

PJK Methodology: Measuring Ring Width

Materials:

PJK11v1_osx program on Mac
Measuring device Metronics qc-1000
Dated cores or cookies

Initialize the program:

1. Make Sure Metronics device is turned on (on switch is on the back of the device) before opening pjk program.
2. Open the PJK11v1_osx program on the Mac desktop.
3. After opening PJK, hit “continue” until reach “Initial Program Set-up Menu”
4. Follow Instructions:
Select “reverse dates” (rv) by typing rv, enter
Press enter
Enter initials
Enter date (ddmmyy)
Enter file name (ddmmyy,session#)
5. Verify data input thus far
Series id (sample id #)
Verify data (t)
6. The program will create an individual file for each session rather than each tree core or cookie.

See the “Guide for Measuring Cores” document before proceeding.

Measure sample:

1. Set sample on velmex platform and position microscope. Core should be on the stage so that the inside is to the right and the bark is to the left.
2. Set ocular cross hairs on middle on the sample’s pith, then wind tray out so the cross hairs are lined up against the edge of the last ring. The measuring stage needs to be positioned so that there is enough free travel to measure the entire core. Set the stage-lock lever to the right (disengage) and move the stage to the left until it is over far enough (but not to the end). Set the lever to the left (engage).
3. Examine the inside rings of the core to determine the appropriate first-year of measure. Often this is the first full ring after the very inside (partial) ring. Sometimes the inner rings are mis-shapen due to growth abnormalities, or are difficult to measure adequately because the ring boundaries are nearly parallel with the long direction of the core. In these cases, one should exclude the innermost rings (usually 2-5, sometimes 20 or more) from measurement.
4. Count back to the first decadal mark to confirm the first year of measurement.
5. Align the core so that the right edge of the vertical crosshair is at the boundary of the first ring to be measured, and so that the measuring path will follow the guidelines described earlier.
6. Zero Metronics device.

7. Turning the knob on the stage “forwards” clockwise moves the stage to the right and increases the value shown on the display. This is the normal direction of measure.
8. Record measurement by pressing the measure button and then advance to the next ring.
9. End session by turning handle counterclockwise so the Metronics device reads a smaller number.
10. Follow menu selections; either quit program or measure new sample.

Ring Width Analysis:

1. Convert .raw/.raw file to a text file so it can be read/imported into excel.
2. Using add on “OpenRWL1.0” add data into excel spreadsheet.

PJK Commands:

THE FOLLOWING DOCUMENTATION DESCRIBES ALL OF THE INTERRUPT FEATURES OF THIS PROGRAMS.

(W): WRITES THE CURRENT MEASUREMENTS TO THE OPEN OUTPUT FILE.

(SO): STARTS THE MEASUREMENT LOOP OVER AGAIN FROM IYR (INITIAL YEAR) OR FYOG (FIRST YEAR OF GROWTH).

(SS): SHIFTS THE ENTIRE SERIES OF MEASUREMENTS FORWARDS OR BACKWARDS (RIGHT OR LEFT) THE DESIRED NUMBER OF YEARS.

(V): VIEW THE CURRENT MEASUREMENTS ON THE SCREEN.

(D): DELETE A SINGLE MEASUREMENT OR A RANGE OF MEASUREMENTS DEFINED BY A SINGLE STARTING YEAR AND A NUMBER OF MEASUREMENTS TO DELETE.

(I): INSERTS ANY VALUE INTO THE MEASUREMENT SERIES AT ANY USER DEFINED LOCATION, SHIFTING THE REMAINING MEASUREMENTS TO THE RIGHT OR LEFT IF REVERSE MEASUREMENT MODE IS BEING USED.

(R): RE-MEASURES x# OF MEASUREMENTS FROM THE CURRENT POSITION. THIS OPTION WILL NOT LET YOU RE MEASURE A SEGMENT IN THE MIDDLE OF THE SERIES AND RESUME WITH THE MOST RECENT MEASUREMENT. IT ONLY ALLOWS THE USER TO GO BACK OVER THE MOST RECENT WORK.

(C): CONTINUE - RESUME MEASURING, CONTINUING WITH THE LAST MEASUREMENT (MOST RECENT) MADE.

(RS): RESET STAGE -->>METRONICS QC1000 & MICROCODE II DISPLAY ONLY THE RESET STAGE OPTION ALLOWS THE USER TO MEASURE SAMPLES LONGER THAN THE MEASUREMENT STAGE LENGTH. WHEN THE END OF THE STAGE IS REACHED RETURN TO THE INTERRUPT MENU AND SELECT (RS). THE MEASURING PROGRAM WILL PROMPT YOU TO REPOSITION THE SAMPLE AND ZERO OUT THE

DISPLAY. FROM THIS POINT ON THE MEASURING PROGRAM NOW TRACKS TWO CUMULATIVE DISTANCE MEASUREMENTS BY CONTINUING TO ADD INCREMENTS TO THE PREVIOUS SET AND STARTING A NEW CUMULATIVE DISTANCE SERIES BEGINNING FROM THE POSITION WHERE THE STAGE WAS RESET.

--> ACU-RITE III DISPLAY ONLY <<--REPOSITIONING A SAMPLE USING THE ACU-RITE THREE DISPLAY DOES NOT REQUIRE AN INTERRUPTION OF THE MEASUREMENT PROGRAM. REPOSITION THE STAGE APPROPRIATELY AND MANUALLY ENTER THE LAST CUMULATIVE DISTANCE MEASURED INTO THE CURRENT ACU-RITE DISPLAY BUFFER AND CONTINUE MEASURING.

(Q): ABORT PROGRAM - WHATEVER MEASUREMENTS ARE IN THE CURRENT BUFFER WILL BE LOST, MEASUREMENTS MADE FROM EARLIER SAMPLES ARE SAVED. TO SAVE CURRENT MEASUREMENTS WRITE THEM TO THE OUTPUT FILE FIRST (W).

<<<<<<<<<<< STOP MEASURING >>>>>>>>>>>>

TO QUIT THE MEASURING LOOP AT ANY TIME SEND A CUMULATIVE DISTANCE VALUE THAT IS LESS THAN THE PREVIOUS CUMULATIVE DISTANCE. THIS WILL TRIGGER THE_ PROGRAM TO COMPUTE A NEGATIVE INCREMENT, A REAL IMPROBABILITY, AND RETURN THE USER TO THE MAIN INTERRUPT MENU.

VERSION 13: HIT ANY KEY.

MICROCODE II DISPLAY INSTALLATION INSTRUCTIONS *****

SET UP OF THE MICROCODE II DEVICE IS SIMPLE. SWITCH ON THE DIGITAL DISPLAY AND CHECK THAT THE DIRECTION SWITCH, ON THE BACK OF THE MACHINE IS SWITCHED TO THE RIGHT. ON THE FRONT PANEL BE SURE THE UNITS SELECTION SWITCH IS SET TO MM. AND THE DISPLAY IS IN ABS. ABSOLUTE MODE. WHEN SWITCHING ON THE MICROCODE THE DISPLAY WILL READ "HELP.OO", THIS IS NORMAL, ANYTHING ELSE IS NOT GOOD, SWITCH OFF THE MACHINE AND

START AGAIN. TO ZERO OUT THE DISPLAY USE THE "ZERO" BUTTON ON THE FAR RIGHT. NOTE THAT THE NUMBER DISPLAYED ON THE MICROCODE IS THE CUMULATIVE DISTANCE TRAVELED FROM THE INITIAL MEASUREMENT YEAR. WHEN RESETTNG ONES POSITION OR CONTINUING MEASUREMENTS THE MEASURING PROGRAM WILL ALWAYS PROMPT THE USER TO MOVE THE SAMPLE TO THE LAST CUMULATIVE DISTANCE RELATIVE TO THE INITIAL MEASUREMENT YEAR.

METRONICS OC1000 *****

SIMILAR TO THE MICROCODE II THE QC-1000 WHEN TURNED ON DISPLAYS THE RESULTS OF A SELF TEST THAT IS CLEARED WHEN THE DISPLAY ON BUTTON IS PUSHED. TO OPERATE CORRECTLY BE SURE THAT THE DISPLAYS INTERNAL SET-UP PARAMETERS ARE SET PROPERLY. DIRECTIONS ON WHAT PARAMETERS NEED TO BE CHANGED ARE GIVEN

IN THE MEASURING PROGRAM's "WhyBother" FILE. INSTRUCTIONS ON HOW TO CHANGE THESE PARAMETERS ARE PROVIDED ON THE LAST PAGES OF THE QC-1000'S OPERATIONS MANUAL. LIKE THE MICROCODE II WHEN MEASURING HAS REACHED THE END OF THE STAGE LENGTH THE DISPLAY MUST BE RESET AND ZEROED-OUT.

THIS FILE IS CALLED PJK.DOC. IT MAY BE PRINTED OUT AND USED AS AN OPERATORS GUIDE. THIS MEASURING PROGRAM WAS WRITTEN BY PAUL J. KRUSIC, TREE-RING LAB, LAMONT-DOHERTY GEOLOGICAL OBSERVATORY AND IS AVAILABLE FREE FOR MACINTOSH COMPUTERS ONLY.

FOR MORE INFORMATION ABOUT THE PROGRAM IT'S SETUP AND OPERATION, SEE THE WhyBother FILE THAT CAME WITH THIS PROGRAM.
EOF [END-OF-FILE] <RETURN TO INTERRUPT MENU

Useful Information for the PJK program operation:

Everything about the current pjk program is the same as the old programs. Even the same old HELP file is included <pjk.doc>. Actually, you could edit/modify/greatly improve this file yourself to update expand or correct its content and the program will wouldn't care less as long as the file you make is called pjk.doc and remains a plain text file.

Just as one did with early versions of pjk you must tell it the program what type of Display you have and where to find it. The first time the program is opened it will search for a file called pjk setup. If the program cannot find this file you will be asked to provide it with two important bits of information beginning with the model DRO (Digital ReadOut) you are using. The choices are confined to three specific manufacturers' brand names, Metronics, Boekeler and AcuRite. As a matter of fact, the program is in no way wedded to these brands at all and pretty much any serial device that can transmit measurements via a Serial line in an ascii string, could be used with little change to the program's source code.

The next difference is how the program determines the port to use for reading. Truth be told, you do the selecting, the program only presents you with the choices it has found (from the installed USB-Serial adaptor's driver). The choice you make will begin with /dev/tty.... followed by a name of some kind given by the manufacturer of the usb-2-serial converter you are using. On my MacBook using a Keyspan USA 28X dual port adaptor, the port address I use is called /dev/tty.USA28X3d1P2.2 using a Keyspan USA 19HS the port is called /dev/cu.USA19Hb2P1.1

Once you have answered these two questions the program saves your answers in a new file called pjk setup. As long as the information in pjk setup is current, and the file is not edited or moved from where the program put it (v10) or the directory in which the

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program is running (v13+) you needn't initialize these parameters again. Each time the program is launched it will look for the setup file and read from it what it needs in order to find your serial/usb port and properly read data from your DRO.

For example on my little MacBook, using a Metronics Quadra Check (QC10) connected to the usb port through a Keyspan USA28X serial-to-USB converter *, the setup file I use looks like this.

```
<pjksetup> display type: [1] metronics qc-1000  
port address: /dev/tty.USA283d1P2.2
```

Remember if you change either element of your systems configuration then you must force pjk to make a new setup file. This is simply done by deleting any existing setup file and allowing the program to make a new one.

System and hardware requirements:

1. Macintosh OSX 10.3 or higher.
2. "Metronics, Boeckeler or AcuRite" digital readouts (DRO).
3. "Keyspan USA28x B" Serial to USB converter .