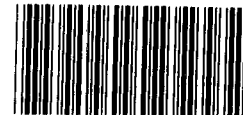


UNITED STATES GENERAL ACCOUNTING OFFICE
Washington, D.C. 20548

~~28531~~
124418

FOR RELEASE ON DELIVERY
Expected at 10:00 a.m., EST
Thursday, June 14, 1984

STATEMENT OF
WILLIAM J. ANDERSON
DIRECTOR, GENERAL GOVERNMENT DIVISION
BEFORE THE
SUBCOMMITTEE ON POSTAL OPERATIONS AND SERVICES
SUBCOMMITTEE ON POSTAL PERSONNEL AND MODERNIZATION
COMMITTEE ON POST OFFICE AND CIVIL SERVICE
HOUSE OF REPRESENTATIVES
ON
A COMPARATIVE REVIEW
OF OPTICAL CHARACTER READERS
USED IN MAIL PROCESSING



124418

029136

Messrs. Chairmen and Members of the Committees:

We are pleased to be here today to present the results of our comparison of the two optical character reader technologies available for mail processing. As you know, our report is still in draft, and we have not yet been able to fully consider comments received on the draft from the Postal Service and from Recognition Equipment, Incorporated (REI), whose equipment is discussed extensively in the draft. The results of our work, as we present them today, are, therefore, tentative and subject to change.

The Service's new generation of mail sorting equipment includes optical character readers and bar code sorters, which provide automated mail sorting down to carrier routes. The use of such automated equipment is based on an expansion of the five-digit ZIP Code to nine digits, effective October 1, 1983.

The Service is buying automated equipment in two phases. As a part of Phase I, now under way, the Service is assigning 252 optical character readers, or OCRs, to 118 postal facilities. These OCRs are all single-line readers. Phase II, scheduled for completion by 1989, will add 403 single-line OCRs and will expand the automation network to 209 facilities. The Service expects to award the Phase II OCR contract to one of four competing bidders within the next 2 to 4 weeks.

In view of your concerns about the soundness of the Service's decision to buy single-line OCRs in Phase II instead of multiline OCRs, you asked that we compare the costs and performances of the two types of OCRs.

HOW SINGLE-LINE AND MULTILINE OCRs DIFFER

Before summarizing the results of our work, perhaps it would be helpful to explain how single-line and multiline OCRs differ.

All OCRs read the address and ZIP Code on the mail piece from the bottom line up and print on the mail piece a bar code representing the ZIP Code. At the destination post office, bar code sorters (BCSS) read the bar code and sort the mail directly down to carrier routes.

The single-line OCR can process at least one line of the address block (the city, state, and ZIP Code line) and correctly bar-code a five-digit ZIP Code or all nine digits of a nine-digit code, whichever code is in the address.

The multiline OCR can process at least four lines of the address block and, depending on the geographic coverage of an internal nine-digit ZIP Code directory, correctly bar code a nine-digit ZIP Code on the mail piece. Using the address information on the mail piece, it searches the directory and obtains the nine-digit ZIP Code. The multiline OCR needs no ZIP Code on the mail piece if the address is in the machine's internal directory.

SUMMARY OF FINDINGS

Now to summarize our findings:

We found that the multiline OCR performs better than the single-line OCR at all ZIP + 4 usage levels tested. That is, it will bar code to nine digits a greater percentage of machinable First-Class Mail than will the single-line OCR. This difference is due to the multiline OCR's capability of bar coding a mail

piece to nine digits without a nine-digit ZIP Code on the mail piece. Although both machines produce substantial work-year savings over a mechanical system, the multiline OCR's performance advantage over the single-line results in greater work-year savings by the multiline machine. However, this difference in work-year savings is not substantial at high ZIP + 4 usage levels. On the other hand, we believe that the single-line machine would cost less to buy and maintain than the multiline machine.

In the final analysis, the key to whether the Postal Service should switch from single-line OCRs to multiline read OCRs is, in our view, the eventual level of ZIP + 4 usage by business mailers: the extent of work-year savings is directly related to the level of ZIP + 4 usage. ZIP + 4 was instituted in October 1983. As of late May 1984, businesses had been very slow to adopt ZIP + 4; the Service had achieved less than 25 percent of its volume goal for fiscal year 1984. I would like to emphasize, however, that since the program was only 8 months old in May, the usage achieved by then should not be used to infer that the program will not ultimately succeed. The extent of ZIP + 4 usage that will develop is still uncertain.

Switching to multiline OCRs at this time would delay the Phase II automation possibly 3 to 4 years and could result in a substantial loss of projected savings. The amount of savings lost would be directly related to the level of ZIP + 4 usage; that is, the greater the ZIP + 4 usage, the greater the amount of savings that would be lost by delaying the Phase II automation.

It might be possible to have a multiline system without a delay in the Service's automation program by--as I will discuss later--designing and building a retrofit kit to convert single-line OCRs to multiline.

CONSTRAINTS ON OUR WORK

Before elaborating on these findings, I should point out two constraints under which we worked. First, because the two machines we attempted to compare--the single-line OCR to be mass-produced in Phase II and a production model multiline OCR designed for processing U.S. mail--have not been manufactured, we were unable to compare actual data on purchase cost, operating performance, and maintenance cost.

Second, only one multiline OCR--the REI machine--has been produced for use with U.S. mail. Although five REI machines were being used by the Service, they were preproduction models whose costs and operating and maintenance experience could not be reliably projected to production models.

Much of our work was therefore necessarily based not on hard data but on assumptions, estimates--and even educated guesses--by manufacturers, the Postal Service, and ourselves.

COMPARING PERFORMANCES OF SINGLE-LINE AND MULTILINE OCRs

To compare performances of single-line and multiline OCRs, we determined the sensitivity of each machine's performance to differences in ZIP + 4 usage rates. Here we define performance as the percentage of mail pieces that the OCR can, on the mail's first pass through the machine, imprint with a nine-digit bar code.

As shown in the table in attachment I to this statement, we found that with high ZIP + 4 usage--above 70 or 80 percent, for instance--multiline OCRs perform slightly better than single-line OCRs. With low ZIP + 4 usage--below 50 percent--multiline OCRs perform significantly better than single-line OCRs. This

difference in performance is due to the multiline OCR's capability of bar-coding a mail piece to nine digits without a nine-digit ZIP Code on the mail piece.

We also estimated, at various ZIP + 4 usage levels, the effect of a single-line versus a multiline decision on the number of annual work-years that automation would save the Service. To do this, we compared annual work-year savings from a complete single-line system with annual work-year savings from a mixed system. The assumed mixed system consisted of a combination of the Phase I single-line OCRs now being deployed and Phase II multiline OCRs.

As shown in the table in attachment II, at all ZIP + 4 usage levels tested, a mixed system of OCRs produced greater work-year savings than the totally single-line system. However, the estimated savings attainable in each system varied with ZIP + 4 usage, as did the savings differences between the two types of systems. The estimated work-year savings difference between the two systems was relatively small when ZIP + 4 usage was high, but widened significantly below the 60 percent level. For example, at a 90 percent usage level, the mixed OCR system showed a 4 percent greater work-year saving than the totally single-line system. At a 38 percent usage level, the mixed system showed a 44 percent greater work-year savings potential.

COMPARISON OF SINGLE LINE OCR
COSTS WITH MULTILINE COSTS

As I stated earlier, we believe the multiline OCR would cost more to buy and maintain. We compared estimated costs of investment, operating labor, and maintenance.

Investment costs

The Service estimated that its total investment cost for a Phase II procurement of single-line OCRs would be about \$302 million. We estimated that if the Service switched from the planned Phase II procurement of 403 single-line OCRs to REI multiline OCRs, it would need a total of 444 multiline OCR transports, an increase of 41 transports over a single-line purchase. (An OCR's mail transport is the mechanical unit through which the mail is fed to be read and sorted.) On the basis of purchase price data from REI, we estimated that a full Phase II procurement of REI multiline OCRs would cost about \$353 million. The \$51 million difference means that a multiline procurement would cost the Service about 17 percent more than a single-line procurement.

Operating labor and maintenance costs

We did not quantify operating labor costs for single-line and multiline OCRs because staffing levels for the two types of machines would be fairly comparable. However, because about 10 percent more multiline transports would be needed than single-line transports, total operating labor costs for all Phase II multiline machines would be higher. Correspondingly, multiline OCR maintenance costs would probably also be higher than Phase II single-line OCR maintenance costs.

EFFECTS OF A DELAY IN PHASE II ACQUISITION

We said earlier that a switch to multiline OCRs for the Phase II purchase would delay the Phase II automation possibly 3 to 4 years. The Service has estimated about 45 months. If automation were delayed, savings that would have been available

had there been no delay would be forgone. The extent of ZIP + 4 usage would influence both the amount of savings forgone and whether these savings would be recovered after the delay.

We estimated the amount of savings that would be forgone if a delay took place. To develop our estimates, we essentially used, without detailed verification, the Service's cash flow projections for the Phase II single-line procurement, and we assumed 3- and 4-year slippages in these projections.

The following sample of figures will indicate the approximate magnitude of potential net savings forgone:

--Assuming a 3-year delay and a 90 percent ZIP + 4 usage rate: about \$950 million. A 57 percent usage rate would lower the savings forgone to about \$600 million, a decrease of \$350 million.

--At a 4-year delay and 90 percent usage: about \$1.25 billion. At 57 percent usage, the figure would drop to about \$780 million, a decrease of \$470 million.

These figures clearly show the sensitivity of savings forgone to ZIP + 4 usage, and the magnitude of the risk involved in delaying the automation program.

As I pointed out earlier, the Service's ability to recover savings forgone after multiline OCRs were installed would depend significantly on ZIP + 4 usage. The amount of savings that multiline OCRs could produce over single-line OCRs would be directly affected by ZIP + 4 usage. The higher the usage level, the greater the difficulty in recovering all forgone savings.

STATUS OF MAILER

RESPONSE TO ZIP + 4

Central to the issue of which OCR system the Service should install is whether businesses will address their mail with ZIP + 4 codes. The cost-effectiveness of both machines is enhanced when letters are addressed with ZIP + 4 codes. However, because the single-line machine lacks the ability to "look up" codes, use of ZIP + 4 by mailers is more critical to maximizing the cost effectiveness of the single-line OCR than the multiline OCR.

The Service has projected that by fiscal year 1989, the year by which it expects the automated system to be fully operational, it will have a 90 percent usage rate; that is, 90 percent of all First-Class, machinable, business mail will be ZIP + 4 addressed. The Service is depending heavily on postage rate incentives to bring ZIP + 4 usage to projected levels. Businesses pay less than full postage for First-Class letters addressed with ZIP + 4 codes and mailed in large quantities. A short-term goal is for 20 percent of all such mail, or about 11 billion pieces, to be ZIP + 4 addressed and to qualify for a ZIP + 4 postage discount by the end of fiscal year 1984, the first year of the program.

Conversion to ZIP + 4

by December 31, 1984

As of late May 1984, according to the Service, the businesses that had converted to ZIP + 4, or had said they would do so before January 1985, were expected to generate, annually, an estimated 2.5 billion pieces of ZIP + 4 mail that would qualify for the discount. If all 2.5 billion mail pieces entered the mail stream in fiscal year 1984, the Service would achieve, by

fiscal year's end, about 23 percent of its fiscal year-end goal of 11 billion pieces of postage-discounted mail.

Current mailer attitudes
about ZIP + 4

To obtain an update on mailer attitudes about the nine-digit code, we obtained information from six business associations that are members of the Postal Service's Mailers Technical Advisory Committee. Members of these associations are, generally, large-volume mailers of First-Class Mail.

The information these associations provided is not intended to be, and should not be construed as, a scientifically valid cross section of ZIP + 4 views. However, from our interviews, we gained the sense that, generally, businesses were interested in ZIP + 4 to some extent but were still concerned about the cost of adding the new code to their address files and about whether the ZIP + 4 postage discounts were sufficient to offset these costs. Some were waiting to learn more about the ZIP + 4 program before deciding what to do.

Future ZIP + 4 usage

These findings represent only the status of the ZIP + 4 program 8 months into its first year of implementation. We lack a basis for assessing the probability that the Service will, or will not, achieve its projected 90 percent usage level by 1989. At this time, mailer usage is still a question mark.

The Service has taken steps to promote greater use. These steps include lifting certain requirements that apparently discouraged some mailers from converting to ZIP + 4 and placing greater emphasis on promotional efforts by customer service representatives.

The Service remains confident of the future of ZIP + 4 usage and believes usage is not as uncertain as GAO suggests.

- - - - -

Before concluding, I would like to briefly discuss an issue which, because of time constraints, we were unable to explore in depth, but which we believe should be mentioned at least in concept.

During our development of the cost and performance data for the two types of OCRs, we made inquiries as to the feasibility of the Service continuing its scheduled procurement of single-line OCRs but simultaneously developing, among OCR manufacturers, the capability to convert delivered single-line OCRs to multiline OCRs should desired ZIP + 4 usage not materialize.

OCR manufacturers told us it would be technically feasible to convert single-line OCRs to multiline. There is, however, a critical element of uncertainty about this option. The performance level that could be achieved is unknown and can be determined only by designing and building a retrofit kit, installing it on a single-line OCR, and testing the converted machine.

This concludes my statement, Messrs. Chairmen. My associates and I will be happy to answer any questions you may have.

Estimated Variations in Average Nine-Digit Bar Coding
Rates in Response to Changes in ZIP + 4 Usage

<u>ZIP + 4 usage rates</u> (percent)	<u>Bar coding rates</u>	
	<u>Single-line OCR</u> (percent)	<u>Multiline OCR^a</u> (percent)
90	61	63
76	51	56
67	45	51
57	38	46
48	32	42
38	26	37
27	18	31

^aThe multiline OCR bar coding rates assume that 40 percent of the originating mail is local mail and will stay within the area served by the originating office. If the nine-digit ZIP Code is not present on the mail piece, the multiline OCR can apply a nine-digit ZIP Code to this local mail only.

Estimated Variations in Annual Work-Year Savings
in Response to Changes in ZIP + 4 Usage

<u>ZIP + 4 usage rate</u> (percent)	<u>Estimated annual work-year savings</u>		Increased work-year savings-- mixed OCR <u>system</u> (percent)
	<u>Single-line OCR system</u>	<u>Mixed OCR system</u>	
90	20,900	21,800	4
76	16,600	18,700	14
57	13,500	17,300	28
38	11,600	16,700	44