HHC 2011 Report

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Introdction

The 38th conference[1] dedicated to HP Calculators, known as the Hewlett-Packard Handheld Conference, HHC, was held at the HP facility in San Diego CA September 24 & 25, 2011. Seventy four serious HP enthusiasts registered from six countries – Argentina, Canada, France, Germany, UK, and the US. Sixty nine of the registrants were present for the mid-day Saturday group photo.

photo by Joseph K. Horn

Fig. 1 – Group photo of the 2011 HHC attendees.

HHC 2011 was truly exceptional

This year was especially exciting because of the six "new" machines that were discussed. These are represented by the photo(s) shown on the cover of the proceedings. See Fig. 2. If you are an up-to-date HP user you should recognize all the machines except that shown symbolically in the second row center.

The first machine in the top row is the HP-41CL[2]. This project has been reported in previous issues of *HP* **Solve**. The first Beta test batch of machines were well received and an order list for the second batch is being made. I haven't heard of anyone being disappointed and users are reporting great strides in being able to have the machine contain and back up incredible amounts of software – more than any other calculator.

The top row center machine is the WP 34S. Eric Rechlin brought a hugh number of overlays to sell and donate as door prizes. I don't think he went home with any so at least 70% of the attendees have one to either put on their machine at home or put on a machine (repurposed HP 20b or HP 30b) they obtained at the Conference. Anyone who needed their calculator reprogrammed was able to have it done during the Conference. Getting set up to reprogram the newer HP calculators (20b, 30b, 15c+, 15LE, or 12C+) requires a computer that has a serial interface which is no longer standard on computers these days.

The last machine in the top row is the recently announced HP 12C 30th Anniversary Edition. This machine was well documented in the last issue of *HP Solve*. The first two of the top row machines are HP user community created machines.

Photos by Richard J. Nelson

Fig. 2 – HHC 2011 Proceedings cover representations of the six "new" machines discussed at HHC 2011. One half of the machines are HP User community created.

The first machine in the bottom row is the recently announced HP 15C Limited Edition. A few people were able to go home with one as a door prize or purchased from a couple of people who had some to sell. this machine was also well documented in the last issue of *HP Solve*.

The middle "machine" (symbolically) is a new machine that will be announced by HP very soon. See article elsewhere in this issue.

The last machine is the latest incarnation of home made calculators in the build-your-own-calculator series by Eric Smith. He presented a recent new high resolution display for his series of machines reported at previous HHC conferences.

The last one of the bottom row of three machines is a user community created machine. HHC 2011 is the only conference when the user community participated in the presentation of as many "new" machines as HP. Of course all of the three user community machines are based on HP machines in one way or another.

HHC 2011 was so packed with technical presentations that we had to extend the hours and maintain a strict adherence to each speakers allotted time. We tried a new method of doing this using a stop light, see Fig. 3, visible to everyone. When it turned yellow the speaker had a minute left and then the red light ended the presentation! This idea is actually an HP inspired mechanism used at their internal conferences as described by Eric Vogal at a Conference many years ago.
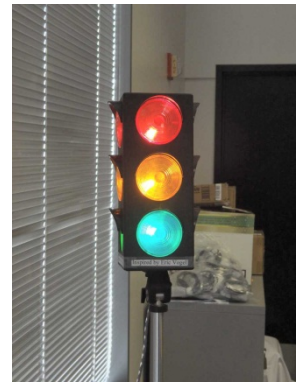

Photo by Jake Schwartz

Fig. 3 - Speaker's stoplight

Conference presentations

HHC 2011 presentations ranged from an extensive and intense confidential presentation by HP to a WP 34S keyboard overlay application demonstration video projected to the large screen. The topics varied from new HP 50g libraries to HP calculator accuracy analysis. See partial list in Fig. 3. This is from the Contents of the Conference proceedings. Many speakers only brought their presentation on a thumb drive in the form of a power point presentation.

#	Title	Author
1	HP 49G+ / 50G O.S. Extension pack.	Andreas Möeller
2	SR-60 Compared to HP Desktops.	David Ramsey
3	Scaled Reptiles of the Nordic Countries.	Eric Smith
4	A User's Perspective of the HP 41CL by Systemyde International.	Geoff Quickfall
5	An HP16C/WP 34S Dictionary.	Jake Schwartz
6	The Four Meanings of "Accurate to 3 Places."	Joseph K Horn
7	How WP 34S Came into Existence.	Marcus von Cube
8	41CL Beta Test Results.	Monte Dalrymple
9	Limited Edition HP 15c Execution Times.	Namir Shammas
10	HP-15C Benchmark: the Devil is in the Details.	Patrice Torchet
11	The PPC Rom 30 Years Later.	Richard J. Nelson
12	Generating normal Deviates.	Richard Schwartz
13	HP-12C Through the Decades.	Wlodek Mier-Jedrzejowicz

Fig. 4 – Partial list (≈60%) of the presentations given at HHC 2011. Monte Dalrymple was not able to give his presentation in person.

We had a special treat when Dennis Harms, one of the HP developers of the voyager series (especially the HP-12C) described the HP software development environment of the late 70's and early 80's. It was very clear that the tools and conditions of "then" and "now" were so different that the current team could not work under the "old" conditions and vice versa.

Best speaker

The attendees vote for the best speaker. Often the difference between first place and second place is one vote. It was very clear that Joseph K Horn deserved winning the Best speaker Award for HHC 2011. His topic was universal and very important for all HP calculator users. See **(3)** for a video link.

His presentation was well prepared and illustrated some very clever techniques for describing how accuracy may be viewed. His HHC 2011 paper may be found elsewhere in this issue.

Photo by Gary Friedman

Fig. 5 – Joseph K. Horn shows certificate.

HP Panel

One of the more important aspects of an HHC is being able to have your questions answered by the HP

Photo by Richard J. Nelson

Fig. 6– HP Q&A Panel. Left to Right: Tim Wessman, R&D; Cyrille de Brebisson, R&D; Laura Harich, Marketing; Julia Wells, Education; and Enrique Ortiz, Latin America Sales.

people who are directly involved with calculators. One hour of time was allocated and everyone was able to question, suggest, and challenge the panel. Fig. 6 shows the HP panel answering questions.

Door prizes

Door prizes[4] were another exceptional part of the 2011 Conference. HP had recently shuffled their offices and many interesting items were collected during the "clean up." These machines and other items were donated to the door prize table. The number of calculators and their variety were greater than anything we have seen at any HHC. You may see some of the door prizes in the background of Fig. 6.

Photo by Jake Schwartz

Photo by Jake Schwartz

Fig. 7 – HP donated calculators.   *Fig. 8 – Opposite end of prize tables with lots of technical goodies.*

The door prizes are donated by HP, the Committee, and the attendees. They are divided into two groups by the HHC Committee. The most valuable or rare items are put into a premium group – usually 5 to 9 items – by the HHC Committee[5]. See Fig. 9 below. The remainder of the prizes are in the main group as shown above. The best speaker gets first pick of this group. Contest winners then get their pick. The remainder of the prizes are selected by drawing the registration tickets at random. When every prize is given away – very close to three per attendee this year – the tickets are put back into the ticket box and everyone gets a chance for one of the premium group prizes.

Based on the video from both cameras here is what was happened. Because there were so many prizes and time was pressing we were not able to write down more detail.

1. The "regular" door prizes lasted almost exactly three full passes through the tickets....there were only a few left in the third batch when the prizes ran out.

2. We have the order and names of the premium prize winners, but we were not able to see exactly what everyone selected. Table 1 lists the winners, in order:

Fig. 9 – Most of the premium prizes. This photo was taken early before all the prizes were drawn – 12 total.

Table 1 – List of Premium Prize Winners

1. Eddie Shore selected the HP71B
2. Egan Ford (took some sort of cable-connected device not seen in Fig. 9 - what was it?)
3. Andreas Moiller (*Germany*)
4. Mark RIngrose (*UK*)
5. Geoff Quickfall took the HP80 (*Canada*)
6. Felix Gross (*Germany*)
7. David Hayden
8. Jeff Bronfeld
9. Roger Hill
10. Howard Owen
11. Neil Hamilton
12. David Ramsey (for spouse Mary)
    (3 of the last 4 prizes were the HP48GII, the HP48G+ and the HP 49G+)

Programming contest

Every HHC has to have a programming contest. We conducted an RPL RPN Programming Contest for the HP 50g (conducted by Bill Butler) and then a contest for legacy RPN machines (Gene Wright). see appendix A for the Contest details.

The winner of the legacy RPN contest used the WP 34s. Code:

```
001 Rv              013 RCL 01
002 Rv              014 X^2
003 STO 01          015 -
004 DSE 01          016 SQRT
005 GTO 02          017 CEIL
006 GTO 03          018 STO+00
007 LBL 02          019 DSE 01
008 STO 00          020 GTO 01
009 X^2             021 RCL 00
010 STO 02          022 LBL 03
011 LBL 01          023 4
012 RCL 02          024 x
```

The execution time for a radius of 5000 was about 28 seconds.

After the conference, solutions were posted on the HP Museum forum that were faster and for older machines. For reference the HP 67 found the answer for a radius of 5000 in about 1.4 hours.

The fastest program posted to the museum was for the WP 34S. It solved the 5000 radius problem in just under 2 seconds, as it was found that integer mode on the WP 34S worked much faster.

```
001 BASE 10         014 RCL- Y
002 RCL Z           015 RCLx Y
003 FILL            016 SQRT
004 STO+ Z          017 FS? C
005 RCLx X          018 INC X
006 2               019 SL 1
007 /               020 STO+ Z
008 SQRT            021 DROP
009 INC X           022 DSE X
010 STO Z           023 BACK 10
011 STOx Z          024 4
012 -               025 RCLx Z
013 RCL T           026 DECM
```

The HP Museum thread showing many examples of programs for various machines can be found here:

http://www.hpmuseum.org/cgi-sys/cgiwrap/hpmuseum/archv020.cgi?read=197720

Observations and conclusions

The number of new machines discussed at HHC's has been decreasing in the last decade. The exception for "new" machines was made this year with a total of six machines to discuss with the actual software engineers that spirit their development. Only one developer was not present, see Fig. 4. Perhaps not all team members were able to present, but at least one team member for each machine was at HHC 2011.

The technical challenges of setting up the Conference were substantial this year because HP had several conferences of their own taking place during "our" weekend. At 1 PM on Friday it looked like we wouldn't have enough tables, chairs, of square footage. We had 88 attendees pre-registered on the website and tables for 32. Space was a bit tight as the photos show, but the technical problems were solved and the Conference was a great experience for everyone. The official HHC Hotel, The Holiday Inn, even pitched in delivering tables on Friday afternoon.

It is the enthusiasm and problem solving attitude of all the attendees that makes our conferences unique. Will it will be possible to top 2011? Who knows, we are a long way from September 2012 so all bets are off. The future of HP calculators is indeed bright.

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Notes for HHC 2011 Report

(1). To review all HHC's of this century see: hhuc.us.

To review a list of all past HHC's see: http://hhuc.us/2011/conflist.htm

(2). To get more information on the HP-41CL See *HP Solve* issues #24, page 35, #23 page 38, and #23 page 11.

http://h20331.www2.hp.com/Hpsub/cache/580500-0-0-225-121.html?jumpid=reg_R1002_USEN

(3) To watch Joseph's HHC 2011 talk see: http://www.youtube.com/watch?v=CYR-1jBTUa4

(4). See this link for a partial list of (non-HP) door prizes. The final number was at least seven times those on the list. http://hhuc.us/2011/Door-Prizes-2011.pdf

(5). The HHC 2011 Committee is comprised of the following:
Gene Wright – Registration.
Richard J. Nelson – Hotel, Speakers Schedule, Proceedings.
Joseph K. Horn – Website.
Jake Schwartz – Videographer, Historian.
Eric Rechlin – Reality checker, general helper.

# Appendix A – HHC 2011 Programming Contests – Page 1 of 2
HHC 2011 Legacy RPN Programming Contest Rules

Problem Description: Did you know that if you draw a circle that fills the screen on your 1080p high definition display, almost a million pixels are lit? That's a lot of pixels! But do you know exactly how many pixels are lit? Let's find out!

Assume the display is set on a Cartesian grid where every pixel is a perfect unit square. For example, one pixel occupies the area of a square with corners (0,0) and (1,1). A circle can be drawn by specifying its center in grid coordinates and its radius. A pixel on the display is lit if any part of is covered by the circle; pixels whose edge or corner are <u>just touched</u> by the circle, however, are not lit

You must compute the exact number of pixels "lit" when a circle with a given position and radius is drawn.

Input: Each test case consists of three integers, x, y, and r (1 $\leq$ x, y, r $\leq$ 5000), specifying respectively the center (x, y) and radius of the circle drawn. The radius will be loaded into stack register Z, the y coordinate of the center of the circle into stack register Y, and the x coordinate of the circle into stack register X. Assume successive program runs are to be started by simply entering new values and pressing R/S. Assume that all circles fit on the display panel even if in reality they would not.
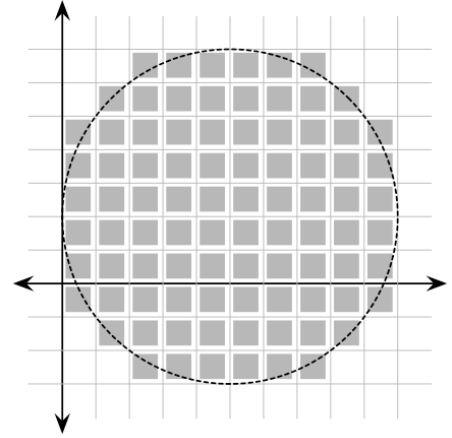
Output: Return the number of pixels that are lit when the specified circle is drawn.

Sample Cases: (A) Input of 1 ENTER 1 ENTER 1 R/S should return 4. This represents a circle with a center of (1,1) and a radius of 1. The display would have 4 pixels "on" to represent this circle. (B) Input of 5 ENTER 2 ENTER 5 R/S should return 88. This represents a circle with a center of (5,2) and a radius of 5. The display would have 88 pixels "on" to represent this circle. This is the circle shown in the figure above. 88 pixels are "on" in this picture.

Machines Eligible: This contest is open to any and all RPN machines: 15c, 15c+, 15c LE, 34S, 41CL, 42S, 67, 65, etc. RPL users are welcome to try the problem, but this is for RPN machines only.

Rules: (aka the fine print)
1) The decision of the judge is FINAL. No appeals are allowed to anyone or anything.
2) The purpose of this contest is to have fun and learn.
3) At least two contestants must submit an entry.
4) No custom built ROM or machine code can be built and used for this problem. Any already existing functionality in the machine is ok.
5) You must submit a machine with your program already keyed in to the judge AS WELL as a legible listing of your program with your name on the listing AND the machine. Machines with no names that are given to the judge are assumed to be <u>gifts</u> to the judge. Thank you!
6) Submission must be made by the end of the contest (Time is TBA).
7) Assume the program will start running with step 001 and/or a R/S.
8) By submitting a program, you agree to allow it to be shared with the community.
9) This is a contest between individuals, not teams. One submittal <> one person.
10) You may not access the internet for any help in any fashion. Do not cheat in any way. Do not check the HP Museum Forum either.
11) You must be present to win.
12) If a point is unclear, ask immediately. No excuses for ignorance. Clarifications will be shared with the entire group during the conference.
13) Assume default machine settings. Your program must stop with the default settings in place.
14) Winner will be the program with the fastest times over the test cases giving correct results. If in the judge's sole discretion, two entries are "about the same speed," the winner will be the shortest routine. In case of a tie, the most elegant solution (according to the judge) wins.
15) The purpose of this contest is to learn and have fun. Happy Programming.

HHC 2011 RPL RPN Programming Contest Rules

The Problem

Write a program for the HP50g in RPN Mode which takes a non-empty string of any length consisting of some or all of the 26 letters A, B, C … Z and returns, as a type 28 integer, the exact number of distinct arrangements of these letters in the string. (Permuting multiple occurrences of the same letter does not change the arrangement.)

Examples

$$\text{"DEEDED"} \rightarrow 20$$
$$\text{"ANTITRINITARIAN"} \rightarrow 126126000$$
$$\text{"ABCDEFGHIJKLMNOPQRST"} \rightarrow 2432902008176640000$$
$$\text{"AAAAABBBBBCCCCCDDDDDEEEEE"} \rightarrow 623360743125120$$

Note that these results are 6!/3!3!, 15!/3!3!3!4!2!, 20!/1!^20 and 25!/5!^5 respectively.

The Rules

1. The program must be a (self-contained) single object in user code which does not call itself by name.
2. Default flag settings (except for flag –95) are assumed and must be restored if changed.
3. The stack, apart from input and output, must be left as found.
4. The program must not contain KILL or otherwise interfere with the programmatic testing and evaluation of submissions.
5. Your program must be transferred to the judge's machine under some identifying three-letter name before the announced deadline.
6. The winning program will be the one for which size*speed (bytes*sec) is least, where the speed of execution will be determined for one or more longer input strings, probably of several hundred letters, chosen by the judge.
7. The purpose of the contest is to have fun and the decision of the judge is final.

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