



# THE WHOLE IS GREATER THAN THE SUM OF ITS PARTS *or* THE EFFECTS OF INTERFACING WATERLOO SCRIPT WITH THE IBM 6670 INFORMATION DISTRIBUTOR

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## *Abstract*

Waterloo SCRIPT is a powerful text formatting language with extensive capabilities. The IBM 6670 Information Distributor is a laser printer that produces high-quality output. However, without special considerations, text formatted with Waterloo SCRIPT cannot be printed correctly on the 6670. An interface is needed in order to allow use of both technologies together. This paper presents the evolution of Clemson's SCRIPT/6670 Post Processor and examines its impact on users as well as the Academic Computing Support staff at Clemson University.

## *Introduction*

What do you do when your text formatter's output will not behave properly with your output device? One way is to provide a go-between to get them on speaking terms. At Clemson, the "text formatter" is Waterloo SCRIPT, the "output device" is the IBM 6670 Information Distributor, and the "go-between" is called the SCRIPT/6670 Post Processor.

## *Evolution*

In the summer of 1978, Clemson University obtained an output device called the IBM 6640 Document Printer. It used ink jet technology and provided us with much better quality documents than any line printer we had. The main reason for getting the 6640 was to provide an alternate means for graduate students to prepare theses and dissertations. At that time, we were using Waterloo SCRIPT, and there were problems with printing the formatted text from SCRIPT properly on the 6640. This prompted the development of a "post processor" for SCRIPT when using the 6640. It provided the necessary control statements for the 6640 and performed necessary translations to produce special symbols.

Later, we realized that, in order to facilitate indexing (superscripting and subscripting), we needed an "interim" post processor. Therefore, each job that used SCRIPT and required output on the 6640 contained three steps: SCRIPT, interim post processor, and final post processor. This approach was somewhat awkward, but the end result was good. These were the grandparents of the current post processor at Clemson.

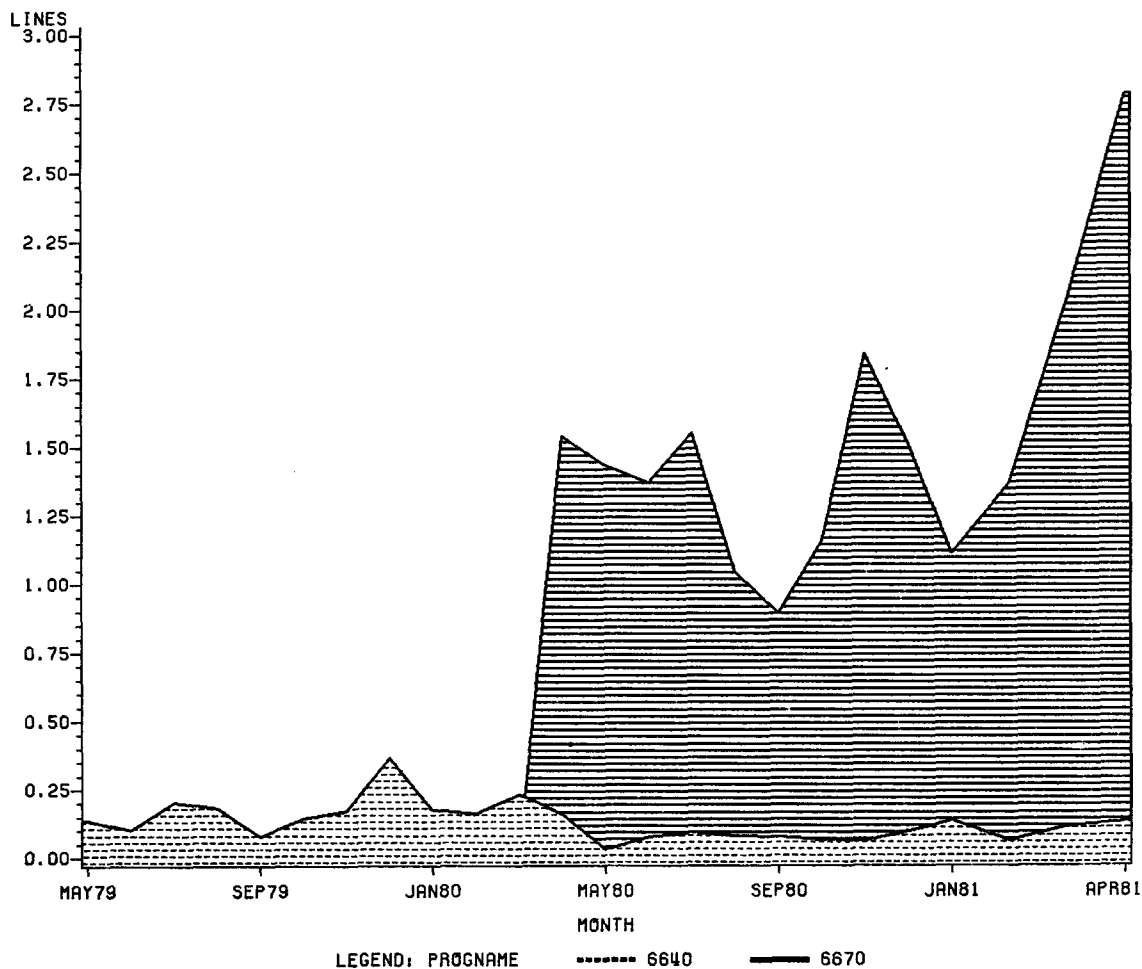
In April 1980, we relinquished the tired but tenacious 6640 to another department on campus, and a new printer, the IBM 6670 Information Distributor was delivered for our use. Using laser technology, this printer produced excellent copy faster than the 6640; it was also highly intelligent.

But the 6670 did pose some new problems. Since it handled text differently from the 6640, the post processor for the 6640 could not be used with the 6670. Some control statements, indexing, and the physical limits of the printed page were different. A new interface had to be written.

We wanted people to be able to use the 6670 with SCRIPT as soon as possible, so, with time constraints tight, we elected to write the SCRIPT/6670 Post Processor in PL/I. PL/I enabled us to get the post processor into production quickly, but there was a trade-off. Though we were able to reduce each SCRIPT/6670 job to two steps, the overhead incurred with PL/I caused computer (CPU) time to increase. Also, this new post processor was doing much more error checking, translation, and manipulation of the text than the old one. A twenty-page document that used to take two seconds of CPU time now requires ten seconds. In spite of this, the first version of the SCRIPT/6670 Post Processor proved to be a success, and the initial usage of the 6670 was massive compared to the 6640.

### MONTHLY 6640/6670 USAGE

RESULTING FROM POST PROCESSOR  
in millions of lines



In the fall of 1981, we plan to have the second version of the SCRIPT/6670 Post Processor in production. Our main goal for this new version is to reduce the amount of CPU time needed to "post process" the SCRIPT output.

#### *Impact on Users*

A major complaint with the first version of the 6670 Post Processor is that so much estimated CPU time must be specified for each job. Each page of SCRIPTed output handled by the Post Processor requires about one-half second of CPU time. Since this process occurs after the SCRIPT step of a job, this does not include the time it takes to actually SCRIPT the document. This impacts the user's job turnaround; the larger the document, the longer the wait for job execution and output.

Other complaints result from the 6670's inability to print tables and figures sideways on a page. Indexing also causes some problems, along with the loss of some output characters due to constraints imposed by our Job Entry Subsystem (JES2).

In spite of these constraints, the credibility of SCRIPT used with the 6670 is intact. We can only speculate that low opinions would have resulted if the SCRIPT/6670 Post Processor was not a reality.

#### *Impact on ACS Staff*

The Academic Computing Support (ACS) staff must divide its time among many duties, including consulting, documentation preparation, installation of new software, maintenance of existing software, teaching short courses, as well as software development. The design and development of the SCRIPT/6670 Post Processor required approximately three man-months and was difficult because we had no 6670 at Clemson at that time. Two weeks before Clemson's 6670 was delivered, we tested the Post Processor on a 6670 at IBM in Atlanta. Top priority was given to the Post Processor due to time constraints--we did not want SCRIPT users to become disillusioned with the 6670 before it was given a fair chance.

When users learned that high quality output could be produced using SCRIPT, the usage of the 6670 with SCRIPT increased drastically, especially at the end of semesters when reports, theses, and dissertations were usually due. This resulted in more SCRIPT questions at the ACS "Help Desk," an area where our staff receives questions, complaints, suggestions, and compliments (hopefully) from the people who use Clemson's computer facility. Most questions were about THESIS, a package written in SCRIPT at Clemson to facilitate the preparation of theses and dissertations in a form acceptable to the Graduate School. (See paper entitled "A Word Processing Application for Inexperienced Users" by Geoffrey Alexander.)

Another area of impact for ACS was documentation for the use of SCRIPT with the 6670. It was prepared and distributed at the time the conversion to the 6670 was made. A table of special symbols was produced and documented so that all of the special symbols available on the 6670 could be used. A miniguide explained what catalogued procedures to use and how to use them. This documentation helped to convert users to the 6670 with a minimum of trouble.

### *Conclusion*

The SCRIPT/6670 Post Processor is Clemson's successful solution to the problem of using both Waterloo SCRIPT and the IBM 6670 Information Distributor together. Each has merit on its own, but "the whole is greater than the sum of its parts."