



APPENDIX C

An alphabetic listing of all the options available in PASHA

This section gives a listing of all the 'options' available in PASHA. The options in PASHA are always displayed on the screen inside option 'boxes' and are selected by positioning the mouse cursor over the desired option and pressing the spacebar or any other key including mouse buttons. However, in certain options the use of special keys will initiate important variations within the options. These special keys are described in this section.

Each entry in this listing consists of an underlined title which is the name of the option, followed by where it can be found. For example the entry:

DISP MODE : (LOAD FLOW OPTIONS)

describes the function of the option DISP MODE which can be found in the load flow section.

AC LOADFLOW CALCULATION : (MAIN OPTIONS)

Selection of this option initiates checks to ensure that all essential data exist and, if the checks are satisfactory, proceeds with the loadflow. Completion is indicated by displaying a comment on convergence and a list of local options which indicates the types of display and other available facilities. These include "HELP".

ACCESS THE DATA BASE : (MAIN OPTIONS)

This option allows a catalogue of typical or specific plant data to be created. Line, transformer, generator, controller and motor data held in the DATA BASE files can be accessed, by any number of systems, with automatic conversion of the pu values from 'on rating' to 'system'

base.

AVR DATA 1,2,3 : (EDIT PAGE MAIN OPTIONS)

These options enable the system data for the AVR's to be entered or changed by accessing the AVR data pages. Pages 1 and 2 contain the actual AVR parameters, while page 3 is used to include parameters from the data base.

ANALYSIS PARAMETERS: (EDIT PAGE MAIN OPTIONS)

Selection of this option enables the system study parameters to be set or changed.

BUSBAR DATA : (EDIT PAGE MAIN OPTIONS)

This option enables the system data for the Busbars to be entered or changed by accessing the BUSBAR data pages.

CHANGE SIZE : (DRAW OPTIONS)

Allows the user to rescale the diagram by entering a scaling factor. Scale factors less than one will shrink the diagram and those greater than one will increase the size of the diagram. The scaling factor changes the size of the network symbols etc. but the size of busbar names remains the same. Consequently when the diagram is reduced substantially it becomes difficult to locate the busbar names properly. Names are, therefore, not displayed when the scaling factor is less than 0.7.

CHANGE SIZE AND RECENTRE : (DRAW OPTIONS)

Enables the user to rescale the network diagram as well as to choose a new centre point for the display. The current centre is marked with an 'X' when this option is selected. For further details see the RECENTRE and CHANGE SIZE options.

CONSTRUCT A NEW NETWORK : (MAIN OPTIONS)

Enter this section when a new system diagram is to be drawn. Selection of this option automatically clears any "existing" system data in the computer core and prepares to accept the new network. HELP on how to construct a network can be accessed at any stage during network drawing, without loss of any of the items already drawn. NOTE: Any "existing" system data will be lost if it has not been filed. See appendix D for a full list of all the drawing codes used by PASHA.

CONTINUE DRAWING : (DRAW OPTIONS)

Exits from the scaling options and allows the user to continue drawing.

CUR SCALE : (FAULT LEVEL WAVEFORM OPTIONS)

Resets the scale for the current axis (vertical). The default value is 20 pu.

DISP MODE : (LOAD FLOW OPTIONS)

The display modes can be controlled directly from the main loadflow section which produces a diagram with the selected flows displayed on it. To do this position the cursor on the 'DISP MODE' option and:

Press key 1 to display BUS LOADS-MVA flows

" key 2 to display BUS VOLT-MW flows

" key 3 to display BUS VOLTS-MVAR flows

" key 4 to display BUS VOLTS/ANGLE-MW/MVAR flows

" key 5 to display BUS VOLTS/ANGLE-MW/MVAR flows and TAP SETTINGS.

Note: The branch flows displayed on the diagrams are the maximum values for each branch i.e. may relate to the sending or the receiving end.

If this option is selected using any key other than those above a help page is generated which allows you to change the variables displayed on the load flow diagram. To select a particular mode position the mouse cursor over the required option title and:

Press the space-bar to change the display mode

or Press X to select the mode and produce the new diagram display

EDIT THE PRESENT NETWORK DATA : (MAIN OPTIONS)

Select this option to enter data for new networks, or to change or supplement the data of existing networks. It is possible to provide data in stages, entering in the first instance part of the data, or just the data essential for the initial studies. The amount of data provided affects not only the type of studies which can be performed but

also the detail to which plant is modelled in the studies. For example, if only loadflows are to be performed, no generator reactances need be entered, but if fault studies are planned, either the transient or subtransient reactances, or both, must be entered depending on the time interval to be considered.

Data is entered into the arrays in core, and not the system files. It is therefore advisable to file the system, immediately after entering a set of data, and not at the end of a session when it may be forgotten, leading to the loss of the data on exit, file retrieval etc.

The significance and units of data required for each column is given in the EDIT section HELP information and can be accessed directly from the page on which the parameters are listed.

Data can be entered directly (in DATA PAGES 1 and 2), or by reading values from the DATA BASE (via DATA PAGES 3). For DATA BASE details see DATA BASE HELP INFORMATION.

EXIT FROM THE PROGRAM : (MAIN OPTIONS)

Selection of this option exits from PASHA (clearing all system data) and returns control to the terminal. The system in core should be filed before exiting, if it is not already on file and might be needed again. PASHA cannot distinguish between any 'what if' type changes and the planned, design changes in the network, or data, which need to be filed for future use. If a user has selected the CONSTRUCT, MODIFY, or EDIT options, without subsequently filing the new, or modified network, the program issues a warning, and gives the user the option to return and file the network or to exit directly. In the latter case, any changes will be lost on EXIT.

FULL LEVEL CALCULATIONS : (MAIN OPTIONS)

Selection of this option initiates checks to ensure that all essential data exist and, if the checks are satisfactory, selects the appropriate machine models and proceeds with some preliminary calculations common to all fault types. Local options are displayed when this is completed, and allow the type of fault, output etc to be selected, or further "HELP" information to be accessed.

FAULT LOC : (FAULT LEVEL WAVEFORM OPTIONS)

Allows a new fault location to be entered.

FAULTS : (LOAD FLOW OPTIONS)

Enters the fault level section with the system in its current form which will include any outages or load changes

introduced.

FILE THE PRESENT NETWORK : (MAIN OPTIONS)

Enter this section to name and file newly constructed networks, or to file modified networks, or to update the data of networks already on file. New and modified networks should be filed if they are likely to be needed again. Modified networks should be filed to replace the existing, filed version or to create a new, separate file. An individual password can be assigned to each network during the filing procedure and affords protection against unauthorised or accidental file erasure. No restriction is imposed on file retrieval, or on the deletion, or the overwriting of files which have no password (if a blank is entered). The File procedure is conversational and self explanatory but some additional information is given in ARCHIVING FACILITIES HELP. The filing procedure does not disturb, or remove, the network data in core.

FLT FLOWS : (FAULT LEVEL MAIN OPTIONS)

Responds by asking for a busbar to be specified, then redraws the system diagram and displays the maximum MVA flows in each branch for a fault on that busbar. The flows calculated will be for the last type of fault selected. If FLT FLOWS is selected before a fault type is selected, then a L-L-L fault type is assumed.

FLT IMP : (FAULT LEVEL MAIN OPTIONS)

Permits changes in the value of fault impedance.

FLT TIME : (FAULT LEVEL MAIN OPTIONS)

Permits changes of the time at which fault currents are calculated (where the necessary machine data exist to do this).

FULL LIST : (FAULT LEVEL MAIN OPTIONS)

Displays the results of the last fault calculation on the terminal. If FULL LIST is selected before any of the calculation options, the system data will be displayed on the screen.

FULL LIST : (FAULT LEVEL WAVEFORM OPTIONS)

Displays tabulated results on the terminal.

FULL LIST : (LOAD FLOW OPTIONS)

Initiates the display, on the terminal, of the results of the last loadflow calculation. Selecting this option by pressing the space bar gives the full listing. Pressing keys 1 to 6 starts the display at one of the main sections:

- (1) Line power flows,
- (2) Overloaded circuits and violated voltage,
- (3) Busbars,
- (4) Area report,
- (5) Controls,
- (6) Induction motors and
- (7) Transformer tap-changes.

FULL LIST : (TRANSIENT STABILITY MAIN OPTIONS)

Initiates the display, on the terminal, of the tabulated results of the last transient stability calculation. Selecting this option by pressing the space bar gives the full listing. Pressing keys F to B starts the display at one of the main sections:

- (F) Produce a full list,
- (A) List only AVR results.
- (G) List only Governor results.
- (S) List only Synchronous machine results.
- (I) List only Induction motor results.
- (B) List only busbar results.

GENERATOR DATA 1, 2, 3 : (EDIT PAGE MAIN OPTIONS)

These options enable the system data for the Generators to be entered or changed by accessing the Generator data pages. Pages 1 and 2 contain the actual Generator parameters, while page 3 is used to include parameters from the data base.

GOVERNOR DATA 1, 2, 3 : (EDIT PAGE MAIN OPTIONS)

These options enable the system data for the Governors to be entered or changed by accessing the Governor data pages. Pages 1 and 2 contain the actual Governor parameters, while page 3 is used to include parameters from the data base.

HELP : (EDIT PAGE OPTIONS)
: (FAULT LEVEL MAIN OPTIONS)
: (FAULT LEVEL PLOT OPTIONS)
: (FAULT LEVEL WAVEFORM OPTIONS)
: (LOAD FLOW OPTIONS)
: (TRANSIENT STABILITY PLOT OPTIONS)

Displays useful HELP information on the terminal screen.

INDUCTION MOTOR DATA 1, 2, 3 : (EDIT PAGE MAIN OPTIONS)

These options enable the system data for the Induction motors to be entered or changed by accessing the IM data pages. Pages 1 and 2 contain the actual IM parameters, while page 3 is used to include parameters from the data base.

L-G : (FAULT LEVEL MAIN OPTIONS)

Calculates the fault currents for a Line-to Ground fault on each busbar in turn, draws the system diagram and displays the fault MVA for each busbar on the diagram.

L-G W: (FAULT LEVEL WAVEFORM OPTIONS)

Calculates and displays the current waveforms for a line-to-ground fault with maximum asymmetry on the faulted red phase.

L-L : (FAULT LEVEL MAIN OPTIONS)

Calculates the fault currents for a Line-to line fault on each busbar in turn, draws the system diagram and displays the fault MVA for each busbar on the diagram.

L-L W : (FAULT LEVEL WAVEFORM OPTIONS)

Calculates and displays the current waveforms for a line-to-line fault, with equal-opposite asymmetry in the two faulted phases (yellow and blue).

L-L-G : (FAULT LEVEL MAIN OPTIONS)

Calculates the fault currents for a Line-to-line-to-ground fault on each busbar in turn, draws the system diagram and displays the fault MVA for each busbar on the diagram.

L-L-G W : (FAULT LEVEL WAVEFORM OPTIONS)

Calculates and displays the current waveforms for a line-to-line-to-ground fault with equal-opposite asymmetry in the two faulted phases (yellow and blue).

L-L-L : (FAULT LEVEL MAIN OPTIONS)

Calculates the fault currents for a three phase fault on each busbar in turn, draws the system diagram and displays the fault MVA for each busbar on the diagram.

Three different current values can be displayed on the diagram by using the special keys A, P or S:

Press key A to display Asymmetric RMS currents

" key P to display Asymmetric Peak currents

" key S or any other key to display Symmetric RMS currents

L-L-L W : (FAULT LEVEL WAVEFORM OPTIONS)

Calculates and displays the current waveforms for a three phase fault, with either maximum or zero asymmetry on the red phase.

LINE DATA 1, 2, 3 : (EDIT PAGE MAIN OPTIONS)

These options enable the system data for the Line's to be entered or changed by accessing the Line data pages. Pages 1 and 2 contain the actual Line parameters, while page 3 is used to include parameters from the data base.

LOAD CHNG : (LOAD FLOW OPTIONS)

Allows a factor to be entered by which all loads are multiplied and a further loadflow is then performed.

LOAD FLOW : (FAULT LEVEL MAIN OPTIONS)

Permits direct entry, or return, from the faults section to the loadflow section.

LOAD FLOW CONTROL DATA : (EDIT PAGE MAIN OPTIONS)

Selection of this option enables controlling busbars names to be entered using an edit page.

MODIFY THE PRESENT NETWORK DIAGRAM : (MAIN OPTIONS)

Enter this section when changes are to be made to the current network. The system held in core is retained and the drawing section is entered to allow the required changes to be introduced. All changes made are automatically reflected in the system data : deletions of network items remove any associated data entries, whilst additional slots are created for each new item drawn. Any new data can be entered through the EDIT option. New items are entered at the bottom of the data lists and will, therefore, appear at the end of the appropriate data pages.

NEXT PAGE : (EDIT PAGE OPTIONS)

Often, data entries, particularly for some data groups, exceed the number which can be accommodated on the screen and are subdivided into a number of pages. The NEXT PAGE option is displayed only when a further page of data exists, and is blocked when the last page is reached. The standard selection of this option (using the cursor and space bar) displays the page immediately following the current one. If, however, a digit is typed (instead of the space bar), then that number of pages are skipped.

OUTAGES : (LOAD FLOW OPTIONS)

Responds by inviting the user to specify temporary outages for any number and any type of system plant and then performs a loadflow on the reduced system. Any previous outages are restored. Current outages will be carried into the load change and fault options if these are selected next.

PLOT : (LOAD FLOW - FAULT LEVEL)

Plots the entire diagram with the latest result on a plotting file.

PLOT TIME : (TRANSIENT STABILITY MAIN OPTIONS)

Displays a page containing the variables necessary to specify the required plotting of the results.

PLOTX-Y : (TRANSIENT STABILITY MAIN OPTIONS)

PLOT FOUR PER PAGE : (TRANSIENT STABILITY PLOT OPTIONS)

Divides the screen into four sections and plots up to four graphs simultaneously. See the PLOT ONE PER PAGE option.

PLOT ONE PER PAGE : (TRANSIENT STABILITY PLOT OPTIONS)

Plots the first graph required, using the full screen. When each graph is completed, pressing the space bar clears the screen and proceeds to draw the next graph in sequence : - voltage magnitudes, voltage angles, synchronous machine rotor angles and induction motor slips. Any group not required is skipped over in the sequence by omitting to specify names in that group e.g. it is possible to plot induction motor slips only, by entering names in the motor column, but none in the busbar and synchronous machine columns.

PREVIOUS PAGE : (EDIT PAGE OPTIONS)

As with NEXT PAGE, but paging is backwards.

PRINT: (FAULT LEVEL MAIN OPTIONS)

Sends results of the last fault calculation to the lineprinter file for printing later. If PRINT is selected before any of the calculation options the system data will be appended to the line printer file.

PRINT : (FAULT LEVEL WAVEFORM OPTIONS)

Sends tabulated results to the lineprinter file.

PRINT : (LOAD FLOW OPTIONS)

Sends the results of the last loadflow to the lineprinter file. The listing contains system and study titles and details on :-

- (1) Line power flows
- (2) overloaded circuits,
- (3) Busbars,
- (4) Area report,
- (5) Controls,
- (6) Induction motors and
- (7) Transformer tap-changes.

PRINT : (TRANSIENT STABILITY MAIN OPTIONS)

Sends the results of the transient stability calculation to the lineprinter file. Selecting this option by pressing the space bar gives the full listing. Pressing keys F to B starts the display at one of the main sections:

- (F) Produce a full list,
- (A) Print only AVR results.
- (G) Print only Governor results.
- (S) Print only Synchronous machine results.
- (I) Print only Induction motor results.
- (B) Print only busbar results.

PROTECTION: (FAULT LEVEL MAIN OPTIONS)

Refer to chapter 11. (not available in this list yet)

RECENTRE : (DRAW OPTIONS)

Enables the user to re-centre the diagram, thereby allowing a diagram larger than the physical screen size to be constructed. When this option is selected an 'X' is displayed in the centre of the diagram and the user is

invited to specify a new centre point by moving the mouse cursor to his new centre point. If an 'N' is typed at this point and a particular busbar name is entered, this busbar is drawn at the centre of the screen.

REDISPLAY : (EDIT PAGE OPTIONS)

This option can be used to update the current display of a page of data after editing or entering data on that page, or to transfer from one page to another and also from any EDIT page to the associated DATA BASE pages. Position the cursor on REDISPLAY and press :-

1 to transfer from either DATA 2 or DATA 3 to the DATA 1 page.

2 to transfer from either DATA 1 or DATA 3 to the DATA 2 page.

3 to transfer from either DATA 2 or DATA 1 to the DATA 3 page.

F to transfer to the next group of data in the sequence:
busbar, line, transformer, generator, AVR, governor,
induction motor, loadflow control, analysis parameters,
busbar, line,...

B to transfer to the previous group of data i.e. in reverse order to F.

T to transfer from the "system" data pages to the
and vice-versa.

corresp

Page to go through edit pages.

Up-Dn

S to search for a busbar name.

ANY KEY OTHER THAN THOSE ABOVE to display the current page.

NOTE: when a DATA 2, or a DATA 3 page does not exist, pressing 2 or 3 redispays the current page.

REDISPLAY : (TRANSIENT STABILITY PLOT OPTIONS)

Redisplays the "Selection of Variables to be plotted" page to confirm the data entered or to edit this page in the usual way.

RESET TO NORMAL SIZE : (DRAW OPTIONS)

Resets the diagram to the default size and centre position before any scaling changes were made.

RETRIEVE A NETWORK FROM FILE : (MAIN OPTIONS)

Enter this section to access any one of the systems which were constructed and filed on previous occasions. Selection of this option automatically clears any "existing" system data in the computer core and prepares to read in the graphic and system data for the system to be selected from the list of files. The RETRIEVE procedure is self explanatory but some additional information is given in ARCHIVING FACILITIES HELP, which follows this section. NOTE: Any "existing" system data will be lost if it has not been filed.

RETURN : (EDIT PAGE OPTIONS)

Return to the list of data group options, but if X is typed whilst selecting this option, then the return will be straight back to the main options list. The X-RETURN combination performs an automatic filing operation when called from the DATA BASE pages.

RETURN : (FAULT LEVEL MAIN OPTIONS)

Exits from faults and returns to the Main options.

RETURN : (FAULT LEVEL WAVEFORM OPTIONS)

Returns the user to the fault level main options. Keying <X> when selecting this option returns directly to the MAIN options.

RETURN : (LOAD FLOW OPTIONS)

Exits from the loadflow section to the Main Options.

RETURN : (TRANSIENT STABILITY MAIN OPTIONS)

Exits from the transient stability section and displays the "MAIN" options.

RETURN : (TRANSIENT STABILITY PLOT OPTIONS)

Returns the user to the main stability options. Keying <X> when selecting this option returns directly to the MAIN PASHA options.

RETURN TO MAIN OPTIONS : (EDIT PAGE MAIN OPTIONS)

Exits from the EDIT section and returns to the MAIN PASHA

options.

SCALE : (FAULT LEVEL MAIN OPTIONS)
: (LOAD FLOW OPTIONS)

Allows the system diagram to be re-scaled and recentered. Different sections of a large system can thus be displayed on the screen, with the appropriate study results.

SET COLOUR & SYMBOLS : (MAIN OPTIONS)

Default settings can be changed or selected.

TIME SCALE : (FAULT LEVEL WAVEFORM OPTIONS)

Resets the overall fault study time duration and the time axis scale (horizontal). The default value is 100 msec.

TIME STEP : (FAULT LEVEL WAVEFORM OPTIONS)

Sets the time interval at which the instantaneous values of the fault currents are calculated and plotted. Satisfactory waveform displays are obtained by calculating currents at steps of 30 degrees or less. The default value of 30 degrees is treated as a base which can be subdivided into any integral number of steps.

TRANSFORMER DATA 1, 2, 3 : (EDIT PAGE MAIN OPTIONS)

These options enable the system data for the Transformer's to be entered or changed by accessing the Transformer data pages. Pages 1 and 2 contain the actual Transformer parameters, while page 3 is used to include parameters from the data base.

TRANSIENT STABILITY CALCULATIONS : (MAIN OPTIONS)

Accesses the transient stability calculation procedure.

USER DEFINED EQUIPMENT MODELLING : (MAIN OPTIONS)

Refer to chapter 10. (not available in this list yet)

V-MVA DIS : (LOAD FLOW OPTIONS)

Draws system diagram and displays the branch MVA flows and the busbar voltages on the diagram.

WAVEFORMS : (FAULT LEVEL MAIN OPTIONS)

Accesses the fault current waveform plot options.

