

APPENDIX B
ICP STATUS - FEBRUARY 2000
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Note: A few minor changes were made to the original version of this document before adding it as an appendix to this report.

Introduction

This appendix documents the existing problems with the Interactive Calibration Program. It also documents some changes that would be helpful. The primary list is based on the last officially released version of ICP which was version 14.1 on May 6, 1999. The appendix also documents problems that were fixed by Hillel Sukenik after that date and bugs that occurred when those problems were corrected. The last executable made by Hillel for testing before he died was stored in /users/hhs/icp/dev/alpha/for_eric. This version will be referred to as 'ICP.update'.

Possible significant future enhancements to ICP, such as new displays or analysis features, are not included in this appendix. This appendix is only concerned with existing features.

The items are not listed in any priority based order.

Existing Bugs in Version 14.1

1. The WY-PLOT display initially has a non-zero minimum discharge value (can be seen by looking at the Change Analysis Window -- the value shown appears to be the minimum value in the first time series plotted). This causes a distortion in the plot. When the minimum value is set back to zero, the plot is adjusted and plots correctly. The MCP input for the WY-PLOT doesn't allow a minimum scale value to be entered, only a maximum. The initial minimum scale value for the WY-PLOT should always be zero.
2. The unit hydrograph display under the Selected Parameters option of the ICP Edit menu is not correct if the ordinate spacing is not 6 hours. The display assumes that the ordinate spacing is 6 hours. If the ordinate spacing is not 6 hours, the display still shows a 6 hour ordinate spacing and uses 6 hour intervals on the time axis of the plot. The edit feature still works because the sum of the ordinates is retained as changes are made to the ordinates and the time interval of the ordinate spacing is not changed in the input deck. However, the correct time interval of the ordinate spacing should be displayed and the time axis of the plot should be labeled correctly.
3. If 8 or more time series are included on a WY-PLOT display, the 8th time

series is not visible. There is just a black area in the legend and no hydrograph trace. The 9th time series shows up fine.

4. On the soil moisture zone content part of the WY-PLOT Sacramento Model display, the colors don't appear to be scaled correctly for all the zones. For example, from the plot it may look like the zone is about 1/4 full, but if you know the actual value of the contents, it actually contains more than that amount.

5. The max discharge value for a WY-PLOT display cannot be changed in the Change Analysis Window on the first try (either by typing a new value or using the slider bar). On the second and subsequent tries it works fine. This problem was not in previous versions of ICP.

6. When isolated values exist in the time series to be plotted on a WY-PLOT display (i.e. a value surrounded by missing values), sometimes nothing shows up on the screen. Points can be located using the right mouse button, but no symbol is included on the display. Also, sometimes when a isolated value is in a time series, a line is drawn from zero to the value and then back to zero (looks like a spike on the plot) or when missing data is before or after a string of valid values, a line is drawn from or to the bottom of the plot when the valid values start or end. The rules for plotting values when missing data occurs in a time series being plotted should be:

- a. If missing values occur on both sides of a valid value, the symbol for the time series should always be displayed.
- b. When missing values occur before or after a string of valid values, the plot of the valid values should just start or end, there should not be a line going from or to the bottom of the plot.

7. When multiple WY-PLOTs exist in a control deck and the legend is first displayed, the legend for the first plot is always shown no matter which plot is currently being displayed. The initial legend should be for the plot currently being displayed.

8. Problems exist with the percolation analysis feature of the WY-PLOT display that didn't occur in previous versions of ICP. When the Parameters option is selected, the curves that are generated when new parameters are specified and the Compute button clicked should be labeled with different colors (first is white, then magenta, then yellow, then red, etc). The curves are currently all labeled with the same color. If 'quit' is selected (closes percolation analysis) and then the analysis activated again, the contents of the previous display are still

included on the plot (i.e. curves and points -- the curves and points can be removed by selecting the Clear Points option). The percolation analysis displayed should be refreshed whenever it is activated, i.e. it should only contain the current curve and no points.

9. For the PLOT-TS display the scales are not correct when English units are specified for output displays. The display correctly uses the output units flag from the second MCP input card to control the units on the displays. When 'ENG' is specified, the scales are labeled with English unit codes, i.e. IN, DEGF, CFSD, etc, but the actual scale specifications are still based on the PLOT-TS input which is in metric units (e.g. if the input specifies the range for the display to be from 0.0 to 25.4 mm, the scale is labeled as IN (inches) from 0.0 to 25.4 , rather than 0.0 to 1.0, when English units are specified). Scale numbers need to be changed in addition to units codes when English output is requested.

10. The PLOT-TS display allows the right mouse button to be used to determine the exact value associated with a plot. The date and value are displayed in a text window when the right mouse button is clicked (referred to as x-y display). There are several problems with this feature:

a. If the PLOT-TS display consists of several plots with different time interval data (but only one time interval per plot), the feature only works correctly with the time interval of the first plot (e.g. for a display with 5 plots, 3 showing 6 hour data (including the first plot) and 2 showing 24 hour data, the feature only works properly for the 6 hour plots -- for the 24 hour plots the vertical line doesn't correspond to the date in the text window, thus one can't click at a specific time on the plot and get the associated value displayed. -- the vertical line and the date in the text window do agree when the time scale slider is all the way to the left, but not at any other time.).

b. If the first plot of a PLOT-TS operation has multiple time series with different time intervals, the x-y display only works when the time slider is all the way to the left. For other time windows, the cross-hairs don't intersect the plotted curves (e.g. display including hourly QIN and 6 hour SQIN on the first plot). If multiple plots are included, coredumps sometimes occur when switching from one plot to another with the x-y display.

c. The date part of the x-y display only is large enough to show month/day/year and the hour can't be seen. If the text window is expanded, only the value portion of the window is enlarged. One can move the date value to see the hour, but this has to be done every time that a new value is selected which is quite time consuming. The date portion of the text window

should also enlarge when the window is resized so that the entire date is visible (the initial size of the window could also be made larger so the date is visible and the window doesn't need to be resized).

d. The value shown in the text window is labeled as to units, either English or metric (depending on the output units flag), but the value shown is always in metric units.

11. The panner window of the PLOT-TS display should ignore missing values when determining the scale used for the plot. Currently if the panner is displayed for time series with missing values the scale is -999. to the max value -- missing values should not be used to determine the scale and should not be included on the display. This should also be true for missing time distribution values (-998.) in a station precipitation time series. Missing values are not used to determine the panner scale for a WY-PLOT display.

12. For the PLOT-TS display the time period shown needs to be retained after MCP is rerun and the display refreshed. Currently whenever MCP is rerun and the PLOT-TS display is refreshed using the Select menu, the display returns to the beginning of the time period for the run. The time window last displayed should be retained when the PLOT-TS display is refreshed as in the case of the WY-PLOT display.

13. The documentation for the PLOT-TS operation in section V.3.3 needs to be updated to specify how the input is used for the ICP graphical display. This includes:

a. Card 1 -- Plot Option -- option 3 is always used.

b. order of plots (based on order of cards 2 and 3) -- for the text display the first plot input is at the bottom of the display, while for the graphical display the first plot input is at the top.

c. use of number of columns for each plot as specified on card 2 -- these are used to determine the relative size of each plot for a text display, but are not used for the graphical display (all plots are initially the same size on the graphical display and then can be resized by the user)

14. When the WY-PLOT display percolation analysis window is resized after "points" have been added, the points don't stay in the proper place relative to the LZDEFR scale. Resizing in the vertical direction works fine, i.e. the points stay at the proper place relative to the percolation scale. Resizing in the horizontal direction doesn't work properly.

15. When the PLOT-TS display includes the same time series on multiple plots, the duplicated time series doesn't appear on any of the plots.

16. For the WY-PLOT display, if a non-zero minimum discharge value is entered via the change analysis window, the plot is not displayed correctly. The display needs to plot correctly between the minimum and maximum discharge values. Currently the scale is adjusted properly, but the values are not plotted correctly. The x-y display still shows the correct data values, but the plotted values are not at the correct scale location. When entering a minimum plot ordinate a check should also be made to make sure that the minimum plot ordinate is not greater than maximum plot ordinate (plot can currently freeze when this occurs).

17. When multiple WY-PLOT displays are included, one can switch from one display to another when using the arithmetic scale and from the first to a subsequent display when using the semi-log scale, but a core dump can occur when switching from a subsequent display back to the first display when using the semi-log scale.

18. A core dump can occur under the WY-PLOT display if the Panner window is selected, then Closed, and then the Change Analysis window is selected.

19. If multiple PLOT-TS displays are included, problems occur when switching from one display to another. This includes vertical scales not being correct, panner display messed up, saving and reloading of time series messed up, and sometimes core dumps or abnormal exits. Even if one Quits the PLOT-TS display and reactivates it, the problems persist.

20. Problems can occur when switching from one watershed to another without exiting ICP, especially if the run periods are not the same. Currently it is best to Exit ICP before switching to another watershed.

Changes Suggested for Version 14.1

1. The Snow and Unit Hydrograph selected parameter windows always have to be resized in order to see everything when they are first brought up, whereas the Sacramento Model selected parameter window doesn't (actually even the Sacramento Model window needs to be resized when multiple SAC-SMA operations exist). This is also the case with the ET-demand Curve Text Editing window and the Areal Depletion Curve Text Editing window. When these windows are first selected, their entire contents should be visible.

2. It would be more informative if the "Edit Wide Listing " label would be changed to "View MCP Listing".

3. It would be nice to have a feature under the Unit Hydrograph Selected Parameter Change to be able to change the area associated with the unitgraph. The area could be shown and if the user decided to change it, a new area would be entered and all the ordinates would be multiplied by the ratio of the new area to the old area. Many RFCs have existing unitgraphs that don't quite represent the correct area.
4. When clicking in the WY-PLOT and PLOT-TS display areas with the right mouse button to display the date and value (x-y display), the crosshairs generated need adjusting relative to the time scale. Currently a given date is displayed when you click anywhere from immediately after that date up to the start of the next date. It would be better if when you click anywhere within + or - 1/2 the time interval around a given date, that date would be displayed. This can be best seen when a small number of days are display (e.g. 31 days), though it is evident even when a year or more of data are shown in the window.
5. When the PLOT-TS display is selected on the main Display menu a window appears that just includes a time bar (with no dates) and slider, but no plots. If you use the slider bar, the program coredumps. From this window one then selects which PLOT-TS operation is to be displayed. It seems like when you select the PLOT-TS option under the Display menu that the first PLOT-TS operation in the MCP control deck should be displayed just like with the WY-PLOT display. Then you would use the Select menu to display other PLOT-TS operations if there are more than one in the control deck.
6. It would be nice to be able to edit time series via the new PLOT-TS display. One use of this display is to check the form of precipitation by displaying MAP, MAT, SWE, SNOG, and daily flow time series. When the form of precipitation is not correct, the MAT time series are altered to change rain to snow or vice-versa. It would be nice with the PLOT-TS display to click on the right mouse button and display a value and then change that value in the small text window and click on a 'Edit Value' or 'Change Value' button and have the value changed in the time series. Any time series to be edited would first need to be specified somewhere (a list of INPUT time series could be provided to select from -- only INPUT time series should be changed). At that point the time series would be read from the appropriate file into temporary storage. When the editing is complete, a new time series would be written back to the same file with a suffix attached to the end, thus the original time series would be preserved.
7. For the WY-PLOT display currently only one 'SQME' time series can be saved for display when the 'Load Last SQME' feature is selected. If there are multiple WY-PLOT operations, still only one SQME time series for only one of the

plots can be saved. It would be nice to at least be able to save one SQME time series for each plot. Even better would be a feature like used by the PLOT-TS display where one time series of any type can be saved for each plot and then reloaded later.

8. WY-PLOT hydrograph displays should be in English units if the output flag on card 2 of the MCP control deck is set to 'ENG'. (Future list item 1)

9. The x-y display for PLOT-TS allows the value of any plotted time series to be displayed. The plotted point closest to where you click is the one included in the x-y display. This feature should be added to the WY-PLOT display. Currently the WY-PLOT x-y display only looks at the first time series in the plot (normally QME).

10. Under the Select option of the PLOT-TS panner display, it would be helpful to display the identifier, as well as the data type for each time series on a plot. Currently only the data type is displayed and there may be several of the same data types included on the plot.

11. An x-y display feature would be helpful for the WY-PLOT SNOW-17 and SAC-SMA displays so that exact values can be determined from the plots.

12. It would be nice if the legend window for the PLOT-TS display would show which color line is used for each time series.

Problems Fixed in ICP.update

1. Minimum plot ordinate for the WY-PLOT display is now initially set to 0.0. (item 1 in version 14.1 bug list)

2. Maximum plot ordinate for the WY-PLOT display can now be changed on the first try via the Change Analysis window. (item 5 in version 14.1 bug list)

3. English units are now properly shown on PLOT-TS displays and the PLOT-TS x-y display. (items 9 and 10.d in version 14.1 bug list)

4. The PLOT-TS x-y display now shows the correct date for all plots even if different time intervals are used for the plots. (items 10.a and 10.b in version 14.1 bug list)

5. Both the date and value portion of the text window for the PLOT-TS x-y display will now change when the window is resized. This enables the user to view the entire date field (i.e. month/day/year/hour) at one time. (item 10.c in version 14.1 bug list)

6. The PLOT-TS panner display no longer uses missing values when determining the scale of the panner plot. However, now the scale for the panner display for each plot is based only on the first time series in the plot even if other time series contain larger values. (item 11 in version 14.1 bug list)
7. The time period displayed by PLOT-TS is now retained when the plot is refreshed by clicking under the Select menu. (item 12 in version 14.1 bug list)
8. When using the WY-PLOT and PLOT-TS x-y displays, the crosshairs will appear at the closest data point, in the horizontal direction, to where you click rather than the preceding point. (item 4 in version 14.1 suggested change list)
9. The time series value contained in the x-y display for the WY-PLOT was changed to be the same as for PLOT-TS, i.e. the time series closest, in the vertical direction, to where you click is displayed. This allows the value of any time series in the plot to be shown in the x-y display. (item 9 in version 14.1 suggested change list)

Changes Made in ICP.update

1. Changed vertical discharge scale on the WY-PLOT display so that if the maximum minus the minimum is less than 250., then the increment is set to 10. rather than 50.
2. Time scale at bottom of WY-PLOT display was adjusted so that it lines up properly with the discharge, snow, Sacramento displays.

New Bugs in ICP.update

1. The x-y display for the WY-PLOT operation is not correct when the semi-log scale is selected. In some cases values shown in the test window are even negative.
2. The problems noted under item 19 in the version 14.1 bug list still occur when switching from one PLOT-TS display to another. In addition, the time scale may also not be correct and sometimes the Change Analysis window can't be used to change the maximum and minimum scale values.
3. For the WY-PLOT display, the values are still not plotted properly when a non-zero minimum discharge value is entered via the Change Analysis window (item 16 in version 14.1 bug list) though the plotting is now done differently than in version 14.1.