Give Us Your Wish List

For those of you who have already taken the time to fill out and return the Customer Services User Satisfaction Questionnaire, I want to thank you. I have read the twenty I have received, and appreciate the time many of you have taken to write comments on the questionnaire.

If you have not returned the survey, remember our deadline is November 15.

This is your opportunity to help us put our priorities in line with yours!

Maribeth Ward
Vice President, Customer Service

ATTENTION MVS SITES!

New JCL for Release 4.5 Installation
See page 5.

Velma Veneziano and Dr. James Aagaard, of Northwestern University Library, are the originators of the NOTIS online integrated library management system. In this issue we feature a recent interview with Ms. Veneziano, originally published in NUL Computing News. Our thanks go to Wayne MacPherson of N.U.'s Science and Engineering Library.

Keep It Simple and Elegant:
An Interview with Velma Veneziano

"In the process of interacting with the users you find out what it is that they actually need ... NOTIS was not developed in an ivory tower."

Q: You started at Northwestern as a systems analyst in 1967. Could you tell us about your previous experience and how you heard about the opportunities here?

A: I have no formal training in computer science or in mathematics or in library science. I was a history major in college, back before and during World War II days, when computers were very uncommon.

I got involved accidentally in 1958 at Science Research Associates [which later became a division of IBM]. They published materials for schools and did educational testing. They needed a "girl Friday" to work on means of automatically collecting and processing standardized test scores, using computerized page readers. At that stage they were practically combing the streets for anyone with the slightest interest in computers.

Once on the job I was fortunate to have a real computer wizard who took me in tow and
Once we had developed a plan which called for developing an integrated, online system, which would be implemented modularly, John McGowan decided we needed a site where we had more latitude for experimentation than we would have in the main library. So he and I moved to Tech (now the Science and Engineering Library) until the new library opened in January of 1970. During that time, Jim Aagaard (who was then at Vogelback) got interested in the library application and developed our first application, circulation control, which became operational in January 1970. It was one of the first online circulation systems in the country, and the first self-service system.

After we moved back to the main library, we were fortunate to have a dynamic team of eager, forward-thinking people that Tom Buckman (a former University Librarian who replaced Jens Nyholm) had brought in. It was an ideal environment in which to make a break with the past. Originally, we planned to develop a cataloging and acquisitions system only for monographs; however Mike Costin, who was then head of Technical Services, convinced me that we should include serials.

In retrospect, knowing how much I didn’t know about serials at that point, I would not have tackled it. Fortunately, after a few false starts, it worked. Our development strategy, while somewhat idiosyncratic, had worked.

One of the things we have discovered over the years is that the only way users can effectively be involved in the design process is to use the prototyping technique. It is very easy to look at paper specifications and actually visualize how the system will work in practice.

So we have over the years decided that even though work sometimes has to be redone, it is better to make prototypes than to try to come up with the perfect version from just paper specifications. The first version of the author-title index was really a prototype. We went through many versions of the process, with almost daily changes being made. This was very time-consuming, but users accept a system more readily if they feel they are involved.

It is not unusual for users always get exactly what they say they want. But in the process of interacting with the user you find out what is important that actually usually. It is usually possible to come up with a compromise. One of the reasons for the continued success of our development efforts is that we have had very, very close interaction with the librarians. NOTIS was not developed in an ivory tower.

As the Law, Medical, Dental schools started to use NOTIS this close interaction became more difficult. It is unfortunate that, with our small staff, we are not able to meet with them as often as we would like. I can’t walk into their offices, sit down and chat with them about their problems. But this is a drawback which comes with growth. We don’t have the nice, neat little laboratory environment that we had in the early days. It is also unfortunate that even in the main library as more and more departments have become dependent on NOTIS, we have had to balance the needs of one department with the needs of another. These needs don’t always coincide as neatly as one would like. So hard decisions have to be made.

I often feel that some of the people around the library, particularly the newer ones, are unaware of how difficult it is for a staff as small as ours (never more than five people) to not only keep a system as large as NOTIS operating on a day-to-day basis, but to develop new applications and enhancements for existing applications. They think these systems come ready-made, ready to plug in.

We have taken the approach that the system would be an integrated system so that every function performed had to serve multiple users. Instead of automating one job at a time we looked at library operations as a whole. The advantage is that when you get through you have a system that hangs together. The disadvantage is that the nature of many jobs must change, and staff have to learn to cooperate. Departments are now independent, which is sometimes a source of tensions.

Another problem which occurs when a system gets as big as NOTIS, and when the development staff is so small, is that a backlog of applications develops. People get impatient with what they see as their needs being ignored. They decide, "Let’s not wait; let’s use our handy-dandy PC and write our own program." Unfortunately, it is very difficult to integrate these programs into a mainframe based environment. Often, also, the programs are not well documented and when the originator leaves they may sit on the shelf, unused.

Q: Did you ever think the NOTIS software would grow as large as it has and be marketed?
A: No. I didn’t. In the early 70’s, when we were still using typesetter-like terminals, Jay Paulukonis, who was the librarian at Tech, and I talked about the possibility of having public access terminals. Just the cost of the terminals made it seem inconceivable that the public would ever get access to an online catalog. The success of the online catalog was a big surprise to me. It is a tribute to the risk-taking of people in Tech Services and in Public Services. People made up their minds that there would be an online catalog and tackled it with optimism. When you make up your mind that something is going to be, and set out to bring it about, the odds are that it will happen.

We resisted for a long time marketing the system. However, over time we had so many libraries expressing interest in buying the software that our resolve collapsed. However, the first few systems which were sold did not include any maintenance to maintenance. Even though we could see that there was so much demand, Jim and I and everyone in ISOD really did not want to get into the marketing business; we would have liked to sell the system outright to someone to market, but it didn’t work out, so we set up NOTIS Systems, Inc. This leaves ISOD staff free to concentrate on the needs of Northwestern.

NOTIS Systems, Inc. has done a phenomenal job with marketing, but we hope they can do as good a job with keeping the system state-of-the-art. If you aren’t constantly improving a system, it loses its competitive edge.

Q: Do you feel possessive at times towards what you have done?
A: I want NOTIS Systems, Inc. to improve

"It seemed to me that, if we were to do anything other than marginal improvements in operations, an online system was needed — not a batch system which poured out piles of paper."

"We went through an extensive review process, with almost daily changes being made. This was very time-consuming, but users accept a system more readily if they feel they are involved."

"At that time batch processing was still the most accepted mode; people were just beginning to think about online systems. But after studying library processes, it seemed to me that, if we were to do anything other than marginal improvements in operations, an online system was needed, not a batch system which poured out piles of paper that immediately became obsolete."

"We thought of automating one job at a time we looked at library operations as a whole. The advantage is that when you get through you have a system that hangs together."
NOTIS, because no one knows better than the staff of ISDO how many improvements are needed. Naturally I have my own ideas on what those improvements I want for N.U. may not necessarily coincide with what other NOTIS users want.

Q: What improvements do you want?
A: I hope NOTIS will keep the system simple and elegant. I don't like patchwork and add-ons. If NOTIS is to continue to be a good product, it must stay simple. It must stay comprehensible.

Q: Is there anything you would do differently?
A: I regret that we, at Northwestern, have not made more progress in retrospective conversion. Of course there are many small things which I would like to have a chance to do over, but in all the major areas I have no regrets.

Q: Rumor has it that you retired.
A: That is like the rumor about Mark Twaín; it's been grossly exaggerated. Last year I went on a 2½ time basis, because I wanted more time to travel. Now I'm back full time. I enjoy working. After years and years of working, I find many of the activities with which I was once occupied occupy their time boring. I hope to be able to work as long as there is work to be done and my health stays good.

Q: What things would you like to do to enhance the system?
A: The area that intrigues me is how best to organize knowledge so as to enhance access. I am interested in the process by which knowledge is transferred. That is why the index redesign project has been fascinating to me. There is so much left that we can do to improve access using the basic structure of the new indexes but applying them in new ways.

For example, we need to experiment with providing access by classification numbers. We need to be doing more work with evaluating the logs of LUUS transactions and building in means by which we can take a user's terminology and translate it into the term used in cataloging. We need to experiment with "mapping" the vocabularies of different disciplines into a single unified super vocabulary. We need to be thinking in terms of providing users with an "expert" system.

Q: I know people have spent a lot of time talking about keywords/Boolean as one way to take what people think they need and transform it.
A: Keyword-Boolean access is a brute force approach. People think in concepts, not in words. With k-b you get too much noise, but equally important, too much is missed. Using keyword/Boolean requires a user to know all the terms under which to look and even what form of a word to look under. There are better ways to lead the user to the desired information, using a controlled vocabulary, accessible by concept, with words displayed in context.

Q: What is a controlled vocabulary?
A: The most familiar example in libraries is the Library of Congress subject headings list. Even more systematic are MeSH subject headings which are very controlled, very hierarchically arranged. Some thesauri, such as the one for art and architecture, are very highly developed. There are also ways of describing material by a string of concepts strung together as in PICSIS. These are ways that the cataloger, indexer, and abstractor can provide controlled access to data.

We need to unify all these different lists and thence to provide one master vocabulary. Such a vocabulary needs to be constantly evaluated by experts and updated using information gathered from actual searches. One of the worst problems we have with k-b access is that the casual user doesn't know how limited the computer is, and how shallow cataloging data is.

Q: Doing the same job for 21 years, you obviously have found it intriguing.
A: I sometimes think that if I had to pay to do the job I would. Fortunately, I do get paid, although perhaps not as much as if I were in business and industry. However, the freedom of the academic world, and the company of stimulating, adventurous people, more than compensates for the small monetary reward. Not many people have that luxury.
**MERGED HEADINGS INDEX STORAGE CORRECTION**

The following corrects an article that appeared in NOTIS/24 (September, 1988), page six, "Merged Headings Index Project Update." That article detailed the disk storage requirements of the National Geographic Society's bibliographic and authority records plus the new Merged Headings Index.

Due to a typing error, the bibliographic file was incorrectly stated to require 1220 cylinders. The correct number of cylinders required is 120. For a 3380 drive, this equates to 85,455,500 bytes. As stated in the article, the index for this file takes up an additional cylinder (712,140 bytes). The bibliographic file contains 130,471 records.

We apologize for the confusion.

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**ESBKO DISCUSSES RESULTS OF VTLS TEST-IN-PROGRESS**

EBSCO, a major vendor of serials subscriptions to libraries, sponsored a breakfast meeting during the October Library & Information Technology Association (LITA) Conference in Boston.

The purpose of the meeting was to discuss implementation issues arising from the ongoing test at Auburn University of the NOTIS Vendor Invoice Tape Load System (VTLS). VTLS provides a means for loading vendor invoice information onto magnetic tape into a library's data base. As these tapes are loaded, invoice records are created and fund and order/pay/receipt records are updated automatically.

Auburn University has successfully communicated to ESBKO the data necessary for the vendor to create a serials renewal invoice tape. Auburn is now preparing to load the ESBKO invoice tape data into the NOTIS acquisitions module.

Here is a summary of the major implementation issues raised during the Boston meeting.

1. **Use of Title Number and Expenditure-by-Class Code**

An ESBKO customer preparing to use VTLS must put the vendor-assigned title number for each order into the division note field in the NOTIS order/pay/receipt record (OPR). The customer may also enter an "expenditure-by-class" code in the OPR. If the customer does not enter expenditure-by-class codes in NOTIS OPRs, default codes must be specified in the VTLS software.

2. **Use of "Note-to-Vendor" Field**

As customers create new OPRs after the initial load of invoice data, they can use the "Note-to-Vendor" field in the OPR to communicate new data to the vendor. Data in the Note-to-Vendor field appears on the printed purchase order produced with a new OPR.

3. **Communicating Changes to the Vendor**

An ESBKO customer may also choose to generate periodically a new tape containing data about the customer's subscriptions (e.g., at the beginning of a new fiscal year when fund codes may have changed). The customer's ESBKO representative should be kept closely informed about all changes in the customer's subscriptions.

4. **Multiple Invoice Records**

At the Boston meeting NOTIS/ESBKO users asked how the VTLS programs deal with renewal invoices that have more line items than can be entered in one NOTIS invoice record. The VTLS programs first determine the maximum number of payment statements allowed by the customer in one invoice record and then create as many invoice records as necessary to hold all line items from the vendor's invoice. For a further discussion of the process, see the article "VTLS and Vouchers" in NOTIS/24 (November 1987), pp. 11-12.

Other NOTISes articles of interest to VTLS users are:

- "Getting Ready for the New NOTIS Invoice Tape Load Programs" in NOTIS/24 (May 1987)

Customers who want more information about VTLS may also refer to chapter 244 of the NOTIS Terminal Operator's Manual, Vol. 1, Part 2, Technical Services, "Introduction to the Invoice Tape Load Programs;" and Chapter M4 of the NOTIS Library Implementation Manual, "Implementing the Invoice Tape Load Programs."

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**FIBER OPTICS CONNECT MAINFRAME, LIBRARY AT CENTRAL MICHIGAN**

Daniel Ferrer of Central Michigan University reports that CMU is now using fiber optic cable to link the library with the computer center.

CMU has placed an IBM 7171 communications controller, which supports the library's NOTIS system terminals, in the library and connected it to the IBM mainframe via 4000 feet of fiber optic cable. An IBM 3044 Fiber Optic Channel Extender facilitates the connection.

Fiber optics cable is known for its virtually error-free transmission of data at speeds far in excess of anything attainable over ordinary copper wire.

**CONVERSION SERVICES NEWS**

**CONVERSION WELCOMES EASTON, MIEMME**

NOTIS has created two new positions to help speed the conversion workflow. Although the titles are new, the people who now fill these positions are seasoned NOTIS employees.

Bill Easton (as of September 1) is the new Projects Coordinator for Conversion Services. He is responsible for keeping conversion projects on schedule, scheduling conversion projects, and helping conversion staff with technical questions. Bill came to Conversion Services from the Systems Engineering department (now Technical Support), where he was filling in as Acting Manager of the department.

Jim Miesse became the new Account Manager for Conversion Services on October 1. The Account Manager for Conversion services is the primary contact for NOTIS customers in the conversion process. Jim will make many training visits and will be responsible for assuring the quality of Conversion Services products. Jim came to Conversion Services from User Services.
Systems Engineering (Technical Support) News

“SYSTEMS ENGINEERING” BECOMES “TECH SUPPORT”

Wally Bardwell, who recently became manager of the NOTIS Systems Engineering Department, has announced that effective immediately the department’s name has been changed to “Technical Support.”

Wally explained that, as manager, he wanted to emphasize the customer support role of the department. Just the department name is changing, not its structure or its basic mission.

“Technical Support” more accurately describes the work of NOTIS systems engineers in providing assistance to NOTIS users.

Systems Development News

STAFF CHANGES

Randy Menakes, formerly of Systems Engineering (now called Technical Support), began work in Systems Development as Systems Analyst on October 1. Randy’s first project involves further developing the technical specifications for implementation of NOTIS’s multiple data base project. The aim of this project is to provide library users with access to multiple locally-mounted data bases through the NOTIS online public catalog interface. In his new position Randy will help turn functional specifications into technical specifications ready for use by programmers. All of the accounts for which Randy was Systems Engineer have been assigned to Gerry Ginsburg.

NOTIS's NEW LOOK

NOTIS Systems’ Documentation Services department is committed to providing NOTIS users with clear and helpful information in printed form. In pursuit of this goal we recently decided to improve the appearance and readability of our monthly newsletter. You are viewing the results of this upgrade, and we would welcome your comments.

This issue of NOTISes incorporates the page-layout capabilities of recent “desktop publishing” technology. A local area network driven by AppleShare software, a Macintosh II computer, a LaserWriter II printer, Quark Xpress, Microsoft Word, and MacDraw software: these are the main components in NOTIS’s new (and still developing) publishing system.

We have already begun to use desktop publishing as part of our general upgrade of NOTIS technical and user documentation; you will be seeing much more of it over the next few months.

This is more than just a “cosmetic” improvement — though there’s nothing wrong with a page of text being good-looking as well as informative. But the real advantage of the new technology over the old is that it allows writers and editors much more control over how material will be graphically presented to the reader. This is especially important in the production of technical and instructional material. Many studies of how people read have shown that graphic organization of text — including the use of typefaces of appropriate sizes and styles, illustrations, headings and other editorial “signposts”, and, of course, the all-important use of “white space” — all of these elements, used wisely or poorly, can make a measurable difference in our ability to read, comprehend and retain printed information. In other words, appearance is directly related to usability.

With desktop publishing, the creator of a text can see exactly how it will look when it is set in type, arranged on the page, and printed. It can easily be changed until it “looks right” — a matter of minutes, not days or weeks as before.

We believe that the result of these enhanced capabilities will be that our documentation will continue to improve in accuracy and timeliness as well as in readability.

RELEASE 4.5 I/O MANUAL REVISIONS DISTRIBUTED

During the weeks of October 10 and October 17, our printing services vendor mailed packets of new technical documentation to all TECH I contacts.

The packets contain complete revisions of the following Installation & Operations Manual sections:

Chapter 7 - NOTIS Batch Operations
Chapter 8 - Keyword/Boolean Search Appendixes A, B1, B2, B3, B4, C and D.

If you have not received your packet of technical documentation, please let us know.

NEW WRITER JOINS STAFF

Documentation Services has the pleasure of announcing the addition to its staff of Jane Larkin, effective November 7. Jane will write user documentation, filling the position vacated by Stuart Miller when he became Department Manager.

Jane has a Library degree from the University of Illinois and is an experienced data base searcher. She has worked at the American Medical Association Library and Continental Illinois Bank in Chicago. Jane is also a member of the SLA Illinois Chapter newsletter. She also writes book reviews for several publications.

TROUBLESHOOTING

This column is a regular feature of NOTISes. As we encounter problems which we plan to include in the Troubleshooting Guide (Appendix E to the Installation & Operations Manual), we list them here in NOTISes so you won’t have to wait until a new release in order to be aware of them. If you have suggestions, send them to Jerry Schedi.

It is our intention that you should take these troubleshooting pages and append them to the Troubleshooting Guide which you received in February, 1988. The problems have been, and will continue to be, assigned “temporary” numbers from V001-9995, so that they will be in sequence. We will periodically send out an updated index which will encompass both these problems and the ones already in the guide. Once per year we will send you an entirely new guide in which all of the problems which have appeared in NOTISes since the last publication of the guide will be integrated and assigned permanent numbers.

Problem V112 in the September Troubleshooting should have included an acknowledgement of the work by Beth Nicol (Auburn University) in diagnosing this problem with the LD120 job. Thank you, Beth!

Thanks to Barb Hieber at Pitt for the following two corrections.

Correction to Problem 7101: LD120 prints the expired action report, not purchase orders/claims.

Correction to Problem 8508: The last sentence should read: "... the secondary allocation for DPHINTRA is, and must be, 6.”

Problem V115(Revision of Problem 0018) You get an abend ASRA on any LT, LC, or LP trans-
action (so that you can’t even call up the initial help screen)

Possible Causes: The original 0019 entry for this problem was wrong. It was not the reassembly which corrected this problem but rather the specification of FEATURE=ICKYBD in the TCT entry for the terminal being used. If all of your terminals have dualsense keyboards and you do not want to make this change to the terminal entries, you can eliminate the test for this in LC400BAL by commenting the "TMTTCEPBR,TMTTCEFDK" instruction 4 lines after the label A603, and the "E8A191" instruction which follows it.

What the program is trying to do is to produce a message, "TERMINAL NOT CORRECTLY SPECIFIED IN TCT", it seems that under MVS it does successfully produce this message but that under DOS a bug produces the ASRA.

This problem is much more frequent under CICS 1.7 where the use of ED0 (rather than the hatch TCT) seems to make it a lot easier to forget the DCKYBD.

Problem: V116
In the LB510 batch patron load you have the INSW1 switch in your LB530Txx set off (this is supposed to prevent update of the patron name), but you find that certain updates occur anyway

Possible Causes: Even with INSW1 off, certain minor updates will be made to the patron's name - basically, it will allow additional data on the end of the name.

Examples: Smith, J. to Smith, John; Jones, Betty to Jones, Betty Ann.

Problem: V117 (Revision of Problem 2024)
When you try to display certain records in OPAC (LUx) you get an abend 794p.

Possible Causes: Prior to Release 4.4 the 794p abend indicated a problem with the LOCATN (LC106) table; the 794p, a problem with the LOCTN (LC105), and 7941, a problem with the LOC (LC106).

Because of space problems in LC794BAL, the 794y and 7941 were changed to 794p's with 4.4.

(30CTN)D Here is an entry for this location in the 30CTNDB7. There must be:

(LOCATN) Have you changed in (LC106TBL and LC108Txx) the number of this book's location? You can't do this. This number is hard-coded in the item record.

(MVS only) If this is a Northwestern test record, there are certain processing units (LL, HS) which don't have all their locations defined for them in the LC106/106 we supply. Do you have a valid "UNIT=x" (where x is the institution group) in the LOCATN statement (in LC106Txx) for the location to which the record you were trying to display belongs? You must.

The table would assemble cleanly (provided LC100TBL mirrors the mistake) but the Online Public Catalog will abort.

In LOCC: Is there a LOCC for this location? There must be if there are circulating items attached to one of the copies. (If an item has been discharged, the system expects to check the SHELVES= parameter in the service unit specified by the SRFV parameter in the LOCC to see whether a "Recently returned" message should be displayed.)

Problem: V118 (Revision of V033)
"Special" characters in all records except the bibliographic record display incorrectly or cause PROGXxx's or ATN1 ATN1 ATN1 abends.

Possible Causes: The bibliographic record is the only record for which character translation occurs. (See article in 368 NOTISEIS or Section 1.4.1 of the 4.5 NOTIS Installation and Operations Manual .

One solution some users have implemented is to substitute a dash for any illegal character in the output (controller- to- terminal) translation table in the 3174 or 7171 controller.

Problem: V119 (VSE only) LB510

In running LB510 (to load patron records) you get a "RECORD SKIPPED" message on every record

Possible Causes: Have you tried to comment the "$INCLUDELB510DB$" statement in the LB510 library? Changing this (or any) INCLUDE statement doesn't work (the asterisk is ignored). This statement needs to be deleted (unless you are one of the four pre-4.3 users who require it).

Problem: V120
Whenever you try to charge an item you get an abend 610b.

Possible Causes: This abend indicates that the charge program is taking the processing unit from the item index entry and trying to locate that processing unit in the LC101TBR and can't. This can happen if the version of the LC010DSC which is copied into LB690 (which builds the item index) doesn't match the actual format of the item record. For instance, if you use the 4.5 version of LB690 on a 4.4 format item file or a 4.4 LB690 on a 4.5 item file.

Problem: V121 (MVS 4.5 only)
In discharging an item you get an abend 611L

Possible Causes: The key for the bill & fine record is the patron record number plus the date/time. When an operator overrides (backdates) the date in performing a discharge, the same date/time is used for all items discharged during that session. If a fine is owed, the system tries to create a bill & fine record. The first for a particular patron is OK, but the second abends because VSAM finds that its key duplicates that of the first.

If you have DBT in place on the item file, the abend will cause the discharge to be backed out and the operator will then be able to go in and successfully discharge it with the b/f record being created.

Otherwise, the item will be discharged and the b/f record will not be created. To fix this, add the following 3 lines of code to LC610BAL (after the line at label B969):

```
LD R172,START
```
Choosing a Printer for Spine Labels and Date Due Slips
by Jim Aagaard

This article, by Dr. James Aagaard of Northwestern University Library's Information Systems Development Office, addresses the following issues:

1. Design of NOTIS date due slips
2. Telex printers
3. IBM terminal environments
4. Physical specifications of printers
5. Survey of printer makes
6. EPSON printers
7. Setting page length
8. Setting pitch
9. Settings on the 7171 controller
10. Printing spine labels

1. Design of NOTIS Date Due Slips

The design of the NOTIS circulation module provides for the optional printing of a date due slip, using a format controlled by tables in program LC614.

At Northwestern University Library, we wanted a slip which could be inserted in existing book pockets and which would make it possible to read much of the printed information without the necessity of removing the slip from the pocket. These considerations indicated a slip with dimensions of 5.5 inches in length and 3.25 inches in width. These dimensions include pin feed holes. With a printable width of 2.5 inches and printing at 12 characters per inch, this satisfied our requirements.

2. Telex Printers

When we introduced the circulation system at Northwestern University Library, we planned to use Telex 476L terminals. An examination of the associated Telex 281B printer indicated it would satisfy our requirements with one exception: the printer tractors could not be moved close enough to feed the 3.25 inch forms. This problem was solved with the aid of a local machine shop. The tractors were removed from the printer and sufficient plastic milled from their sides to allow the desired positioning.

It should be noted that the 281B printer is a modified C Ihf 8510 and can be used in other ways than connected to the 476L terminal. Such use is not too practical, however, based on its cost and current unavailability. Other printers, even a standard 8510, cannot be used satisfactorily on the 476L because of an initiation character string which the 476L sends to the printer before each print operation.

3. IBM Terminal Environments With ASCII Printers

There are two other families of terminals which are likely to be encountered in a NOTIS installation:

- IBM 3270-type terminals (using a 3274 or 3274 controller and 3272, 3178, 3191, or equivalent terminals);
- IBM 7171 terminal controller with ASCII terminals (e.g., the IBM 316X series of terminals).

In either of these two environments, it is possible to use a standard ASCII printer such as those being mass-marketed for use with personal computers. Many current inexpensive dot-matrix printers provide an impressive array of capabilities. These include the selection of character style, character pitch, and page length by means of control sequences transmitted to the printer. These functions are very useful, but the control sequences require the use of ASCII codes which have no equivalent in the IBM 3270 environment.

In the IBM-based NOTIS environment, either an IBM 7171 terminal controller or a third-party protocol converter is necessary as an interface between the ASCII devices and the mainframe.

3370 Terminal Environment With Protocol Converter

Our experience has been with the InterLynx/3387 protocol converter manufactured by the Local Data Corporation. These can be obtained for about $850 per device. There are two models. The first model has a front panel which allows configuration changes. This model costs about $100 more. The model without the panel can be configured from a single portable front panel which can service many units or from any standard ASCII display terminal. There are a number of other manufacturers of similar devices. There do not seem to be substantial price differentials. Other brands may provide more or fewer useful options and may require changes in a few of the table entries in LC614.

Protocol converters provide a "transparent mode" in which arbitrary ASCII codes can be passed to the printer. There is no standardization on how this transparent mode is initiated, however. The method originally provided by Local Data and assumed in the LC614 program has been augmented by two additional methods in more recent releases of the protocol converter. These additional methods may provide compatibility with the methods used by competitors of Local Data.

7171 Controller with ASCII Terminals

The situation is not as good for an ASCII printer attached to a 7171 terminal controller. The 7171 takes the place of a protocol converter. Although the 7171 provides for a similar transparent mode, once the mode is set the mode must remain for the remainder of the transmission. This means that the entire text to be printed has to be converted to its ASCII equivalent. This requires twice as much transmission time. The NOTIS programs do not provide for this, limiting the number of features which can be used on the printer.

4. Physical Specifications of Printer

A printer for use with the date due slips of the size described above must have a tractor feed with adjustable spacing between tractors. It should be possible to move the tractors close enough for the 3.25-inch form. The tractors should be ahead of the print head (rather than after the print head) to allow the forms to be removed with minimum wastage. It should be possible to tear the forms close to the print position. The printer must be capable of printing at 12 characters per inch. Although there are many printers available, there are very few which meet all of these requirements.

5. Survey of Printer Makes

We have not found any Okidata models which will work. It appears that there may be some Panasonic models which meet the requirements. We have not examined these Panasonic models carefully because we seem to have difficulty in purchasing them. The C Ihf 8510 has been mentioned above, but assistance from a machine shop is needed.

6. EPSON Printers

EPSON is also a popular brand of printer, and there are several models which can be used. Our first experience was with the EX-800.

Epson EX-800

The EX-800 is fast and is available for about $420. The EX-800 allows for very close tearing of the printed slips. It does require a modification to the tractors to allow them to be set close enough, but the modification can be done with order hand tools. The EX-800 has proved very satisfactory, but it appears that it may soon be discontinued.

Epson FX-850

A more recent introduction, the FX-850, may be even better. (The FX-850 has a higher-quality twin, the LQ-850, which is also usable but costs about $200 more.) The tractors on the FX-850 can be positioned as needed without any modifications. Although at first glance the paper tear position does not appear to be as good as the EX-800, the FX-850 has an optional "short tear-off" capability which is actually
better. The short tear-off capability is activated with
a "DIP" switch on the printer. When a form feed com-
mmand is received, and the command is not followed
by additional data within a short interval, the paper
is advanced several inches to a convenient tearing
position. When the next print command is received,
the paper is automatically reversed to the proper
printing position. The InterLynx/3287 protocol con-
verter used with this printer should have software
at level 4.07 or higher. This is because of the need
for a new option which suppresses the normal gener-
ation of a "new line" function in the printer when the
"end of message" code is received from the NOTIS
program. When this new line function is generated,
it will follow the form feed command and thus sup-
press the short tear-off function. A similar capability
would be needed in other brands of protocol conver-
ers.

Use of the Short Tear-Off Function

The proper use of the short tear-off function requires
that the Epson instruction manual be followed care-
fully. Be sure attempting to make adjustments with
the paper knob on the printer.

Start with the printer power off and place the forms
in the tractor. Then turn the power on and press
the LOAD/EJECT button. The forms will feed into
printing position, but this position will very likely be
too high on the forms. Press the ONLINE button
and note that the MULTI-PART light is blinking.
This indicates that the FORM FEED and LINE
FEED buttons can be used to make an adjustment
in the initial print position. These adjustments are
in very small increments (1/10 of an inch). After this
is set, print a date due slip and note whether the
position at the tearing edge is satisfactory. The
MULTI-PART light will be blinking again, and the
FORM FEED AND LINE FEED buttons again can
be used to position the paper. Once these positions
are set, they will be remembered, even when the
printer is turned off.

7. How to Set Page Length
(Using Protocol Converter)

For proper operation, a page length setting of 33
lines is needed. This can be accomplished in several
ways. LC814 can transmit a code (1B4321) for the
Epson printers) to set it. In this case it must be
done for each slip, since the program has no way of
knowing whether the printer is already set correctly.
The InterLynx protocol converter can send it as part
of an "initialization sequence" whenever the printer
is made ready. Configuration from an ASCII termi-
nal is required to establish this option.

Alternatively, the InterLynx/3287 can be configured
for a page length of 33 lines and for replacing the
form feed command received from the program with
the appropriate number of line feed commands. One
small problem may be encountered when the pro-
gram sets the page length, because (on the EPSON,
again) this resets the top-of-form position also.
Unless the protocol converter has been configured to
suppress the extra line feed after a form feed, the
result is one line too many. Either change the con-
figuration (necessary anyway to use the short tear-
off feature), or change LC614 to specify 32 lines
instead of 33 (like, 1B4320).

8. How to Set Pitch
(Using Protocol Converter)

Another need is for setting the pitch to 12 characters
per inch. This can be done in the same ways as des-
cribed for the page length. In addition most printers
have either "DIP" switches or front panel controls
(as do the EPSONs) which allow this setting to be
made manually.

9. Settings With 7171 Controller

Because of the otherwise unsatisfactory trans-
parent mode capability of the 7171, a printer should
be used which allows manual setting of the charac-
ter pitch. There doesn't seem to be any good method
of setting the page length, however.

10. Split Label Printing

Similar considerations apply for spine labels, except
that the transparent mode capability of the protocol
converter is used more extensively. The SE-LIN
labeling system prints the labels near the center of
the printer, and the margin setting capability of the
printer is used to avoid preceding each line of text
with several dozen blanks. This could be changed
with suitable modification to the tables in program
LC867 for use with a 7171. Also, the program pro-
vides for the possibility of pitch changes as a func-
tion of the number of characters in a line. This
capability could not be used with the 7171.