISP.EQ.0) GO TO 888                                        HYD 0604
02120          IF (TIME.GT.TNET) CALL UVDXDY                                     HYD 0605
02122      888 CONTINUE                                                          HYD 0606
02122    C                                                                       HYD 0607
02122    C                                 STEP 16                                   *NEW
02122    C                                 PUNCH TIDAL PERIOD HYDRODYNAMICS AND/OR   *NEW
02122    C                                 TIDAL PERIOD H-VALUES FOR FINE GRID MODEL. *NEW
02122    C                                                                       HYD 0612**-4
02123     2095 IF((TIMTOT*60.).LT.TPER)GO TO 2096                                    *NEW
02125          IF(TIME.LT.(TIMEIN*60.+TPER))GO TO 2096                               *NEW
02127          IF(KPRINT.NE.1)GO TO 2096                                             *NEW
02131          KEPSAV=ISAVQH                                                         *NEW
02132          ISAVQH=1                                                              *NEW
02133          CALL SAVEQH                                                           *NEW
02134          ISAVQH=KEPSAV                                                         *NEW
02135          KPRINT=0                                                              *NEW
02136          GO TO (747,2096,2096),KRSOFN                                          *NEW
02137      747 PUNCH 144,TIME                                                        *NEW
02142          KG=1                                                                  *NEW
02143          DO 143 J=6,12                                                         *NEW
02146          DO 143 I=3,10                                                         *NEW
02151          IF(I.NE.IHKP(KG).OR.J.NE.JHKP(KG))GO TO 143                           *NEW
02153          KG=KG+1                                                               *NEW
02154          ILB=I+4*(I-3)                                                         *NEW
02155          ILF=ILB+3                                                             *NEW
02156          JLB=5+4*(J-6)                                                         *NEW
02157          JLF=JLB+3                                                             *NEW
02160          DO 141 IK=ILB,ILF                                                     *NEW
02163          DO 141 JK=JLB,JLF                                                     *NEW
02166          HKP=H(IK,JK)                                                          *NEW
02167          IF(H(IK,JK).GT.5.)HKP=H(6,9)                                          *NEW
02171      141 PUNCH 142,IK,JK,HKP                                                   *NEW
02200      143 CONTINUE                                                              *NEW
02203      142 FORMAT(2I4,F10.3)                                                     *NEW
02204      144 FORMAT(F10.3)                                                         *NEW
02204    C                                                                           *NEW
02204    C                                 STEP 17                                   *NEW
02204    C                                 IF SPECIFIED SIMULATION PERIOD HAS        *NEW
02204    C                                 NOT BEEN COMPLETED, REPEAT STEPS          *NEW
02204    C                                 11 THROUGH 16.                            *NEW
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02204   749*   C                                                                                  *NEW
02205   750*    2096 IF(TIME.LT.(TMAX-0.9*DT))GO TO 99                                            *NEW
02207   751*         GO TO (748,2097,2097),KRSOFN                                                 *NEW
02210   752*     748 CALL RITCTP                                                                  *NEW
02211   753*    2097 IF(TCOUNT.GT.DT2)CALL PRINTO                                                 *NEW
02213   754*         GO TO (750,751,772),KRSOFN                                                   *NEW
02213   755*   C                                                                                  *NEW
02213   756*   C                                  STEP 18                                         *NEW
02213   757*   C                                  WRITE EXCITATION FLOWS FOR FINE GRID MODEL.     *NEW
02213   758*   C                                                                                  *NEW
02214   759*     750 CALL RITAP                                                                   *NEW
02215   760*     751 REWIND KQFTP                                                                 *NEW
02216   761*     772 CALL PRT11                                                                   *NEW
02216   762*   C                                                                     HYD 0615*-12
02216   763*   C                                  STEP 19                                         *NEW
02216   764*   C                                  SAVE FINAL VALUES OF TIDAL AMPLITUDESHYD 0617**-1
02216   765*   C                                  AND FLOWS FOR ALL CELLS.           HYD 0618
02216   766*   C                                                                     HYD 0619
02217   767*         IF(KPRINT.EQ.0.AND.ISAVQH.EQ.1) GO TO 773                                    *NEW
02221   768*         IF (ISAVQH.NE.0) CALL SAVEQH                                    HYD 0620
02223   769*     773 IF(IONVEL.GT.0)CALL PVLDEP                                                   *NEW
02225   770*         IF (IONFLO.GT.0.OR.INETFL.EQ.1) CALL PFLDEP                                  **-1
02227   771*         IF (IODISP.GT.0) CALL UVDOUT
02231   772*         IF (IONVEL.GT.1) REWIND KONETV                                  HYD 0624
02233   773*         IF (IONFLO.GT.1) REWIND KONETF                                  HYD 0625
02235   774*         IF (IODISP.GT.1) REWIND KODISP                                  HYD 0626
02235   775*   C                                                                     HYD 0627
02235   776*   C                                  STEP 20                                         *NEW
02235   777*   C                                  PLOT TIDAL AMPLITUDES FOR SPECIFIED  HYD 0629**-1
02235   778*   C                                  STATIONS IN BAY.                   HYD 0630
02235   779*   C                                                                     HYD 0631
02237   780*         IF (NPLOT.EQ.0) GO TO 310                                       HYD 0632
02241   781*         CALL PLOTHS                                                     HYD 0633
02242   782*     310  CONTINUE                                                       HYD 0634
02243   783*    9999 CONTINUE                                                        HYD 0635
02244   784*         STOP                                                            HYD 0636
02245   785*         END                                                             HYD 0637

    END OF UNIVAC 1108 FORTRAN V COMPILATION.     7 *DIAGNOSTIC* MESSAGE(S)
  HYDTID          SYMBOLIC                        05 MAY 72  12:54:26   0  00036670   14   662  (DELETED)
  HYDTID   CODE   RELOCATABLE                     05 MAY 72  12:54:26   1  00060754   48     1  (DELETED)
                                                                        0  00061034   14   250
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QI FOR,* CALTID,CALTID                                                          05 FEB 73   12:06:34.707
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:34

  SUBROUTINE CALTID     ENTRY POINT 000142

  STORAGE USED (BLOCK, NAME, LENGTH)

       0001    *CODE    000152
       0000    *DATA    000033
       0002    *BLANK   032477

  EXTERNAL REFERENCES (BLOCK, NAME)

     0003   NERR2$          0004   NERR3$

  STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0001     000110 1L          0001     000123 10L         0001     000074 131G        0001     000113 2L
   0001     000056 20L         0001     000116 3L          0001     000121 4L          0002     032436 A0
   0002     021443 CB          0002     021777 CELSID      0002 R 032434 CON1        0002 R 032435 CON2
   0002     021063 CT          0002     032442 C1          0002     032446 C2          0002     032452 C3
   0002     000000 D           0000 R 000003 DELT1       0000 R 000002 DELT2       0000 R 000004 DELT3
   0000 R 000005 DELT4       0002     032361 DS          0002 R 032365 DT          0002     032404 DTODS
   0002     032432 DTO2DS      0002 R 032366 DT2         0002     032427 E           0002     013755 F
   0002     032362 G           0002     032363 GCDTO4      0002     032364 GDTODS      0002 R 021347 GTIDE
   0002     031103 G1          0002     031223 G41         0002     031343 G42         0002     031463 G43
   0002     023677 HF          0002     004622 HN          0002     022667 HPLT        0002     022655 HPRT
   0002     023763 HPRTA       0002     022155 IBAR        0000 I 000007 ID          0002 I 031603 IDTIDE
   0002     016266 IFLAG       0002     020673 IFLOW       0002     032357 IMAX        0002     032421 INETFL
   0000     000013 INJP$       0002     032431 IODISP      0002     032424 IONFLO      0002     032423 IONVEL
   0002     022561 IP          0002     032422 IPDATA      0002     032430 ISAVQH      0002     021157 ITIDE
   0002     022333 JBAR        0002     020767 JFLOW       0002     032360 JMAX        0002     022605 JP
   0002     021253 JTIDE       0002     032412 KINDAT      0002     032413 KINIQH      0002     032433 KO
   0002     032420 KODISP      0002     032416 KONETF      0002     032415 KONETV      0002     032417 KOTVEL
   0002     032410 KOUTCD      0002     032414 KOUTDA      0002     032411 KOUTPP      0000 I 000006 KT
   0002     032472 LINMAX      0002     032407 M           0002     032402 NFLOW       0002     032425 NPLOT
   0002     032401 NREEF       0000 I 000000 NTID        0002 I 032403 NTIDE       0000 I 000001 NTIDP1
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0002     032373 OMEGA      0002     032374 PHI        0002     032456 PHI1       0002     032462 PHI2
0002     032466 PHI3       0002     032372 PTIME      0002     020577 QINFLO     0002     007133 QXN
0002     011444 QYN        0002     032426 R          0002     022511 STATON     0002     032370 TCOUNT
0002     032376 THETA      0002     030643 THETA1     0002     030523 TI         0002   R 031677 TIDE1
0002   R 032013 TIDE2      0002   R 032127 TIDE3      0002   R 032243 TIDE4      0002   R 032473 TID1
0002   R 032474 TID2       0002   R 032475 TID3       0002   R 032476 TID4       0002     023731 TIM
0002     032367 TIME       0002     032406 TIMVEL     0002     032405 TMARK      0002     032371 TPER
0002     022631 UAPRT      0002     025423 UAPRTA     0002     022643 VAPRT      0002     027063 VAPRTA
0002     032375 W          0002     030763 W2         0002     032377 XW         0002     032400 YW
0002     002311 Z          0002     021621 ZB

00101      1*          SUBROUTINE CALTID                                                    HYD 0645
00101      2*    C                                                                          HYD 0638
00101      3*    C                THIS INTERPOLATION SUBROUTINE COMPUTES AT EVERY                   *NEW
00101      4*    C          TIME STEP THE APPROPRIATE VALUES OF EXCITING TIDES                      *NEW
00101      5*    C          AT THE OCEAN BOUNDARIES THAT ARE USED AS FORCING                        *NEW
00101      6*    C          FUNCTIONS IN THE COARSE GRID MODEL.                                     *NEW
00101      7*    C                                                                          HYD 0644**-4
00103      8*          COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),                    *NEW
00103      9*         1F(35,35),IFLAG(35,35)                                                        *NEW
00104     10*          COMMON QINFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),            *NEW
00104     11*         *       GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),            **-3
00104     12*         *       STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00104     13*         *       HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00104     14*         *       VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
00104     15*         *       G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
00104     16*         *       TIDE4(76)
00105     17*          COMMON IMAX,JMAX,DS,G,GCDTO4,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 0655
00105     18*         *       OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,     HYD 0656
00105     19*         *       TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF, HYD 0657
00105     20*         *       KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00105     21*         *       ISAVQH,IODISP,DTO2DS,KO                                    HYD 0659
00106     22*          COMMON CON1,CON2,AO(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00107     23*          COMMON LINMAX,TID1,TID2,TID3,TID4
00110     24*          CON1 = CON1+DT
00111     25*          IF (CON1.LT.60.0) GO TO 20
00113     26*          CON1 = DT2
00114     27*          CON2 = CON2 + 1.0
00115     28*          NTID = CON2
00116     29*          NTIDP1 = NTID + 1
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00117      30*            DELT2 = (TIDE2(NTIDP1)-TIDE2(NTID))*DT/60.0
00120      31*            DELT1 = (TIDE1(NTIDP1)-TIDE1(NTID))*DT/60.0
00121      32*            DELT3 = (TIDE3(NTIDP1)-TIDE3(NTID))*DT/60.0
00122      33*            DELT4=(TIDE4(NTIDP1)-TIDE4(NTID))*DT/60.                                 *NEW
00123      34*        20 CONTINUE
00124      35*            TID1 = TID1 + DELT1
00125      36*            TID2 = TID2 + DELT2
00126      37*            TID3 = TID3 + DELT3
00127      38*            TID4=TID4+DELT4                                                          *NEW
00130      39*            DO 10 KT = 1,NTIDE                                             HYD 0672
00133      40*            ID = IDTIDE(KT)                                                HYD 0673
00134      41*            GO TO  (1,2,3,4) , ID                                          HYD 0674
00135      42*          1 GTIDE(KT)=TID1                                                           *NEW
00136      43*            GO TO 10                                                       HYD 0676**-1
00137      44*          2 GTIDE(KT) = TID2
00140      45*            GO TO 10                                                       HYD 0678
00141      46*          3 GTIDE(KT) = TID3
00142      47*            GO TO 10                                                       HYD 0680
00143      48*          4 GTIDE(KT) = TID4
00144      49*         10 CONTINUE                                                       HYD 0682
00146      50*            RETURN                                                         HYD 0683
00147      51*            END                                                            HYD 0684

    END OF UNIVAC 1108 FORTRAN V COMPILATION.      0 *DIAGNOSTIC* MESSAGE(S)
  CALTID          SYMBOLIC                      05 MAY 72   12:54:27   0  00067710    14    49  (DELETED)
  CALTID  CODE    RELOCATABLE                   05 MAY 72   12:54:27   1  00071166    24     1  (DELETED)
                                                                       0  00071216    14    11
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@I FOR,* CALCQH,CALCQH                                                                05 FEB 73    12:06:36.149
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:36

   SUBROUTINE CALCQH     ENTRY POINT 003145

   STORAGE USED (BLOCK, NAME, LENGTH)

         0001    *CODE    003160
         0000    *DATA    000100
         0002    *BLANK   032477
         0003    ALL      007133
         0004    MQ       010544
         0005    MRQ      000003
         0006    MQPI     002311

   EXTERNAL REFERENCES (BLOCK, NAME)

     0007   RITCTP       0010   NERR2$        0011   SQRT          0012   NEXP6$        0013   NERR3$

   STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001    003123 100L     0001    001741 101L     0001    001753 102L     0001    001765 103L
    0001    002054 104L     0001    002060 105L     0001    002065 106L     0001    002164 107L
    0001    002170 108L     0001    002175 109L     0001    001767 110L     0001    002041 111L
    0001    002151 112L     0001    002067 113L     0001    002073 114L     0001    001773 115L
    0001    000032 120G     0001    002202 137L     0001    002230 138L     0001    002256 139L
    0001    002304 140L     0001    002345 141L     0001    002523 142L     0001    002526 143L
    0001    002733 144L     0001    002736 145L     0001    002437 160L     0001    002450 161L
    0001    002353 162L     0001    002621 163L     0001    002633 164L     0001    002534 165L
    0001    002537 166L     0001    002751 167L     0001    002745 168L     0001    002662 169L
    0001    002757 170L     0001    002742 171L     0001    000064 201L     0001    000074 202L
    0001    000076 203L     0001    000106 204L     0001    000115 205L     0001    000127 206L
    0001    000137 207L     0001    000141 208L     0001    000151 209L     0001    000160 210L
    0001    003066 250L     0001    000217 60L      0001    003072 603G     0001    003060 70L
    0001    000261 71L      0001    000413 72L      0001    000527 73L      0001    000653 74L
    0001    000777 75L      0001    001056 76L      0001    001072 77L      0001    001117 78L
    0001    001170 79L      0001    001202 80L      0001    001227 81L      0001    001307 82L
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0001     001323 83L      0001     001350 84L      0001     001427 85L      0001     001441 86L
0001     001466 87L      0001     001505 88L      0001     001517 89L      0001     001545 90L
0001     001557 91L      0001     001605 92L      0001     001633 93L      0001     001661 94L
0001     001711 95L      0001     002765 96L      0001     003017 97L      0001     003044 98L
0002     032436 AO       0002 R   021443 CB       0002     021777 CELSID   0000 R   000021 COEFX
0000 R   000025 COEFY    0002     032434 CON1     0002     032435 CON2     0002 R   021063 CT
0002     032442 C1       0002     032446 C2       0002     032452 C3       0002 R   000000 D
0000 R   000016 DBARX    0000 R   000023 DBARY    0000 R   000026 DBX      0000 R   000027 DBY
0000 R   000017 DCON     0002 R   032361 DS       0002 R   032365 DT       0002 R   032404 DTODS
0002 R   032432 DTO2DS   0002 R   032366 DT2      0002 R   032427 E        0002     013755 F
0004 R   000000 FX       0004 R   002311 FY       0002 R   032362 G        0002 R   032363 GCDTO4
0002 R   032364 GDTODS   0002 R   021347 GTIDE    0002     031103 G1       0002     031223 G41
0002     031343 G42      0002     031463 G43      0003 R   004622 H        0002     023677 HF
0000 R   000034 HMAX     0002 R   004622 HN       0002     022667 HPLT     0002     022655 HPRT
0002     023763 HPRTA    0000 I   000005 I        0002     022155 IBAR     0004 I   004624 ICLL
0002     031603 IDTIDE   0000 I   000007 IFL      0002 I   016266 IFLAG    0000 I   000010 IFLG
0002     020673 IFLOW    0002     032357 IMAX     0002     032421 INETFL   0000     000044 INJP$
0002     032431 IODISP   0002     032424 IONFLO   0002     032423 IONVEL   0002     022561 IP
0002     032422 IPDATA   0002     032430 ISAVQH   0002     021157 ITIDE    0000 I   000006 J
0000 I   000011 JAFL     0002     022333 JBAR     0000 I   000012 JBFL     0004 I   006574 JCLL
0000 I   000030 JFL      0006 I   000000 JFLAG    0002     020767 JFLOW    0002     032360 JMAX
0002     022605 JP       0002     021253 JTIDE    0000 I   000001 KB       0000 I   000033 KBT
0000 I   000002 KD       0002     032412 KINDAT   0002     032413 KINIQH   0002     032433 KO
0002     032420 KODISP   0002     032416 KONETF   0002     032415 KONETV   0002     032417 KOTVEL
0004 I   004623 KOUNT    0002     032410 KOUTCD   0002     032414 KOUTDA   0002     032411 KOUTPP
0005     000001 KQCTP    0005     000002 KQFTP    0005 I   000000 KRSOFN   0000 I   000003 KT
0000 I   000032 KTT      0002     032472 LINMAX   0002     032407 M        0000 I   000004 N
0002     032402 NFLOW    0002     032425 NPLOT    0002     032401 NREEF    0002     032403 NTIDE
0002 R   032373 OMEGA    0002     032374 PHI      0002     032456 PHI1     0002     032462 PHI2
0002     032466 PHI3     0002     032372 PTIME    0000 R   000020 QBARX    0000 R   000024 QBARY
0000 R   000013 QDIFXS   0000 R   000014 QDIFYS   0002 R   020577 QINFLO   0003 R   000000 QX
0000 R   000022 QXBAR    0002 R   007133 QXN      0003 R   002311 QY       0000 R   000015 QYBAR
0002 R   011444 QYN      0002 R   032426 P        0000 R   000000 SIGN     0004 R   004622 SQTG
0002     022511 STATON   0002     032370 TCOUNT   0002     032376 THETA    0002     030643 THETA1
0002     030523 TI       0002     031677 TIDE1    0002     032013 TIDE2    0002     032127 TIDE3
0002     032243 TIDE4    0002     032473 TID1     0002     032474 TID2     0002     032475 TID3
0002     032476 TID4     0002     023731 TIM      0002     032367 TIME     0002     032406 TIMVEL
0002     032405 TMARK    0002     032371 TPER     0002     022631 UAPRT    0002     025423 UAPRTA
0002     022643 VAPRT    0002     027063 VAPRTA   0002     032375 W        0002     030763 W2
0002 R   032377 XW       0002 R   032400 YW       0002 R   002311 Z        0002 R   021621 ZB
0000 R   000031 ZMAX
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00101         SUBROUTINE CALCQH                                                HYD 0698
00101   C                                                                      HYD 0685
00101   C              THIS SUBROUTINE IS THE BASIC COMPUTATIONAL ELEMENT     HYD 0687
00101   C          OF THE TIDAL HYDRODYNAMIC MODEL.        DEPENDING                   *NEW
00101   C          ON THE TYPE OF BOUNDARY CONDITION REQUIRED BY A GIVEN      HYD 0690**-2
00101   C          COMPUTATIONAL GRID CELL AS SPECIFIED BY ITS IDENTIFYING    HYD 0691
00101   C          FLAG VALUE, CONTROL IS TRANSFERRED TO THE APPROPRIATE      HYD 0692
00101   C          EQUATION FOR THE EXPLICIT DETERMINATION OF THE TIDAL       HYD 0693
00101   C          APPLITUDE AND THE FLOWS PER UNIT WIDTH AT THE TOP AND      HYD 0694
00101   C          RIGHT-HAND SIDE OF THE CELL. CONTROL PASSES THROUGH        HYD 0695
00101   C          THIS SUBROUTINE DURING EACH TIME STEP OF THE SIMULATION.  HYD 0696
00101   C          FLOWS TO BE TRANSFERRED FROM THE COARSE GRID MODEL TO               *NEW
00101   C          THE FINE GRID MODEL ARE COMPILED ON MAGNETIC TAPE.                  *NEW
00101   C                                                                      HYD 0697
00103         COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),               *NEW
00103        1F(35,35),IFLAG(35,35)                                                    *NEW
00104         COMMON Q.NFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),       *NEW
00104        *       GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),       **-3
00104        *       STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00104        *       HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00104        *       VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
00104        *       G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
00104        *       TIDE4(76)
00105         COMMON IMAX,JMAX,DS,G,GCDT04,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 0708
00105        *       OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,       HYD 0709
00105        *       TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF,  HYD 0710
00105        *       KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00105        *       ISAVQH,IODISP,DTO2DS,KO                                     HYD 0712
00106         COMMON CON1,CON2,AO(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00107         COMMON LINMAX,TID1,TID2,TID3,TID4
00110         COMMON/ALL/QX(35,35),QY(35,35),H(35,35)                                 *NEW
00111         COMMON/MQ/FX(35,35),FY(35,35),SQTG,KOUNT,ICLL(1000),JCLL(1000)          *NEW
00112         COMMON/MRQ/KRSOFN,KQCTP,KQFTP                                           *NEW
00113         COMMON/MQPI/JFLAG(35,35)                                                *NEW
00114         KB=0                                                             HYD 0717
00115         KD=0                                                             HYD 0718
00116         KT=0                                                             HYD 0719
00117         DO 70 N=1,KOUNT                                                         *NEW
00122         I=ICLL(N)                                                               *NEW
00123         J=JCLL(N)                                                               *NEW
00124         IFL=IFLAG(I,J)                                                   HYD 0722**-2
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00125     42*          IFLG = IFL
00126     43*          JAFL=JFLAG(I,J)/10                                              00002900*NEW
00127     44*          JBFL=JFLAG(I,J)-10*JAFL                                         00003000*NEW
00130     45*          GO TO (201,202,203,204),JAFL                                    00003100*NEW
00131     46*      201 QDIFXS=(QX(I,J+1)-QX(I,J-1))/(DS*2.)                            00003200*NEW
00132     47*          GO TO 205                                                       00003300*NEW
00133     48*      202 QDIFXS=0.                                                       00003400*NEW
00134     49*          GO TO 205                                                       00003500*NEW
00135     50*      203 QDIFXS=(QX(I,J+1)-QX(I,J))/DS                                   00003600*NEW
00136     51*          GO TO 205                                                       00003700*NEW
00137     52*      204 QDIFXS=(QX(I,J)-QX(I,J-1))/DS                                   00003800*NEW
00140     53*      205 GO TO (206,207,208,209),JBFL                                    00003900*NEW
00141     54*      206 QDIFYS=(QY(I+1,J)-QY(I-1,J))/(2.*DS)                            00004000*NEW
00142     55*          GO TO 210                                                       00004100*NEW
00143     56*      207 QDIFYS=0.                                                       00004200*NEW
00144     57*          GO TO 210                                                       00004300*NEW
00145     58*      208 QDIFYS=(QY(I+1,J)-QY(I,J))/DS                                   00004400*NEW
00146     59*          GO TO 210                                                       00004500*NEW
00147     60*      209 QDIFYS=(QY(I,J)-QY(I-1,J))/DS                                   00004600*NEW
00150     61*      210 IF(IFL.GT.20)GO TO 60                                           00004700*NEW
00152     62*          GO TO (70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,98,   00004800*NEW
00152     63*         *     87,88), IFL                                                00004900*NEW
00153     64*       60  IFL=IFL-20                                                     00005000*NEW
00154     65*          GO TO (89,90,91,92,93,94,95,101,102,103,104,105,106,107,        00005100*NEW
00154     66*         *      108,109,137,138,139,140,141,142,143,144,145),IFL          00005200*NEW
00155     67*       71 QYBAR=0.25*(QY(I,J)+QY(I+1,J)+QY(I,J-1)+QY(I+1,J-1))                    *NEW
00156     68*          DBARX=D(I,J)+D(I+1,J)                                                   *NEW
00157     69*          DCON=2./DBARX                                                           *NEW
00160     70*          QYBAR=QYBAR*DCON                                                        *NEW
00161     71*          QBARX=SQRT(QX(I,J)*QX(I,J)*DCON*DCON+QYBAR*QYBAR)                       *NEW
00162     72*          COEFX=1.+GCDTO4*FX(I,J)*QBARX/DBARX**1.333-DCON*DTO2DS*(QX(I-1,J)       *NEW
00162     73*         1-QX(I+1,J))                                                             *NEW
00163     74*          QXBAR=0.25*(QX(I,J)+QX(I,J+1)+QX(I-1,J)+QX(I-1,J+1))                    *NEW
00164     75*          DBARY=D(I,J)+D(I,J+1)                                           00006800*NEW
00165     76*          DCON=2./DBARY                                                   00006900*NEW
00166     77*          QXBAR=QXBAR*DCON                                                        *NEW
00167     78*          QBARY=SQRT(QXBAR*QXBAR+QY(I,J)*QY(I,J)*DCON*DCON)               00007000*NEW
00170     79*          COEFY=1.+GCDTO4*FY(I,J)*QBARY/DBARY**1.333-DCON*DTO2DS*(QY(I,J-1) 00007100*NEW
00170     80*         1-QY(I,J+1))                                                     00007200*NEW
00171     81*          GO TO 96                                                        00007300*NEW
00172     82*       72 KB = KB+1                                                       00007400*NEW
00173     83*          DBX = (H(I,J) + H(I+1,J)) * 0.5 -ZB(KB)                         00007500*NEW
00174     84*          DBARX = D(I,J) + D(I+1,J)                                       00007600*NEW
```

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00175     85*       QYBAR=0.25*(QY(I,J)+QY(I+1,J)+QY(I,J-1)+QY(I+1,J-1))                  *NEW
00176     86*       DCON=2./DBARX                                                 00008200*NEW
00177     87*       QYBAR=QYBAR*DCON                                                      *NEW
00200     88*       COEFX = 1.0 +DTO2DS*DBARX*ABS(QX(I,J))/(CB(KB)*DBX)**2        00008300*NEW
00200     89*      1-DCON*DTO2DS*(QX(I-1,J)-QX(I+1,J))                            00008400*NEW
00201     90*       KB = KB+1                                                     00008500*NEW
00202     91*       DBY = (H(I,J) + H(I,J+1)) * 0.5 - ZB(KB)                      00008600*NEW
00203     92*       QXBAR=0.25*(QX(I,J)+QX(I,J+1)+QX(I-1,J)+QX(I-1,J+1))                  *NEW
00204     93*       DBARY=D(I,J)+D(I,J+1)                                         00009200*NEW
00205     94*       DCON=2./DBARY                                                 00009300*NEW
00206     95*       QXBAR=QXBAR*DCON                                                      *NEW
00207     96*       COEFY = 1.0 +DTO2DS*DBARY*ABS(QY(I,J))/(CB(KB)*DBY)**2        00009400*NEW
00207     97*      1-DCON*DTO2DS*(QY(I,J-1)-QY(I,J+1))                            00009500*NEW
00210     98*       GO TO 96                                                      00009600*NEW
00211     99*    73 QXBAR=0.25*(QX(I,J)+QX(I,J+1)+QX(I-1,J)+QX(I-1,J+1))                  *NEW
00212    100*       DBARY=D(I,J)+D(I,J+1)                                         00010200*NEW
00213    101*       DCON=2./DBARY                                                 00010300*NEW
00214    102*       QXBAR=QXBAR*DCON                                                      *NEW
00215    103*       QBARY=SQRT(QXBAR*QXBAR+QY(I,J)*QY(I,J)*DCON*DCON)             00010400*NEW
00216    104*       COEFY=1.+GCDTO4*FY(I,J)*QBARY/DBARY**1.333-DCON*DTO2DS*(QY(I,J-1) 00010500*NEW
00216    105*      1-QY(I,J+1))                                                   00010600*NEW
00217    106*       KB = KB+1                                                     00010700*NEW
00220    107*       DBX = (H(I,J) + H(I+1,J)) * 0.5 -ZB(KB)                       00010800*NEW
00221    108*       QYBAR=0.25*(QY(I,J)+QY(I+1,J)+QY(I,J-1)+QY(I+1,J-1))                  *NEW
00222    109*       DBARX=D(I,J)+D(I+1,J)                                         00011400*NEW
00223    110*       DCON=2./DBARX                                                 00011500*NEW
00224    111*       QYBAR=QYBAR*DCON                                                      *NEW
00225    112*       COEFX = 1.0 +DTO2DS*DBARX*ABS(QX(I,J))/(CB(KB)*DBX)**2        00011600*NEW
00225    113*      1-DCON*DTO2DS*(QX(I-1,J)-QX(I+1,J))                            00011700*NEW
00226    114*       GO TO 96                                                      00011800*NEW
00227    115*    74 QYBAR=0.25*(QY(I,J)+QY(I+1,J)+QY(I,J-1)+QY(I+1,J-1))                  *NEW
00230    116*       DBARX=D(I,J)+D(I+1,J)                                         00012400*NEW
00231    117*       DCON=2./DBARX                                                 00012500*NEW
00232    118*       QYBAR=QYBAR*DCON                                                      *NEW
00233    119*       QBARX=SQRT(QX(I,J)*QX(I,J)*DCON*DCON+QYBAR*QYBAR)             00012600*NEW
00234    120*       COEFX=1.+GCDTO4*FX(I,J)*QBARX/DBARX**1.333-DCON*DTO2DS*(QX(I-1,J) 00012700*NEW
00234    121*      1-QX(I+1,J))                                                   00012800*NEW
00235    122*       KB = KB+1                                                     00012900*NEW
00236    123*       DBY = (H(I,J) + H(I,J+1)) * 0.5 - ZB(KB)                      00013000*NEW
00237    124*       QXBAR=0.25*(QX(I,J)+QX(I,J+1)+QX(I-1,J)+QX(I-1,J+1))                  *NEW
00240    125*       DBARY=D(I,J)+D(I,J+1)                                         00013600*NEW
00241    126*       DCON=2./DBARY                                                 00013700*NEW
00242    127*       QXBAR=QXBAR*DCON                                                      *NEW
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00243   128*        COEFY = 1.0 +DTO2DS*DBARY*ABS(QY(I,J))/(CB(KB)*DBY)**2          00013800*NEW
00243   129*       1-DCON*DTO2DS*(QY(I,J-1)-QY(I,J+1))                              00013900*NEW
00244   130*        GO TO 96                                                        00014000*NEW
00245   131*     75 QXBAR=0.25*(QX(I,J)+QX(I,J+1)+QX(I-1,J)+QX(I-1,J+1))                    *NEW
00246   132*        DBARY=D(I,J)+D(I,J+1)                                           00014600*NEW
00247   133*        DCON=2./DBARY                                                   00014700*NEW
00250   134*        QXBAR=QXBAR*DCON                                                        *NEW
00251   135*        QBARY=SQRT(QXBAR*QXBAR+QY(I,J)*QY(I,J)*DCON*DCON)               00014800*NEW
00252   136*        COEFY=1.+GCDTO4*FY(I,J)*QBARY/DBARY**1.333-DCON*DTO2DS*(QY(I,J-1) 00014900*NEW
00252   137*       1-QY(I,J+1))                                                     00015000*NEW
00253   138*           GO TO 97                                                     00015100*NEW
00254   139*     76 KD = KD + 1                                                     00015200*NEW
00255   140*        QXN(I,J) = QINFLO(KD)                                           00015300*NEW
00256   141*        JFL=1                                                           00015400*NEW
00257   142*        GO TO 114                                                       00015500*NEW
00260   143*     77 KT = KT + 1                                                     00015600*NEW
00261   144*        QXN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))            00015700*NEW
00262   145*        GO TO 75                                                        00015800*NEW
00263   146*     78 KB = KB+1                                                       00015900*NEW
00264   147*        DBY = (H(I,J) + H(I,J+1)) * 0.5 - ZB(KB)                        00016000*NEW
00265   148*        QXBAR=0.25*(QX(I,J)+QX(I,J+1)+QX(I-1,J)+QX(I-1,J+1))                    *NEW
00266   149*        DBARY=D(I,J)+D(I,J+1)                                           00016600*NEW
00267   150*        DCON=2./DBARY                                                   00016700*NEW
00270   151*        QXBAR=QXBAR*DCON                                                        *NEW
00271   152*        COEFY = 1.0 +DTO2DS*DBARY*ABS(QY(I,J))/(CB(KB)*DBY)**2          00016800*NEW
00271   153*       1-DCON*DTO2DS*(QY(I,J-1)-QY(I,J+1))                              00016900*NEW
00272   154*        GO TO 97                                                        00017000*NEW
00273   155*     79 KD = KD+1                                                       00017100*NEW
00274   156*        QXN(I,J) = QINFLO(KD)                                           00017200*NEW
00275   157*        GO TO 78                                                        00017300*NEW
00276   158*     80 KT = KT+1                                                       00017400*NEW
00277   159*        QXN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))            00017500*NEW
00300   160*        GO TO 78                                                        00017600*NEW
00301   161*     81 QYBAR=0.25*(QY(I,J)+QY(I+1,J)+QY(I,J-1)+QY(I+1,J-1))                    *NEW
00302   162*        DBARX=D(I,J)+D(I+1,J)                                           00018200*NEW
00303   163*        DCON=2./DBARX                                                   00018300*NEW
00304   164*        QYBAR=QYBAR*DCON                                                        *NEW
00305   165*        QBARX=SQRT(QX(I,J)*QX(I,J)*DCON*DCON+QYBAR*QYBAR)               00018400*NEW
00306   166*        COEFX=1.+GCDTO4*FX(I,J)*QBARX/DBARX**1.333-DCON*DTO2DS*(QX(I-1,J) 00018500*NEW
00306   167*       1-QX(I+1,J))                                                     00018600*NEW
00307   168*        GO TO 96                                                        00018700*NEW
00310   169*     82 KD = KD+1                                                       00018800*NEW
00311   170*        QYN(I,J) = QINFLO(KD)                                           00018900*NEW
```

```
      JFL=1
      GO TO 115
   83 KT = KT+1
      QYN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))
      GO TO 81
   84 KB = KB+1
      DBX = (H(I,J) + H(I+1,J)) * 0.5 -ZB(KB)
      QYBAR=0.25*(QY(I,J)+QY(I+1,J)+QY(I,J-1)+QY(I+1,J-1))
      DBARX=D(I,J)+D(I+1,J)
      DCON=2./DBARX
      QYBAR=QYBAR*DCON
      COEFX = 1.0 +DTO2DS*DBARX*ABS(QX(I,J))/(CB(KB)*DBX)**2
     1-DCON*DTO2DS*(QX(I-1,J)-QX(I+1,J))
      IF(IFLG.EQ.45)KB=KB+1
      GO TO 96
   85 KD = KD+1
      QYN(I,J) = QINFLO(KD)
      GO TO 84
   86 KT = KT+1
      QYN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))
      GO TO 84
   87 KD = KD+1
      QXN(I,J) = QINFLO(KD)
      KD = KD+1
      QYN(I,J) = QINFLO(KD)
      GO TO 98
   88 KD = KD+1
      QYN(I,J) = QINFLO(KD)
      GO TO 98
   89 KT = KT+1
      QXN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))
      GO TO 88
   90 KD = KD+1
      QXN(I,J) = QINFLO(KD)
      GO TO 98
   91 KT = KT+1
      QYN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))
      GO TO 90
   92 KT = KT+1
      QYN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))
      GO TO 98
   93 KT = KT+1
      QXN(I,J) = -CT(KT)*SQRT(G*D(I,J))*(GTIDE(KT)-H(I,J))
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00365   214*          GO TO 98                                                00023500*NEW
00366   215*       94 KT = KT+1                                               00023600*NEW
00367   216*          QYN(I,J) = CT(KT)*SQRT(G*D(I,J+1))*(GTIDE(KT)-H(I,J+1)) 00023700*NEW
00370   217*          HN(I,J) = GTIDE(KT)                                     00023800*NEW
00371   218*          GO TO 70                                                00023900*NEW
00372   219*       95 KT = KT+1                                               00024000*NEW
00373   220*          QXN(I,J) = CT(KT)*SQRT(G*D(I+1,J))*(GTIDE(KT)-H(I+1,J)) 00024100*NEW
00374   221*          HN(I,J) = GTIDE(KT)                                     00024200*NEW
00375   222*          GO TO 70                                                00024300*NEW
00376   223*      101 KD = KD+1                                               00024400*NEW
00377   224*          QXN(I,J) = QINFLO(KD)                                   00024500*NEW
00400   225*          GO TO 70                                                00024600*NEW
00401   226*      102 KD=KD+1                                                 00024700*NEW
00402   227*          QYN(I,J) = QINFLO(KD)                                   00024800*NEW
00403   228*             GO TO 70                                             00024900*NEW
00404   229*      103 JFL = 1                                                 00025000*NEW
00405   230*      110 QYN(I,J) = 0.0                                          00025100*NEW
00406   231*      115 ZMAX=AMAX1(Z(I,J),Z(I+1,J))                             00025200*NEW
00407   232*          IF (H(I,J).GT.ZMAX.OR.H(I+1,J).GT.ZMAX) GO TO 111       00025300*NEW
00411   233*          QXN(I,J) = 0.0                                          00025400*NEW
00412   234*          GO TO (98,75,78,70,106), JFL                            00025500*NEW
00413   235*      111 GO TO (81,71,74,70,113), JFL                            00025600*NEW
00414   236*      104 JFL = 2                                                 00025700*NEW
00415   237*          IFLG = 2                                                00025800*NEW
00416   238*          GO TO 110                                               00025900*NEW
00417   239*      105 JFL = 3                                                 00026000*NEW
00420   240*          IFLG = 2                                                00026100*NEW
00421   241*          GO TO 110                                               00026200*NEW
00422   242*      106 JFL = 1                                                 00026300*NEW
00423   243*      113 QXN(I,J) = 0.0                                          00026400*NEW
00424   244*      114 ZMAX=AMAX1(Z(I,J),Z(I,J+1))                             00026500*NEW
00425   245*          IF (H(I,J).GT.ZMAX.OR.H(I,J+1).GT.ZMAX) GO TO 112       00026600*NEW
00427   246*          QYN(I,J) = 0.0                                          00026700*NEW
00430   247*          IF (JFL.GT.1) IFLG = IFLAG(I,J)                         00026800*NEW
00432   248*          GO TO (98,81,84,70,81), JFL                             00026900*NEW
00433   249*      112 GO TO (75,71,73,70,71), JFL                             00027000*NEW
00434   250*      107 JFL = 2                                                 00027100*NEW
00435   251*          IFLG = 2                                                00027200*NEW
00436   252*          GO TO 113                                               00027300*NEW
00437   253*      108 JFL = 3                                                 00027400*NEW
00440   254*          IFLG = 2                                                00027500*NEW
00441   255*          GO TO 113                                               00027600*NEW
00442   256*      109 JFL = 5                                                 00027700*NEW
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00443   257*          IFLG = 2                                                  00027800*NEW
00444   258*          GO TO 110                                                 00027900*NEW
00445   259*      137 KTT = KT+1                                                00028000*NEW
00446   260*          IF (GTIDE(KTT).GT.Z(I,J)) GO TO 77                        00028100*NEW
00450   261*          KT=KT+1                                                           *NEW
00451   262*          QXN(I,J) = 0.0                                            00028200*NEW
00452   263*          GO TO 75                                                  00028300*NEW
00453   264*      138 KTT = KT+1                                                00028400*NEW
00454   265*          IF (GTIDE(KTT).GT.Z(I,J)) GO TO 93                        00028500*NEW
00456   266*          KT=KT+1                                                           *NEW
00457   267*          QXN(I,J) = 0.0                                            00028600*NEW
00460   268*          GO TO 98                                                  00028700*NEW
00461   269*      139 KTT = KT+1                                                00028800*NEW
00462   270*          IF (GTIDE(KTT).GT.Z(I+1,J)) GO TO 95                      00028900*NEW
00464   271*          KT=KT+1                                                           *NEW
00465   272*          QXN(I,J) = 0.0                                            00029000*NEW
00466   273*          GO TO 70                                                  00029100*NEW
00467   274*      140 KBT=KB+1                                                  00029200*NEW
00470   275*          IFLG=3                                                    00029300*NEW
00471   276*          IF(H(I,J).GT.ZB(KBT).OR.H(I+1,J).GT.ZB(KBT))GO TO 72      00029400*NEW
00473   277*          QXN(I,J)=0.                                               00029500*NEW
00474   278*          KB=KB+1                                                   00029600*NEW
00475   279*          GO TO 78                                                  00029700*NEW
00476   280*      141 JFL=2                                                     00029800*NEW
00477   281*          QYN(I,J)=0.                                               00029900*NEW
00500   282*      162 KBT=KB+1                                                  00030000*NEW
00501   283*          IF(H(I,J).GT.ZB(KBT).AND.H(I+1,J).GT.ZB(KBT))GO TO 160    00030100*NEW
00503   284*          HMAX=AMAX1(H(I,J),H(I+1,J))                               00030200*NEW
00504   285*          IF(HMAX.GT.ZB(KBT))GO TO 161                              00030300*NEW
00506   286*          KB=KB+1                                                           *NEW
00507   287*          QXN(I,J)=0.                                               00030400*NEW
00510   288*          GO TO (106,98,171),JFL                                            *NEW
00511   289*      160 GO TO (108,84,168),JFL                                            *NEW
00512   290*      161 KB=KB+1                                                   00030700*NEW
00513   291*          DBX=HMAX-ZB(KB)                                           00030800*NEW
00514   292*          SIGN=1.0                                                          *NEW
00515   293*          IF(H(I+1,J).GT.ZB(KB))SIGN=-1.0                                   *NEW
00517   294*          QXN(I,J)=SIGN*CB(KB)*DBX*SQTG*SQRT(DBX)                           *NEW
00520   295*          GO TO (114,98,171),JFL                                            *NEW
00521   296*      142 JFL=1                                                     00031300*NEW
00522   297*          GO TO 162                                                 00031400*NEW
00523   298*      143 JFL=2                                                     00031500*NEW
00524   299*          QXN(I,J)=0.                                               00031600*NEW
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00525     165 KBT=KB+1                                                        00031700*NEW
00526     166 IF(H(I,J).GT.ZB(KBT).AND.H(I,J+1).GT.ZB(KBT))GO TO 163               *NEW
00530         HMAX=AMAX1(H(I,J),H(I,J+1))                                     00031900*NEW
00531         IF(HMAX.GT.ZB(KBT))GO TO 164                                    00032000*NEW
00533         KB=KB+1                                                              *NEW
00534         QYN(I,J)=0.                                                     00032100*NEW
00535         GO TO (103,98,167,98),JFL                                            *NEW
00536     163 GO TO (105,78,72,78),JFL                                             *NEW
00537     164 KB=KB+1                                                         00032400*NEW
00540         IF(IFLAG(I,J).NE.45.OR.JFL.EQ.4)GO TO 169                            *NEW
00542         KB=KB+1                                                         00032600*NEW
00543     169 DBY=HMAX-ZB(KB)                                                 00032800*NEW
00544         SIGN=1.0                                                             *NEW
00545         IF(H(I,J+1).GT.ZB(KB))SIGN=-1.0                                      *NEW
00547         QYN(I,J)=SIGN*CB(KB)*DBY*SQTG*SQRT(DBY)                              *NEW
00550         GO TO (115,98,170,98),JFL                                            *NEW
00551     144 JFL=1                                                           00033300*NEW
00552         GO TO 165                                                       00033400*NEW
00553     145 JFL=3                                                           00033500*NEW
00554         IFLG=3                                                          00033600*NEW
00555         GO TO 162                                                            *NEW
00556     171 JFL=4                                                                *NEW
00557         GO TO 165                                                            *NEW
00560     168 KBT=KB+2                                                             *NEW
00561         GO TO 166                                                            *NEW
00562     167 KB=KB-1                                                              *NEW
00563         IFLG=45                                                              *NEW
00564         GO TO 84                                                             *NEW
00565     170 KB=KB-2                                                         00034100*NEW
00566         IFLG=45                                                         00034300*NEW
00567         GO TO 84                                                             *NEW
00570      96 QXN(I,J)=(QX(I,J)+GDTODS*DBARX*(H(I,J)-H(I+1,J))-DT*QYBAR*QDIFXS  00034500*NEW
00570        1+DT2*DBARX*OMEGA*QYBAR+DT*XW)/COEFX                             00034600*NEW
00571         IF (IFLG.GT.11) GO TO 98                                        00034700*NEW
00573      97 QYN(I,J)=(QY(I,J)+GDTODS*DBARY*(H(I,J)-H(I,J+1))-DT*QXBAR*QDIFYS  00034800*NEW
00573        1+DT2*DBARY*OMEGA*QXBAR+DT*YW)/COEFY                             00034900*NEW
00574      98 HN(I,J) = H(I,J)+DTODS*((QXN(I-1,J)-QXN(I,J))+                  00035000*NEW
00574        *                  (QYN(I,J-1)-QYN(I,J)))+DT*(R-E)               00035100*NEW
00575      70 CONTINUE                                                        HYD 0864-141
00577         IF(KRSOFN.NE.1)GO TO 250                                             *NEW
00601         CALL RITCTP                                                          *NEW
00602     250 DO 100 N=1,KOUNT                                                     *NEW
00605         I=ICLL(N)                                                            *NEW
```

```
00606    343*          J=JCLL(N)                                                            *NEW
00607    344*          QX(I,J)=QXN(I,J)                                             HYD 0867**-2
00610    345*          QY(I,J)=QYN(I,J)                                             HYD 0868
00611    346*          H(I,J)=HN(I,J)                                               HYD 0869
00612    347*          D(I,J) = H(I,J)-Z(I,J)                                       HYD 0870
00613    348*          IF (D(I,J).GT.0.0) GO TO 100                                         *NEW
00615    349*          D(I,J) = 0.1                                                         *NEW
00616    350*          H(I,J) = Z(I,J)                                                      *NEW
00617    351*      100 CONTINUE                                                     HYD 0871
00621    352*          RETURN                                                       HYD 0872
00622    353*          END                                                          HYD 0873

     END OF UNIVAC 1108 FORTRAN V COMPILATION.          0 *DIAGNOSTIC* MESSAGE(S)
   CALCQH          SYMBOLIC                  05 MAY 72   12:54:31   0  00071450    14    187  (DELETED)
   CALCQH  CODE    RELOCATABLE               05 MAY 72   12:54:31   1  00076542    24      1  (DELETED)
                                                                    0  00076572    14     77
```

```
@I FOR,* PRINTI,PRINTI                                                                                 05 FEB 73    12:06:42.801
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:42

   SUBROUTINE PRINTI     ENTRY POINT 000512

   STORAGE USED (BLOCK, NAME, LENGTH)

        0001    *CODE     000525
        0000    *DATA     000514
        0002    *BLANK    032477
        0003    ALL       007133
        0004    MQPI      002311

   EXTERNAL REFERENCES (BLOCK, NAME)

     0005   NPRT$            0006   NIO2$            0007   NIO1$            0010   NWDU$            0011   NERR3$

   STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

     0001   000043 122G       0001   000071 142G       0000   000067 150F       0000   000102 151F
     0000   000115 152F       0001   000103 153L       0000   000201 154F       0000   000212 155F
     0000   000230 156F       0000   000247 157F       0000   000275 158F       0000   000312 159F
     0001   000130 171G       0000   000452 2055F      0001   000156 210G       0000   000130 219F
     0000   000145 220F       0001   000206 231G       0000   000434 240F       0000   000445 242F
     0000   000333 260F       0001   000244 260G       0000   000343 261F       0001   000263 266G
     0000   000364 270F       0000   000404 271F       0000   000410 273F       0000   000375 276F
     0000   000401 277F       0001   000276 277G       0000   000413 280F       0001   000472 300L
     0000   000423 301F       0000   000431 303F       0001   000316 314G       0001   000331 320G
     0001   000342 327G       0001   000355 336G       0001   000372 346G       0001   000412 354G
     0001   000426 363G       0001   000453 400G       0001   000461 405G       0002   032436 AO
     0002 R 021443 CB         0002 R 021777 CELSID     0002   032434 CON1       0002   032435 CON2
     0002 R 021063 CT         0002   032442 C1         0002   032446 C2         0002   032452 C3
     0002   000000 D          0002   032361 DS         0002   032365 DT         0002   032404 DTODS
     0002   032432 DTO2DS     0002   032366 DT2        0002 R 032427 E          0002 R 013755 F
     0002   032362 G          0002   032363 GCDT04     0002   032364 GDTODS     0002   021347 GTIDE
     0002   031103 G1         0002   031223 G41        0002   031343 G42        0002   031463 G43
     0003   004622 H          0002   023677 HF         0002   004622 HN         0002   022667 HPLT
```

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0002     022655 HPRT      0002     023763 HPRTA     0000 I 000063 I         0002 I 022155 IBAR
0002 I 031603 IDTIDE    0000 I 000000 IDUMY     0002 I 016266 IFLAG     0002 I 020673 IFLOW
0002 I 032357 IMAX      0002     032421 INETFL    0000     000460 INJP$     0002     032431 IODISP
0002     032424 IONFLO    0002     032423 IONVEL    0002 I 022561 IP        0002 I 032422 IPDATA
0002     032430 ISAVQH    0002 I 021157 ITIDE     0000 I 000064 J         0002 I 022333 JBAR
0004 I 000000 JFLAG     0002 I 020767 JFLOW     0000 I 000065 JJ        0000 I 000066 JK
0002 I 032360 JMAX      0002 I 022605 JP        0002 I 021253 JTIDE     0002     032412 KINDAT
0002     032413 KINIQH    0002     032433 KO        0002     032420 KODISP    0002     032416 KONETF
0002     032415 KONETV    0002     032417 KOTVEL    0002     032410 KOUTCD    0002     032414 KOUTDA
0002     032411 KOUTPP    0000 I 000062 L         0002     032472 LINMAX    0002     032407 M
0002 I 032402 NFLOW     0002 I 032425 NPLOT     0002 I 032401 NREEF     0002 I 032403 NTIDE
0002 R 032373 OMEGA     0002 R 032374 PHI       0002     032456 PHI1      0002     032462 PHI2
0002     032466 PHI3      0002     032372 PTIME     0002 R 020577 QINFLO    0003     000000 QX
0002     007133 QXN       0003     002311 QY        0002     011444 QYN       0002 R 032426 R
0002 R 022511 STATON    0002     032370 TCOUNT    0002 R 032376 THETA     0002     030643 THETA1
0002     030523 TI        0002     031677 TIDE1     0002     032013 TIDE2     0002     032127 TIDE3
0002     032243 TIDE4     0002     032473 TID1      0002     032474 TID2      0002     032475 TID3
0002     032476 TID4      0002     023731 TIM       0002     032367 TIME      0002     032406 TIMVEL
0002     032405 TMARK     0002     032371 TPER      0002     022631 UAPRT     0002     025423 UAPRTA
0002     022643 VAPRT     0002     027063 VAPRTA    0002 R 032375 W         0002     030763 W2
0002     032377 XW        0002     032400 YW        0002 R 002311 Z         0002 R 021621 ZB
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```
00101      1*          SUBROUTINE PRINTI                                           HYD 0884
00101      2*    C                                                                 HYD 0874
00101      3*    C              THIS SUBROUTINE PRINTS ALL DATA READ IN                    *NEW
00101      4*    C           BY THE EXECUTIVE CONTROL ROUTINE, EXCEPT FOR THAT     HYD 0877**-1
00101      5*    C           PREVIOUSLY PRINTED BY THAT ROUTINE. APPROPRIATE       HYD 0878
00101      6*    C           DESCRIPTIVE HEADINGS AND TITLES ARE PRINTED WITH THE  HYD 0879
00101      7*    C           DATA SO THAT MODEL USERS CAN CHECK TO SEE THAT ALL    HYD 0880
00101      8*    C           PROTOTYPE CONDITIONS ARE PROPERLY ACCOUNTED FOR IN    HYD 0881
00101      9*    C           THE MODEL.                                            HYD 0882
00101     10*    C                                                                 HYD 0883
00103     11*          COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),           *NEW
00103     12*         1F(35,35),IFLAG(35,35)                                               *NEW
00104     13*          COMMON QINFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),   *NEW
00104     14*          *      GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),   **-3
00104     15*          *      STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00104     16*          *      HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00104     17*          *      VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
00104     18*          *      G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
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00104          *       TIDE4(76)
00105          COMMON IMAX,JMAX,DS,G,GCDTO4,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 0894
00105          *       OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,      HYD 0895
00105          *       TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF,  HYD 0896
00105          *       KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00105          *       ISAVQH,IODISP,DTO2DS,KO                                     HYD 0898
00106          COMMON CON1,CON2,AO(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00107          COMMON LINMAX,TID1,TID2,TID3,TID4
00110          COMMON/ALL/QX(35,35),QY(35,35),H(35,35)                                   *NEW
00111          COMMON/MQPI/JFLAG(35,35)                                                  *NEW
00112          DIMENSION IDUMY(50)
00113          PRINT 2055                                                          HYD 0904
00115          PRINT 150                                                           HYD 0905
00117    150   FORMAT(9X,53HSTATION LOCATIONS FOR TIME PRINT-OUT OF HYDRODYNAMICSHYD 0906
00117         .,//)                                                                HYD 0907
00120          PRINT 151,(L,STATON(1,L),STATON(2,L),IP(L),JP(L),L=1,20)            HYD 0908
00132    151   FORMAT (9X,15HSTATION NUMBER ,I2,5X,A4,A4,5X,4HI = ,I2,5X,4HJ = , HYD 0909
00132         *I2,/)                                                               HYD 0910
00133          IF(NPLOT.EQ.0)GO TO 153                                             HYD 0911
00135          PRINT 152                                                           HYD 0912
00137    152   FORMAT(///,9X,49HSTATION LOCATIONS FOR TIME PLOTS OF HYDRODYNAMICSHYD 0913
00137         .,//)                                                                HYD 0914
00140          PRINT 151,(L,STATON(1,L),STATON(2,L),IP(L),JP(L),L=1,NPLOT)         HYD 0915
00152    153   PRINT 219                                                           HYD 0916
00154      219 FORMAT (///,9X,58HINITIAL WIND CONDITIONS AND RAINFALL AND EVAPORAHYD 0917
00154         *TION RATES,//)                                                      HYD 0918
00155          PRINT 220, W,THETA,R,E                                              HYD 0919
00163      220 FORMAT (9X,16HWIND VELOCITY = ,F5.1,6H KNOTS,//,9X,13HWIND ANGLE =HYD 0920
00163         * ,F5.1,8H DEGREES,//,9X,16HRAINFALL RATE = ,F5.3,8H IN./DAY,//,     H
00163         *9X,19HEVAPORATION RATE = ,F5.3,8H IN./DAY)
00164          PRINT 154                                                           HYD 0923
00166    154   FORMAT(///9X,38HEXTERNAL FLOW LOCATIONS AND QUANTITIES,//)          HYD 0924
00167          PRINT 155,(I,IFLOW(I),JFLOW(I),QINFLO(I),I=1,NFLOW)                 HYD 0925
00200    155   FORMAT (9X,14HINFLOW NUMBER ,I2,5X,4HI = ,I2,5X,4HJ = ,I2,5X,9HQINHYD 0926
00200         *FLO = ,F7.1,4H CFS,/)                                               HYD 0927
00201          PRINT 2055                                                          HYD 0928
00203          PRINT 156                                                           HYD 0929
00205    156   FORMAT(///,9X,71HSUBMERGED BARRIER LOCATIONS, DISCHARGE COEFFICIENHYD 0930
00205         .TS, AND MSL ELEVATIONS,//)                                          HYD 0931
00206          PRINT 157,(I,IBAR(I),JBAR(I),CELSID(I),CB(I),ZB(I),I=1,NREEF)       HYD 0932
00221    157   FORMAT (9X,12HBARRIER NO. ,I3,4X,4HI = ,I2,4X,4HJ = ,I2,4X,A4,1X,         *NEW
00221         *8HBOUNDARY,4X,14HCOEFFICIENT = ,F4.2,4X,12HELEVATION = ,F5.1,5H FE        *NEW
00221         *ET,/)                                                                     *NEW
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00222          PRINT 2055                                                     HYD 0936**-3
00224          PRINT 158                                                      HYD 0937
00226    158   FORMAT (///,9X,59HGULF TIDAL DISCHARGE COEFFICIENTS AND CELL TIDE HYD 0938
00226         *ASSIGNMENTS,//)                                                HYD 0939
00227          PRINT 159, (I,ITIDE(I),JTIDE(I),CT(I),IDTIDE(I), I=1,NTIDE)    HYD 0940
00241    159   FORMAT(9X,11HTIDAL CELL ,I2,5X,4HI = ,I2,5X,4HJ = ,I2,5X,14HCOEFFIHYD 0941
00241         .CIENT = ,F4.2,5X,11HTIDE = TIDE,I1,/)                          HYD 0942
00242          PRINT 260                                                      HYD 0943
00244      260 FORMAT (///,9X,30HDATA FOR CORIOLIS ACCELERATION,//)           HYD 0944
00245          PRINT 261, OMEGA,PHI                                           HYD 0945
00251      261 FORMAT (9X,28HANGULAR ROTATION OF EARTH = ,F9.7,10H RAD./SEC.,//, HYD 0946
00251         *9X,18HLATITUDE OF BAY = ,F5.2,8H DEGREES,/)                    HYD 0947
00252          PRINT 2055                                                     HYD 0948
00254          PRINT 270                                                      HYD 0949
00256      270 FORMAT (9X,42HMEAN SEA LEVEL WATER DEPTHS THROUGHOUT BAY,//)   HYD 0950
00257          DO 275 J=1,JMAX
00262          JJ = JMAX-J+1
00263          PRINT 276, JJ,(Z(I,JJ), I=1,IMAX)                                      *NEW
00272      275 CONTINUE                                                               *NEW
00274      276 FORMAT (3X,I2,2X,15(1X,F5.1))                                          *NEW
00275          PRINT 277, (I, I=1,IMAX)                                               *NEW
00303      277 FORMAT (/,2X,3HJ/I,15I6)                                               *NEW
00304      271 FORMAT (/,2X,3HJ/I,1X,41I3)                                            *NEW
00305      273 FORMAT (3X,I2,1X,41I3)                                                 **-5
00306          PRINT 2055                                                     HYD 0958
00310          PRINT 280                                                      HYD 0959
00312      280 FORMAT (9X,34HCOMPUTATIONAL CELL IDENTIFICATIONS,//)           HYD 0960
00313          DO 282 J=1,JMAX
00316          JJ = JMAX-J+1
00317          DO 284 I=1,IMAX
00322      284 IDUMY(I) = IFLAG(I,JJ)
00324      282 PRINT 273,JJ, (IDUMY(I),I=1,IMAX)
00334          PRINT 271, (I,I=1,IMAX)
00342          WRITE(6,301)                                                           *NEW
00344      301 FORMAT(1H1,9X,19HCONVECTION FLAGGING,//)                               *NEW
00345          DO 302 J=1,JMAX                                                        *NEW
00350          JK=JMAX-J+1                                                            *NEW
00351      302 WRITE(6,303)JK,(JFLAG(I,JK),I=1,IMAX)                                  *NEW
00361          WRITE(6,271)(I,I=1,IMAX)                                               *NEW
00367      303 FORMAT(3X,I2,1X,41I3)                                                  *NEW
00370          PRINT 2055                                                     HYD 0965
00372          IF(IPDATA.EQ.3)GO TO 300
00374          PRINT 240                                                      HYD 0967
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00376     105*       240 FORMAT (/9X,39HMANNINGS N BOTTOM FRICTION COEFFICIENTS,//)          HYD 0968
00377     106*           DO 241 J=1,JMAX                                                      HYD 0969
00402     107*       241 PRINT 242,J,(F(I,J),I=1,IMAX)                                        HYD 0970
00412     108*       242 FORMAT (/9X,4HJ = ,I2,/,(9X,10F8.5))                                 HYD 0971
00413     109*       300 CONTINUE                                                             HYD 0972
00414     110*      2055 FORMAT (1H1)                                                         HYD 0973
00415     111*           RETURN                                                               HYD 0974
00416     112*           END                                                                  HYD 0975

     END OF UNIVAC 1108 FORTRAN V COMPILATION.         0 *DIAGNOSTIC* MESSAGE(S)
   PRINTI          SYMBOLIC                     05 MAY 72  12:54:33  0  00100660    14   102  (DELETED)
   PRINTI  CODE    RELOCATABLE                  05 MAY 72  12:54:33  1  00103504    24     1  (DELETED)
                                                                     0  00103534    14    57
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@I FOR,* PRINTO,PRINTO                                                          05 FEB 73    12:06:44.706
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:44

   SUBROUTINE PRINTO      ENTRY POINT 000706

              PRINTT      ENTRY POINT 000711

              SAVEQH      ENTRY POINT 000714


              PRT11       ENTRY POINT 000717

   STORAGE USED (BLOCK, NAME, LENGTH)

         0001    *CODE    000722
         0000    *DATA    000204
         0002    *BLANK   032477
         0003    ALL      007133
         0004    PUN      004622


   EXTERNAL REFERENCES (BLOCK, NAME)

     0005    NPRT$           0006    NIO2$           0007    NIO1$           0010    NREW$           0011    NERR2$
     0012    NWDC$           0013    NWBU$           0014    NERR3$


   STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001    000316 1L        0000    000130 110F      0000    000132 111F      0001    000436 115L
    0001    000517 12L       0000    000107 1205F     0001    000016 124G      0001    000016 126G
    0001    000047 142G      0000    000031 16F       0001    000121 164G      0001    000133 174G
    0001    000370 2L        0000    000135 202F      0000    000134 203F      0001    000145 204G
    0000    000030 2055F     0001    000157 213G      0001    000535 22L       0001    000216 237G
    0001    000331 264G      0001    000335 270G      0001    000347 277G      0001    000353 303G
    0001    000406 316G      0001    000407 320G      0001    000424 327G      0001    000425 331G
    0001    000453 343G      0001    000467 355G      0001    000501 365G      0000    000056 40F
    0001    000531 402G      0001    000531 404G      0000    000066 41F       0000    000101 410F
    0000    000074 411F      0001    000554 416G      0001    000567 425G      0001    000602 434G
    0001    000022 44L       0001    000614 443G      0002    032436 AO        0002    021443 CB
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0002   021777 CELSID    0002   032434 CON1      0002   032435 CON2      0002   021063 CT
0002   032442 C1        0002   032446 C2        0002   032452 C3        0002 R 000000 D
0002 R 032361 DS        0002   032365 DT        0002   032404 DTODS     0002   032432 DTO2DS
0002 R 032366 DT2       0000 R 000020 DXA       0000 R 000021 DYA       0002   032427 E
0002   013755 F         0002   032362 G         0002   032363 GCDTO4    0002   032364 GDTODS
0002   021347 GTIDE     0002 R 031103 G1        0002 R 031223 G41       0002 R 031343 G42
0002 R 031463 G43       0003 R 004622 H         0002   023677 HF        0002   004622 HN
0002   022667 HPLT      0002 R 022655 HPRT      0002 R 023763 HPRTA     0000 I 000025 I
0002   022155 IBAR      0002   031603 IDTIDE    0002   016266 IFLAG     0002   020673 IFLOW
0002 I 032357 IMAX      0002   032421 INETFL    0000   000153 INJP$     0002   032431 IODISP
0002   032424 IONFLO    0002   032423 IONVEL    0002 I 022561 IP        0002   032422 IPDATA
0002 I 032430 ISAVQH    0002   021157 ITIDE     0000 I 000024 J         0002   022333 JBAR
0002   020767 JFLOW     0002 I 032360 JMAX      0002 I 022605 JP        0002   021253 JTIDE
0000 I 000013 K         0002   032412 KINDAT    0002   032413 KINIQH    0000 I 000026 KK
0002 I 032433 KO        0002   032420 KODISP    0002   032416 KONETF    0002   032415 KONETV
0002   032417 KOTVEL    0002   032410 KOUTCD    0002 I 032414 KOUTDA    0002   032411 KOUTPP
0000 I 000023 KTR       0000 I 000016 K1        0000 I 000017 K2        0000 I 000014 L
0002 I 032472 LINMAX    0002   032407 M         0000 I 000027 N         0002   032402 NFLOW
0000 I 000012 NLINES    0002   032425 NPLOT     0002   032401 NREEF     0002   032403 NTIDE
0002   032373 OMEGA     0002   032374 PHI       0002   032456 PHI1      0002   032462 PHI2
0002   032466 PHI3      0002   032372 PTIME     0002   020577 QINFLO    0003 R 000000 QX
0002   007133 QXN       0003 R 002311 QY        0002   011444 QYN       0002   032426 R
0002 R 022511 STATON    0002 R 032370 TCOUNT    0002 R 032376 THETA     0000 R 000022 THETAP
0002 R 030643 THETA1    0002 R 030523 TI        0002   031677 TIDE1     0002   032013 TIDE2
0002   032127 TIDE3     0002   032243 TIDE4     0002 R 032473 TID1      0002 R 032474 TID2
0002 R 032475 TID3      0002 R 032476 TID4      0002   023731 TIM       0002 R 032367 TIME
0000 R 000015 TIMP      0002   032406 TIMVEL    0002   032405 TMARK     0002   032371 TPER
0002 R 022631 UAPRT     0002 R 025423 UAPRTA    0004 R 000000 UPLT      0002 R 022643 VAPRT
0002 R 027063 VAPRTA    0004 R 002311 VPLT      0002 R 032375 W         0002 R 030763 W2
0002   032377 XW        0002   032400 YW        0002 R 002311 Z         0002   021621 ZB
0000 R 000000 ZPRT

00101      1*        SUBROUTINE PRINTO                                        HYD 0988
00101      2*     C                                                           HYD 0976
00101      3*     C          THIS SUBROUTINE OUTPUTS THE VALUES OF TIDAL              *NEW
00101      4*     C       AMPLITUDES AND FLOWS PER UNIT WIDTH AT SPECIFIED TIME   HYD 0979**-1
00101      5*     C       INTERVALS FOR TWENTY PRESPECIFIED GRID CELLS LOCATED    HYD 0980
00101      6*     C       IN THE SYSTEM. IF FINAL COMPUTED VALUES OF TIDAL        HYD 0981
00101      7*     C       AMPLITUDES AND FLOWS PER UNIT WIDTH FOR ALL GRID        HYD 0982
00101      8*     C       ELEMENTS ARE DESIRED FOR A RESTART CAPABILITY AT THE        *NEW
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00101      9*   C                END OF THE SIMULATION PERIOD, CONTROL CAN BE TRANSFERRED HYD 0984**-1
00101     10*   C                TO THIS SUBROUTINE WHERE THESE VALUES CAN BE OUTPUTTED   HYD 0985
00101     11*   C                TO CARDS OR MAGNETIC TAPE.                               HYD 0986
00101     12*   C                                                                         HYD 0987
00103     13*         COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),                  *NEW
00103     14*        1F(35,35),IFLAG(35,35)                                                       *NEW
00104     15*         COMMON QINFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),          *NEW
00104     16*        *       GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),          **-3
00104     17*        *       STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00104     18*        *       HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00104     19*        *       VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
00104     20*        *       G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
00104     21*        *       TIDE4(76)
00105     22*         COMMON IMAX,JMAX,DS,G,GCDTO4,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 0998
00105     23*        *       OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,      HYD 0999
00105     24*        *       TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF, HYD 1000
00105     25*        *       KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00105     26*        *       ISAVQH,IODISP,DTO2DS,KO                                    HYD 1002
00106     27*         COMMON CON1,CON2,AO(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00107     28*         COMMON LINMAX,TID1,TID2,TID3,TID4
00110     29*         COMMON/ALL/QX(35,35),QY(35,35),H(35,35)                                    *NEW
00111     30*         COMMON/PUN/UPLT(35,35),VPLT(35,35)                                         *NEW
00112     31*         DIMENSION ZPRT(10)                                                         *NEW
00113     32*         IF (NLINES.NE.LINMAX) GO TO 44
00115     33*         ENTRY PRINTT                                                     HYD 1008
00116     34*         NLINES = 0                                                       HYD 1009
00117     35*         PRINT 2055                                                       HYD 1010
00121     36*    2055 FORMAT (1H1)                                                     HYD 1011
00122     37*         PRINT 16,((STATON(K,L), K=1,2), L=1,10)                          HYD 1012
00133     38*      16 FORMAT(3X,23HTIME     SEA     HYDRO-   ,19X, 43HPRINTOUT STATIONS THR       *NEW
00133     39*        *OUGHOUT SYSTEM          ,/3X,22HHOURS     TIDE  DYNAMICS,2X,10(A4,A4))     **-1
00134     40*      44 NLINES = NLINES+1                                                HYD 1015
00135     41*         KO=KO+1                                                          HYD 1016
00136     42*         TCOUNT = DT2                                                     HYD 1017
00137     43*        ✓TIMP = TIME/60.0                                                 HYD 1018
00140     44*         TI(KO)=TIMP                                                      HYD 1019
00141     45*         DO 38 K=1,10                                                     HYD 1020
00144     46*         K1 = IP(K)                                                       HYD 1021
00145     47*         K2 = JP(K)                                                       HYD 1022
00146     48*         HPRT(K) = H(K1,K2)                                               HYD 1023
00147     49*         UAPRT(K) = QX(K1,K2)*DS/60.0
00150     50*         VAPRT(K) = QY(K1,K2)*DS/60.0
00151     51*         ZPRT(K) = Z(K1,K2)                                                         *NEW
```

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00152          DXA = 0.5*(D(K1,K2)+D(K1+1,K2))*60.0                                    *NEW
00153         DYA = 0.5*(D(K1,K2)+D(K1,K2+1))*60.0                                     *NEW
00154         UPLT(KO,K) = QX(K1,K2)/DXA                                               *NEW
00155         VPLT(KO,K) = QY(K1,K2)/DYA                                               *NEW
00156      38 CONTINUE                                                         HYD 1026
00160         PRINT 40, TIMP,TID1,(HPRT(K), K=1,10)                                    **-1
00170      40 FORMAT (/,1X,F6.2,2X,F6.3,12H  MSL TIDE   ,10(F6.3,2X))          HYD 1028
00171         PRINT 41, TID2,(UAPRT(K), K=1,10)
00200      41 FORMAT (9X,F6.3,2X,8HXFLO CFS,1X,10F8.0)
00201         PRINT 410, TID3,(VAPRT(K), K=1,10)
00210         PRINT 411, TID4,(ZPRT(K), K=1,10)                                        *NEW
00217     411 FORMAT (9X,F6.3,2X,8HGRD ELEV,10F8.2)                                    *NEW
00220     410 FORMAT (9X,F6.3,2X,8HYFLO CFS,1X,10F8.0)
00221         THETAP = THETA*180.0/3.1416                                      HYD 1033
00222         PRINT 1205, TID4,W,THETAP
00227    1205 FORMAT (9X,F6.3,2X,13HWIND SPEED = ,F5.1,6H KNOTS,10X,17HWIND DIREHYD 1035
00227        *CTION = ,F6.1,22H DEGREES W.R.T. X-AXIS)                         HYD 1036
00230         THETA1(KO) = THETAP                                              HYD 1037
00231         W2(KO)=W                                                         HYD 1038
00232         G1(KO) = TID1
00233         G41(KO) = TID2
00234         G42(KO) = TID3
00235         G43(KO) = TID4
00236         DO 39 K=11,20                                                    HYD 1043
00241         K1=IP(K)                                                         HYD 1044
00242         K2=JP(K)                                                         HYD 1045
00243         KTR=K-10                                                         HYD 1046
00244         HPRTA(KO,KTR)=H(K1,K2)                                           HYD 1047
00245         UAPRTA(KO,KTR)=QX(K1,K2)*DS/60.0
00246         VAPRTA(KO,KTR)=QY(K1,K2)*DS/60.0
00247         ZPRT(KTR) = Z(K1,K2)                                                     *NEW
00250         DXA=0.5*(D(K1,K2)+D(K1+1,K2))*60.                                        *NEW
00251         DYA=0.5*(D(K1,K2)+D(K1,K2+1))*60.                                        *NEW
00252         UPLT(KO,K  )=QX(K1,K2)/DXA                                               *NEW
00253         VPLT(KO,K  )=QY(K1,K2)/DYA                                               *NEW
00254   39    CONTINUE                                                         HYD 1050
00256         RETURN                                                           HYD 1051
00257         ENTRY SAVEQH                                                     HYD 1052
00260         IF (ISAVQH.GT.1) REWIND KOUTDA                                   HYD 1053
00262         GO TO (1,2,1), ISAVQH                                            HYD 1054
00263       1 DO 108 J=1,JMAX                                                  HYD 1055
00266     108 PUNCH 110, (H(I,J), I=1,IMAX)                                    HYD 1056
00275     110 FORMAT (8F10.5)                                                  HYD 1057
```

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00276     95*          DO 109 J=1,JMAX                                            HYD 1058
00301     96*      109 PUNCH 111, (QX(I,J),QY(I,J), I=1,IMAX)
00311     97*      111 FORMAT (8F10.4)
00312     98*          IF (ISAVQH.NE.3) GO TO 115                                 HYD 1060
00314     99*        2 WRITE (KOUTDA) ((H(I,J), I=1,IMAX), J=1,JMAX)              HYD 1061
00325    100*          WRITE (KOUTDA) ((QX(I,J),QY(I,J), I=1,IMAX), J=1,JMAX)     HYD 1062
00337    101*      115 CONTINUE                                                   HYD 1063
00340    102*          RETURN                                                     HYD 1064
00341    103*          ENTRY PRT11                                                HYD 1065
00341    104*   C       FIRST CARDS VX, SECOND CARDS VY                                    *NEW
00342    105*          DO 201 K=1,20                                                       *NEW
00345    106*          PUNCH 203, K                                                        *NEW
00350    107*      203 FORMAT (I5)                                                         *NEW
00351    108*          PUNCH 202, IP(K),JP(K),(UPLT(KK,K), KK=1,KO)                        *NEW
00361    109*          PUNCH 202, IP(K),JP(K),(VPLT(KK,K), KK=1,KO)                        *NEW
00371    110*      202 FORMAT (2I4,18F4.1,/,20F4.1)                                        *NEW
00372    111*      201 CONTINUE                                                            *NEW
00374    112*          K=1                                                        HYD 1066
00375    113*   12     NLINES = 0                                                 HYD 1067
00376    114*          PRINT 2055                                                 HYD 1068
00400    115*          PRINT 16,((STATON(N,L), N=1,2), L=11,20)                   HYD 1069
00411    116*   22     NLINES=NLINES+1                                            HYD 1070
00412    117*          PRINT 40,TI(K),G1(K),(HPRTA(K,KTR),KTR=1,10)               HYD 1071
00422    118*          PRINT 41,G41(K),(UAPRTA(K,KTR),KTR=1,10)                   HYD 1072
00431    119*          PRINT 410,G42(K),(VAPRTA(K ,KTR),KTR=1,10)                 HYD 1073
00440   *DIAGNOSTIC*    =  IS AN IMPROPER PUNCTUATION MARK.
00440    120*          PRINT 411, G43(K),(ZPRT(KTR), KTR=1=10)                             *NEW
00447    121*          PRINT 1205,G43(K),W2(K),THETA1(K)                          HYD 1074
00454    122*          IF(K.EQ.KO)RETURN                                          HYD 1075
00456    123*          K=K+1                                                      HYD 1076
00457    124*          IF (NLINES.NE.LINMAX) GO TO 22
00461    125*          GO TO 12                                                   HYD 1078
00462    126*          END                                                        HYD 1079

     END OF UNIVAC 1108 FORTRAN V COMPILATION.     1 *DIAGNOSTIC* MESSAGE(S)
  PRINTO          SYMBOLIC              05 MAY 72  12:54:35   0  00105172   14   103  (DELETED)
  PRINTO  CODE    RELOCATABLE           05 MAY 72  12:54:35   1  00110034   36     1  (DELETED)
                                                              0  00110100   14    44
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QI FOR,* NETVQD,NETVQD                                                          05 FEB 73   12:06:46.983
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:47

  SUBROUTINE NETVQD    ENTRY POINT 001212

             NETFLO    ENTRY POINT 001215

             UVDXDY    ENTRY POINT 001220

             PVLDEP    ENTRY POINT 001223

             PFLDEP    ENTRY POINT 001226

             UVDOUT    ENTRY POINT 001231


             ZEROS     ENTRY POINT 001234

  STORAGE USED (BLOCK, NAME, LENGTH)

      0001   *CODE    001237
      0000   *DATA    003776
      0002   *BLANK   032477
      0003   ALL      007133


  EXTERNAL REFERENCES (BLOCK, NAME)

    0004   NPRT$         0005   NIO2$          0006   NERR2$         0007   NWDC$          0010   NIO1$
    0011   NWBU$         0012   NERR3$


  STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0001   000312 1L       0000   001740 108F     0001   000533 11L      0001   000016 114G
   0001   000017 117G     0001   000605 12L      0001   000114 140G     0001   000115 143G
   0001   000156 157G     0001   000157 162G     0001   000364 2L       0000   001704 2055F
   0001   000237 206G     0000   002035 208F     0001   001002 21L      0000   002037 211F
   0001   000242 211G     0001   001055 22L      0001   000325 235G     0001   000331 241G
   0001   000344 251G     0001   000350 255G     0001   000402 266G     0001   000403 270G
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0000		001765	28F	0001		000421	300G	0001		000422	302G	0001		000463	320G
0001		000466	323G	0001		000546	345G	0001		000552	351G	0001		001124	353L
0001		000565	361G	0001		000571	365G	0001		000623	376G	0001		000624	400G
0001		000642	410G	0001		000643	412G	0001		000710	430G	0001		000713	433G
0001		000432	453L	0001		001015	461G	0001		001021	465G	0001		001034	475G
0001		001040	501G	0001		001073	514G	0001		001074	516G	0001		001112	526G
0001		001113	530G	0001		001141	542G	0001		001142	545G	0000		002006	5505F
0000		001767	5506F	0001		000653	553L	0001		000203	555L	0001		000746	559L
0001		000076	665L	0001		000127	667L	0001		000051	668L	0000		001721	670F
0000		001705	675F	0000		001751	681F	0000		001742	685F	0002		032436	AO
0002		021443	CB	0002		021777	CELSID	0002		032434	CON1	0002		032435	CON2
0002		021063	CT	0002		032442	C1	0002		032446	C2	0002		032452	C3
0002	R	000000	D	0000	R	002041	DEPTH	0002	R	032361	DS	0002	R	032365	DT
0002		032404	DTODS	0002		032432	DTO2DS	0002		032366	DT2	0000	R	002041	DX
0000	R	001702	DXA	0000	R	002041	DY	0000	R	001703	DYA	0002		032427	E
0002		013755	F	0002		032362	G	0002		032363	GCDTO4	0002		032364	GDTODS
0002		021347	GTIDE	0002		031103	G1	0002		031223	G41	0002		031343	G42
0002		031463	G43	0003		004622	H	0002		023677	HF	0002		004622	HN
0002		022667	HPLT	0002		022655	HPRT	0002		023763	HPRTA	0000	I	001701	I
0002		022155	IBAR	0002		031603	IDTIDE	0002	I	016266	IFLAG	0002		020673	IFLOW
0002	I	032357	IMAX	0002	I	032421	INETFL	0000		003745	INJP$	0002	I	032431	IODISP
0002	I	032424	IONFLO	0002	I	032423	IONVEL	0002		022561	IP	0002		032422	IPDATA
0002		032430	ISAVQH	0002		021157	ITIDE	0000	I	001700	J	0002		022333	JBAR
0002		020767	JFLOW	0002	I	032360	JMAX	0002		022605	JP	0002		021253	JTIDE
0002		032412	KINDAT	0002		032413	KINIQH	0002		032433	KO	0002	I	032420	KODISP
0002	I	032416	KONETF	0002	I	032415	KONETV	0002		032417	KOTVEL	0002		032410	KOUTCD
0002		032414	KOUTDA	0002		032411	KOUTPP	0002		032472	LINMAX	0002		032407	M
0002		032402	NFLOW	0002		032425	NPLOT	0002		032401	NREEF	0002		032403	NTIDE
0002		032373	OMEGA	0002		032374	PHI	0002		032456	PHI1	0002		032462	PHI2
0002		032466	PHI3	0002		032372	PTIME	0002		020577	QINFLO	0000	R	002041	QNETX
0000	R	000000	QNETY	0003	R	000000	QX	0002		007133	QXN	0003	R	002311	QY
0002		011444	QYN	0002		032426	R	0002		022511	STATON	0002		032370	TCOUNT
0002		032376	THETA	0002		030643	THETA1	0002		030523	TI	0002		031677	TIDE1
0002		032013	TIDE2	0002		032127	TIDE3	0002		032243	TIDE4	0002		032473	TID1
0002		032474	TID2	0002		032475	TID3	0002		032476	TID4	0002		023731	TIM
0002		032367	TIME	0002		032406	TIMVEL	0002		032405	TMARK	0002	R	032371	TPER
0002		022631	UAPRT	0002		025423	UAPRTA	0000	R	002041	UAVE	0002		022643	VAPRT
0002		027063	VAPRTA	0000	R	002041	VAVE	0000	R	002041	VNETX	0000	R	002041	VNETY
0002		032375	W	0002		030763	W2	0002		032377	XW	0002		032400	YW
0002		002311	Z	0002		021621	ZB								

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00101          SUBROUTINE NETVQD                                                   HYD 1088
00101       C                                                                      HYD 1080
00101       C           THIS IS A  SUBROUTINE WHICH AT THE OPTION OF THE           HYD 1082
00101       C        USER CALCULATES NET VELOCITIES AND FLOWS OVER A TIDAL         HYD 1083
00101       C        CYCLE AND ALSO AVERAGE DEPTHS FOR ALL COMPUTATIONAL           HYD 1084
00101       C        GRID ELEMENTS. THESE VALUES CAN BE OUTPUTTED TO CARDS         HYD 1085
00101       C        OR MAGNETIC TAPE.                                             HYD 1086
00101       C                                                                      HYD 1087
00103          COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),                *NEW
00103         1F(35,35),IFLAG(35,35)                                                    *NEW
00104          COMMON QINFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),        *NEW
00104         *       GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),        **-3
00104         *       STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00104         *       HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00104         *       VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
00104         *       G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
00104         *       TIDE4(76)
00105          COMMON IMAX,JMAX,DS,G,GCDT04,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 1098
00105         *       OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,       HYD 1099
00105         *       TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF,   HYD 1100
00105         *       KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00105         *       ISAVQH,IODISP,DTO2DS,KO                                      HYD 1102
00106          COMMON CON1,CON2,A0(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00107          COMMON LINMAX,TID1,TID2,TID3,TID4
00110          COMMON/ALL/QX(35,35),QY(35,35),H(35,35)                                  *NEW
00111          DIMENSION QNETX(32,30),QNETY(32,30),VNETX(32,30),VNETY(32,30),           *NEW
00111         1DEPTH(32,30),UAVE(32,30),VAVE(32,30),DX(32,30),DY(32,30)                 *NEW
00112          EQUIVALENCE (VNETX,VNETY,DEPTH,UAVE,VAVE,DX,DY,QNETX)                    **-2
00113          DO 668 J=1,JMAX                                                     HYD 1107
00116          DO 668 I=1,IMAX                                                     HYD 1108
00121          IF (IFLAG(I,J).EQ.1) GO TO 668                                      HYD 1109
00123          DXA=0.5*(D(I,J)+D(I+1,J))                                           HYD 1110
00124          DYA=0.5*(D(I,J)+D(I,J+1))                                           HYD 1111
00125          VNETX(I,J) = VNETX(I,J)+QX(I,J)/(60.0*DXA)                          HYD 1112
00126          VNETY(I,J) = VNETY(I,J)+QY(I,J)/(60.0*DYA)                          HYD 1113
00127          DEPTH(I,J) = DEPTH(I,J)+D(I,J)                                      HYD 1114
00130      668 CONTINUE                                                            HYD 1115
00133          IF (IONFLO.GT.0.OR.INETFL.EQ.1) GO TO 665
00135          RETURN                                                              HYD 1117
00136          ENTRY NETFLO                                                        HYD 1118
00137      665 DO 667 J=1,JMAX                                                     HYD 1119
00142          DO 667 I=1,IMAX                                                     HYD 1120
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00145        IF (IFLAG(I,J).EQ.1) GO TO 667                                HYD 1121
00147        QNETX(I,J) = QNETX(I,J)+QX(I,J)                               HYD 1122
00150        QNETY(I,J) = QNETY(I,J)+QY(I,J)                               HYD 1123
00151    667 CONTINUE                                                      HYD 1124
00154        RETURN                                                        HYD 1132
00155        ENTRY UVDXDY                                                  HYD 1133
00156        DO 555 J=1,JMAX                                               HYD 1134
00161        DO 555 I=1,IMAX                                               HYD 1135
00164        IF (IFLAG(I,J).EQ.1) GO TO 555                                HYD 1136
00166        DXA = 0.5*(D(I,J)+D(I+1,J))                                   HYD 1137
00167        DYA = 0.5*(D(I,J)+D(I,J+1))                                   HYD 1138
00170        UAVE(I,J) = UAVE(I,J)+ABS(QX(I,J))/DXA                        HYD 1139
00171        VAVE(I,J) = VAVE(I,J)+ABS(QY(I,J))/DYA                        HYD 1140
00172    555 CONTINUE                                                      HYD 1141
00175        RETURN                                                        HYD 1142
00176        ENTRY PVLDEP                                                  HYD 1143
00177        PRINT 2055                                                    HYD 1144
00201   2055 FORMAT (1H1)                                                  HYD 1145
00202        PRINT 675                                                     HYD 1146
00204    675 FORMAT (10X,54HNET VELOCITIES (FEET/SECOND) AND AVERAGE DEPTHS (FEHYD 1147
00204       *ET),///)                                                      HYD 1148
00205        DO 669 J=1,JMAX                                               HYD 1149
00210        DO 669 I=1,IMAX                                               HYD 1150
00213        VNETX(I,J)=VNETX(I,J)*DT/TPER                                 HYD 1151
00214        VNETY(I,J)=VNETY(I,J)*DT/TPER                                 HYD 1152
00215        DEPTH(I,J) = DEPTH(I,J)*DT/TPER                               HYD 1153
00216        PRINT 670, I,J,VNETX(I,J),VNETY(I,J),DEPTH(I,J)               HYD 1154
00225    670 FORMAT (10X,4HI = ,I2,5X,4HJ = ,I2,5X,8HVNETX = ,F10.6,5X,    HYD 1155
00225       *   8HVNETY = ,F10.6,5X,8HDEPTH = ,F6.3)                       HYD 1156
00226    669 CONTINUE                                                      HYD 1157
00231        IF (IONVEL.EQ.0) GO TO 453                                    HYD 1158
00233        GO TO (1,2,1), IONVEL                                         HYD 1159
00234      1 DO 109 J=1,JMAX                                               HYD 1160
00237    109 PUNCH 108, (VNETX(I,J),VNETY(I,J), I=1,IMAX)                  HYD 1161
00247    108 FORMAT (8F10.6)                                               HYD 1162
00250        DO 107 J=1,JMAX                                               HYD 1163
00253    107 PUNCH 108, (DEPTH(I,J), I=1,IMAX)                             HYD 1164
00262        IF (IONVEL.NE.3) GO TO 453                                    HYD 1165
00264      2 WRITE (KONETV) ((VNETX(I,J),VNETY(I,J), I=1,IMAX), J=1,JMAX)  HYD 1166
00276        WRITE (KONETV) ((DEPTH(I,J), I=1,IMAX), J=1,JMAX)             HYD 1167
00307    453 CONTINUE                                                      HYD 1168
00310        RETURN                                                        HYD 1170
00311        ENTRY PFLDEP                                                  HYD 1171
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00312        PRINT 2055                                                         HYD 1172
00314        PRINT 685                                                          HYD 1173
00316    685 FORMAT (10X,29HNET FLOWS (CUBIC FEET/SECOND),///)                  HYD 1174
00317        DO 680 J=1,JMAX                                                    HYD 1175
00322        DO 680 I=1,IMAX                                                    HYD 1176
00325        QNETX(I,J) = QNETX(I,J)*DS*DT/(60.0*TPER)                          HYD 1177
00326        QNETY(I,J) = QNETY(I,J)*DS*DT/(60.0*TPER)                          HYD 1178
00327        PRINT 681, I,J,QNETX(I,J),QNETY(I,J)                               HYD 1179
00335    681 FORMAT (10X,4HI = ,I2,5X,4HJ = ,I2,5X,8HQNETX = ,F12.2,5X,         HYD 1180
00335       *8HQNETY = ,F12.2)                                                  HYD 1181
00336    680 CONTINUE                                                           HYD 1182
00341        IF (IONFLO.EQ.0) GO TO 553                                         HYD 1183
00343        GO TO (11,12,11), IONFLO                                           HYD 1184
00344     11 DO 27 J=1,JMAX                                                     HYD 1185
00347     27 PUNCH 28, (QNETX(I,J),QNETY(I,J), I=1,IMAX)                        HYD 1186
00357     28 FORMAT (8F10.3)                                                    HYD 1187
00360        DO 29 J=1,JMAX                                                     HYD 1188
00363     29 PUNCH 108, (DEPTH(I,J), I=1,IMAX)                                  HYD 1189
00372        IF (IONFLO.NE.3) GO TO 553                                         HYD 1190
00374     12 WRITE (KONETF) ((QNETX(I,J),QNETY(I,J), I=1,IMAX), J=1,JMAX)       HYD 1191
00406        WRITE (KONETF) ((DEPTH(I,J), I=1,IMAX), J=1,JMAX)                  HYD 1192
00417    553 CONTINUE                                                           HYD 1193
00420        RETURN                                                             HYD 1223
00421        ENTRY UVDOUT                                                       HYD 1224
00422        PRINT 2055                                                         HYD 1225
00424        PRINT 5506                                                         HYD 1226
00426   5506 FORMAT (5X, 74HAVERAGE VELOCITIES OVER A TIDAL CYCLE AND COMPUTED  HYD 1227
00426       *DISPERSION COEFFICIENTS,///)                                       HYD 1228
00427        DO 560 J=1,JMAX                                                    HYD 1229
00432        DO 560 I=1,IMAX                                                    HYD 1230
00435        IF (IFLAG(I,J).EQ.1) GO TO 559                                     HYD 1231
00437        UAVE(I,J) = UAVE(I,J)*DT/(60.0*TPER)                               HYD 1232
00440        VAVE(I,J) = VAVE(I,J)*DT/(60.0*TPER)                               HYD 1233
00441        DX(I,J) =0.5*(UAVE(I,J)*TPER*30.0)**2.0/(TPER*60.0)                HYD 1234
00442        DY(I,J) =0.5*(VAVE(I,J)*TPER*30.0)**2.0/(TPER*60.0)                HYD 1235
00443    559 PRINT 5505, I,J,UAVE(I,J),VAVE(I,J),DX(I,J),DY(I,J)                HYD 1236
00453   5505 FORMAT (5X,4HI = ,I2,5X,4HJ = ,I2,5X,7HUAVE = ,F8.5,4H FPS,5X,     HYD 1237
00453       *7HVAVE = ,F8.5,4H FPS,5X,5HDX = ,F8.2,10H FTSQD/SEC,5X,5HDY = ,    HYD 1238
00453       *F8.2,10H FTSQD/SEC)                                                HYD 1239
00454    560 CONTINUE                                                           HYD 1240
00457        GO TO (21,22,21), IODISP                                           HYD 1242
00460     21 DO 209 J=1,JMAX                                                    HYD 1243
00463    209 PUNCH 208, (UAVE(I,J),VAVE(I,J), I=1,IMAX)                         HYD 1244
```

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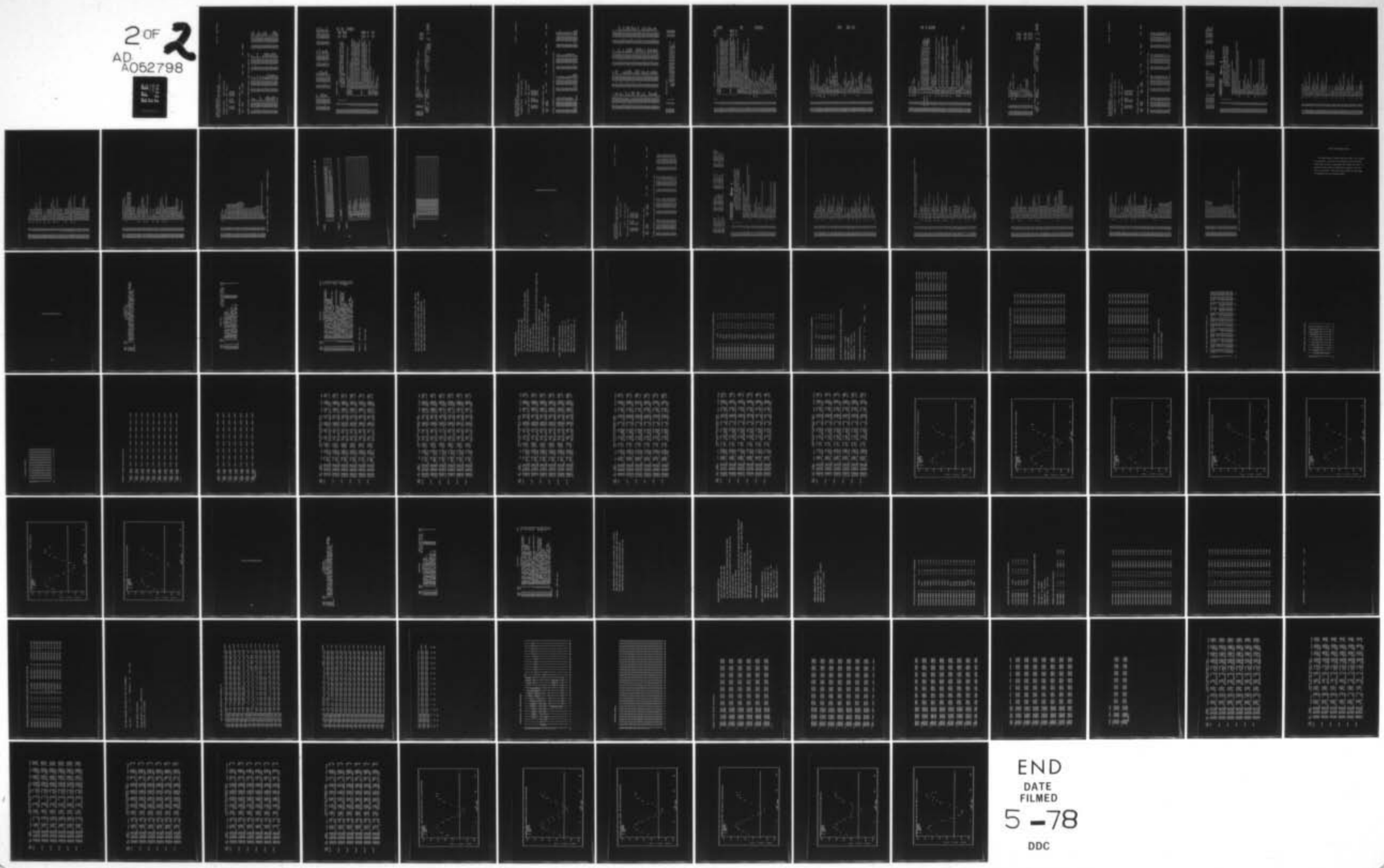
00473   129*    208 FORMAT (8F10.6)                                              HYD 1245
00474   130*        DO 210 J=1,JMAX                                              HYD 1246
00477   131*    210 PUNCH 211, (DX(I,J),DY(I,J), I=1,IMAX)                      HYD 1247
00507   132*    211 FORMAT (8F10.3)                                              HYD 1248
00510   133*        IF (IODISP.NE.3) GO TO 353                                   HYD 1249
00512   134*     22 WRITE (KODISP) ((UAVE(I,J),VAVE(I,J), I=1,IMAX), J=1,JMAX)   HYD 1250
00524   135*        WRITE (KODISP) ((DX(I,J),DY(I,J), I=1,IMAX), J=1,JMAX)       HYD 1251
00536   136*    353 CONTINUE                                                     HYD 1252
00537   137*        RETURN                                                       HYD 1253
00540   138*        ENTRY ZEROS
00541   139*        DO 410 J=1,JMAX
00544   140*        DO 410 I=1,IMAX
00547   141*        VNETX(I,J) = 0.0
00550   142*        VNETY(I,J) = 0.0
00551   143*        QNETX(I,J) = 0.0
00552   144*        QNETY(I,J) = 0.0
00553   145*        DEPTH(I,J) = 0.0
00554   146*        UAVE(I,J) = 0.0
00555   147*        VAVE(I,J) = 0.0
00556   148*        DX(I,J) = 0.0
00557   149*        DY(I,J) = 0.0
00560   150*    410 CONTINUE
00563   151*        RETURN
00564   152*        END                                                          HYD 1263

     END OF UNIVAC 1108 FORTRAN V COMPILATION.        0 *DIAGNOSTIC* MESSAGE(S)
  NETVQD         SYMBOLIC                    05 MAY 72  12:54:38  0  00111250   14   151  (DELETED)
  NETVQD  CODE   RELOCATABLE                 05 MAY 72  12:54:38  1  00115352   48     1  (DELETED)
                                                                  0  00115432   14    75
```

AD-A052 798 WATER RESOURCES ENGINEERS INC AUSTIN TX F/G 8/8
COMPARISON OF NUMERICAL AND PHYSICAL HYDRAULIC MODELS, MASONBOR--ETC(U)
JUN 77 F D MASCH, R J BRANDES, J D REAGAN DACW72-72-C-0028
UNCLASSIFIED CERC-GITI-6-APP-2-VOL-2 NL

2 OF 2
AD
A052798



END
DATE
FILMED
5 -78
DDC

```
@I FOR,* MARKER,MARKER                                                                    05 FEB 73    12:06:49.688
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:49

  SUBROUTINE STRVEL     ENTRY POINT 000102

  STORAGE USED (BLOCK, NAME, LENGTH)

       0001    *CODE     000110
       0000    *DATA     000024
       0002    *BLANK    032477
       0003    ALL       007133

  EXTERNAL REFERENCES (BLOCK, NAME)

    0004   NWBU$            0005   NIO2$            0006   NIO1$            0007   NERR3$

  STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0001     000067 10L        0001     000037 123G       0001     000040 125G       0001     000055 134G
   0001     000056 136G       0002     032436 AO         0002     021443 CB         0002     021777 CELSID
   0002     032434 CON1       0002     032435 CON2       0002     021063 CT         0002     032442 C1
   0002     032446 C2         0002     032452 C3         0002 R   000000 D          0002     032361 DS
   0002 R   032365 DT         0002     032404 DTODS      0002     032432 DTO2DS     0002     032366 DT2
   0002     032427 E          0002     013755 F          0002     032362 G          0002     032363 GCDTO4
   0002     032364 GDTODS     0002     021347 GTIDE      0002     031103 G1         0002     031223 G41
   0002     031343 G42        0002     031463 G43        0003     004622 H          0002     023677 HF
   0002     004622 HN         0002     022667 HPLT       0002     022655 HPRT       0002     023763 HPRTA
   0000 I   000001 I          0002     022155 IBAR       0002     031603 IDTIDE     0002     016266 IFLAG
   0002     020673 IFLOW      0002 I   032357 IMAX       0002     032421 INETFL     0000     000006 INJP$
   0002     032431 IODISP     0002     032424 IONFLO     0002     032423 IONVEL     0002     022561 IP
   0002     032422 IPDATA     0002     032430 ISAVQH     0002     021157 ITIDE      0000 I   000002 J
   0002     022333 JBAR       0002     020767 JFLOW      0002 I   032360 JMAX       0002     022605 JP
   0002     021253 JTIDE      0002     032412 KINDAT     0002     032413 KINIQH     0002     032433 KO
   0002     032420 KODISP     0002     032416 KONETF     0002     032415 KONETV     0002 I   032417 KOTVEL
   0002     032410 KOUTCD     0002     032414 KOUTDA     0002     032411 KOUTPP     0002     032472 LINMAX
   0002     032407 M          0002     032402 NFLOW      0002     032425 NPLOT      0002     032401 NREEF
   0002     032403 NTIDE      0002     032373 OMEGA      0002     032374 PHI        0002     032456 PHI1
```

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0002     032462 PHI2        0002     032466 PHI3        0002     032372 PTIME       0002     020577 QINFLO
0003 R 000000 QX          0002     007133 QXN         0003 R 002311 QY          0002     011444 QYN
0002     032426 R           0002     022511 STATON      0000 R 000000 TAPTIM      0002     032370 TCOUNT
0002     032376 THETA       0002     030643 THETA1      0002     030523 TI          0002     031677 TIDE1
0002     032013 TIDE2       0002     032127 TIDE3       0002     032243 TIDE4       0002     032473 TID1
0002     032474 TID2        0002     032475 TID3        0002     032476 TID4        0002     023731 TIM
0002 R 032367 TIME        0002 R 032406 TIMVEL      0002 R 032405 TMARK       0002     032371 TPER
0002     022631 UAPRT       0002     025423 UAPRTA      0002     022643 VAPRT       0002     027063 VAPRTA
0002     032375 W           0002     030763 W2          0002     032377 XW          0002     032400 YW
0002     002311 Z           0002     021621 ZB

00101      1*        SUBROUTINE STRVEL                                                     *NEW
00101      2*    C                                                                   HYD 1264**-1
00101      3*    C              THIS IS A SUBROUTINE WHICH AT THE OPTION OF THE       HYD 1266
00101      4*    C         USER STORES INSTANTANEOUS HYDRODYNAMICS FOR ALL CELLS          *NEW
00101      5*    C         AT SPECIFIED TIME INTERVALS AND STORES THESE VALUES       HYD 1268**-1
00101      6*    C         ON MAGNETIC TAPE.                                         HYD 1269
00101      7*    C                                                                   HYD 1270
00103      8*        COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),              *NEW
00103      9*       1F(35,35),IFLAG(35,35)                                                  *NEW
00104     10*        COMMON/ALL/QX(35,35),QY(35,35),H(35,35)                                *NEW
00105     11*        COMMON QINFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),      *NEW
00105     12*       *       GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),      **-3
00105     13*       *       STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00105     14*       *       HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00105     15*       *       VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
00105     16*       *       G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
00105     17*       *       TIDE4(76)
00106     18*        COMMON IMAX,JMAX,DS,G,GCDTO4,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 1281
00106     19*       *       OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,    HYD 1282
00106     20*       *       TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF, HYD 1283
00106     21*       *       KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00106     22*       *       ISAVQH,IODISP,DTO2DS,KO                                   HYD 1285
00107     23*        COMMON CON1,CON2,AO(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00110     24*        COMMON LINMAX,TID1,TID2,TID3,TID4
00111     25*        TMARK = TMARK+DT                                                HYD 1290
00112     26*        IF (TMARK.LT.TIMVEL) GO TO 10                                   HYD 1291
00114     27*        TMARK = 0.0
00115     28*        TAPTIM = TIME/60.0
00116     29*        WRITE (KOTVEL) (TAPTIM)
```

```
00121     30*           WRITE (KOTVEL) ((D(I,J), I=1,IMAX), J=1,JMAX)
00132     31*           WRITE (KOTVEL) ((QX(I,J),QY(I,J), I=1,IMAX), J=1,JMAX)
00144     32*        10 CONTINUE                                                          HYD 1301
00145     33*           RETURN                                                            HYD 1302
00146     34*           END                                                               HYD 1303

    END OF UNIVAC 1108 FORTRAN V COMPILATION.        0 *DIAGNOSTIC* MESSAGE(S)
  MARKER         SYMBOLIC                  05 MAY 72  12:54:39  0  00117464    14    33  (DELETED)
  MARKER  CODE   RELOCATABLE               05 MAY 72  12:54:39  1  00120402    24     1  (DELETED)
                                                                0  00120432    14     9
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@I FOR,* PLOTHS,PLOTHS                                                              05 FEB 73   12:06:50.992
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:51

  SUBROUTINE PLOTHS    ENTRY POINT 000774


          HPLOT        ENTRY POINT 000777

  STORAGE USED (BLOCK, NAME, LENGTH)

      0001    *CODE    001002
      0000    *DATA    000506
      0002    *BLANK   032477
      0003    ALL      007133
      0004    MPRC     000002


  EXTERNAL REFERENCES (BLOCK, NAME)

   0005   NRDC$           0006   NIO1$            0007   NIO2$            0010   NPRT$            0011   NERR2$
   0012   NERR3$


  STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

   0000     000363 10F        0000     000365 11F        0001     000232 12L        0001     000004 130G
   0001     000011 134G       0001     000330 14L        0001     000022 143G       0001     000270 15L
   0001     000030 151G       0001     000325 16L        0001     000335 17L        0000     000362 2055F
   0001     000574 21L        0001     000164 213G       0001     000613 22L        0001     000174 222G
   0001     000214 237G       0000     000424 25F        0000     000431 26F        0000     000437 27F
   0001     000311 274G       0000     000444 28F        0001     000465 31L        0001     000332 310G
   0001     000340 317G       0001     000506 32L        0001     000526 33L        0001     000477 346G
   0001     000546 35L        0000     000373 36F        0001     000517 362G       0000     000404 37F
   0001     000537 376G       0000     000414 38F        0001     000565 414G       0001     000605 427G
   0001     000622 442G       0001     000647 451G       0001     000665 465G       0001     000675 474G
   0001     000726 506G       0000     000357 707F       0000     000360 708F       0001     000112 710L
   0001     000124 711L       0001     000141 712L       0001     000153 713L       0000     000370 9F
   0000 R   000341 A          0000 R   000064 ACOLMN     0000 R   000332 ADOT       0000 R   000324 AEQUAL
   0000 R   000325 AI         0000 R   000323 AMINUS     0002     032436 AO         0000 R   000331 APLUS
   0000 R   000327 ASTRSK     0000 R   000330 BLANK      0002     021443 CB         0002     021777 CELSID
```

```
0000 R 000326 CO       0002   032434 CON1      0002   032435 CON2      0002   021063 CT
0002   032442 C1       0002   032446 C2        0002   032452 C3        0002   000000 D
0000 R 000337 DIFHF    0000 R 000340 DIFHP     0002   032361 DS        0002   032365 DT
0002   032404 DTODS    0002   032432 DTO2DS    0002   032366 DT2       0002   032427 E
0002   013755 F        0002   032362 G         0002   032363 GCDTO4    0002   032364 GDTODS
0002   021347 GTIDE    0002   031103 G1        0002   031223 G41       0002   031343 G42
0002   031463 G43      0003 R 004622 H         0002 R 023677 HF        0002   004622 HN
0002 R 022667 HPLT     0002   022655 HPRT      0002   023763 HPRTA     0004 R 000000 HSHIFT
0000 I 000342 I        0002   022155 IBAR      0000 I 000352 IC        0000 I 000351 ICC
0002   031603 IDTIDE   0000 I 000353 IDUMY     0002   016266 IFLAG     0002   020673 IFLOW
0000 I 000000 IHF      0000 I 000032 IHPLT     0002   032357 IMAX      0002   032421 INETFL
0000   000466 INJP$    0002   032431 IODISP    0002   032424 IONFLO    0002   032423 IONVEL
0002 I 0225[illegible] IP       0002   032422 IPDATA    0002   032430 ISAVQH    0000 I 000346 IT
0000 I 000345 ITCONT   0000 I 000344 ITID      0002   021157 ITIDE     0000 I 000347 ITIDM1
0000 I 000350 ITIDPR   0000 I 000333 I$        0000 I 000334 J         0002   022333 JBAR
0002   020767 JFLOW    0002   032360 JMAX      0002 I 022605 JP        0002   021253 JTIDE
0000 I 000335 K        0002   032412 KINDAT    0002   032413 KINIQH    0002   032433 KO
0002   032420 KODISP   0002   032416 KONETF    0002   032415 KONETV    0002   032417 KOTVEL
0002   032410 KOUTCD   0002   032414 KOUTDA    0002   032411 KOUTPP    0000 I 000354 K1
0000 I 000355 K2       0000 I 000336 L         0002   032472 LINMAX    0002 I 032407 M
0000 I 000356 MM1      0002   032402 NFLOW     0002 I 032425 NPLOT     0002   032401 NREEF
0002   032403 NTIDE    0002   032373 OMEGA     0002   032374 PHI       0002   032456 PHI1
0002   032462 PHI2     0002   032466 PHI3      0002 R 032372 PTIME     0002   020577 QINFLO
0003   000000 QX       0002   007133 QXN       0003   002311 QY        0002   011444 QYN
0002   032426 R        0002   022511 STATON    0002   032370 TCOUNT    0002   032376 THETA
0002   030643 THETA1   0002   030523 TI        0002   031677 TIDE1     0002   032013 TIDE2
0002   032127 TIDE3    0002   032243 TIDE4     0000 R 000343 TIDPRT    0002   032473 TID1
0002   032474 TID2     0002   032475 TID3      0002   032476 TID4      0002 R 023731 TIM
0002   032367 TIME     0004   000001 TIMTOT    0002   032406 TIMVEL    0000 R 000227 TITEL
0000 R 000253 TITELY   0002   032405 TMARK     0002   032371 TPER      0002   022631 UAPRT
0002   025423 UAPRTA   0002   022643 VAPRT     0002   027063 VAPRTA    0002   032375 W
0002   030763 W2       0002   032377 XW        0002   032400 YW        0002   002311 Z
0002   021621 ZB

00101      1*        SUBROUTINE PLOTHS                                         HYD 1312
00101      2*    C                                                             HYD 1304
00101      3*    C            THIS IS A SUBROUTINE WHICH AT THE OPTION OF THE  HYD 1306
00101      4*    C       USER PLOTS BOTH THE COMPUTED AND OBSERVED TIDAL       HYD 1307
00101      5*    C       AMPLITUDES AT SPECIFIED GRID CELLS IN THE SYSTEM.     HYD 1308
00101      6*    C       THESE LINE PRINTER PLOTS CAN BE MADE FOR AS MANY AS   HYD 1309
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00101     C                 TWENTY LOCATIONS.                                   HYD 1310
00101     C                                                                     HYD 1311
00103           COMMON D(35,35),Z(35,35),HN(35,35),QXN(35,35),QYN(35,35),               *NEW
00103          1F(35,35),IFLAG(35,35)                                                   *NEW
00104           COMMON QINFLO(60),IFLOW(60),JFLOW(60),CT(60),ITIDE(60),JTIDE(60),       *NEW
00104         *        GTIDE(60),CB(110),ZB(110),CELSID(110),IBAR(110),JBAR(110),       **-3
00104         *        STATON(2,20),IP(20),JP(20),UAPRT(10),VAPRT(10),HPRT(10),
00104         *        HPLT(26,20),HF(26),TIM(26),HPRTA(80,10),UAPRTA(80,10),
00104         *        VAPRTA(80,10),TI(80),THETA1(80),W2(80),G1(80),G41(80),
00104         *        G42(80),G43(80),IDTIDE(60),TIDE1(76),TIDE2(76),TIDE3(76),
00104         *        TIDE4(76)
00105           COMMON IMAX,JMAX,DS,G,GCDT04,GDTODS,DT,DT2,TIME,TCOUNT,TPER,PTIME,HYD 1322
00105         *        OMEGA,PHI,W,THETA,XW,YW,NREEF,NFLOW,NTIDE,DTODS,TMARK,     HYD 1323
00105         *        TIMVEL,M,KOUTCD,KOUTPP,KINDAT,KINIQH,KOUTDA,KONETV,KONETF, HYD 1324
00105         *        KOTVEL,KODISP,INETFL,IPDATA,IONVEL,IONFLO,NPLOT,R,E,
00105         *        ISAVQH,IODISP,DTO2DS,KO                                    HYD 1326
00106           COMMON CON1,CON2,A0(4),C1(4),C2(4),C3(4),PHI1(4),PHI2(4),PHI3(4)
00107           COMMON LINMAX,TID1,TID2,TID3,TID4
00110           COMMON/ALL/QX(35,35),QY(35,35),H(35,35)                                 *NEW
00111           COMMON/MPRC/HSHIFT,TIMTOT                                               *NEW
00112           DIMENSION IHF(26),IHPLT(26),ACOLMN(99),TITEL(20),TITELY(40)
00113           DATA AMINUS/1H-/,AEQUAL/1H=/,AI/1HI/,CO/1HO/
00120           DATA ASTRSK/1H*/,BLANK/1H /,APLUS/1H+/,ADOT/1HX/
00125           DATA TITELY/1H ,1HM,1HS,1HL,1H ,1H ,1HT,1HI,1HD,1HE,1H ,1H ,1HF,
00125          *1HE,1HE,1HT,24*1H /
00127           DO 100 J=1,NPLOT
00132           READ 707, (TITEL(K), K=1,20)
00140       707 FORMAT (20A4)
00141           READ 708, (HF(L), L=1,26)                                               *NEW
00147       708 FORMAT (16F5.2)                                                         **-1
00150           DO 709 L=1,26                                                           *NEW
00153           HF(L) = HF(L)-HSHIFT                                                    *NEW
00154           IF (HF(L).LT.-1.29) HF(L) = 0.0                                         *NEW
00156           HF(L) = HF(L)*10.0                                                      **-1
00157           HPLT(L,J) = HPLT(L,J)*10.0
00160           IHF(L) = HF(L)
00161           IHPLT(L) = HPLT(L,J)
00162           DIFHF = HF(L)-IHF(L)
00163           DIFHP = HPLT(L,J)-IHPLT(L)
00164           IF (DIFHF.LT.0.0) GO TO 710
00166           IF (DIFHF.GE.0.5) IHF(L) = IHF(L)+1
00170           GO TO 711
00171       710 A = ABS(DIFHF)
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00172     50*          IF (A.GE.0.5) IHF(L) = IHF(L)-1
00174     51*      711 IF (DIFHP.LT.0.0) GO TO 712
00176     52*          IF (DIFHP.GE.0.5) IHPLT(L) = IHPLT(L)+1
00200     53*          GO TO 713
00201     54*      712 A = ABS(DIFHP)
00202     55*          IF (A.GE.0.5) IHPLT(L)= IHPLT(L)-1
00204     56*      713 CONTINUE
00205     57*      709 CONTINUE
00207     58*          PRINT 2055
00211     59*     2055 FORMAT (1H1)
00212     60*          DO 5 I=1,91
00215     61*          ACOLMN(I) = ASTRSK
00216     62*        5 CONTINUE
00220     63*          PRINT 10, (ACOLMN(I), I=1,91)
00226     64*       10 FORMAT (9X,91A1)
00227     65*          PRINT 11, ASTRSK,ASTRSK
00233     66*       11 FORMAT (9X,A1,89X,A1)
00234     67*          PRINT 9, ASTRSK, (TITEL(K), K=1,20), ASTRSK
00244     68*        9 FORMAT (9X,A1,9X,20A4,A1)
00245     69*          TIDPRT = 6.0                                          *NEW
00246     70*          ITID = 52                                             *NEW
00247     71*          ITCONT = 5                                            **-2
00250     72*          IT = 1
00251     73*       12 ITCONT = ITCONT+1
00252     74*          IF (ITID.LT.16) IT = IT+1
00254     75*          ITID = ITID-2                                         *NEW
00255     76*          ITIDM1 = ITID-1                                       *NEW
00256     77*          ACOLMN(1) = AI                                        **-1
00257     78*          IF (ITCONT.LT.6) GO TO 15
00261     79*          TIDPRT = TIDPRT-1.0                                   *NEW
00262     80*          ITCONT = 1                                            **-1
00263     81*          ACOLMN(1) = APLUS
00264     82*       15 CONTINUE
00265     83*          ITIDPR = 10.0*TIDPRT
00266     84*          IF (ITIDPR.NE.0) GO TO 14
00270     85*          IF (ITCONT.NE.1) GO TO 14
00272     86*          ICC = 0
00273     87*          DO 16 IC=2,76
00276     88*          ICC = ICC+1
00277     89*          ACOLMN(IC) = AMINUS
00300     90*          IF (ICC.NE.6) GO TO 16
00302     91*          ACOLMN(IC) = APLUS
00303     92*          ICC = 0
```

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00304     93*       16 CONTINUE
00306     94*          GO TO 17
00307     95*       14 DO 13 IC = 2,76
00312     96*       13 ACOLMN(IC) = BLANK
00314     97*       17 CONTINUE
00315     98*          L = 0
00316     99*          DO 20 IC=1,76,3
00321    100*          L = L+1
00322    101*          IF (IHF(L).EQ.ITID.OR.IHF(L).EQ.ITIDM1) ACOLMN(IC) = CO                *NEW
00324    102*          IF (IHPLT(L).EQ.ITID.OR.IHPLT(L).EQ.ITIDM1) ACOLMN(IC) = ADOT          *NEW
00326  *DIAGNOSTIC*    THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
00326    103*          IF (ACOLMN(IC).EQ.ADOT.AND.IHF(L).EQ.ITID) ACOLMN(IC) = AEQUAL         *NEW
00330  *DIAGNOSTIC*    THE TEST FOR EQUALITY BETWEEN NON-INTEGERS MAY NOT BE MEANINGFUL.
00330    104*          IF (ACOLMN(IC).EQ.ADOT.AND.IHF(L).EQ.ITIDM1) ACOLMN(IC) = AEQUAL       *NEW
00332    105*       20 CONTINUE                                                               **-3
00334    106*          IF (ITID.LT.46) GO TO 35                                               *NEW
00336    107*          IDUMY = (52-ITID)/2                                                    *NEW
00337    108*          GO TO (31,32,33),IDUMY                                                 **-2
00340    109*       31 PRINT 36, ASTRSK,TITELY(IT),TIDPRT,ACOLMN(1),(ACOLMN(IC),IC=16,76)
00340    110*         *,ASTRSK
00353    111*       36 FORMAT (9X,A1,2X,A1,2X,F4.1,A1,3X,11HO  OBSERVED,61A1,4X,A1)
00354    112*          GO TO 22
00355    113*       32 PRINT 37, ASTRSK,TITELY(IT),ACOLMN(1),(ACOLMN(IC),IC=16,76),ASTRSK
00367    114*       37 FORMAT (9X,A1,2X,A1,6X,A1,3X,11HX  COMPUTED,61A1,4X,A1)
00370    115*          GO TO 22
00371    116*       33 PRINT 38, ASTRSK,TITELY(IT),ACOLMN(1),(ACOLMN(IC),IC=16,76),ASTRSK
00403    117*       38 FORMAT (9X,A1,2X,A1,6X,A1,3X,11H=  BOTH    ,61A1,4X,A1)
00404    118*          GO TO 22
00405    119*       35 CONTINUE
00406    120*          IF (ITCONT.EQ.1) GO TO 21
00410    121*          PRINT 25, ASTRSK,TITELY(IT),(ACOLMN(IC), IC=1,76),ASTRSK
00421    122*          GO TO 22
00422    123*       21 PRINT 26, ASTRSK,TITELY(IT),TIDPRT,(ACOLMN(IC), IC=1,76),ASTRSK
00434    124*       25 FORMAT (9X,A1,2X,A1,6X,76A1,4X,A1)
00435    125*       26 FORMAT (9X,A1,2X,A1,2X,F4.1,76A1,4X,A1)
00436    126*       22 CONTINUE
00437    127*          IF (TIDPRT.GT.-2.0) GO TO 12                                           *NEW
00441    128*          DO 30 I=1,5                                                            **-1
00444    129*       30 IHF(I) = (I-1)*6.0
00446    130*          PRINT 27, ASTRSK,(IHF(I), I=1,5),ASTRSK
00456    131*       27 FORMAT (9X,A1,8X,I2,4(16X,I2),7X,A1)
00457    132*          PRINT 28, ASTRSK,ASTRSK
00463    133*       28 FORMAT (9X,A1,41X,12HTIME - HOURS,36X,A1)
```

```
00464   134*           DO 29 I=1,91
00467   135*           ACOLMN(I) = ASTRSK
00470   136*        29 CONTINUE
00472   137*           PRINT10, (ACOLMN(I), I=1,91)
00500   138*       100 CONTINUE
00502   139*           RETURN
00503   140*           ENTRY HPLOT                                                     HYD 1431
00504   141*           M = M+1                                                         HYD 1432
00505   142*           DO 47 K=1,NPLOT                                                 HYD 1433
00510   143*           K1 = IP(K)
00511   144*           K2 = JP(K)
00512   145*           MM1 = M-1                                                       HYD 1434
00513   146*           TIM(M)=PTIME/60.0*MM1                                           HYD 1435
00514   147*           HPLT(M,K) = H(K1,K2)
00515   148*        47 CONTINUE                                                        HYD 1437
00517   149*           RETURN                                                          HYD 1438
00520   150*           END                                                             HYD 1439

    END OF UNIVAC 1108 FORTRAN V COMPILATION.     2 *DIAGNOSTIC* MESSAGE(S)
 PLOTHS         SYMBOLIC                    05 MAY 72  12:54:41  0  00120630  14   144  (DELETED)
 PLOTHS  CODE   RELOCATABLE                 05 MAY 72  12:54:41  1  00124570  24     1  (DELETED)
                                                                 0  00124620  14    62
```

```
@I FOR RITAP,RITAP                                                                                  05 FEB 73   12:06:53.466
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 12:06:53

   SUBROUTINE RITAP      ENTRY POINT 001127

              RITCTP     ENTRY POINT 001132

   STORAGE USED (BLOCK, NAME, LENGTH)

        0001    *CODE    001135
        0000    *DATA    012011
        0002    *BLANK   000000
        0003    ALL      007133
        0004    MRQ      000003
        0005    MPRC     000002


   EXTERNAL REFERENCES (BLOCK, NAME)

     0006   NRDU$          0007   NIO1$          0010   NIO2$          0011   NREW$          0012   NRBU$
     0013   NWBU$          0014   NERR3$


   STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000014 115G      0001   000022 122G      0001   000036 131G      0001   000043 135G
    0001   000055 144G      0001   000067 153G      0001   000074 157G      0001   000116 164G
    0001   000140 173G      0001   000756 19L       0001   000053 20L       0001   000145 200G
    0001   000161 206G      0001   000170 214G      0001   000204 222G      0000   011731 23F
    0001   000213 230G      0001   000227 236G      0001   000236 244G      0001   000251 253G
    0001   000256 260G      0001   000272 266G      0001   000301 274G      0001   000315 302G
    0001   000323 307G      0001   000335 316G      0001   000342 323G      0001   000354 331G
    0001   000361 336G      0001   000375 344G      0001   000403 351G      0001   000416 360G
    0001   000423 365G      0001   000444 375G      0001   000462 406G      0001   000467 413G
    0001   000510 423G      0001   000543 442G      0001   000603 461G      0001   000610 466G
    0001   000631 476G      0001   000641 504G      0001   000654 513G      0001   000661 520G
    0001   000702 530G      0001   000727 544G      0001   000100 6L        0001   001064 615G
    0001   001071 621G      0000 R 007243 D         0000 R 011726 DTOT      0003 R 004622 H
    0000 R 002371 HOLD      0005 R 000000 HSHIFT    0000 R 002355 HTP       0000 R 002405 HTPU
```

```
0000 I 011723 I          0000   011763 INJP$      0000 I 011730 J          0000 I 011725 KCT
0000 I 011721 KCTM       0004 I 000001 KQCTP      0004 I 000002 KQFTP      0004   000000 KRSOFN
0000 I 011724 M          0000 I 011727 N          0000 R 011554 Q          0000 R 002325 QOLD
0000 R 002421 QS         0000 R 004732 QT         0000 R 002311 QTP        0000 R 002341 QTPU
0003 R 000000 QX         0003 R 002311 QY         0000 R 011720 TIME       0005 R 000001 TIMTOT
0000 R 011722 TMAX       0000 R 000000 Z          0000 R 011636 ZT
```

VERSION 2

```
00101          SUBROUTINE RITAP
00101    C
00101    C                THIS SUBROUTINE STORES SELECTED FLOWS FROM A
00101    C            COARSE GRID MODEL, THEN INTERPOLATES BY TIME,
00101    C            DISTRIBUTES BY DEPTH PROPORTION, AND WRITES THE
00101    C            TRANSFER FLOWS ON MAGNETIC TAPE FOR SUBSEQUENT
00101    C            USE BY THE FINE GRID MODEL.
00101    C
00103          COMMON/ALL/QX(35,35),QY(35,35),H(35,35)
00104          COMMON/MRQ/KRSOFN,KQCTP,KQFTP
00105          COMMON/MPRC/HSHIFT,TIMTOT
00106          DIMENSION Z(35,35),QTP(12),QOLD(12),QTPU(12),HTP(12),HOLD(12),
00106         1HTPU(12),QS(35,35),QT(35,35),D(35,35),Q(50),ZT(50)
00107       23 FORMAT(25X,F4.0)
00110          TIME=0.
00111          KCTM=4
00112          TMAX=3600.*TIMTOT
00113          READ(5,23)(ZT(I),I=1,46)
00121          DO 65 I=1,46
00124       65 ZT(I)=ZT(I)-HSHIFT
00126          REWIND KQCTP
00127          READ(KQCTP)(QTP(M),M=1,12),(HTP(M),M=1,12)
00141          KCT=0
00142          REWIND KQFTP
00143       20 DO 4 M=1,12
00146          HOLD(M)=HTP(M)
00147        4 QOLD(M)=QTP(M)
00151        5 READ(KQCTP)(QTP(M),M=1,12),(HTP(M),M=1,12)
00163        6 DO 7 M=1,12
00166          HTPU(M)=HOLD(M)+KCT/KCTM*(HTP(M)-HOLD(M))
00167        7 QTPU(M)=QOLD(M)+KCT*(QTP(M)-QOLD(M))/KCTM
00171          DTOT=0.
00172          DO 45 I=9,19
```

```
00175      45 Z(I,4)=ZT(I-8)
00177         DO 27 I=9,12
00202         D(I,4)=HTPU(1)-Z(I,4)
00203      27 DTOT=DTOT+D(I,4)
00205         DO 9 I=9,12
00210       9 QT(I,4)=QTPU(1)/DTOT*D(I,4)
00212         DTOT=0.
00213         DO 28 I=13,16
00216         D(I,4)=HTPU(2)-Z(I,4)
00217      28 DTOT=DTOT+D(I,4)
00221         DO 10 I=13,16
00224      10 QT(I,4)=QTPU(2)/DTOT*D(I,4)
00226         DTOT=0.
00227         DO 29 I=17,19
00232         D(I,4)=HTPU(3)-Z(I,4)
00233      29 DTOT=DTOT+D(I,4)
00235         DO 11 I=17,19
00240      11 QT(I,4)=QTPU(3)/DTOT*D(I,4)
00242         N=0
00243         DO 36 I=9,19
00246         N=N+1
00247      36 Q(N)=QT(I,4)
00251         DTOT=0.
00252         DO 46 J=5,12
00255      46 Z(8,J)=ZT(J+7)
00257         DO 30 J=5,8
00262         D(8,J)=HTPU(4)-Z(8,J)
00263      30 DTOT=DTOT+D(8,J)
00265         DO 12 J=5,8
00270      12 QS(8,J)=QTPU(4)/DTOT*D(8,J)
00272         DTOT=0.
00273         DO 31 J=9,12
00276         D(8,J)=HTPU(5)-Z(8,J)
00277      31 DTOT=DTOT+D(8,J)
00301         DO 13 J=9,12
00304      13 QS(8,J)=QTPU(5)/DTOT*D(8,J)
00306         DO 37 J=5,12
00311         N=N+1
00312      37 Q(N)=QS(8,J)
00314         DTOT=0.
00315         DO 62 J=13,15
00320      62 QS(21,J)=QTPU(6)/3.
00322         DO 63 J=13,15
```

```
00325             N=N+1
00326          63 Q(N)=QS(21,J)
00330             DO 47 J=16,19
00333          47 Z(1,J)=ZT(J+7)
00335             DO 32 J=16,19
00340             D(1,J)=HTPU(7)-Z(1,J)
00341          32 DTOT=DTOT+D(1,J)
00343             DO 14 J=16,19
00346          14 QS(1,J)=QTPU(7)/DTOT*D(1,J)
00350             DO 38 J=16,19
00353             N=N+1
00354          38 Q(N)=QS(1,J)
00356             DTOT=0.
00357             DO 48 J=23,25
00362          48 Z(4,J)=ZT(J+4)
00364             DO 24 J=23,25
00367             D(4,J)=HTPU(8)-Z(4,J)
00370             IF(D(4,J).LT.0.)D(4,J)=0.
00372          24 DTOT=DTOT+D(4,J)
00374             DO 15 J=23,25
00377          15 QS(4,J)=QTPU(8)/DTOT*D(4,J)
00401             Q(28)=QS(4,23)
00402             Q(30)=QS(4,24)
00403             Q(32)=QS(4,25)
00404             DTOT=0.
00405             DO 49 J=22,25
00410          49 Z(32,J)=ZT(J+8)
00412             DO 25 J=22,25
00415             D(32,J)=HTPU(9)-Z(32,J)
00416             IF(D(32,J).LT.0.)D(32,J)=0.
00420          25 DTOT=DTOT+D(32,J)
00422             DO 16 J=22,25
00425          16 QS(32,J)=QTPU(9)/DTOT*D(32,J)
00427             Q(27)=QS(32,22)
00430             Q(29)=QS(32,23)
00431             Q(31)=QS(32,24)
00432             Q(36)=QS(32,25)
00433             Z(29,25)=ZT(34)
00434             D(29,25)=HTPU(10)-Z(29,25)
00435             IF(D(29,25).LT.0.)D(29,25)=0.
00437             DTOT=D(29,25)
00440             Z(31,25)=ZT(35)
00441             DO 26 I=31,32
```

```
00444          D(I,25)=HTPU(10)-Z(I,25)
00445          IF(D(I,25).LT.0.)D(I,25)=0.
00447       26 DTOT=DTOT+D(I,25)
00451          QT(29,25)=QTPU(10)*D(29,25)/DTOT
00452          QT(31,25)=QTPU(10)*D(31,25)/DTOT
00453          QT(32,25)=QTPU(10)*D(32,25)/DTOT
00454          Q(34)=QT(29,25)
00455          Q(35)=QT(31,25)
00456          Q(37)=QT(32,25)
00457          DTOT=0.
00460          DO 50 I=12,16
00463       50 Z(I,28)=ZT(I+24)
00465          DO 33 I=12,16
00470          D(I,28)=HTPU(11)-Z(I,28)
00471          IF(D(I,28).LT.0.)D(I,28)=0.
00473       33 DTOT=DTOT+D(I,28)
00475          DO 17 I=12,16
00500       17 QT(I,28)=QTPU(11)/DTOT*D(I,28)
00502          N=39
00503          DO 41 I=12,16
00506          N=N+1
00507       41 Q(N)=QT(I,28)
00511          DTOT=0.
00512          DO 51 J=25,30
00515       51 Z(20,J)=ZT(J+16)
00517          DO 34 J=25,30
00522          D(20,J)=HTPU(12)-Z(20,J)
00523          IF(D(20,J).LT.0.)D(20,J)=0.
00525       34 DTOT=DTOT+D(20,J)
00527          DO 18 J=25,30
00532       18 QS(20,J)=QTPU(12)/DTOT*D(20,J)
00534          Q(33)=QS(20,25)
00535          Q(38)=QS(20,26)
00536          Q(39)=QS(20,27)
00537          Q(45)=QS(20,28)
00540          Q(46)=QS(20,29)
00541          Q(47)=QS(20,30)
00542          WRITE(KQFTP)(Q(N),N=1,47)
00550          IF(TIME.GE.TMAX)GO TO 19
00552          KCT=KCT+1
00553          TIME=TIME+5.
00554          IF(KCT.LE.KCTM)GO TO 6
00556          KCT=1
```

```
00557   163*          GO TO 20
00560   164*       19 REWIND KQCTP
00561   165*          RETURN
00562   166*          ENTRY RITCTP
00563   167*          QTP(1)=QY(5,5)*20.
00564   168*          QTP(2)=QY(6,5)*20.
00565   169*          QTP(3)=QY(7,5)*20.
00566   170*          QTP(4)=QX(4,6)*20.
00567   171*          QTP(5)=QX(4,7)*20.
00570   172*          QTP(6)=QX(7,8)*20.
00571   173*          QTP(7)=QX(2,9)*20.
00572   174*          QTP(8)=QX(3,10)*20.
00573   175*          QTP(9)=QX(10,10)*20.
00574   176*          QTP(10)=QY(10,10)*20.
00575   177*          QTP(11)=QY(6,11)*20.
00576   178*          QTP(12)=QX(7,11)*20.
00577   179*          HTP(1)=H(5,5)
00600   180*          HTP(2)=H(6,5)
00601   181*          HTP(3)=H(7,5)
00602   182*          HTP(4)=H(4,6)
00603   183*          HTP(5)=H(4,7)
00604   184*          HTP(6)=H(7,8)
00605   185*          HTP(7)=H(2,9)
00606   186*          HTP(8)=H(3,10)
00607   187*          HTP(9)=H(10,10)
00610   188*          HTP(10)=H(10,10)
00611   189*          HTP(11)=H(6,11)
00612   190*          HTP(12)=H(7,11)
00613   191*          WRITE(KQCTP)(QTP(I),I=1,12),(HTP(I),I=1,12)
00625   192*          RETURN
00626   193*          END

        END OF UNIVAC 1108 FORTRAN V COMPILATION.      0 *DIAGNOSTIC* MESSAGE(S)
```

INSERTS IN PROGRAM HYDTID FOR SIMULATION OF INLET GEOMETRY WITHOUT JETTY (NOV. 1964)

Insert 1

```
      DATA/IFLOW/9,10,11,12,13,14,15,16,17,18,19,20,21,8,21,8,21,8,21,
     18,21,8,21,8,21,8,21,8,21,3*21,4*1,32,4,32,4,32,4,20,29,31,32,32,
     220,20,12,13,14,15,16,3*20,3*0/
      DATA/JFLOW/13*4,2*5,2*6,2*7,2*8,2*9,2*10,2*11,2*12,13,14,15,
     116,17,18,19,22,2*23,2*24,6*25,26,27,6*28,29,30,3*0/
```

Insert 2

```
      NFLOW=57
```

Insert 3

```
      DO 702 I=9,21
  702 QY(I,4)=QINFLO(I-8)
      N=14
      DO 703 J=5,12
      QX(8,J)=QINFLO(N)
      QX(21,J)=QINFLO(N+1)
  703 N=N+2
      DO 704 J=13,15
  704 QX(21,J)=QINFLO(J+17)
      DO 705 J=16,19
  705 QX(1,J)=QINFLO(J+17)
      DO 706 I=12,16
  706 QY(I,28)=QINFLO(I+38)
      DO 707 J=28,30
```

Insert 3 continued

707	QX(20,J)=QINFLO(J+27)
	QX(32,22)=QINFLO(37)
	QX(4,23)=QINFLO(39)
	QX(32,23)=QINFLO(39)
	QX(4,24)=QINFLO(40)
	QX(32,24)=QINFLO(41)
	QX(4,25)=QINFLO(42)
	QX(20,25)=QINFLO(43)
	QY(29,25)=QINFLO(44)
	QY(31,25)=QINFLO(45)
	QX(32,25)=QINFLO(46)
	QY(32,25)=QINFLO(47)
	QX(20,26)=QINFLO(48)
	QX(20,27)=QINFLO(49)

Subroutine RITAP, Version I

```
@I FOR RITAP,RITAP                                                                          05 FEB 73    11:32:18.172
UNIVAC 1108 FORTRAN V LEVEL 2206 0023
THIS COMPILATION WAS DONE ON 05 FEB 73 AT 11:32:18

   SUBROUTINE RITAP       ENTRY POINT 001244

           RITCTP         ENTRY POINT 001247

   STORAGE USED (BLOCK, NAME, LENGTH)

        0001    *CODE     001252
        0000    *DATA     012024
        0002    *BLANK    000000
        0003    ALL       007133
        0004    MRQ       000003
        0005    MPRC      000002


   EXTERNAL REFERENCES (BLOCK, NAME)

    0006   NRDUS           0007   NIO1$           0010   NIO2$           0011   NREWS           0012   NRBUS
    0013   NWBUS           0014   NERR3$


   STORAGE ASSIGNMENT FOR VARIABLES (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001    000014 115G      0001    000022 122G      0001    000036 131G      0001    000043 135G
    0001    000055 144G      0001    000067 153G      0001    000074 157G      0001    000116 164G
    0001    000135 173G      0001    001061 19L       0001    000053 20L       0001    000142 200G
    0001    000156 206G      0001    000165 214G      0001    000201 222G      0000    011745 23F
    0001    000210 230G      0001    000224 236G      0001    000233 244G      0001    000246 253G
    0001    000253 260G      0001    000267 266G      0001    000276 274G      0001    000312 302G
    0001    000322 310G      0001    000335 317G      0001    000342 324G      0001    000356 332G
    0001    000365 340G      0001    000401 346G      0001    000410 354G      0001    000424 362G
    0001    000434 370G      0001    000454 401G      0001    000462 407G      0001    000476 415G
    0001    000506 423G      0001    000521 432G      0001    000526 437G      0001    000547 447G
    0001    000565 460G      0001    000572 465G      0001    000613 475G      0001    000646 514G
    0001    000706 533G      0001    000713 540G      0001    000734 550G      0001    000744 556G
    0001    000757 565G      0001    000764 572G      0001    000100 6L        0001    001005 602G
    0001    001032 616G      0001    001201 673G      0001    001206 677G      0000 R  007257 D
```

```
0000 R 011742 DTOT      0003 R 004622 H        0000 R 002401 HOLD   0005 R 000000 HSHIFT
0000 R 002363 HTP       0000 R 002417 HTPU     0000 I 011737 I      0000   011776 INJPS
0000 I 011744 J         0000 I 011741 KCT      0000 I 011735 KCTM   0004 I 000001 KQCTF
0004 I 000002 KQFTP     0004   000000 KRSOFN   0000 I 011740 M      0000 I 011743 N
0000 R 011570 W         0000 R 002327 QOLD     0000 R 002435 QS     0000 R 004746 QT
0000 R 002311 QTP       0000 R 002345 QTPU     0003 R 000000 QX     0003 R 002311 QY
0000 R 011734 TIME      0005 R 000001 TIMTOT   0000 R 011736 TMAX   0000 R 000000 Z
0000 R 011652 ZT
```

VERSION 1

```
00101          SUBROUTINE RITAP
00101    C
00101    C             THIS SUBROUTINE STORES SELECTED FLOWS FROM A
00101    C         COARSE GRID MODEL, THEN INTERPOLATES BY TIME,
00101    C         DISTRIBUTES BY DEPTH PROPORTION, AND WRITES THE
00101    C         TRANSFER FLOWS ON MAGNETIC TAPE FOR SUBSEQUENT
00101    C         USE BY THE FINE GRID MODEL.
00101    C
00103          COMMON/ALL/QX(35,35),QY(35,35),H(35,35)
00104          COMMON/MRQ/KRSOFN,KQCTP,KQFTP
00105          COMMON/MPRC/HSHIFT,TIMTOT
00106          DIMENSION Z(35,35),QTP(14),QOLD(14),QTPU(14),HTP(14),HOLD(14),
00106         1HTPU(14),QS(35,35),QT(35,35),D(35,35),Q(50),ZT(50)
00107       23 FORMAT(25X,F4.0)
00110          TIME=0.
00111          KCTM=4
00112          TMAX=3600.*TIMTOT
00113          READ(5,23)(ZT(I),I=1,56)
00121          DO 65 I=1,56
00124       65 ZT(I)=ZT(I)-HSHIFT
00126          REWIND KQCTP
00127          READ(KQCTP)(QTP(M),M=1,14),(HTP(M),M=1,14)
00141          KCT=0
00142          REWIND KQFTP
00143       20 DO 4 M=1,14
00146          HOLD(M)=HTP(M)
00147        4 QOLD(M)=QTP(M)
00151        5 READ(KQCTP)(QTP(M),M=1,14),(HTP(M),M=1,14)
00163        6 DO 7 M=1,14
00166          HTPU(M)=HOLD(M)+KCT/KCTM*(HTP(M)-HOLD(M))
00167        7 QTPU(M)=QOLD(M)+KCT*(QTP(M)-QOLD(M))/KCTM
```

```
00171              DTOT=0.
00172              DO 45 I=9,21
00175           45 Z(I,4)=ZT(I-8)
00177              DO 27 I=9,12
00202              D(I,4)=HTPU(1)-Z(I,4)
00203           27 DTOT=DTOT+D(I,4)
00205              DO 9 I=9,12
00210            9 QT(I,4)=QTPU(1)/DTOT*D(I,4)
00212              DTOT=0.
00213              DO 28 I=13,16
00216              D(I,4)=HTPU(2)-Z(I,4)
00217           28 DTOT=DTOT+D(I,4)
00221              DO 10 I=13,16
00224           10 QT(I,4)=QTPU(2)/DTOT*D(I,4)
00226              DTOT=0.
00227              DO 29 I=17,21
00232              D(I,4)=HTPU(3)-Z(I,4)
00233           29 DTOT=DTOT+D(I,4)
00235              DO 11 I=17,21
00240           11 QT(I,4)=QTPU(3)/DTOT*D(I,4)
00242              N=0
00243              DO 36 I=9,21
00246              N=N+1
00247           36 Q(N)=QT(I,4)
00251              DTOT=0.
00252              DO 46 J=5,12
00255           46 Z(8,J)=ZT(J+7)
00257              DO 30 J=5,8
00262              D(8,J)=HTPU(4)-Z(8,J)
00263           30 DTOT=DTOT+D(8,J)
00265              DO 12 J=5,8
00270           12 QS(8,J)=QTPU(4)/DTOT*D(8,J)
00272              DTOT=0.
00273              DO 31 J=9,12
00276              D(8,J)=HTPU(5)-Z(8,J)
00277           31 DTOT=DTOT+D(8,J)
00301              DO 13 J=9,12
00304           13 QS(8,J)=QTPU(5)/DTOT*D(8,J)
00306              N=14
00307              DO 109 J=5,12
00312              Q(N)=QS(8,J)
00313          109 N=N+2
00313        C
```

```
00313    C      ARRANGE ZT IN ORDER (9-21,4),(8,5-12),(21,5-15),(1,16-19),(4,23-25),
00313    C      (32,22-25),(29,25),(31-32,25),(12-16,28),(20,25-30)
00313    C
00315           DTOT=0.
00316           DO 101 J=5,15
00321       101 Z(21,J)=ZT(J+17)
00323           DO 102 J=5,8
00326           D(21,J)=HTPU(13)-Z(21,J)
00327       102 DTOT=DTOT+D(21,J)
00331           DO 103 J=5,8
00334       103 QS(21,J)=QTPU(13)/DTOT*D(21,J)
00336           DTOT=0.
00337           DO 104 J=9,12
00342           D(21,J)=HTPU(14)-Z(21,J)
00343       104 DTOT=DTOT+D(21,J)
00345           DO 105 J=9,12
00350       105 QS(21,J)=QTPU(14)/DTOT*D(21,J)
00352           DTOT=0.
00353           DO 106 J=13,15
00356           D(21,J)=HTPU(6)-Z(21,J)
00357       106 DTOT=DTOT+D(21,J)
00361           DO 107 J=13,15
00364       107 QS(21,J)=QTPU(6)/DTOT*D(21,J)
00366           N=15
00367           DO 108 J=5,12
00372           Q(N)=QS(21,J)
00373       108 N=N+2
00375           Q(30)=QS(21,13)
00376           Q(31)=QS(21,14)
00377           Q(32)=QS(21,15)
00400           DO 47 J=16,19
00403        47 Z(1,J)=ZT(J+17)
00405           DTOT=0.
00406           DO 32 J=16,19
00411           D(1,J)=HTPU(7)-Z(1,J)
00412        32 DTOT=DTOT+D(1,J)
00414           DO 14 J=16,19
00417        14 QS(1,J)=QTPU(7)/DTOT*D(1,J)
00421           N=32
00422           DO 38 J=16,19
00425           N=N+1
00426        38 Q(N)=QS(1,J)
00430           DTOT=0.
```

```
00431          DO 48 J=23,25
00434       48 Z(4,J)=ZT(J+4)
00436          DO 24 J=23,25
00441          D(4,J)=HTPU(8)-Z(4,J)
00442          IF(D(4,J).LT.0.)D(4,J)=0.
00444       24 DTOT=DTOT+D(4,J)
00446          DO 15 J=23,25
00451       15 QS(4,J)=QTPU(8)/DTOT*D(4,J)
00453          Q(38)=QS(4,23)
00454          Q(40)=QS(4,24)
00455          Q(42)=QS(4,25)
00456          DTOT=0.
00457          DO 49 J=22,25
00462       49 Z(32,J)=ZT(J+8)
00464          DO 25 J=22,25
00467          D(32,J)=HTPU(9)-Z(32,J)
00470          IF(D(32,J).LT.0.)D(32,J)=0.
00472       25 DTOT=DTOT+D(32,J)
00474          DO 16 J=22,25
00477       16 QS(32,J)=QTPU(9)/DTOT*D(32,J)
00501          Q(37)=QS(32,22)
00502          Q(39)=QS(32,23)
00503          Q(41)=QS(32,24)
00504          Q(46)=QS(32,25)
00505          Z(29,25)=ZT(34)
00506          D(29,25)=HTPU(10)-Z(29,25)
00507          IF(D(29,25).LT.0.)D(29,25)=0.
00511          DTOT=D(29,25)
00512          Z(31,25)=ZT(35)
00513          DO 26 I=31,32
00516          D(I,25)=HTPU(10)-Z(I,25)
00517          IF(D(I,25).LT.0.)D(I,25)=0.
00521       26 DTOT=DTOT+D(I,25)
00523          QT(29,25)=QTPU(10)*D(29,25)/DTOT
00524          QT(31,25)=QTPU(10)*D(31,25)/DTOT
00525          QT(32,25)=QTPU(10)*D(32,25)/DTOT
00526          Q(44)=QT(29,25)
00527          Q(45)=QT(31,25)
00530          Q(47)=QT(32,25)
00531          DTOT=0.
00532          DO 50 I=12,16
00535       50 Z(I,28)=ZT(I+24)
00537          DO 33 I=12,16
```

```
00542           D(I,28)=HTPU(11)-Z(I,28)
00543           IF(D(I,28).LT.0.)D(I,28)=0.
00545        33 DTOT=DTOT+D(I,28)
00547           DO 17 I=12,16
00552        17 QT(I,28)=QTPU(11)/DTOT*D(I,28)
00554           N=49
00555           DO 41 I=12,16
00560           N=N+1
00561        41 Q(N)=QT(I,28)
00563           DTOT=0.
00564           DO 51 J=25,30
00567        51 Z(20,J)=ZT(J+16)
00571           DO 34 J=25,30
00574           D(20,J)=HTPU(12)-Z(20,J)
00575           IF(D(20,J).LT.0.)D(20,J)=0.
00577        34 DTOT=DTOT+D(20,J)
00601           DO 18 J=25,30
00604        18 QS(20,J)=QTPU(12)/DTOT*D(20,J)
00606           Q(43)=QS(20,25)
00607           Q(48)=QS(20,26)
00610           Q(49)=QS(20,27)
00611           Q(55)=QS(20,28)
00612           Q(56)=QS(20,29)
00613           Q(57)=QS(20,30)
00614           WRITE(KQFTP)(Q(N),N=1,57)
00622           IF(TIME.GE.TMAX)GO TO 19
00624           KCT=KCT+1
00625           TIME=TIME+5.
00626           IF(KCT.LE.KCTM)GO TO 6
00630           KCT=1
00631           GO TO 20
00632        19 REWIND KQCTP
00633           RETURN
00634           ENTRY RITCTP
00635           QTP(1)=QY(5,5)*20.
00636           QTP(2)=QY(6,5)*20.
00637           QTP(3)=QY(7,5)*20.
00640           QTP(4)=QX(4,6)*20.
00641           QTP(5)=QX(4,7)*20.
00642           QTP(6)=QX(7,8)*20.
00643           QTP(7)=QX(2,9)*20.
00644           QTP(8)=QX(3,10)*20.
00645           QTP(9)=QX(10,10)*20.
```

```
00646   QTP(10)=QY(10,10)*20.
00647   QTP(11)=QY(6,11)*20.
00650   QTP(12)=QX(7,11)*20.
00651   QTP(13)=QX(7,6)*20.
00652   QTP(14)=QX(7,7)*20.
00653   HTP(1)=H(5,5)
00654   HTP(2)=H(6,5)
00655   HTP(3)=H(7,5)
00656   HTP(4)=H(4,6)
00657   HTP(5)=H(4,7)
00660   HTP(6)=H(7,8)
00661   HTP(7)=H(2,9)
00662   HTP(8)=H(3,10)
00663   HTP(9)=H(10,10)
00664   HTP(10)=H(10,10)
00665   HTP(11)=H(6,11)
00666   HTP(12)=H(7,11)
00667   HTP(13)=H(7,6)
00670   HTP(14)=H(7,7)
00671   WRITE(KQCTP)(QTP(I),I=1,14),(HTP(I),I=1,14)
00703   RETURN
00704   END

        END OF UNIVAC 1108 FORTRAN V COMPILATION.      0 *DIAGNOSTIC* MESSAGE(S)
```

OUTPUT FROM PROGRAM HYDTID

Two complete sets of sample output from HYDTID are included in this section. Both are for simulation of the verification period 0400 to 2100 on 12 September 1969, however the first is output from the coarse grid model and the second is from the fine grid sub-model. Each set includes exactly the same types of information but for different models.

Coarse Grid Model Output

```
 CARD    CARD                          DESCRIPTION
 TYPE     NO                      ALPHANUMERIC TITLE
 ----    ----                     ------------------
TITLE       1 TWO DIMENSIONAL HYDRODYNAMIC MODEL OF MASONBORO INLET (N. CAROLINA)
TITLE       2 MODEL STUDY FOR COASTAL ENGINEERING RESEARCH CENTER (CORPS OF ENGRS)
TITLE       3 RUN MADE USING COARSE GRID MODEL FOR INITIAL VERIFICATION
TITLE       4 SIMULATION PERFORMED FOR PERIOD 400-2100 SEPTEMBER 12, 1969
ENDTITLE
```

CARD TYPE	CARD NO	DESCRIPTION	TYPE OF INPUT/OUTPUT CARD,TAPE,BOTH, OR NONE	TAPE NO
FILE A	1	READ BASIC CELL INPUT DATA FROM	CARD	0
FILE A	2	READ INITIAL HYDRODYNAMICS FROM	CARD	0
FILE A	3	COMPUTE AND SAVE NET VELOCITIES ON	NONE	0
FILE A	4	COMPUTE AND SAVE NET FLOWS ON	NONE	0
FILE A	5	COMPUTE AND SAVE DISPERSION COEF. ON	NONE	0
FILE A	6	STORE ENDING VALUES OF HYDRODYNAMICS ON	NONE	0
FILE A	7	STORE INSTANTANEOUS VELOCITIES ON	NONE	0
FILE A	8	WRITE/READ INPUTS FOR FINE GRID MODEL ON	TAPE	1
FILE A	9	STORE COARSE GRID DATA FOR FINE GRID ON	TAPE	2
ENDFILE A				

CARD TYPE	CARD NO	DESCRIPTION	VALUE
FILE B	1	MODEL TYPE (1=COARSE PROD,2=FINE PROD,3=COARSE NON-PROD)	1.0
FILE B	2	PRINT INPUT DATA (1=NO PRINT, 2=W/MANN. N, 3=W/O MANN. N)	2.0
FILE B	3	NUMBER OF STATIONS FOR WHICH PLOTS ARE DESIRED	7.0
FILE B	4	TOTAL REAL TIME FOR OPERATION OF MODEL (HOURS)	17.0
FILE B	5	START REAL TIME FOR OPERATION OF MODEL (HOURS)	4.0
FILE B	6	REAL TIME INT. FOR STORING INSTANT. HYDRODYNAMICS (MIN)	.0
FILE B	7	REAL TIME PERIOD OF TIDAL CYCLE (HOURS)	12.5
FILE B	8	INITIAL WIND MAGNITUDE (KNOTS)	4.0
FILE B	9	DIRECTION FROM WHICH INITIAL WIND BLOWS (CLOCKWISE FROM N	20.0
FILE B	10	AVERAGE PRECIPITATION RATE (INCHES/DAY)	.0
FILE B	11	AVERAGE EVAPORATION RATE (INCHES/DAY)	.0
FILE B	12	ANGLE BETWEEN NORTH AND X-AXIS (DEG. CLOCKWISE FROM N.)	48.0
FILE B	13	TOTAL NUMBER OF COMPUTATIONAL ELEMENTS IN X-DIRECTION	12.0
FILE B	14	TOTAL NUMBER OF COMPUTATIONAL ELEMENTS IN Y-DIRECTION	16.0
FILE B	15	GRID SIZE OF COMPUTATIONAL ELEMENTS (FEET)	1200.0
FILE B	16	PROGRAM COMPUTATIONAL TIME STEP (SECONDS)	20.0
FILE B	17	LATITUDE OF ESTUARINE SYSTEM (DEGREES)	34.2
FILE B	18	NUMBER OF OUTPUT SETS (HOURS) PRINTED PER PAGE	6.0
FILE B	19	COMPUTE NET FLOWS BUT DO NOT STORE (1=YES, 2=NO)	2.0
FILE B	20	DIFFERENCE BETWEEN MSL AND INPUT DATUM(FEET)	1.3

ENDFILE B

ENDFILE C BASIC CELL DATA

ENDFILE D EXCITING TIDES

TWO DIMENSIONAL HYDRODYNAMIC MODEL OF MASONBORO INLET (N. CAROLINA)

MODEL STUDY FOR COASTAL ENGINEERING RESEARCH CENTER (CORPS OF ENGRS)

RUN MADE USING COARSE GRID MODEL FOR INITIAL VERIFICATION

SIMULATION PERFORMED FOR PERIOD 400-2100 SEPTEMBER 12, 1969

```
MODEL-OPERATION INFORMATION
     BASIC CELL INPUT DATA READ FROM CARDS
     INITIAL HYDRODYNAMICS READ FROM CARDS
     ALL INPUT DATA (EXCLUDING INITIAL HYDRODYNAMICS) PRINTED AND LABELED
     TIDAL AMPLITUDES AND FLOWS WERE COMPUTED AND PRINTED FOR SELECTED CELLS
     NET FLOWS WERE NOT COMPUTED
     NET VELOCITIES WERE NOT COMPUTED
     AVERAGE VELOCITIES AND DISPERSION COEFFICIENTS WERE NOT PUNCHED ON CARDS OR STORED ON TAPE
     INSTANTANEOUS VELOCITIES WERE NOT STORED ON TAPE
     ENDING VALUES OF HYDRODYNAMICS WERE NOT SAVED
     TIDAL AMPLITUDE PLOTS WERE MADE FOR  7 SELECTED STATIONS IN BAY
     MODEL WAS OPERATED TO SIMULATE  17.0 HOURS OF REAL TIME

     COARSE GRID MODEL

MODEL DIMENSIONS AND CHARACTERISTICS
     NUMBER OF CELLS IN X-DIRECTION = 12
     NUMBER OF CELLS IN Y-DIRECTION = 16
     TOTAL NUMBER OF CELLS IN MODEL =  192
     WIDTH OF EACH CELL = 1200.0 FEET
     NUMBER OF TIDAL EXCITATION CELLS = 32
```

NUMBER OF SUBMERGED BARRIERS = 11

NUMBER OF EXTERNAL FLOW SOURCES = 0

COMPUTATIONAL TIME INCREMENT = .333 MINUTES

PERIOD OF TIDAL CYCLE = 12.5 HOURS

STATION LOCATIONS FOR TIME PRINT-OUT OF HYDRODYNAMICS

STATION NUMBER 1	I7J6	I = 7	J = 6
STATION NUMBER 2	I7J8	I = 7	J = 8
STATION NUMBER 3	I6J10	I = 6	J = 10
STATION NUMBER 4	I9J10	I = 9	J = 10
STATION NUMBER 5	I3J9	I = 3	J = 9
STATION NUMBER 6	I11J8	I = 11	J = 8
STATION NUMBER 7	I7J13	I = 7	J = 13
STATION NUMBER 8	I10J10	I = 10	J = 10
STATION NUMBER 9	I11J10	I = 11	J = 10
STATION NUMBER 10	I6J8	I = 6	J = 8
STATION NUMBER 11	I6J7	I = 6	J = 7
STATION NUMBER 12	I6J11	I = 6	J = 11
STATION NUMBER 13	I6J12	I = 6	J = 12
STATION NUMBER 14	I3J11	I = 3	J = 11
STATION NUMBER 15	I7J7	I = 7	J = 7
STATION NUMBER 16	I2J13	I = 2	J = 13
STATION NUMBER 17	I8J12	I = 8	J = 12
STATION NUMBER 18	I8J13	I = 8	J = 13
STATION NUMBER 19	I10J13	I = 10	J = 13
STATION NUMBER 20	I11J15	I = 11	J = 15

STATION LOCATIONS FOR TIME PLOTS OF HYDRODYNAMICS

STATION NUMBER 1	I7J6	I = 7	J = 6
STATION NUMBER 2	I7J8	I = 7	J = 8
STATION NUMBER 3	I6J10	I = 6	J = 10
STATION NUMBER 4	I9J10	I = 9	J = 10
STATION NUMBER 5	I3J9	I = 3	J = 9
STATION NUMBER 6	I11J8	I = 11	J = 8
STATION NUMBER 7	I7J13	I = 7	J = 13

INITIAL WIND CONDITIONS AND RAINFALL AND EVAPORATION RATES

WIND VELOCITY = 4.0 KNOTS

WIND ANGLE = 20.0 DEGREES

RAINFALL RATE = .000 IN./DAY

EVAPORATION RATE = .000 IN./DAY

EXTERNAL FLOW LOCATIONS AND QUANTITIES

INFLOW NUMBER 1 I = 0 J = 0 QINFLO = .0 CFS

SUBMERGED BARRIER LOCATIONS, DISCHARGE COEFFICIENTS, AND MSL ELEVATIONS

BARRIER NO. 1	I = 6	J = 6	SIDE BOUNDARY	COEFFICIENT = .50	ELEVATION = -6.3 FEET
BARRIER NO. 2	I = 6	J = 7	SIDE BOUNDARY	COEFFICIENT = .40	ELEVATION = -1.3 FEET
BARRIER NO. 3	I = 6	J = 8	SIDE BOUNDARY	COEFFICIENT = .40	ELEVATION = -2.3 FEET
BARRIER NO. 4	I = 7	J = 8	SIDE BOUNDARY	COEFFICIENT = .50	ELEVATION = .7 FEET
BARRIER NO. 5	I = 7	J = 8	TOP BOUNDARY	COEFFICIENT = 1.30	ELEVATION = -12.2 FEET
BARRIER NO. 6	I = 3	J = 9	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -4.5 FEET
BARRIER NO. 7	I = 5	J = 9	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -5.7 FEET
BARRIER NO. 8	I = 6	J = 10	TOP BOUNDARY	COEFFICIENT = .90	ELEVATION = -8.2 FEET
BARRIER NO. 9	I = 7	J = 10	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -7.2 FEET
BARRIER NO. 10	I = 9	J = 10	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -10.2 FEET
BARRIER NO. 11	I = 11	J = 10	TOP BOUNDARY	COEFFICIENT = .90	ELEVATION = -3.2 FEET

GULF TIDAL DISCHARGE COEFFICIENTS AND CELL TIDE ASSIGNMENTS

TIDAL CELL 1	I = 3	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 2	I = 4	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 3	I = 5	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 4	I = 6	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 5	I = 7	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 6	I = 8	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 7	I = 9	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 8	I = 10	J = 1	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 9	I = 1	J = 2	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 10	I = 11	J = 2	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 11	I = 1	J = 3	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 12	I = 11	J = 3	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 13	I = 1	J = 4	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 14	I = 11	J = 4	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 15	I = 1	J = 5	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 16	I = 11	J = 5	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 17	I = 1	J = 6	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 18	I = 11	J = 6	COEFFICIENT = 2.00	TIDE = TIDE1

TIDAL CELL 19	I = 1	J = 7	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 20	I = 11	J = 7	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 21	I = 1	J = 8	COEFFICIENT = 2.00	TIDE = TIDE2
TIDAL CELL 22	I = 11	J = 8	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 23	I = 1	J = 9	COEFFICIENT = 2.00	TIDE = TIDE2
TIDAL CELL 24	I = 11	J = 9	COEFFICIENT = 2.00	TIDE = TIDE1
TIDAL CELL 25	I = 1	J = 10	COEFFICIENT = 2.00	TIDE = TIDE4
TIDAL CELL 26	I = 11	J = 10	COEFFICIENT = 2.00	TIDE = TIDE3
TIDAL CELL 27	I = 1	J = 11	COEFFICIENT = 2.00	TIDE = TIDE4
TIDAL CELL 28	I = 11	J = 11	COEFFICIENT = 2.00	TIDE = TIDE3
TIDAL CELL 29	I = 1	J = 12	COEFFICIENT = 2.00	TIDE = TIDE4
TIDAL CELL 30	I = 11	J = 12	COEFFICIENT = 2.00	TIDE = TIDE3
TIDAL CELL 31	I = 11	J = 13	COEFFICIENT = 2.00	TIDE = TIDE3
TIDAL CELL 32	I = 11	J = 15	COEFFICIENT = 2.00	TIDE = TIDE3

DATA FOR CORIOLIS ACCELERATION

ANGULAR ROTATION OF EARTH = .0000729 RAD./SEC.

LATITUDE OF BAY = 34.20 DEGREES

MEAN SEA LEVEL WATER DEPTHS THROUGHOUT BAY

J/I	1	2	3	4	5	6	7	8	9	10	11	12
16	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
15	*****	*****	*****	*****	*****	*****	*****	*****	.7	-5.3	-5.3	*****
14	*****	*****	*****	*****	*****	*****	*****	-5.3	-5.3	-5.3	*****	*****
13	*****	-1.3	*****	1.7	-2.3	-6.3	-5.3	-5.3	*****	-3.3	-2.3	*****
12	-5.3	-6.3	-7.3	-8.3	-9.3	-9.3	*****	-.3	-.3	-.3	-2.3	*****
11	-5.3	-2.3	-1.3	*****	.9	-8.3	1.4	1.0	.7	.7	-2.3	*****
10	-5.3	-2.3	.7	1.9	1.4	-10.3	-10.3	-7.3	-10.3	-11.3	-12.3	*****
9	-3.3	-4.3	-4.6	-4.8	-5.8	-7.3	-12.3	*****	*****	*****	-9.3	*****
8	-5.3	-2.3	*****	*****	*****	-4.3	-15.3	-6.3	-10.3	-21.3	-26.3	*****
7	-7.3	-7.3	-7.3	-8.3	-9.3	-6.3	-19.3	-16.3	-23.3	-26.3	-30.3	*****
6	-19.3	-19.3	-19.3	-19.3	-16.3	-9.3	-23.3	-22.3	-29.3	-31.3	-31.3	*****
5	-28.3	-28.3	-28.3	-29.3	-27.3	-21.3	-27.3	-31.3	-31.3	-31.3	-31.3	*****
4	-31.3	-31.3	-31.3	-31.3	-31.3	-31.3	-31.3	-32.3	-32.3	-32.3	-32.3	*****
3	-33.3	-33.3	-32.3	-32.3	-32.3	-32.3	-31.3	-33.3	-33.3	-32.3	-32.3	*****
2	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-32.3	-33.3	-33.3	-33.3	-33.3	*****
1	*****	*****	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	-33.3	*****	*****

COMPUTATIONAL CELL IDENTIFICATIONS

J/I	1	2	3	4	5	6	7	8	9	10	11	12
16	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	30	30	25	1
14	1	1	1	1	1	1	1	30	36	33	1	1
13	1	18	1	30	18	12	12	33	1	36	25	1
12	27	34	12	34	2	6	1	36	30	36	8	1
11	27	36	33	1	30	31	30	36	36	36	8	1
10	27	30	36	30	33	5	15	12	15	34	11	1
9	27	12	15	12	15	2	6	1	1	1	25	1
8	27	6	1	1	1	15	45	12	12	12	8	1
7	27	12	12	12	12	42	6	2	2	2	8	1
6	27	2	2	2	2	4	6	2	2	2	8	1
5	27	2	2	2	2	2	2	2	2	2	8	1
4	27	2	2	2	2	2	2	2	2	2	8	1
3	27	2	2	2	2	2	2	2	2	2	8	1
2	27	2	2	2	2	2	2	2	2	2	8	1
1	1	1	26	26	26	26	26	26	26	26	1	1

CONVECTION FLAGGING

16	11	11	11	11	11	11	11	11	11	11	11	11
15	11	11	11	11	11	11	11	11	41	21	11	11
14	11	11	11	11	11	11	11	21	33	14	11	11
13	11	11	11	41	11	21	21	12	11	42	11	11
12	11	42	21	33	21	12	11	42	41	13	14	11
11	11	33	12	11	41	22	21	33	31	11	14	11
10	11	21	22	21	33	44	21	21	21	33	14	11
9	11	21	21	21	21	33	14	11	11	11	11	11
8	11	12	11	11	11	41	22	41	41	41	12	11
7	11	41	41	41	41	13	14	13	11	11	14	11
6	11	13	11	11	11	11	14	13	11	11	14	11
5	11	13	11	11	11	11	44	13	11	11	14	11
4	11	13	11	11	11	11	11	11	11	11	14	11
3	11	13	11	11	11	11	11	11	11	11	14	11
2	11	33	31	31	31	31	31	31	31	31	14	11
1	11	11	11	11	11	11	11	11	11	11	11	11
J/I	1	2	3	4	5	6	7	8	9	10	11	12

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  .01600  .00000

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  .01600  .00000

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  .01700  .00000

J =  6
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  .01700  .00000

J =  7
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  .01700  .00000

J =  8
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  .02000  .00000

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  .03100  .00000

J = 10
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  .02900  .00000

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  .04400  .00000

J = 14
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J = 16
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  .00000  .00000
     ENDFILE
```

PRINTOUT STATIONS THROUGHOUT SYSTEM

TIME HOURS	SEA TIDE	HYDRO- DYNAMICS	I7J6	I7J8	I6J10	I9J10	I3J9	I11J8	I7J13	I10J10	I11J10	I6J8
4.00	.920	MSL TIDE	.895	.796	.604	.423	.338	.929	.374	.374	.348	.849
	.000	XFLO CFS	0.	-190.	-9866.	13690.	-6872.	-2982.	3841.	13300.	8626.	1970.
	.400	YFLO CFS	35519.	38155.	14485.	0.	0.	-1374.	0.	0.	4339.	0.
	.250	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	.250	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
5.00	1.900	MSL TIDE	1.830	1.733	1.545	1.396	1.224	1.864	1.346	1.351	1.335	1.780
	.730	XFLO CFS	0.	-1312.	-11771.	14747.	-9363.	-3023.	4857.	13379.	8064.	2457.
	1.170	YFLO CFS	37934.	42875.	16145.	0.	0.	-1528.	0.	1045.	4992.	0.
	1.150	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	1.150	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
6.00	2.700	MSL TIDE	2.625	2.517	2.313	2.157	1.943	2.662	2.109	2.108	2.094	2.570
	1.410	XFLO CFS	0.	-2386.	-13965.	16929.	-11624.	-3124.	5599.	14924.	8767.	3115.
	1.920	YFLO CFS	42208.	49617.	18660.	0.	0.	-1707.	0.	1705.	5855.	0.
	1.900	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	1.900	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
7.00	3.120	MSL TIDE	3.061	2.982	2.836	2.739	2.471	3.088	2.707	2.706	2.701	3.020
	1.960	XFLO CFS	0.	-2534.	-13488.	15034.	-12703.	-2541.	5084.	12982.	7245.	2933.
	2.560	YFLO CFS	38437.	46016.	16630.	0.	0.	-1505.	0.	1817.	5500.	0.
	2.570	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	2.570	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
8.00	3.030	MSL TIDE	3.020	3.022	3.033	3.054	2.838	3.018	3.046	3.062	3.071	3.018
	2.550	XFLO CFS	0.	-288.	-7979.	4165.	-9841.	-886.	1525.	3382.	1006.	548.
	3.050	YFLO CFS	19116.	20822.	6146.	0.	0.	-639.	0.	662.	2250.	0.
	3.020	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	3.020	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
9.00	2.500	MSL TIDE	2.544	2.596	2.808	2.861	2.873	2.524	2.952	2.896	2.918	2.530
	2.970	XFLO CFS	0.	1630.	5382.	-13638.	3264.	1963.	-1906.	-11814.	-6460.	-3547.
	3.040	YFLO CFS	-26924.	-33633.	-16198.	0.	0.	1035.	0.	-1787.	-5321.	0.
	3.320	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	3.320	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

PRINTOUT STATIONS THROUGHOUT SYSTEM

TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	I7J6	I7J8	I6J10	I9J10	I3J9	I11J8	I7J13	I10J10	I11J10	I6J8
10.00	1.600	MSL TIDE	1.643	1.724	2.119	2.199	2.297	1.637	2.345	2.248	2.280	1.631
	2.600	XFLO CFS	0.	961.	8857.	-16307.	8993.	2996.	-3193.	-14313.	-7631.	-3533.
	2.430	YFLO CFS	-41623.	-46945.	-19365.	0.	0.	1525.	0.	-1728.	-6420.	0.
	2.680	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	2.680	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
11.00	.570	MSL TIDE	.623	.743	1.278	1.403	1.543	.609	1.595	1.468	1.512	.602
	1.950	XFLO CFS	0.	36.	9722.	-17696.	9505.	3175.	-3929.	-16291.	-9290.	-3220.
	1.700	YFLO CFS	-46563.	-50253.	-20333.	0.	0.	1529.	0.	-1088.	-6693.	0.
	2.020	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	2.020	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
12.00	-.350	MSL TIDE	-.297	-.172	.378	.524	.719	-.315	.724	.594	.636	-.324
	1.200	XFLO CFS	0.	0.	9290.	-16575.	8717.	2766.	-3855.	-16089.	-9775.	-2291.
	.840	YFLO CFS	-44268.	-46466.	-18472.	0.	0.	1270.	0.	0.	-6032.	0.
	1.170	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	1.170	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
13.00	-.950	MSL TIDE	-.911	-.811	-.366	-.240	-.041	-.923	-.073	-.203	-.161	-.932
	.430	XFLO CFS	0.	0.	8198.	-13620.	6944.	2091.	-2662.	-11708.	-7459.	-1424.
	-.000	YFLO CFS	-37463.	-38608.	-15737.	0.	0.	968.	0.	0.	-3996.	0.
	.380	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	.380	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
14.00	-1.000	MSL TIDE	-.986	-.953	-.764	-.738	-.555	-.986	-.626	-.742	-.722	-.993
	-.200	XFLO CFS	0.	0.	6203.	-7926.	4847.	990.	-1163.	-5260.	-3256.	-788.
	-.650	YFLO CFS	-24092.	-24886.	-11025.	0.	0.	547.	0.	0.	-1888.	0.
	-.300	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	-.300	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
15.00	-.500	MSL TIDE	-.526	-.563	-.611	-.649	-.679	-.505	-.637	-.682	-.682	-.517
	-.730	XFLO CFS	0.	0.	2077.	1767.	-399.	-551.	939.	4132.	3048.	1000.
	-.750	YFLO CFS	-1230.	-153.	-2987.	0.	0.	-126.	0.	0.	918.	0.
	-.580	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	-.580	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

PRINTOUT STATIONS THROUGHOUT SYSTEM

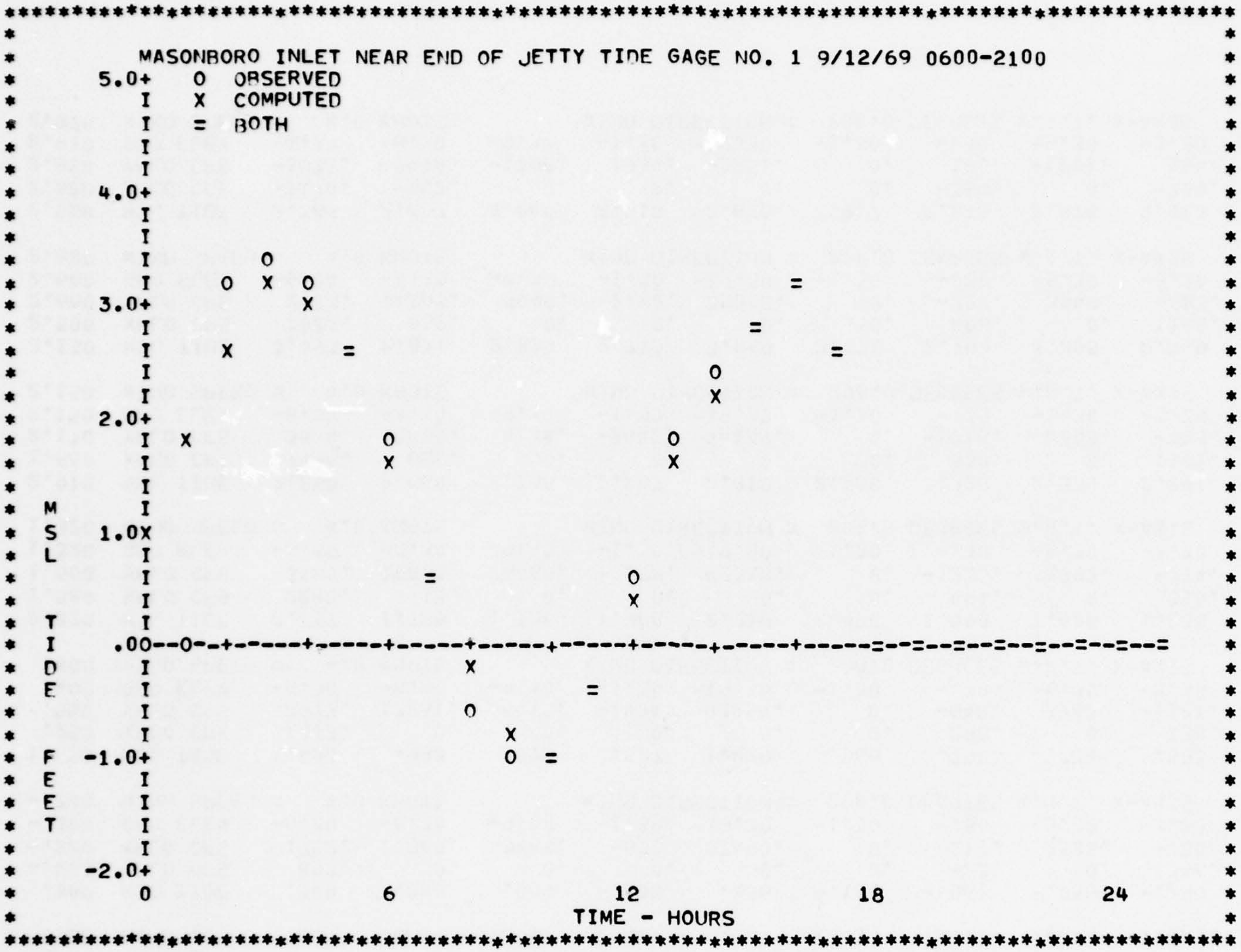
TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	I7J6	I7J8	I6J10	I9J10	I3J9	I11J8	I7J13	I10J10	I11J10	I6J8
16.00	.380	MSL TIDE	.330	.263	.132	.007	-.078	.354	-.029	-.036	-.051	.303
	-.460	XFLO CFS	0.	0.	-7193.	10449.	-5413.	-2156.	2992.	11550.	7859.	1419.
	-.220	YFLO CFS	27179.	28785.	10691.	0.	0.	-963.	0.	0.	3384.	0.
	-.300	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	-.300	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
17.00	1.550	MSL TIDE	1.472	1.348	1.099	.854	.778	1.512	.817	.788	.764	1.411
	.250	XFLO CFS	0.	-971.	-12198.	17114.	-8571.	-3214.	4762.	15889.	10326.	2533.
	.550	YFLO CFS	41866.	46343.	17992.	0.	0.	-1555.	0.	870.	5283.	0.
	.400	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	.400	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
18.00	2.320	MSL TIDE	2.248	2.136	1.912	1.745	1.579	2.284	1.659	1.695	1.681	2.189
	1.080	XFLO CFS	0.	-1924.	-14281.	16976.	-10338.	-2948.	5375.	15082.	8935.	2871.
	1.500	YFLO CFS	43382.	49802.	19903.	0.	0.	-1593.	0.	1537.	5786.	0.
	1.320	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	1.320	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
19.00	2.910	MSL TIDE	2.844	2.746	2.555	2.404	2.270	2.876	2.360	2.356	2.344	2.793
	1.860	XFLO CFS	0.	-2529.	-14125.	17269.	-10867.	-2760.	5592.	15179.	8878.	3084.
	2.170	YFLO CFS	41882.	49510.	19329.	0.	0.	-1571.	0.	1828.	6037.	0.
	2.150	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	2.150	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
20.00	3.130	MSL TIDE	3.087	3.033	2.926	2.842	2.761	3.105	2.819	2.815	2.811	3.057
	2.500	XFLO CFS	0.	-2115.	-11625.	14092.	-9129.	-1969.	4752.	12247.	6819.	2420.
	2.680	YFLO CFS	33630.	39985.	15561.	0.	0.	-1216.	0.	1667.	5248.	0.
	2.680	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	2.680	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
21.00	2.550	MSL TIDE	2.598	2.660	2.774	2.828	2.807	2.561	2.861	2.857	2.879	2.599
	2.820	XFLO CFS	0.	1997.	-92.	-7009.	-753.	986.	-1345.	-5266.	-3748.	-3280.
	2.950	YFLO CFS	-6279.	-13335.	-6418.	0.	0.	370.	0.	-1714.	-1506.	0.
	2.970	GRD ELEV	-23.30	-15.30	-10.30	-10.30	-4.60	-26.30	-5.30	-11.30	-12.30	-4.30
	2.970	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

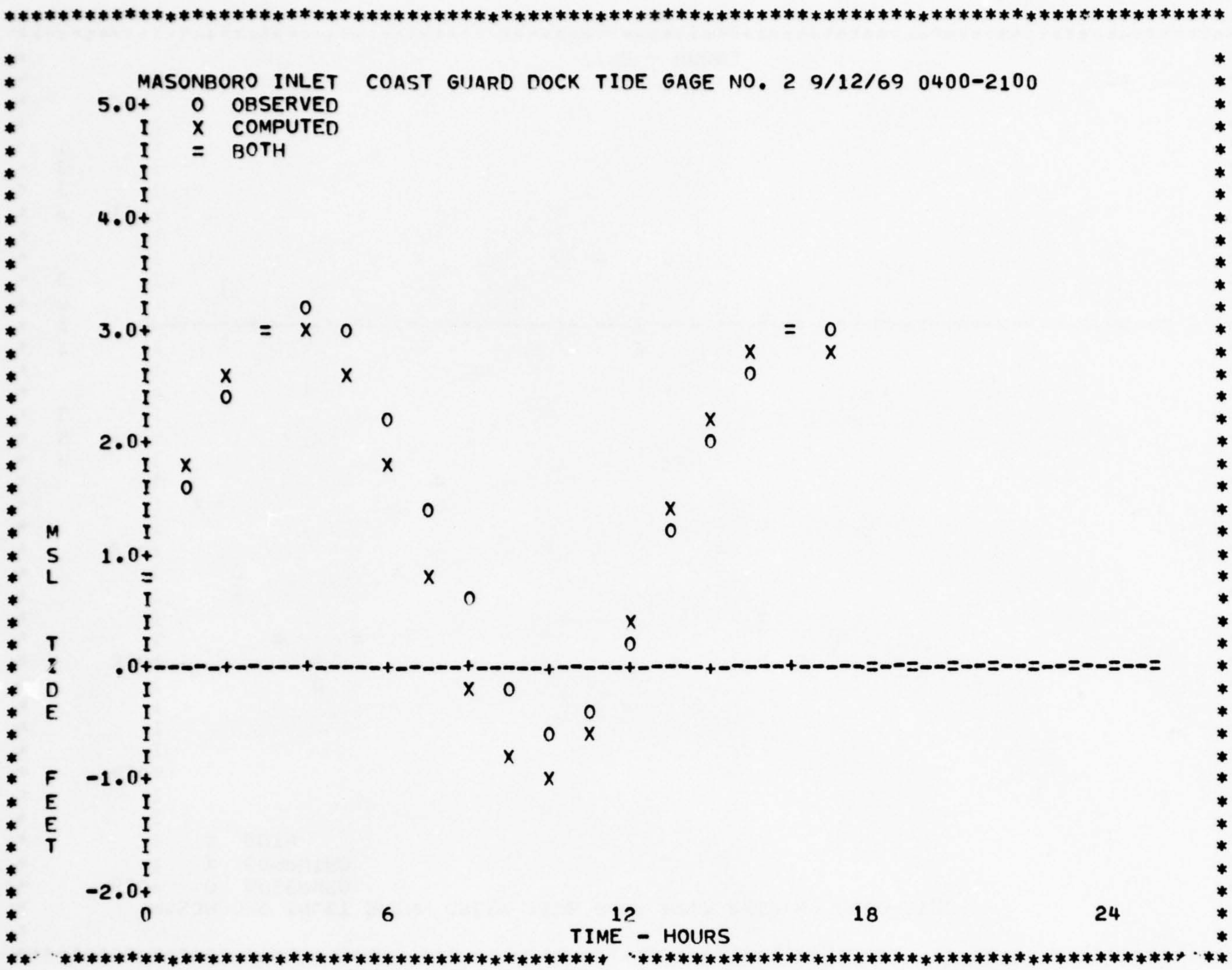
TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	I6J7	I6J11	I6J12	I3J11	I7J7	I2J13	I8J12	I8J13	I10J13	I11J15
					PRINTOUT STATIONS THROUGHOUT SYSTEM							
4.00	.920	MSL TIDE	.907	.523	.427	.231	.860	.179	.319	.337	.191	.186
	.000	XFLO CFS	1354.	0.	0.	0.	0.	0.	79.	0.	300.	529.
	.400	YFLO CFS	2413.	14389.	4571.	-1041.	36422.	0.	-439.	3067.	-875.	0.
	.250	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	.250	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
5.00	1.900	MSL TIDE	1.840	1.460	1.392	1.264	1.796	1.253	1.288	1.312	1.205	1.198
	.730	XFLO CFS	1909.	426.	0.	0.	0.	0.	395.	0.	368.	813.
	1.170	YFLO CFS	2835.	15124.	5473.	-1668.	39471.	0.	-948.	3581.	-833.	0.
	1.150	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	1.150	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
6.00	2.700	MSL TIDE	2.637	2.218	2.151	2.017	2.587	2.013	2.062	2.079	1.982	1.967
	1.410	XFLO CFS	2535.	604.	0.	0.	0.	0.	611.	0.	914.	1556.
	1.920	YFLO CFS	3430.	17184.	6199.	-2187.	44428.	0.	-1109.	4186.	-791.	0.
	1.900	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	1.900	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
7.00	3.120	MSL TIDE	3.071	2.771	2.732	2.656	3.034	2.658	2.682	2.690	2.626	2.612
	1.960	XFLO CFS	2469.	722.	0.	0.	0.	0.	625.	0.	1071.	1854.
	2.560	YFLO CFS	3111.	15014.	5542.	-2190.	40731.	0.	-860.	3989.	-643.	0.
	2.570	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	2.570	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
8.00	3.030	MSL TIDE	3.024	3.034	3.038	3.046	3.022	3.048	3.051	3.050	3.061	3.063
	2.550	XFLO CFS	873.	-25.	0.	0.	0.	0.	-33.	0.	-23.	443.
	3.050	YFLO CFS	548.	5780.	1764.	-973.	19996.	0.	-212.	1183.	163.	0.
	3.020	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	3.020	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
9.00	2.500	MSL TIDE	2.531	2.870	2.946	3.119	2.563	3.144	2.953	2.955	2.976	2.987
	2.970	XFLO CFS	-1934.	-571.	0.	0.	0.	0.	-80.	0.	-987.	-2086.
	3.040	YFLO CFS	-3764.	-15058.	-1913.	3339.	-28650.	0.	-343.	-2241.	72.	0.
	3.320	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	3.320	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	PRINTOUT STATIONS THROUGHOUT SYSTEM									
			I6J7	I6J11	I6J12	I3J11	I7J7	I2J13	I8J12	I8J13	I10J13	I11J15
10.00	1.600	MSL TIDE	1.639	2.209	2.321	2.503	1.670	2.528	2.362	2.359	2.386	2.393
	2.600	XFLO CFS	-1524.	-678.	0.	0.	0.	0.	-260.	0.	-322.	-1251.
	2.430	YFLO CFS	-3893.	-17654.	-3724.	3059.	-42794.	0.	431.	-2503.	-246.	0.
	2.680	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	2.680	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
11.00	.570	MSL TIDE	.614	1.393	1.553	1.806	.661	1.848	1.631	1.620	1.665	1.671
	1.950	XFLO CFS	-1214.	-407.	0.	0.	0.	0.	-344.	0.	-241.	-905.
	1.700	YFLO CFS	-3626.	-19064.	-4551.	2733.	-47385.	0.	850.	-2779.	125.	0.
	2.020	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	2.020	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
12.00	-.350	MSL TIDE	-.309	.495	.671	.939	-.259	1.003	.778	.760	.827	.827
	1.200	XFLO CFS	-651.	0.	0.	0.	0.	0.	-247.	0.	106.	-277.
	.840	YFLO CFS	-2668.	-17667.	-4553.	1954.	-44533.	0.	755.	-2758.	463.	0.
	1.170	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	1.170	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
13.00	-.950	MSL TIDE	-.916	-.256	-.111	.131	-.880	.223	-.032	-.047	.003	-.001
	.430	XFLO CFS	-222.	0.	0.	0.	0.	0.	-95.	0.	150.	115.
	-.000	YFLO CFS	-1666.	-14295.	-3272.	1056.	-37437.	0.	404.	-1947.	448.	0.
	.380	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	.380	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
14.00	-1.000	MSL TIDE	-.981	-.699	-.634	-.493	-.977	-.416	-.300	-.624	-.626	-.635
	-.200	XFLO CFS	-84.	0.	0.	0.	0.	0.	-30.	0.	238.	546.
	-.650	YFLO CFS	-810.	-9285.	-1546.	517.	-24145.	0.	0.	-719.	129.	0.
	-.300	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	-.300	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
15.00	-.500	MSL TIDE	-.510	-.603	-.625	-.636	-.542	-.629	-.300	-.647	-.698	-.720
	-.730	XFLO CFS	374.	0.	0.	0.	0.	0.	-18.	0.	399.	885.
	-.750	YFLO CFS	1173.	-1320.	1044.	65.	-1013.	0.	0.	1150.	-240.	0.
	-.580	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	-.580	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

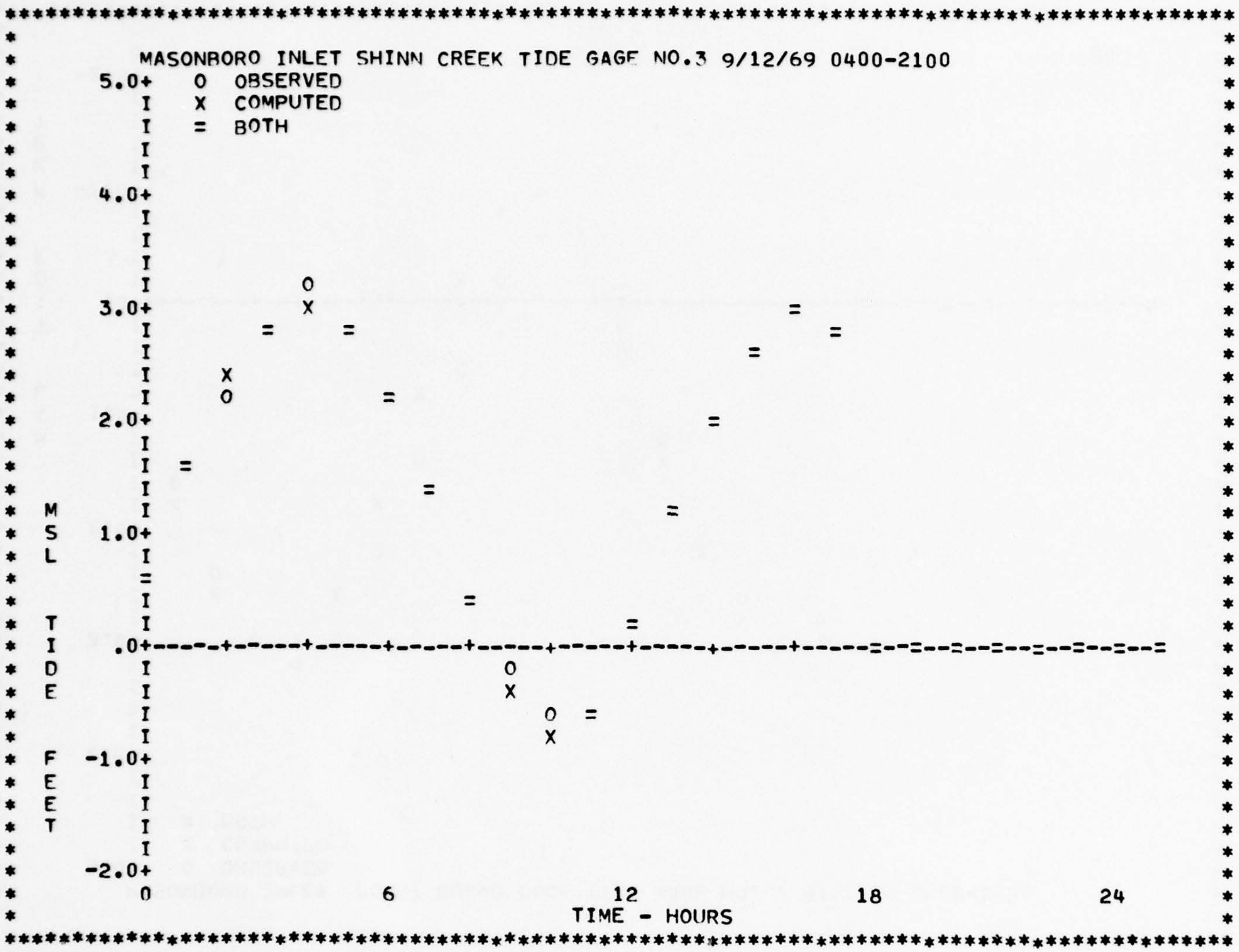
PRINTOUT STATIONS THROUGHOUT SYSTEM

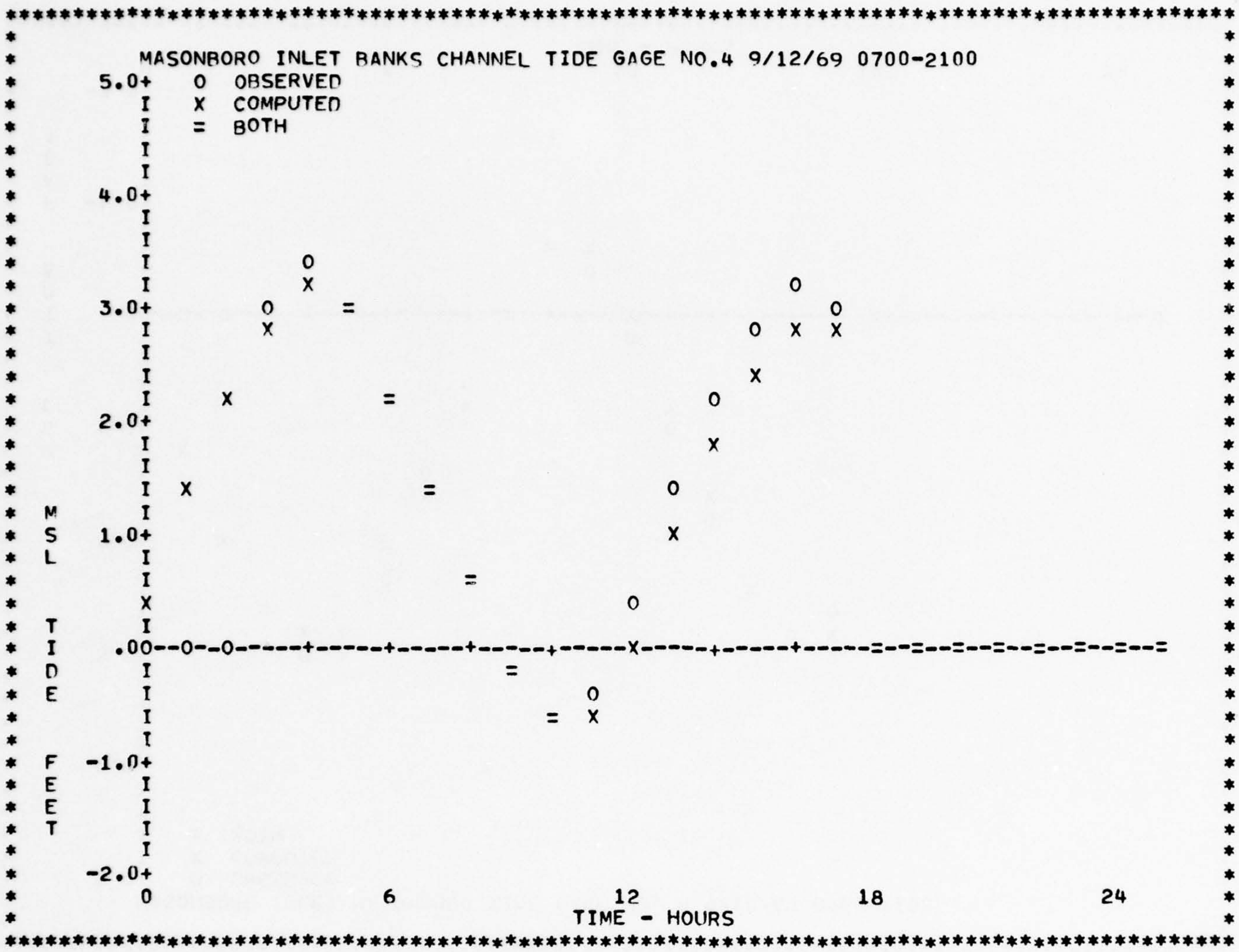
TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	I6J7	I6J11	I6J12	I3J11	I7J7	I2J13	I8J12	I8J13	I10J13	I11J15
16.00	.380	MSL TIDE	.340	.086	.009	-.135	.306	-.183	-.067	-.059	-.189	-.196
	-.460	XFLO CFS	853.	0.	0.	0.	0.	0.	-23.	0.	346.	632.
	-.220	YFLO CFS	1752.	10988.	3489.	-676.	27690.	0.	-212.	2535.	-750.	0.
	-.300	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	-.300	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
17.00	1.550	MSL TIDE	1.483	.983	.875	.627	1.429	.566	.752	.774	.593	.583
	.250	XFLO CFS	1833.	0.	0.	0.	0.	0.	298.	0.	530.	957.
	.550	YFLO CFS	2977.	17261.	5415.	-1404.	43254.	0.	-642.	3783.	-1181.	0.
	.400	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	.400	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
18.00	2.320	MSL TIDE	2.257	1.796	1.706	1.488	2.210	1.470	1.598	1.626	1.535	1.527
	1.080	XFLO CFS	2245.	415.	0.	0.	0.	0.	491.	0.	318.	781.
	1.500	YFLO CFS	3180.	18803.	6050.	-2278.	45318.	0.	-1235.	3792.	-774.	0.
	1.320	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	1.320	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
19.00	2.910	MSL TIDE	2.853	2.460	2.308	2.267	2.810	2.266	2.320	2.334	2.241	2.224
	1.860	XFLO CFS	2496.	686.	0.	0.	0.	0.	650.	0.	1101.	1868.
	2.170	YFLO CFS	3324.	17689.	6138.	-2442.	44139.	0.	-1016.	4303.	-793.	0.
	2.150	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	2.150	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
20.00	3.130	MSL TIDE	3.093	2.871	2.839	2.770	3.069	2.771	2.799	2.805	2.749	2.735
	2.500	XFLO CFS	2032.	662.	0.	0.	0.	0.	608.	0.	1166.	2014.
	2.680	YFLO CFS	2523.	14203.	5090.	-2142.	35562.	0.	-727.	3849.	-683.	0.
	2.680	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	2.680	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
21.00	2.550	MSL TIDE	2.583	2.807	2.840	2.910	2.626	2.917	2.876	2.874	2.910	2.923
	2.820	XFLO CFS	-2170.	-552.	0.	0.	0.	0.	-364.	0.	-709.	-1086.
	2.950	YFLO CFS	-3533.	-5478.	-1398.	1334.	-8251.	0.	126.	-1201.	164.	0.
	2.970	GRD ELEV	-6.30	-8.30	-9.30	-1.30	-19.30	-1.30	-.30	-5.30	-3.30	-5.30
	2.970	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

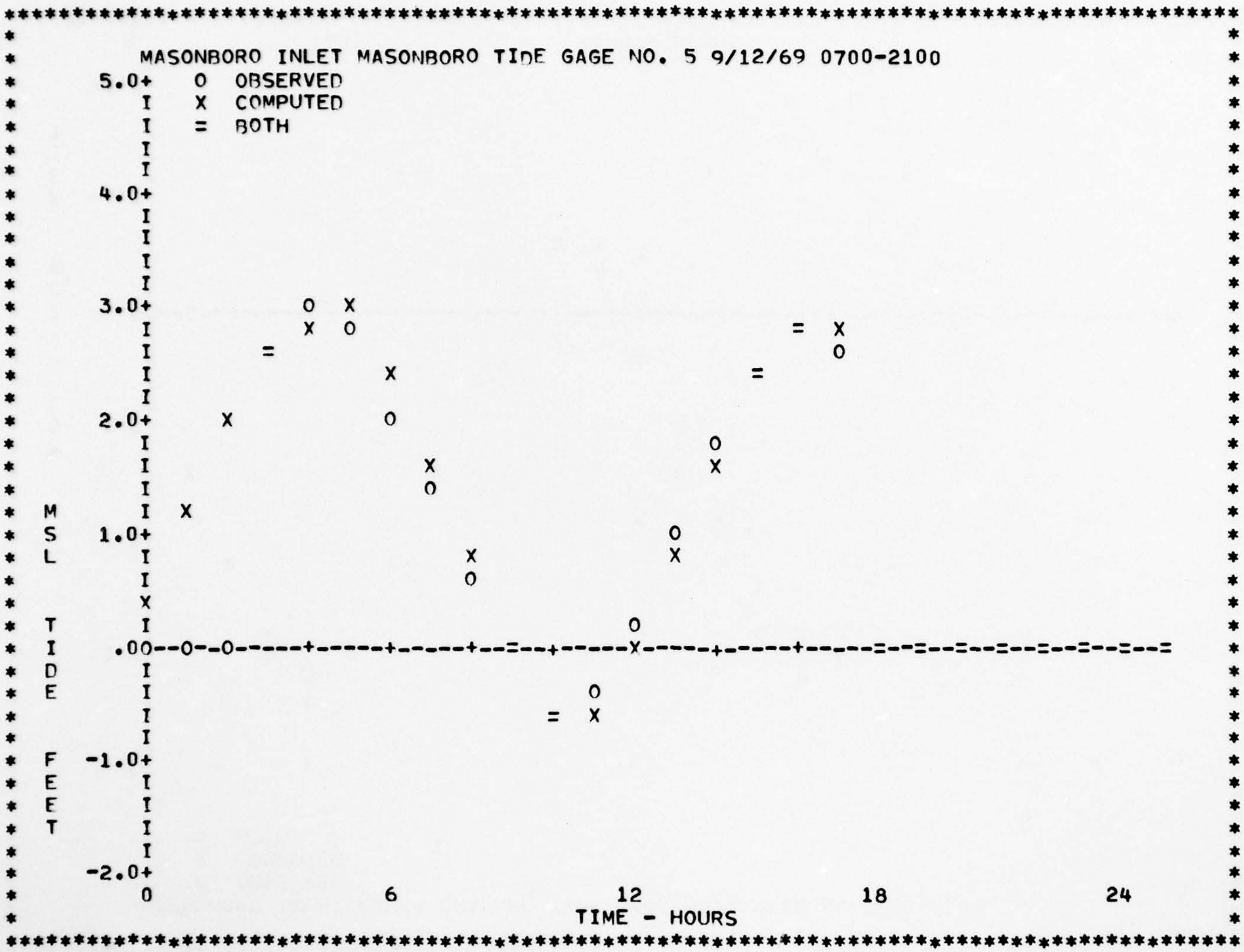

MASONBORO INLET NEAR END OF JETTY TIDE GAGE NO. 1 9/12/69 0600-2100
O OBSERVED
X COMPUTED
= BOTH
5.0
4.0
3.0
2.0
1.0
.00
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS

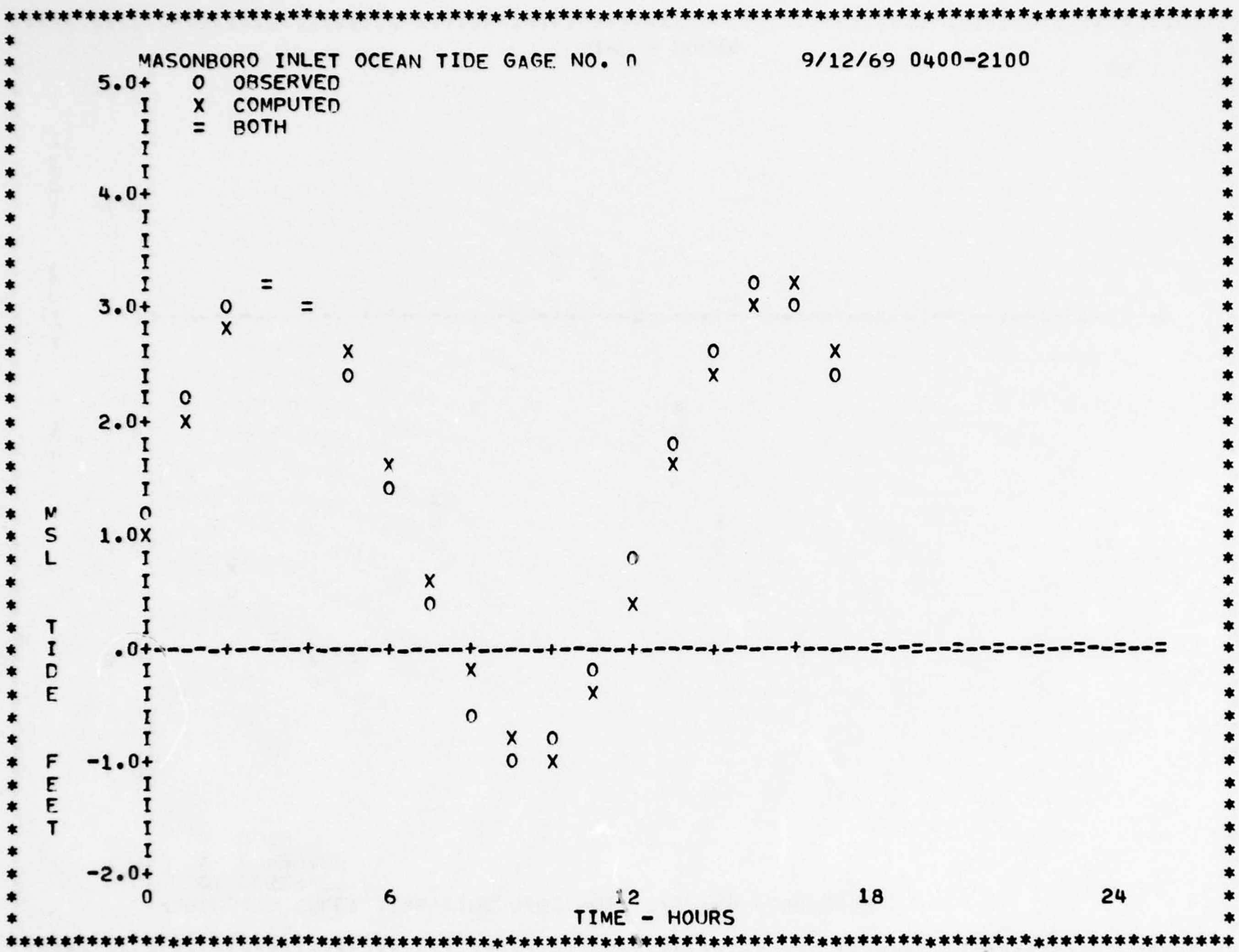


MASONBORO INLET COAST GUARD DOCK TIDE GAGE NO. 2 9/12/69 0400-2100
O OBSERVED
X COMPUTED
= BOTH
5.0
4.0
3.0
2.0
1.0
.0
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS

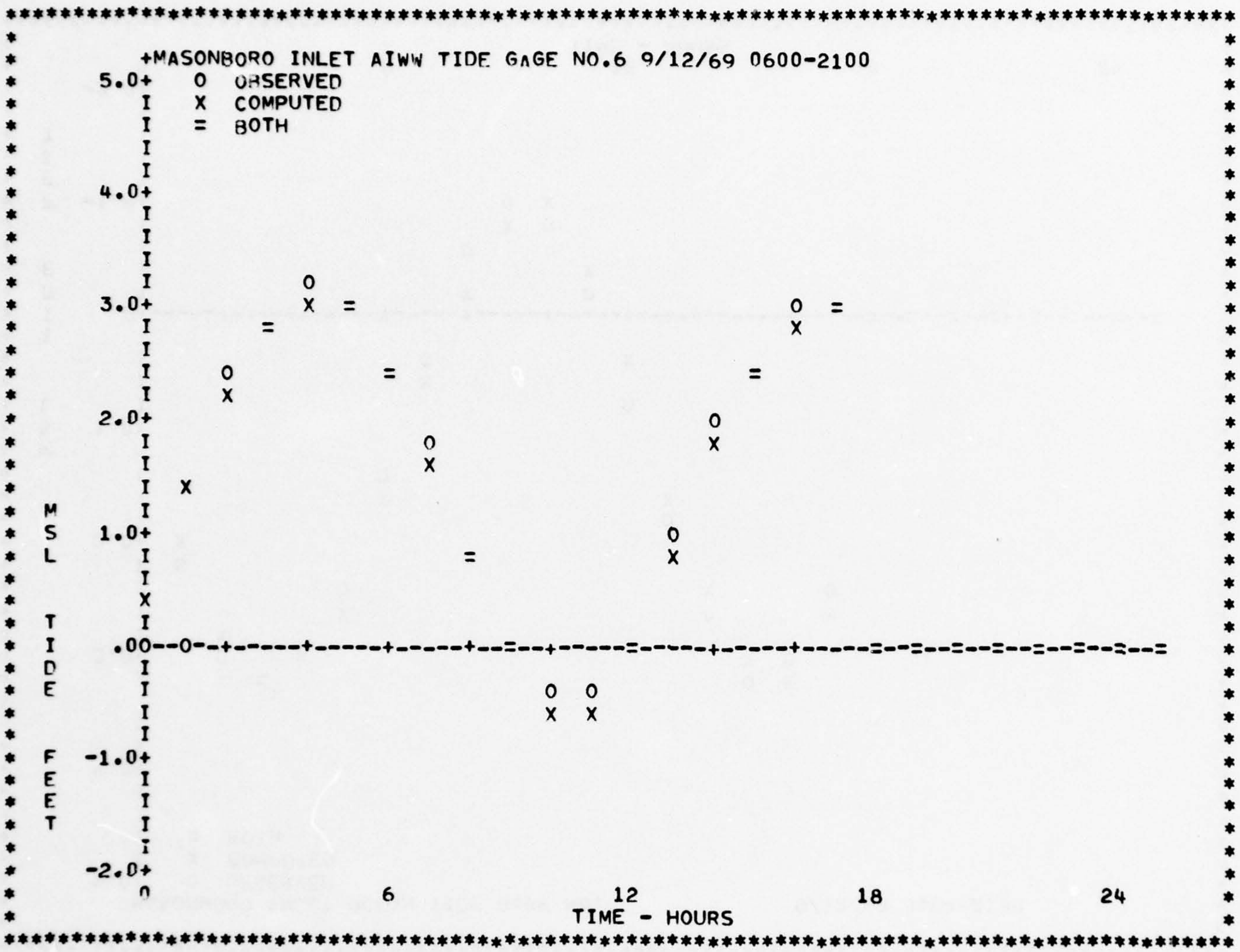

MASONBORO INLET SHINN CREEK TIDE GAGE NO.3 9/12/69 0400-2100
O OBSERVED
X COMPUTED
= BOTH
5.0
4.0
3.0
2.0
1.0
.0
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS


MASONBORO INLET BANKS CHANNEL TIDE GAGE NO.4 9/12/69 0700-2100
O OBSERVED
X COMPUTED
= BOTH
5.0
4.0
3.0
2.0
1.0
.00
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS


MASONBORO INLET MASONBORO TIDE GAGE NO. 5 9/12/69 0700-2100
O OBSERVED
X COMPUTED
= BOTH
5.0
4.0
3.0
2.0
1.0
.00
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS



MASONBORO INLET OCEAN TIDE GAGE NO. 0
9/12/69 0400-2100
O OBSERVED
X COMPUTED
= BOTH
5.0
4.0
3.0
2.0
1.0
.0
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS



+MASONBORO INLET AIWW TIDE GAGE NO.6 9/12/69 0600-2100
O OBSERVED
X COMPUTED
= BOTH
5.0
4.0
3.0
2.0
1.0
.00
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS

Fine Grid Sub-Model Output

CARD TYPE	CARD NO	DESCRIPTION ALPHANUMERIC TITLE
TITLE	1	TWO DIMENSIONAL HYDRODYNAMIC MODEL OF MASONBORO INLET (N. CAROLINA)
TITLE	2	MODEL STUDY FOR COASTAL ENGINEERING RESEARCH CENTER (CORPS OF ENGRS)
TITLE	3	RUN MADE USING FINE GRID MODEL FOR DETAILED VERIFICATION
TITLE	4	SIMULATION PERFORMED FOR PERIOD 400-2100 SEPTEMBER 12, 1969
ENDTITLE		

CARD TYPE	CARD NO	DESCRIPTION	TYPE OF INPUT/OUTPUT CARD,TAPE,BOTH, OR NONE	TAPE NO
FILE A	1	READ BASIC CELL INPUT DATA FROM	CARD	0
FILE A	2	READ INITIAL HYDRODYNAMICS FROM	CARD	0
FILE A	3	COMPUTE AND SAVE NET VELOCITIES ON	NONE	0
FILE A	4	COMPUTE AND SAVE NET FLOWS ON	NONE	0
FILE A	5	COMPUTE AND SAVE DISPERSION COEF. ON	NONE	0
FILE A	6	STORE ENDING VALUES OF HYDRODYNAMICS ON	CARD	0
FILE A	7	STORE INSTANTANEOUS HYDRODYNAMICS ON	TAPE	2
FILE A	8	WRITE/READ INPUTS FOR FINE GRID MODEL ON	TAPE	1
FILE A	9	STORE COARSE GRID DATA FOR FINE GRID ON	NONE	0
ENDFILE A				

CARD TYPE	CARD NO	DESCRIPTION	VALUE
FILE B	1	MODEL TYPE (1=COARSE PROD,2=FINE PROD,3=COARSE NON-PROD)	2.0
FILE B	2	PRINT INPUT DATA (1=NO PRINT, 2=W/MANN. N, 3=W/O MANN. N)	2.0
FILE B	3	NUMBER OF STATIONS FOR WHICH PLOTS ARE DESIRED	6.0
FILE B	4	TOTAL REAL TIME FOR OPERATION OF MODEL (HOURS)	17.0
FILE B	5	START REAL TIME FOR OPERATION OF MODEL (HOURS)	4.0
FILE B	6	REAL TIME INT. FOR STORING INSTANTANEOUS VEL. (MINUTES)	30.0
FILE B	7	REAL TIME PERIOD OF TIDAL CYCLE (HOURS)	12.5
FILE B	8	INITIAL WIND MAGNITUDE (KNOTS)	4.0
FILE B	9	DIRECTION FROM WHICH INITIAL WIND BLOWS (CLOCKWISE FROM N	20.0
FILE B	10	AVERAGE PRECIPITATION RATE (INCHES/DAY)	.0
FILE B	11	AVERAGE EVAPORATION RATE (INCHES/DAY)	.0
FILE B	12	ANGLE BETWEEN NORTH AND X-AXIS (DEG. CLOCKWISE FROM N.)	48.0
FILE B	13	TOTAL NUMBER OF COMPUTATIONAL ELEMENTS IN X-DIRECTION	33.0
FILE B	14	TOTAL NUMBER OF COMPUTATIONAL ELEMENTS IN Y-DIRECTION	30.0
FILE B	15	GRID SIZE OF COMPUTATIONAL ELEMENTS (FEET)	300.0
FILE B	16	PROGRAM COMPUTATIONAL TIME STEP (SECONDS)	5.0
FILE B	17	LATITUDE OF ESTUARINE SYSTEM (DEGREES)	34.2
FILE B	18	NUMBER OF OUTPUT SETS (HOURS) PRINTED PER PAGE	6.0
FILE B	19	COMPUTE NET FLOWS BUT DO NOT STORE (1=YES, 2=NO)	2.0
FILE B	20	DIFFERENCE BETWEEN MSL AND INPUT DATUM(FEET)	1.3
ENDFILE B			

ENDFILE C BASIC CELL DATA

TWO DIMENSIONAL HYDRODYNAMIC MODEL OF MASONBORO INLET (N. CAROLINA)

MODEL STUDY FOR COASTAL ENGINEERING RESEARCH CENTER (CORPS OF ENGRS)

RUN MADE USING FINE GRID MODEL FOR DETAILED VERIFICATION

SIMULATION PERFORMED FOR PERIOD 400-2100 SEPTEMBER 12, 1969

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MODEL-OPERATION INFORMATION

     BASIC CELL INPUT DATA READ FROM CARDS

     INITIAL HYDRODYNAMICS READ FROM CARDS

     ALL INPUT DATA (EXCLUDING INITIAL HYDRODYNAMICS) PRINTED AND LABELED

     TIDAL AMPLITUDES AND FLOWS WERE COMPUTED AND PRINTED FOR SELECTED CELLS

     NET FLOWS WERE NOT COMPUTED

     NET VELOCITIES WERE NOT COMPUTED

     AVERAGE VELOCITIES AND DISPERSION COEFFICIENTS WERE NOT PUNCHED ON CARDS OR STORED ON TAPE

     INSTANTANEOUS VELOCITIES WERE STORED ON TAPE UNIT NO.  2 AT  30.0 MINUTE TIME INTERVALS

     ENDING VALUES OF HYDRODYNAMICS WERE PUNCHED ON CARDS

     TIDAL AMPLITUDE PLOTS WERE MADE FOR  6 SELECTED STATIONS IN BAY

     MODEL WAS OPERATED TO SIMULATE  17.0 HOURS OF REAL TIME


     FINE GRID MODEL


MODEL DIMENSIONS AND CHARACTERISTICS

     NUMBER OF CELLS IN X-DIRECTION = 33

     NUMBER OF CELLS IN Y-DIRECTION = 30

     TOTAL NUMBER OF CELLS IN MODEL =  990

     WIDTH OF EACH CELL =  300.0 FEET

     NUMBER OF TIDAL EXCITATION CELLS =  0
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NUMBER OF SUBMERGED BARRIERS = 11

NUMBER OF EXTERNAL FLOW SOURCES = 47

COMPUTATIONAL TIME INCREMENT = .083 MINUTES

PERIOD OF TIDAL CYCLE = 12.5 HOURS

STATION LOCATIONS FOR TIME PRINT-OUT OF HYDRODYNAMICS

STATION NUMBER 1	I21J20	I = 21	J = 20
STATION NUMBER 2	I6J17	I = 6	J = 17
STATION NUMBER 3	I32J23	I = 32	J = 23
STATION NUMBER 4	I15J25	I = 15	J = 25
STATION NUMBER 5	I20J29	I = 20	J = 29
STATION NUMBER 6	I20J10	I = 20	J = 10
STATION NUMBER 7	I19J10	I = 19	J = 10
STATION NUMBER 8	I17J17	I = 17	J = 17
STATION NUMBER 9	I18J17	I = 18	J = 17
STATION NUMBER 10	I19J17	I = 19	J = 17
STATION NUMBER 11	I5J18	I = 5	J = 18
STATION NUMBER 12	I5J19	I = 5	J = 19
STATION NUMBER 13	I16J24	I = 16	J = 24
STATION NUMBER 14	I17J24	I = 17	J = 24
STATION NUMBER 15	I29J22	I = 29	J = 22
STATION NUMBER 16	I29J23	I = 29	J = 23
STATION NUMBER 17	I29J24	I = 29	J = 24
STATION NUMBER 18	I30J25	I = 30	J = 25
STATION NUMBER 19	I16J17	I = 16	J = 17
STATION NUMBER 20	I4J24	I = 4	J = 24

STATION LOCATIONS FOR TIME PLOTS OF HYDRODYNAMICS

STATION NUMBER 1	I21J20	I = 21	J = 20
STATION NUMBER 2	I6J17	I = 6	J = 17
STATION NUMBER 3	I32J23	I = 32	J = 23
STATION NUMBER 4	I15J25	I = 15	J = 25
STATION NUMBER 5	I20J29	I = 20	J = 29
STATION NUMBER 6	I20J10	I = 20	J = 10

INITIAL WIND CONDITIONS AND RAINFALL AND EVAPORATION RATES

WIND VELOCITY = 4.0 KNOTS

WIND ANGLE = 20.0 DEGREES

RAINFALL RATE = .000 IN./DAY

EVAPORATION RATE = .000 IN./DAY

EXTERNAL FLOW LOCATIONS AND QUANTITIES

INFLOW NUMBER 1	I = 9	J = 4	QINFLO = .0 CFS
INFLOW NUMBER 2	I = 10	J = 4	QINFLO = .0 CFS
INFLOW NUMBER 3	I = 11	J = 4	QINFLO = .0 CFS

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INFLOW NUMBER  4     I = 12     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER  5     I = 13     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER  6     I = 14     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER  7     I = 15     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER  8     I = 16     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER  9     I = 17     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER 10     I = 18     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER 11     I = 19     J =  4     QINFLO =      .0 CFS
INFLOW NUMBER 12     I =  8     J =  5     QINFLO =      .0 CFS
INFLOW NUMBER 13     I =  8     J =  6     QINFLO =      .0 CFS
INFLOW NUMBER 14     I =  8     J =  7     QINFLO =      .0 CFS
INFLOW NUMBER 15     I =  8     J =  8     QINFLO =      .0 CFS
INFLOW NUMBER 16     I =  8     J =  9     QINFLO =      .0 CFS
INFLOW NUMBER 17     I =  8     J = 10     QINFLO =      .0 CFS
INFLOW NUMBER 18     I =  8     J = 11     QINFLO =      .0 CFS
INFLOW NUMBER 19     I =  8     J = 12     QINFLO =      .0 CFS
INFLOW NUMBER 20     I = 21     J = 13     QINFLO =      .0 CFS
INFLOW NUMBER 21     I = 21     J = 14     QINFLO =      .0 CFS
INFLOW NUMBER 22     I = 21     J = 15     QINFLO =      .0 CFS
INFLOW NUMBER 23     I =  1     J = 16     QINFLO =      .0 CFS
INFLOW NUMBER 24     I =  1     J = 17     QINFLO =      .0 CFS
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INFLOW NUMBER 25     I =  1     J = 18     QINFLO =      .0 CFS
INFLOW NUMBER 26     I =  1     J = 19     QINFLO =      .0 CFS
INFLOW NUMBER 27     I = 32     J = 22     QINFLO =      .0 CFS
INFLOW NUMBER 28     I =  4     J = 23     QINFLO =      .0 CFS
INFLOW NUMBER 29     I = 32     J = 23     QINFLO =      .0 CFS
INFLOW NUMBER 30     I =  4     J = 24     QINFLO =      .0 CFS
INFLOW NUMBER 31     I = 32     J = 24     QINFLO =      .0 CFS
INFLOW NUMBER 32     I =  4     J = 25     QINFLO =      .0 CFS
INFLOW NUMBER 33     I = 20     J = 25     QINFLO =      .0 CFS
INFLOW NUMBER 34     I = 29     J = 25     QINFLO =      .0 CFS
INFLOW NUMBER 35     I = 31     J = 25     QINFLO =      .0 CFS
INFLOW NUMBER 36     I = 32     J = 25     QINFLO =      .0 CFS
INFLOW NUMBER 37     I = 32     J = 25     QINFLO =      .0 CFS
INFLOW NUMBER 38     I = 20     J = 26     QINFLO =      .0 CFS
INFLOW NUMBER 39     I = 20     J = 27     QINFLO =      .0 CFS
INFLOW NUMBER 40     I = 12     J = 28     QINFLO =      .0 CFS
INFLOW NUMBER 41     I = 13     J = 28     QINFLO =      .0 CFS
INFLOW NUMBER 42     I = 14     J = 28     QINFLO =      .0 CFS
INFLOW NUMBER 43     I = 15     J = 28     QINFLO =      .0 CFS
INFLOW NUMBER 44     I = 16     J = 28     QINFLO =      .0 CFS
INFLOW NUMBER 45     I = 20     J = 28     QINFLO =      .0 CFS
INFLOW NUMBER 46     I = 20     J = 29     QINFLO =      .0 CFS
```

INFLOW NUMBER 47   I = 20   J = 30   QINFLO =   .0 CFS

SUBMERGED BARRIER LOCATIONS, DISCHARGE COEFFICIENTS, AND MSL ELEVATIONS

BARRIER NO.	1	I = 19	J = 10	TOP BOUNDARY	COEFFICIENT = .90	ELEVATION = -21.2 FEET
BARRIER NO.	2	I = 20	J = 10	TOP BOUNDARY	COEFFICIENT = .90	ELEVATION = -16.3 FEET
BARRIER NO.	3	I = 17	J = 17	TOP BOUNDARY	COEFFICIENT = 1.00	ELEVATION = -21.2 FEET
BARRIER NO.	4	I = 18	J = 17	TOP BOUNDARY	COEFFICIENT = 1.00	ELEVATION = -16.2 FEET
BARRIER NO.	5	I = 19	J = 17	TOP BOUNDARY	COEFFICIENT = .90	ELEVATION = -5.2 FEET
BARRIER NO.	6	I = 5	J = 18	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -6.2 FEET
BARRIER NO.	7	I = 5	J = 19	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -4.2 FEET
BARRIER NO.	8	I = 29	J = 22	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -19.2 FEET
BARRIER NO.	9	I = 29	J = 23	SIDE BOUNDARY	COEFFICIENT = .90	ELEVATION = -16.2 FEET
BARRIER NO.	10	I = 16	J = 24	TOP BOUNDARY	COEFFICIENT = .90	ELEVATION = -10.2 FEET
BARRIER NO.	11	I = 17	J = 24	TOP BOUNDARY	COEFFICIENT = .90	ELEVATION = -15.2 FEET

GULF TIDAL DISCHARGE COEFFICIENTS AND CELL TIDE ASSIGNMENTS

TIDAL CELL 1 I = 0 J = 0 COEFFICIENT = .00 TIDE = TIDE0

DATA FOR CORIOLIS ACCELERATION

ANGULAR ROTATION OF EARTH = .0000729 RAD./SEC.

LATITUDE OF BAY = 34.20 DEGREES

MEAN SEA LEVEL WATER DEPTHS THROUGHOUT BAY

```
  30  ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** ***** *****    .7 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  29  ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** *****  -1.3    .7    .7 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  28  ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****  -1.3  -1.3  -1.3 -12.3
-19.3  -2.3  -1.3   -.3    .7 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  27  ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****   -.3    .7   -.3  -3.3
-19.3 -19.3   1.7   -.3   -.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  26  ***** ***** ***** ***** ***** ***** *****    .7    .7    .7    .7    .7    .7   -.3  -1.3
-11.3 -19.3    .7    .7    .7 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  25  ***** ***** *****    .7    .7    .7    .7    .7    .7    .7    .7    .7   1.7    .7  -2.3
-10.3 -17.3 ***** *****   1.7 ***** ***** ***** ***** ***** ***** ***** *****  -2.3  -2.3
 -2.3  -1.3 *****
  24  ***** ***** *****    .7    .7    .7    .7    .7    .7    .7 ***** ***** *****    .7  -1.3
-10.3 -15.3  -1.3    .7 ***** ***** ***** ***** ***** ***** ***** *****  -2.3  -3.3  -3.3
 -3.3  -8.3 *****
  23  ***** ***** *****    .7    .7    .7    .7    .7    .7    .7 *****   -.3  -1.3  -1.3  -1.3
-10.3 -15.3  -2.3  -2.3  -5.3  -6.3  -6.3  -5.3  -9.3 -12.3 -12.3 -12.3 -16.3 -16.3 -16.3
-16.3 -16.3 *****
  22  ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****  -1.3  -1.3  -1.3  -1.3
 -9.3 -14.3  -6.3  -6.3  -5.3  -4.3  -3.3  -7.3 -12.3 -13.3 -14.3 -16.3 -18.3 -19.3 -19.3
-17.3 -11.3 *****
  21  ***** ***** ***** ***** ***** ***** ***** ***** *****   -.3  -1.3   -.3  -1.3  -1.3  -1.3
 -8.3 -13.3 -15.3  -5.3  -4.3  -7.3 -11.3 -12.3 -11.3 -11.3  -9.3  -6.3  -5.3 ***** *****
***** ***** *****
  20  ***** ***** ***** ***** ***** *****    .7    .7   -.3   -.3   -.3  -1.3  -2.3  -2.3  -2.3  -2.3
 -6.3 -20.3 -17.3 -11.3 -11.3 -13.3 -11.3 ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  19   -1.3  -2.3  -3.3  -4.3  -4.3  -4.3  -4.8  -5.3  -6.3  -6.3  -7.3  -7.3  -7.3  -7.3  -6.3
 -7.3 -24.3 -17.3  -3.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  18   -4.3  -4.3  -5.3  -5.3  -6.3  -6.3  -6.3  -6.3  -6.3  -6.3  -5.3  -2.3  -2.3  -2.3  -3.3
 -8.3 -23.3 -16.3  -5.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
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 17    -4.3  -5.3  -4.3  -4.3  -1.3   -.3   -.3   -.3    .7    .7    .7 *****   -.3   -.3 *****
 -1.3 -21.3 -28.3  -8.3  -2.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 16    -4.3  -3.3  -2.3  -1.3 *****   -.3    .7   1.7   1.7 ***** ***** ***** ***** *****   -.3
 -2.3 -14.3 -23.3 -17.3  -6.3  -3.3 ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 15   ***** *****  -2.3  -1.3   1.7 ***** ***** ***** ***** ***** ***** ***** ***** *****  -3.3
 -5.3  -2.3 -23.3 -18.3 -10.3  -5.3 ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 14   ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****  -3.3  -3.3  -7.3  -7.3
 -4.3  -2.3 -12.3 -17.3 -18.3  -8.3 ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 13   ***** ***** ***** ***** ***** ***** ***** *****  -1.3  -2.3  -3.3  -6.3  -6.3  -8.3  -5.3
 -3.3  -2.3  -7.3 -12.3 -19.3 -11.3 ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 12   ***** ***** ***** ***** ***** ***** *****  -5.3  -6.3  -7.3  -7.3  -7.3  -7.3  -7.3  -6.3
 -5.3  -2.3  -4.3 -13.3 -21.3 -12.3 ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 11   ***** ***** ***** ***** ***** ***** ***** -10.3 -10.3 -10.3  -9.3  -8.3  -7.3  -7.3  -7.3
 -5.3  -3.3  -1.3 -21.3 -21.3 -12.3 ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 10   ***** ***** ***** ***** ***** ***** ***** -11.3 -11.3 -11.3 -10.3  -9.3  -8.3  -8.3  -8.3
 -6.3  -1.3  -1.3 -21.3 -21.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  9   ***** ***** ***** ***** ***** ***** ***** -13.3 -12.3 -12.3 -11.3 -11.3  -9.3  -9.3  -8.3
 -6.3  -4.3  -1.3 -16.3 -22.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  8   ***** ***** ***** ***** ***** ***** ***** -14.3 -13.3 -13.3 -11.3 -11.3 -10.3  -9.3  -7.3
 -7.3  -5.3  -8.3 -13.3 -23.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  7   ***** ***** ***** ***** ***** ***** ***** -15.3 -14.3 -13.3 -11.3 -11.3 -11.3  -9.3  -8.3
 -8.3  -8.3  -9.3 -23.3 -23.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  6   ***** ***** ***** ***** ***** ***** ***** -18.3 -16.3 -15.3 -13.3 -11.3 -11.3 -10.3  -9.3
 -9.3  -7.3  -9.3 -23.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  5   ***** ***** ***** ***** ***** ***** ***** -21.3 -24.3 -18.3 -15.3 -13.3 -12.3 -11.3  -9.3
 -9.3  -7.3  -9.3 -23.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  4   ***** ***** ***** ***** ***** ***** ***** ***** -26.3 -23.3 -21.3 -18.3 -14.3 -12.3 -11.3
-10.3  -9.3 -14.3 -21.3 ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
  3   ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
```

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***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
   2   ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
   1   ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****
***** ***** *****
 J/I    1    2    3    4    5    6    7    8    9   10   11   12   13   14   15
 J/I   16   17   18   19   20   21   22   23   24   25   26   27   28   29   30
 J/I   31   32   33
```

COMPUTATIONAL CELL IDENTIFICATIONS

J/I	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	30	30	7	1	1	1	1	1	1	1	1	1	1	1	1	1
28	1	1	1	1	1	1	1	1	1	1	1	13	13	13	13	13	30	36	36	7	1	1	1	1	1	1	1	1	1	1	1	1	1
27	1	1	1	1	1	1	1	1	1	1	1	36	36	36	2	2	31	36	36	7	1	1	1	1	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	30	30	30	30	36	36	36	36	2	31	36	36	7	1	1	1	1	1	1	1	1	1	1	1	1	1
25	1	1	1	28	30	30	30	36	36	36	36	36	36	36	34	2	6	1	1	7	1	1	1	1	1	1	1	1	13	12	13	19	1
24	1	1	1	28	36	36	36	36	36	33	1	1	1	36	36	5	32	30	18	1	1	1	1	1	1	1	1	12	2	2	2	7	1
23	1	1	1	28	36	36	36	36	36	33	1	30	30	36	36	2	2	34	2	12	12	12	12	12	12	12	12	2	4	2	2	7	1
22	1	1	1	1	1	1	1	1	1	1	1	36	36	36	36	2	2	2	2	2	2	2	2	2	2	2	2	2	4	2	2	7	1
21	1	1	1	1	1	1	1	1	1	30	30	36	36	36	36	2	2	2	2	2	2	2	2	2	2	2	2	6	1	1	1	1	1
20	1	1	1	1	1	30	30	30	30	36	36	34	34	34	34	2	2	2	2	2	2	6	1	1	1	1	1	1	1	1	1	1	1
19	28	12	12	12	15	34	34	34	34	34	34	2	2	2	2	2	2	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	28	2	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	28	2	2	31	36	36	36	36	36	36	33	1	36	18	1	36	5	5	5	18	1	1	1	1	1	1	1	1	1	1	1	1	1
16	28	2	31	33	1	36	36	36	33	1	1	1	1	1	30	2	2	2	2	2	18	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	31	36	18	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	7	1	1	1	1	1	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1	1	1	1	1	12	12	12	2	2	2	2	2	2	7	1	1	1	1	1	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1	1	30	12	12	2	2	2	2	2	2	2	2	2	7	1	1	1	1	1	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	2	2	2	2	2	6	1	1	1	1	1	1	1	1	1	1	1	1
11	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	2	36	36	2	2	6	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	36	36	36	5	9	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	2	36	36	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	2	2	36	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	2	2	2	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	2	2	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	28	2	2	2	2	2	2	2	2	2	2	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	29	29	29	29	29	29	29	29	29	29	29	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

CONVECTION FLAGGING

J/I	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
30	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
29	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	41	41	12	11	11	11	11	11	11	11	11	11	11	11	11	11
28	11	11	11	11	11	11	11	11	11	11	11	41	41	41	41	41	41	13	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11
27	11	11	11	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11
26	11	11	11	11	11	11	11	41	41	41	41	13	11	11	11	11	31	31	31	14	11	11	11	11	11	11	11	11	11	11	11	11	11
25	11	11	11	11	41	41	41	13	11	31	31	31	31	11	11	11	14	11	11	12	11	11	11	11	11	11	11	11	41	41	41	11	11
24	11	11	11	11	13	11	11	11	11	14	11	11	11	13	11	11	44	41	11	11	11	11	11	11	11	11	11	41	13	11	11	14	11
23	11	11	11	11	33	31	31	31	31	14	11	41	41	13	11	11	11	11	44	41	41	41	41	41	41	41	41	13	11	11	11	14	11
22	11	11	11	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	31	31	31	31	14	11
21	11	11	11	11	11	11	11	11	11	41	41	13	11	11	11	11	11	11	11	11	11	31	31	31	31	31	31	14	11	11	11	11	11
20	11	11	11	11	11	41	41	41	41	13	11	11	11	11	11	11	11	11	31	31	31	14	11	11	11	11	11	11	11	11	11	11	11
19	11	41	41	41	41	13	11	11	11	11	11	11	11	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11	11
18	11	13	11	11	11	11	11	11	11	11	31	31	31	31	31	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11	11
17	11	13	11	31	31	11	11	11	11	31	14	11	22	11	11	13	11	11	44	11	11	11	11	11	11	11	11	11	11	11	11	11	11
16	11	33	11	14	11	33	31	31	14	11	11	11	11	11	41	13	11	11	11	44	11	11	11	11	11	11	11	11	11	11	11	11	11
15	11	11	33	24	11	11	11	11	11	11	11	11	11	11	13	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11
14	11	11	11	11	11	11	11	11	11	11	11	41	41	41	13	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11
13	11	11	11	11	11	11	11	11	41	41	41	13	11	11	11	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11
12	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11
11	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	11	11	11	31	14	11	11	11	11	11	11	11	11	11	11	11	11
10	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11
9	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11
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7	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	11	11	31	14	11	11	11	11	11	11	11	11	11	11	11	11	11
6	11	11	11	11	11	11	11	11	13	11	11	11	11	11	11	11	11	11	14	11	11	11	11	11	11	11	11	11	11	11	11	11	11
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MANNINGS N BOTTOM FRICTION COEFFICIENTS

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.00000	.00000	.00000							

ENDFILE D

PRINTOUT STATIONS THROUGHOUT SYSTEM

TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	I21J20	I6J17	I32J23	I15J25	I20J29	I20J10	I19J10	I17J17	I18J17	I19J17
4.00	.000	MSL TIDE	.700	.401	.380	.521	.700	.863	.863	.699	.699	.699
	.000	XFLO CFS	5828.	-129.	6212.	82.	0.	0.	-2706.	-12244.	-6241.	-2359.
	.000	YFLO CFS	-205.	-171.	1668.	585.	15.	11031.	11153.	13032.	13795.	6827.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
5.00	.000	MSL TIDE	1.659	.579	1.401	1.648	1.495	2.343	2.324	1.933	1.968	1.980
	.000	XFLO CFS	6074.	-173.	5963.	53.	0.	0.	-2820.	-13271.	-7379.	-1658.
	.000	YFLO CFS	-242.	-209.	2499.	755.	80.	12243.	12127.	15600.	16406.	4831.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
6.00	.000	MSL TIDE	2.458	1.446	2.197	2.428	2.374	3.232	3.215	2.772	2.819	2.845
	.000	XFLO CFS	6268.	-441.	6444.	-69.	52.	0.	-2698.	-14989.	-8566.	-2299.
	.000	YFLO CFS	-552.	-272.	2770.	1260.	70.	12882.	12760.	17912.	19006.	5905.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
7.00	.000	MSL TIDE	3.000	2.109	2.835	2.990	2.953	3.605	3.592	3.241	3.285	3.312
	.000	XFLO CFS	5145.	-643.	5480.	-235.	84.	0.	-2551.	-13789.	-7993.	-2231.
	.000	YFLO CFS	-722.	-300.	2379.	1355.	98.	11498.	11220.	16723.	17691.	5428.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
8.00	.000	MSL TIDE	3.242	2.750	3.269	3.256	3.263	3.329	3.325	3.269	3.279	3.288
	.000	XFLO CFS	1265.	-610.	1410.	-252.	-21.	0.	-1467.	-7480.	-4631.	-897.
	.000	YFLO CFS	-1039.	-292.	825.	559.	-14.	5696.	5277.	8259.	8472.	1508.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
9.00	.000	MSL TIDE	3.048	3.097	3.191	3.115	3.198	2.609	2.616	2.768	2.765	2.765
	.000	XFLO CFS	-2938.	294.	-4953.	-1355.	-91.	0.	-243.	3170.	3432.	1533.
	.000	YFLO CFS	-2633.	67.	-2566.	256.	-85.	-9003.	-9731.	-14752.	-11264.	-3844.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

PRINTOUT STATIONS THROUGHOUT SYSTEM

TIME HOURS	SEA TIDE	HYDRO- DYNAMICS	I21J20	I6J17	I32J23	I15J25	I20J29	I20J10	I19J10	I17J17	I18J17	I19J17
10.00	.000	MSL TIDE	2.423	2.750	2.649	2.544	2.719	1.416	1.431	1.814	1.807	1.810
	.000	XFLO CFS	-3730.	460.	-6146.	-1294.	-66.	0.	1040.	2702.	5048.	1730.
	.000	YFLO CFS	-3541.	358.	-2514.	188.	-82.	-14339.	-16055.	-22367.	-17452.	-5517.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
11.00	.000	MSL TIDE	1.705	2.178	2.014	1.813	2.019	.145	.177	.833	.819	.828
	.000	XFLO CFS	-3723.	368.	-7224.	-1022.	-11.	0.	1116.	2932.	5725.	1681.
	.000	YFLO CFS	-4510.	362.	-2321.	2.	-29.	-17470.	-19369.	-24148.	-18639.	-6098.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
12.00	.000	MSL TIDE	.903	1.495	1.236	.976	1.223	-.821	-.775	.016	-.013	-.008
	.000	XFLO CFS	-3351.	211.	-7431.	-703.	0.	0.	1006.	3288.	5480.	1346.
	.000	YFLO CFS	-4871.	281.	-1910.	-2.	-16.	-18021.	-19704.	-22242.	-16868.	-5336.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
13.00	.000	MSL TIDE	.110	.769	.388	.133	.887	-1.285	-1.249	-.605	-.632	-.632
	.000	XFLO CFS	-3296.	69.	-5644.	-196.	0.	0.	876.	2162.	3944.	799.
	.000	YFLO CFS	-4065.	140.	-3601.	-151.	-3.	-15669.	-16865.	-18528.	-13857.	-4192.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
14.00	.000	MSL TIDE	-.567	.059	-.467	-.557	.810	-1.180	-1.162	-.893	-.904	-.905
	.000	XFLO CFS	-2181.	2.	-2620.	-7.	0.	0.	586.	1054.	2491.	453.
	.000	YFLO CFS	-2633.	2.	-2974.	-90.	-1.	-10333.	-11063.	-12225.	-9166.	-2680.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
15.00	.000	MSL TIDE	-.634	-.300	-.710	-.625	.772	-.544	-.545	-.589	-.588	-.585
	.000	XFLO CFS	886.	0.	2051.	-29.	0.	0.	624.	-1371.	339.	-114.
	.000	YFLO CFS	-221.	0.	262.	17.	-1.	-597.	-722.	-274.	141.	-15.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

PRINTOUT STATIONS THROUGHOUT SYSTEM

TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	I21J20	I6J17	I32J23	I15J25	I20J29	I20J10	I19J10	I17J17	I18J17	I19J17
16.00	.000	MSL TIDE	.111	-.300	-.122	.092	.756	.570	.557	.301	.313	.309
	.000	XFLO CFS	5042.	0.	5516.	64.	0.	0.	-2438.	-8810.	-4519.	-565.
	.000	YFLO CFS	209.	0.	2032.	214.	-0.	9780.	10162.	10781.	11028.	2799.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
17.00	.000	MSL TIDE	1.175	.076	.768	1.164	.807	2.049	2.028	1.544	1.579	1.583
	.000	XFLO CFS	7361.	-59.	7269.	92.	0.	0.	-3187.	-14509.	-7914.	-1577.
	.000	YFLO CFS	-95.	-119.	3062.	655.	0.	13743.	13709.	16712.	17684.	5317.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
18.00	.000	MSL TIDE	2.170	1.151	1.890	2.129	2.084	2.986	2.968	2.501	2.548	2.571
	.000	XFLO CFS	6591.	-341.	6623.	29.	16.	0.	-2660.	-15232.	-8644.	-2171.
	.000	YFLO CFS	-518.	-283.	2835.	1135.	38.	13385.	13381.	18040.	19157.	5857.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
19.00	.000	MSL TIDE	2.812	2.163	2.569	2.777	2.729	3.538	3.523	3.108	3.156	3.183
	.000	XFLO CFS	6090.	-565.	6491.	-153.	71.	0.	-2612.	-14752.	-8482.	-2373.
	.000	YFLO CFS	-655.	-296.	2748.	1457.	87.	12536.	12392.	17820.	19035.	6093.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
20.00	.000	MSL TIDE	3.203	2.866	3.070	3.188	3.160	3.650	3.640	3.383	3.415	3.435
	.000	XFLO CFS	4712.	-579.	5150.	-222.	84.	0.	-2227.	-11880.	-6866.	-1948.
	.000	YFLO CFS	-680.	-279.	2185.	1316.	95.	10007.	9731.	14437.	15477.	4952.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
21.00	.000	MSL TIDE	3.136	3.135	3.244	3.141	3.173	2.951	2.952	3.031	3.023	3.016
	.000	XFLO CFS	-1429.	64.	-2211.	54.	-82.	0.	-1186.	-1270.	1280.	965.
	.000	YFLO CFS	-1854.	-80.	-613.	-521.	-84.	-2806.	-2468.	-4437.	-5155.	-2013.
	.000	GRD ELEV	-13.30	-.30	-16.30	-2.30	.70	-21.30	-21.30	-21.30	-28.30	-8.30
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

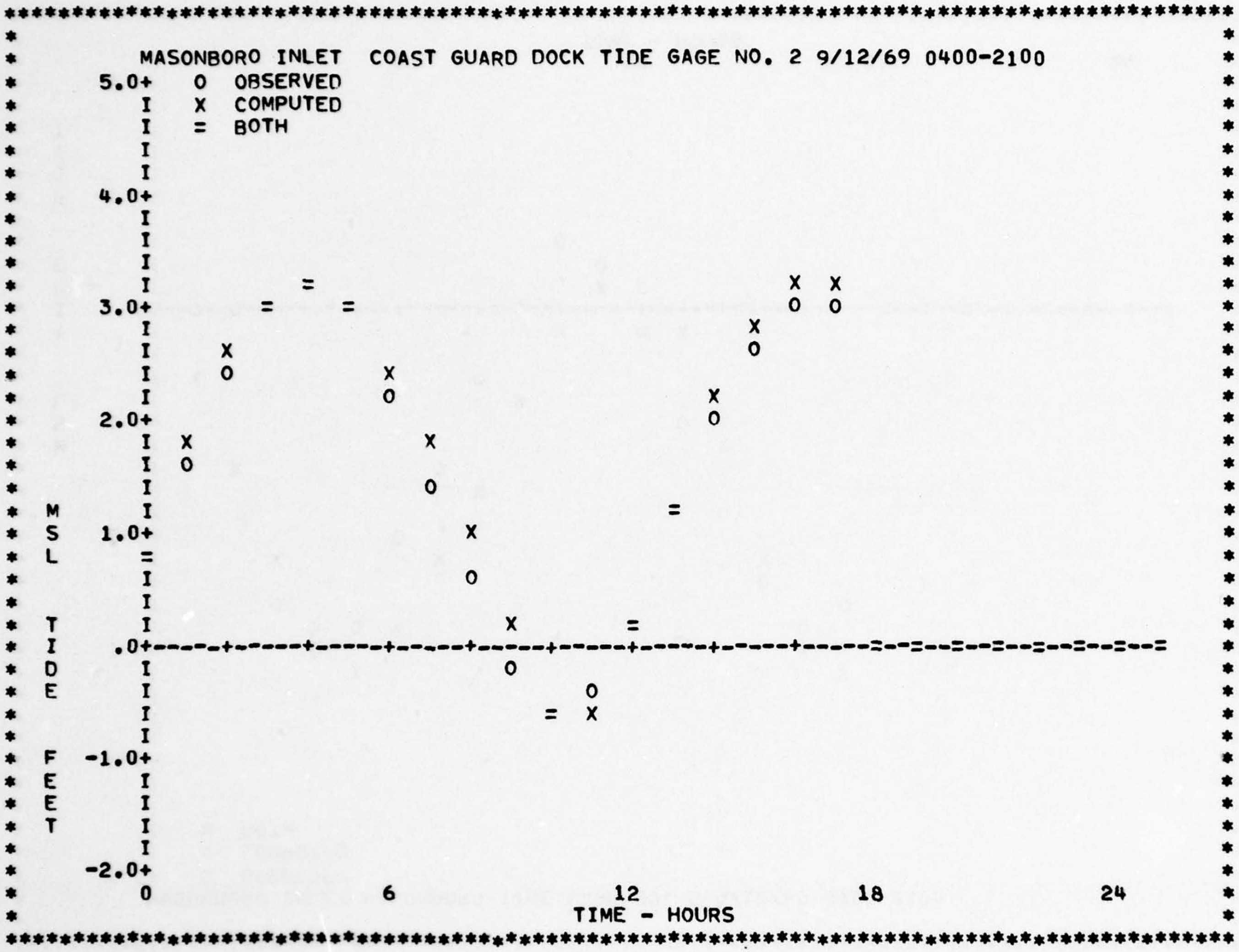
TIME HOURS	SEA TIDE	HYDRO- DYNAMICS	PRINTOUT STATIONS THROUGHOUT SYSTEM									
			I5J18	I5J19	I16J24	I17J24	I29J22	I29J23	I29J24	I30J25	I16J17	I4J24
4.00	.000	MSL TIDE	.401	.401	.608	.663	.380	.380	.380	.696	.613	.700
	.000	XFLO CFS	-3945.	-2555.	-1507.	-709.	5389.	5490.	2175.	510.	-4243.	0.
	.000	YFLO CFS	-395.	0.	5430.	8316.	1672.	2103.	499.	0.	3960.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
5.00	.000	MSL TIDE	.367	.410	1.731	1.735	1.453	1.456	1.457	1.416	1.889	.700
	.000	XFLO CFS	-5495.	-3545.	-1441.	-542.	6633.	5680.	1501.	686.	-4761.	0.
	.000	YFLO CFS	-561.	0.	5250.	8857.	1082.	1356.	887.	0.	5200.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
6.00	.000	MSL TIDE	1.197	1.237	2.530	2.538	2.251	2.254	2.255	2.213	2.706	.700
	.000	XFLO CFS	-6483.	-4431.	-2034.	-1088.	7298.	6265.	1999.	1036.	-5813.	3.
	.000	YFLO CFS	-648.	0.	6285.	10456.	1438.	1942.	1310.	0.	6470.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
7.00	.000	MSL TIDE	1.867	1.900	3.062	3.070	2.868	2.871	2.871	2.846	3.179	.700
	.000	XFLO CFS	-6820.	-4836.	-2077.	-1199.	6291.	5412.	1945.	1093.	-5551.	78.
	.000	YFLO CFS	-664.	0.	5609.	9351.	1408.	1975.	1352.	0.	6349.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
8.00	.000	MSL TIDE	2.632	2.645	3.259	3.262	3.262	3.263	3.264	3.266	3.254	.700
	.000	XFLO CFS	-5195.	-3796.	-1134.	-463.	1666.	1432.	613.	337.	-2967.	32.
	.000	YFLO CFS	-488.	0.	1973.	3787.	615.	751.	460.	0.	3330.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
9.00	.000	MSL TIDE	3.116	3.115	3.044	3.038	3.135	3.135	3.144	3.173	2.751	.700
	.000	XFLO CFS	1421.	1123.	654.	335.	-6257.	-5398.	-954.	-715.	1250.	187.
	.000	YFLO CFS	120.	0.	-5958.	-8277.	-1432.	-2621.	-969.	0.	-2555.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

PRINTOUT STATIONS THROUGHOUT SYSTEM

TIME HOURS	SEA TIDE	HYDRO- DYNAMICS	I5J18	I5J19	I16J24	I17J24	I29J22	I29J23	I29J24	I30J25	I16J17	I4J24
10.00	.000	MSL TIDE	2.857	2.857	2.426	2.406	2.562	2.561	2.573	2.616	1.754	.700
	.000	XFLO CFS	4423.	3438.	555.	430.	-7515.	-6827.	-851.	-994.	-1240.	1.
	.000	YFLO CFS	587.	0.	-6847.	-10573.	-1676.	-2932.	-1037.	0.	-611.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
11.00	.000	MSL TIDE	2.325	2.325	1.651	1.631	1.903	1.901	1.916	1.967	.792	.700
	.000	XFLO CFS	4873.	3708.	1355.	355.	-8237.	-7583.	-868.	-873.	-1286.	-36.
	.000	YFLO CFS	650.	0.	-7395.	-11275.	-1676.	-2756.	-876.	0.	-261.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
12.00	.000	MSL TIDE	1.659	1.660	.798	.792	1.131	1.131	1.154	1.204	.057	.700
	.000	XFLO CFS	4688.	3453.	3054.	424.	-7855.	-7260.	-825.	-603.	664.	0.
	.000	YFLO CFS	619.	0.	-7318.	-10419.	-1375.	-2115.	-552.	0.	-1458.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
13.00	.000	MSL TIDE	.921	.922	-.012	-.015	.312	.315	.324	.377	-.563	.700
	.000	XFLO CFS	3994.	2809.	2370.	261.	-6824.	-5807.	-328.	-320.	784.	0.
	.000	YFLO CFS	509.	0.	-5943.	-8637.	-857.	-1603.	-625.	0.	-1207.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
14.00	.000	MSL TIDE	.178	.178	-.623	-.627	-.485	-.484	-.480	-.384	-.873	.700
	.000	XFLO CFS	3029.	2015.	1371.	98.	-4242.	-3166.	248.	-282.	487.	0.
	.000	YFLO CFS	362.	0.	-3804.	-5848.	-398.	-1008.	-837.	0.	-710.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
15.00	.000	MSL TIDE	-.730	-.729	-.622	-.624	-.685	-.685	-.683	-.613	-.589	.700
	.000	XFLO CFS	35.	41.	627.	25.	1360.	1196.	-46.	-204.	28.	0.
	.000	YFLO CFS	19.	0.	-579.	-891.	-359.	-677.	-761.	0.	73.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	

PRINTOUT STATIONS THROUGHOUT SYSTEM

TIME HOURS	SEA TIDE	HYDRO-DYNAMICS	I5J18	I5J19	I16J24	I17J24	I29J22	I29J23	I29J24	I30J25	I16J17	I4J24
16.00	.000	MSL TIDE	-.683	-.658	.153	.155	-.065	-.066	-.062	-.087	.281	.700
	.000	XFLO CFS	-3177.	-1835.	-603.	218.	5576.	4677.	465.	-11.	-2582.	0.
	.000	YFLO CFS	-311.	0.	3786.	6413.	436.	366.	-297.	0.	2830.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
17.00	.000	MSL TIDE	-.144	-.096	1.277	1.282	.848	.851	.853	.784	1.501	.700
	.000	XFLO CFS	-5105.	-3156.	-1380.	-299.	7975.	6817.	1491.	613.	-4891.	0.
	.000	YFLO CFS	-520.	0.	5829.	9872.	1097.	1270.	811.	0.	5271.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
18.00	.000	MSL TIDE	.929	.969	2.242	2.249	1.946	1.949	1.951	1.905	2.439	.700
	.000	XFLO CFS	-6045.	-4056.	-1941.	-954.	7454.	6387.	1909.	939.	-5765.	0.
	.000	YFLO CFS	-609.	0.	6432.	10815.	1401.	1824.	1213.	0.	6333.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
19.00	.000	MSL TIDE	1.992	2.014	2.878	2.887	2.620	2.623	2.624	2.586	3.042	.700
	.000	XFLO CFS	-5854.	-4162.	-2235.	-1289.	7332.	6300.	2156.	1171.	-5878.	55.
	.000	YFLO CFS	-566.	0.	6489.	10793.	1537.	2128.	1439.	0.	6597.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
20.00	.000	MSL TIDE	2.770	2.780	3.247	3.254	3.098	3.100	3.100	3.080	3.338	.700
	.000	XFLO CFS	-4751.	-3489.	-1983.	-1188.	5856.	5039.	1878.	1084.	-4830.	5.
	.000	YFLO CFS	-444.	0.	5196.	8696.	1353.	1912.	1301.	0.	5491.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	
21.00	.000	MSL TIDE	3.140	3.140	3.125	3.124	3.213	3.213	3.217	3.233	3.037	.700
	.000	XFLO CFS	-475.	-317.	-613.	440.	-3162.	-2611.	-439.	-554.	246.	89.
	.000	YFLO CFS	-51.	0.	-2117.	-3302.	-261.	-733.	-785.	0.	-1365.	0.
	.000	GRD ELEV	-6.30	-4.30	-10.30	-15.30	-19.30	-16.30	-3.30	-2.30	-1.30	.70
	.000	WIND SPEED =	4.0	KNOTS		WIND DIRECTION =		208.0	DEGREES	W.R.T.	X-AXIS	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3.0
2.0
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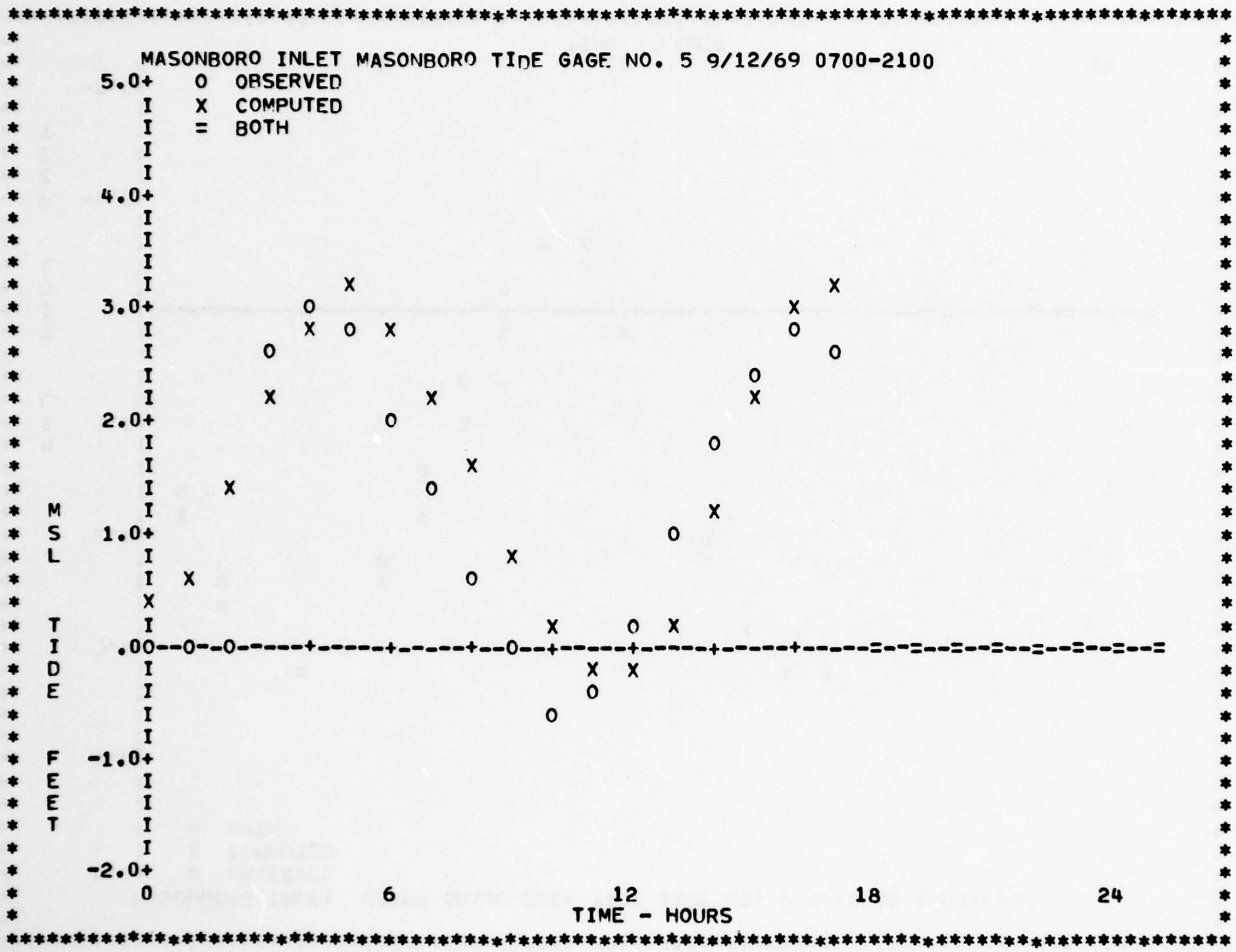
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS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MSL TIDE FEET
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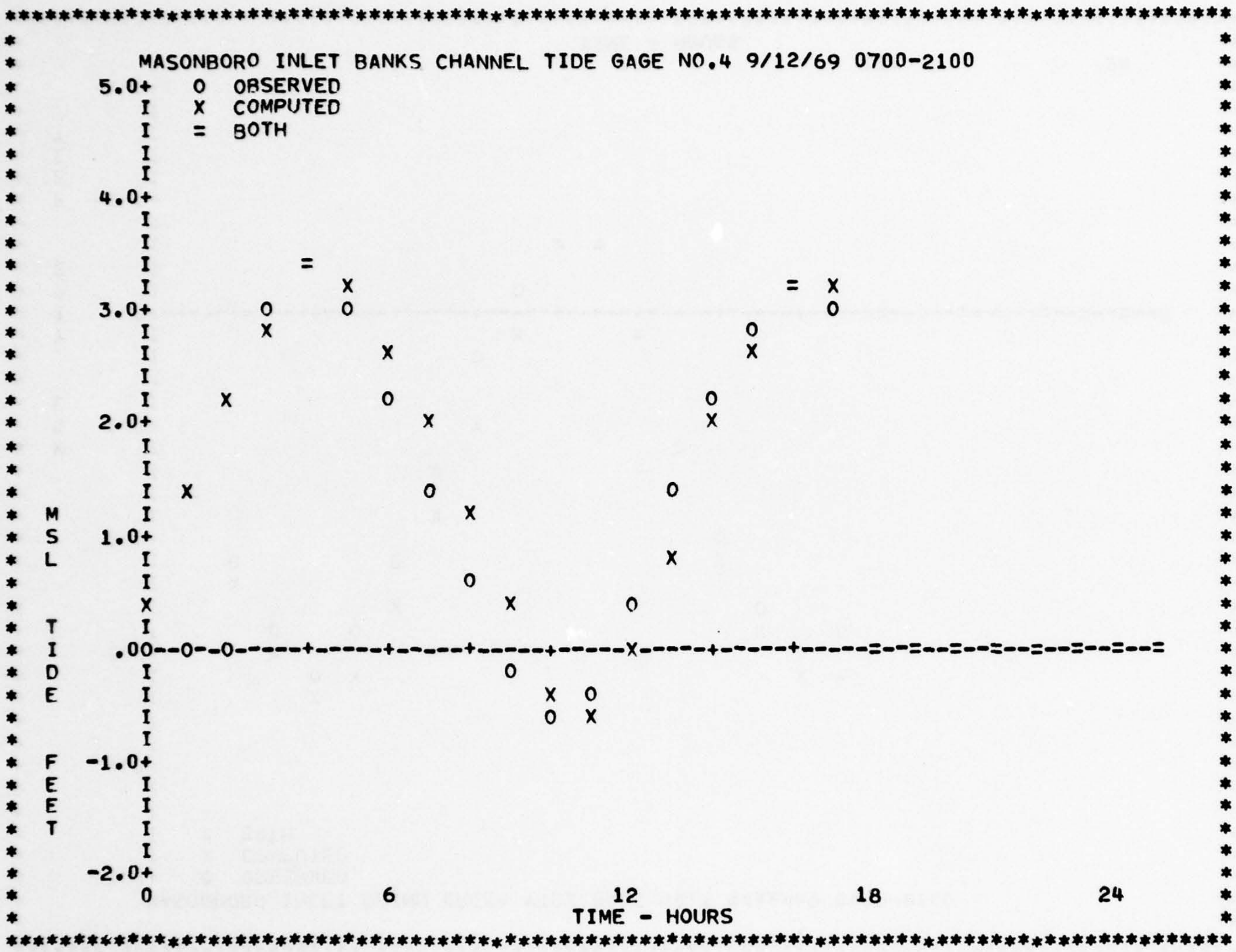
6
12
18
24
TIME - HOURS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1.0
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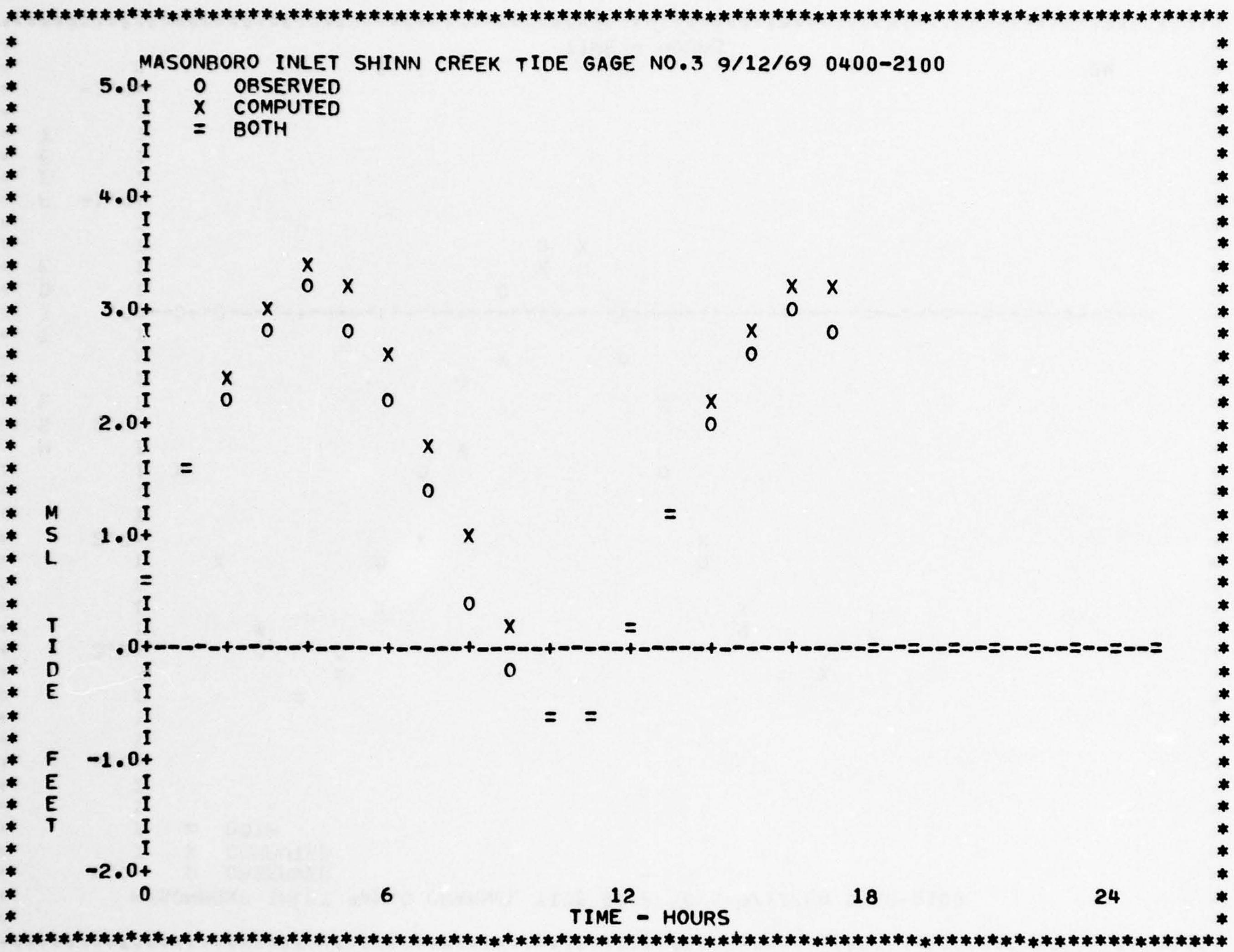
0
6
12
18
24
TIME - HOURS



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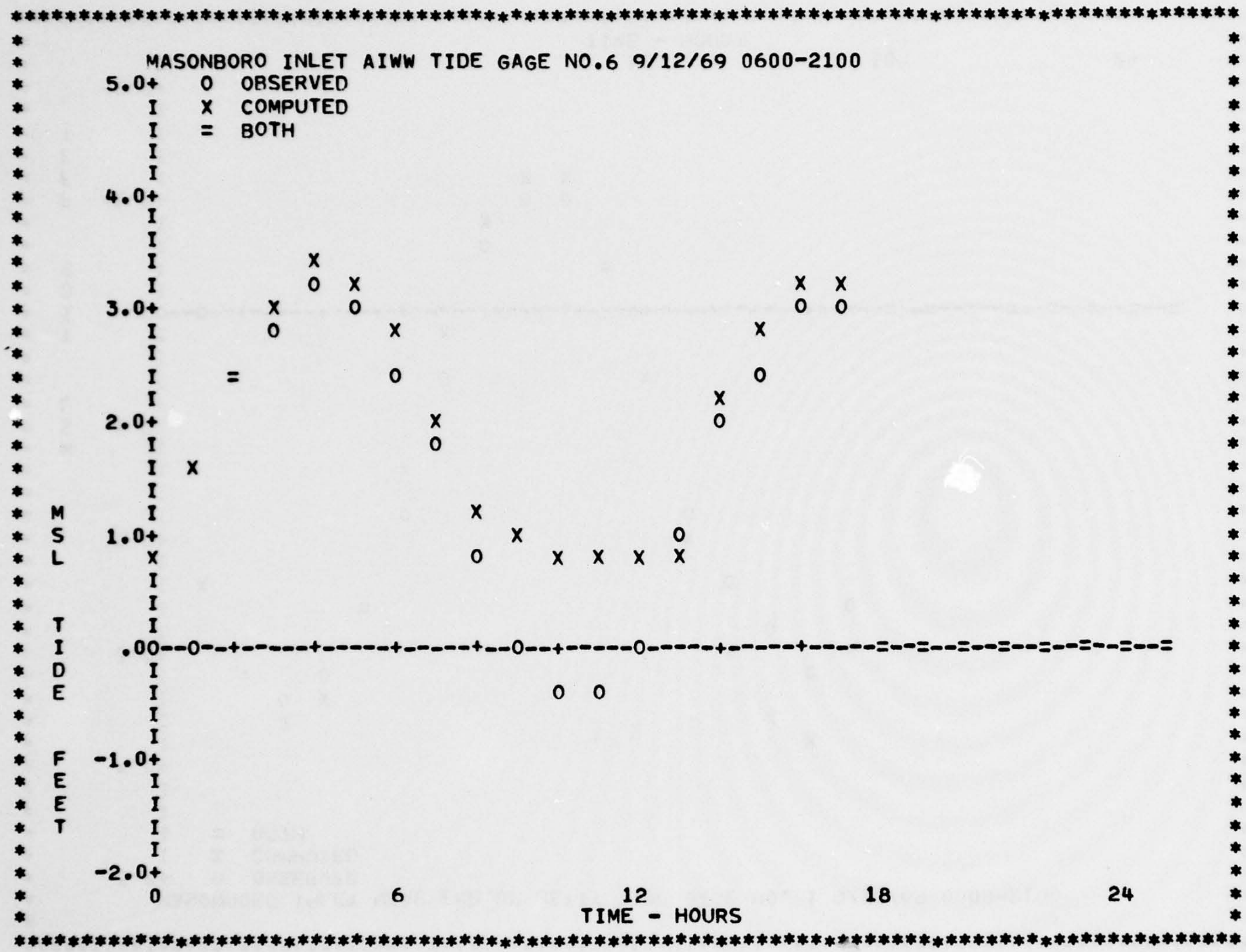
3.0
2.0
1.0
.0
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS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X COMPUTED
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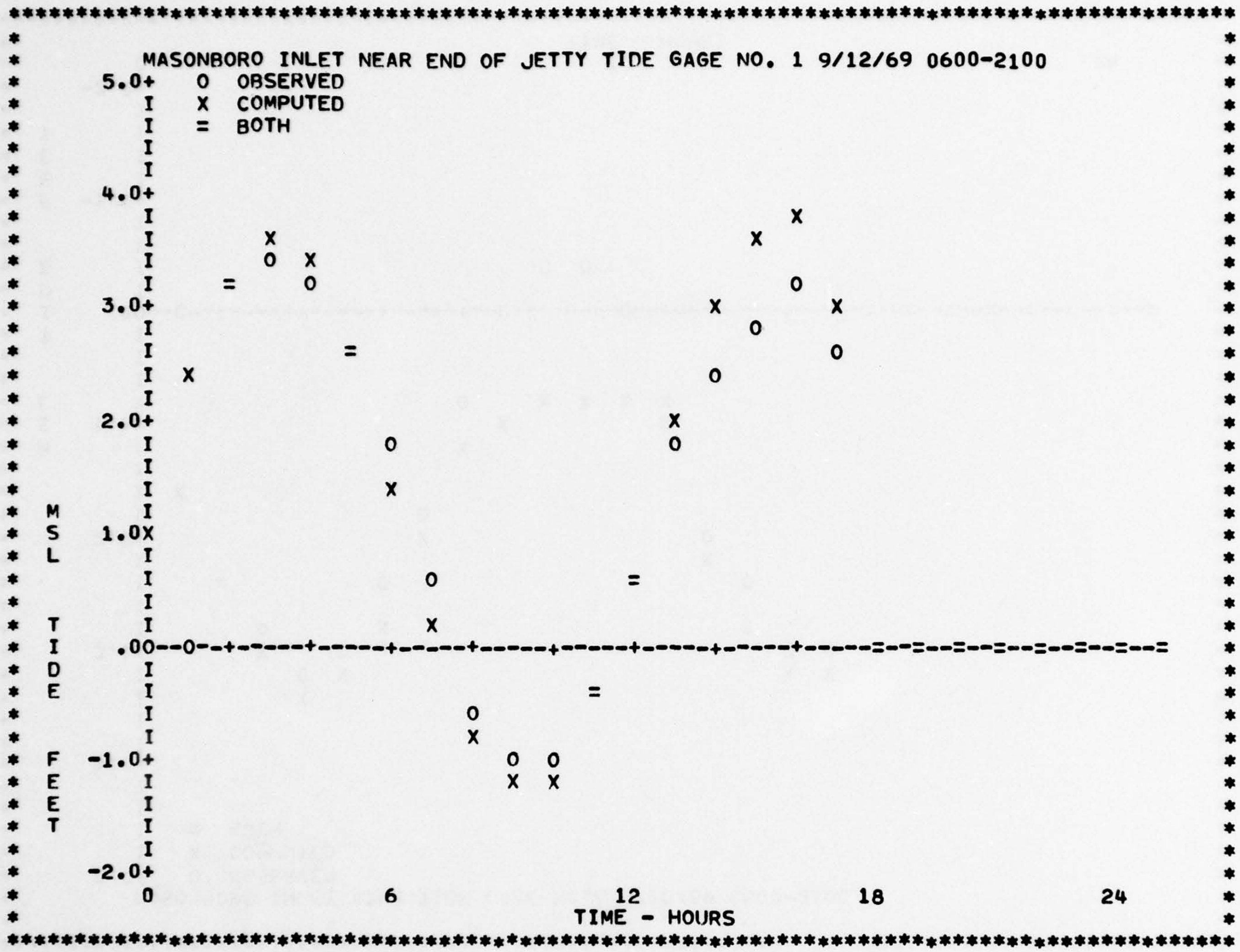
2.0
1.0
.00
-1.0
-2.0
0
6
12
18
24
TIME - HOURS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3.0
2.0
1.0
.00
-1.0
-2.0
MSL TIDE FEET
0
6
12
18
24
TIME - HOURS