Metric Conversion Software

by James E. Frye, Jr., SR/WA and Richard R. Walker

At an IRWA chapter meeting in 1994, I discovered that the Federal Highway Administration had mandated the future use of the metric system of measurement in all federally funded projects. As an appraiser involved in the right-of-way acquisition process, I anticipated a multitude of problems arising from this mandate.

Personally, I am very accustomed to "traditional" land measurement. I can visualize an acre of land. I know that a yard is about one pace, or the height of my waist. (It used to be the length of my belt, but that's another story.) In other words, I am comfortable with the system I know.

But I am not alone. Most right-of-way professionals are in the same situation. Deeds and sales data are typically expressed in acres, square feet, and variations thereof. We all have to face the problem of converting engineers' plans back to traditional measurements so they can be understood.

I envisioned my worst nightmare: meeting with a landowner in Shenandoah County, who wasn't overly thrilled to see me in the first place, and trying to explain that it was my job to figure out the value of a 10 hectare acquisition associated with the new road that would cut his farm in half. Pity the unfortunate negotiator who would follow me, trying to explain to the same landowner that his land was worth $10 per square meter.

I imagined myself on the witness stand facing seven commissioners (the Virginia jury system for right-of-way hearings) and defending my valuation of $10 per square meter for an acquisition of 10 hectares, while the appraisal professional for the landowner testified to $100,000 an acre. I needed a tool to make metric conversions simple.

An important consideration was cost. A metric converter should be inexpensive. Of course, it also should be easy to use. Perhaps a pocket calculator. No, there would be too many transference errors—and no flexibility—you'd be stuck with a limited set of conversion criteria (what if the calculator couldn't convert rods and chains to meters?).

THE METRIC REPORTER
STANDARD COMMANDS

The **F1** function key displays a help index. The help file is included as a separate database that can be edited and printed to paper either one screen at a time, or in total, to serve as a user manual.

The **F3** function key allows resetting of the date, setting of a standard device (printer of file) for creating reports, and identification of user data to appear on reports.

The **F4** function key prints a report from a list screen when displayed.

The **F10** function key displays a look-up table when the cursor is on the related field.

The **INS** key adds a record to any list; the **DEL** key deletes the specified record.

The **ENTER** key accepts data and proceeds to the next field; the **ESC** key goes back through fields.

The **CTRL-ENTER** key accepts and saves a record and screen; the **CTRL-ESC** key exits a screen without saving the related record.

The program Main Menu includes the following choices:

To compute project measurement conversion...
1. from metric to English measurements
2. from English to metric measurements
3. of Celsius and Fahrenheit temperatures

Any of these first three choices causes a project list to appear; an existing project may be selected or a new one added. Once a project is selected, a list of existing project measurements appears. Measurements may be edited or added, and the list may be printed either from this screen or from the Report Menu.

To add factors to the conversion database...
4. update metric to English conversion factors
5. update English to metric conversion factors

Conversion factors may be added by selecting either of these Main Menu choices, or by adding a factor to any displayed look-up list. In this way, the conversion factor database can be expanded to include measurements most frequently used by an organization.

A factor added to the list can be used repeatedly. We offer one caution, however, when using this flexibility feature: adding an incorrect factor will result in computations that are inaccurate. If an organization requires a static list of conversion factors, a version of Metric Reporter is available that restricts the addition of conversion factors.

The last Menu choice...
6. accesses a report menu to print (either to hard copy or an ASCII file) any of the following: a list of projects and descriptions; a list of included conversion factors for metric measurements; a list of included conversion factors for English measurements; or a list of measurement conversions for any specific project.

These reports can be imported into word-processing or spreadsheet applications to create presentation documents as desired.

What I really needed was a metric converter that would run as software on my personal computer. Appraisals for right-of-way projects have many conversions. Therefore, the software not only had to compute conversions, it also should save them in organized lists. Finally, it would be useful if I could import these lists to my word processor.

This was a job for my pal, Rich Walker ...

THE DEVELOPMENT PROCESS
When Jim Frye first approached me about developing a spreadsheet template that would compute conversions between metric and English systems of measurement, we took the usual steps for developing an application, asking basic questions: How should the menus be structured? What form of output is desirable? What will input data look like and how should it be structured? Soon, the list of "wants" grew beyond the scope of a simple template.

Jim wanted to be able to:
- hit one key, pop up a list of conversion factors and simply "pick one."
- add conversions factors to the list.
- save a list of conversions cross-indexed to the original report. If data could be imported into a report, that would be ideal.
- run it on an XT (8086 processor) so he could use his old notebook.
- allow his new secretary to use it with a minimum of training.

After searching through many existing conversion programs, several were evaluated to see if they could be used to meet the requirements. All fell short in one or more areas.

Through trial and error, a new program was developed. It evolved as a cooperative effort in design and problem solving—a computer-user expressing needs and a developer trying to redesign the application to satisfy those specifications.

THE PROGRAM
The Metric Reporter is easy to use. Jim has more computer savvy than he admits, but over the years, he has had to train numerous secretaries who were unfamiliar with the kinds of calculations he frequently uses. The Metric Reporter provides menu and command choices that are always apparent on screen. Lists can be added to at any time during data input.

The menu choices are selected by using the arrow/cursor keys or typing the first number/letter of the choice and using the ENTER key to execute. Command choices are reflected at the bottom of each screen with the appropriate function key and the action.

The Metric Reporter software was designed to solve a specific set of problems. IRWA has worked with us, reviewing and testing the product, and making it available to its members at metrics seminars through the distribution of individual copies and, where applicable, bulk sales and site licenses. The Association's input has been very instrumental in the development of the software.

ONGOING DEVELOPMENT

As developers of the Metric Reporter, we are continuing to improve and enhance the program, creating new report formats, adding support for other database formats (dBase, Paradox, Btrieve, Foxpro), adding mouse support and pull-down menus, and possibly a version to run on Windows™, which would support easy cut-and-paste to word-processing and spreadsheet documents. Additional work is being done to expand the features and increase the speed of the program. We would appreciate any comments and suggestions to help make the application more valuable to the end users. ❑

Jim Frye is the senior appraiser for JEF Enterprises, an appraisal firm in Woodstock, Va. He may be contacted by phone at (540) 459-5570. Mr. Frye is a graduate of James Madison University. He has taken graduate studies at Virginia Commonwealth University and has taught in the Virginia Community College system. An active member of IRWA, Mr. Frye has been involved in right-of-way acquisition since 1986.

Rich Walker is CEO of Compass Management Group, a computer consulting and applications concern in Woodstock, Va., (540) 459-3100, and a principal in the Alliance Management Computer Training Center in Manassas, Va., (703) 331-3170. A graduate of the College of William and Mary, Mr. Walker has taught in the Virginia Community College system and is a retired Certified Public Accountant.