July 16, 1985

Ruth Bakke, Ph.D.
Dean of the College of Science and Technology
Corpus Christi State University
Corpus Christi, Texas

Dear Dean Bakke:

The Donor Management System is presently installed and operational at the Nueces County Medical Society Community Blood Bank in Corpus Christi, Texas.

Parts of this current system have been utilized for two years. All functional parts were consolidated and modified to the current structure in June, 1985. The system is integrated with Laboratory and Hospital Services programs at the present time, and will be interfaced to the Hewlett-Packard Financial Accounting System in the near future.

The source code, written by William A. Goodoff, is the property of the Nueces County Medical Society Community Blood Bank. All code was developed using Hewlett-Packard 3000 Series 42 hardware and their Multiprogramming Executive Operating System (MPE-V).

Sincerely,

Julie A. Beck
Executive Director
Blood Donor Management System

William A. Goodoff

Committee: Allen Bush, Chairman

Nancy Cameron

Charlotte Busch

July 18, 1985
# Table of Contents

Abstract

Introduction:
- Background  Page 2
- Rationale     Page 3
- Environment   Page 4
- Scope         Page 5

The Project:
- The Main Menu  Page 6
- Registration and Maintenance  Page 7
- Donor Plans     Page 15
- Call Lists and Mailings   Page 23
- Donor Purge      Page 29
- Deferral         Page 32
- Statistics and Reports  Page 40

Results

Bibliography  Page 47

Manual Documents  Appendix A

System Flowchart and Overview  Appendix B

Data Base Schema and File Layouts  Appendix C

Total System Overview  Appendix D

Automated Documents  Appendix E

Source Code:
- COBOL Copylib for all Modules  Appendix F
- The Main Menu                   Appendix G
- Registration and Maintenance   Appendix H
- Donor Plans                     Appendix I
- Call Lists and Mailings        Appendix J
- Donor Purge                     Appendix K
- Deferral                        Appendix L
- Statistics and Reports          Appendix M
Abstract

The Nueces County Medical Society Community Blood Bank was established in Corpus Christi, Texas, in 1970 to provide blood and blood products to the residents of Corpus Christi and the surrounding area. The amount of blood-units drawn has risen from 6,000 in 1970 to 24,000 at the present time.

The aim of this project is to provide the Nueces County Medical Society Community Blood Bank with an automated method for processing, tracking and maintaining the donations to the Nueces County Medical Society Community Blood Bank and, in so doing, to continue to assist in supplying the necessary products needed in our community.

All donors and blood units are registered using this system. Because of the large amount (60 %) of units drawn on mobile vehicles, both interactive and batch registration is performed. Maintenance programs are included so that donors and their blood units can be modified and inquiry into past records can be performed.

A series of programs for the initiation and maintenance of donor clubs is included. These donor clubs provide lower blood costs to participants in Family, Group or Replacement plans.

Mailings and call lists play a significant role in the recruitment of donors. Mailings are used to notify donors of their next eligibility date and to remind donors of expiring plan coverage and scheduled blood drives at places of employment. As it becomes periodically necessary to contact eligible donors by telephone, lists of donors in a particular blood group are furnished to the donor room staff.

For archival purposes, a set of programs allows for purging any inactive donors and blood units from the system at the end of two years. These records are stored on magnetic tape.

Because of the possibility of the transmittal of disease through blood transfusion, a set of programs maintains a list of those persons who are not eligible to donate for medical reasons (deferred donors).

A group of statistical programs useful in the management of the blood center utilizes information on the current donor base.
The Nueces County Medical Society Community Blood Bank had maintained a manual system since its inception in 1970. Information was recorded on a donor record card (Appendix A) each time the donor visited the blood center or one of the mobile units. Each card had space available for four donations, thus a new card was begun after every fourth donation. These cards were then filed in a card cabinet in alphabetical order within the numbered donor club plan of the donation. If the donation was not as a member of a donor club (e.g. Family Assurance Plan), the cards were filed by the city of residence of the donor. Since it was possible for a donor to donate to several different plans, a donor's history could be placed in numerous locations in the file cabinet.

After the donor had successfully donated blood, it took several days for the physical records to be processed at the blood center. A clerk-typist addressed and mailed a blood-type card (Appendix A) to each donor stating their next date of eligibility. Mailings were also originated when Family Assurance Plans needed to be renewed every six months. Using this filing system, such a mailing could be omitted if the donor had donated at a donor club mobile site, but the donation was for a Family Assurance Plan (i.e. the donor record card could have been filed under the donor club and the donor was not notified when his Family Assurance Plan expired). Several weeks prior to a donor club draw, post cards (Appendix A) were manually addressed and mailed to members of the plan (provided the donor record card was filed with that plan).

At the time of donation a donor receipt (Appendix A) was given to the donor and two copies kept for internal records. One copy was forwarded to the accounting office so that plan coverage records could be updated. The other copy was filed by blood type so the donor could be contacted by telephone when the need arose for his blood group.

The active card catalog consisted of six years of donations. Periodically the donor receptionist consolidated the donations of one donor, as well as removing the oldest batches of cards. The possibility existed that some cards could be overlooked or misfiled in such a system. This method of 'purging' the files was marginally successful at best.

The list of deferred donors was maintained with a word processor on a micro-computer system. The list was verified manually at the time of each donation. The list was alphabetical and contained the name, deferral date, type of deferral and expiration date (if any) of the deferral. The list was generated monthly with copies being distributed to all mobile units and drawing stations.

All statistics were produced manually using summary sheets of past months.
Rationale

As the blood needs of the Corpus Christi area increase, it becomes more important to be able to recruit and process blood using the quickest and safest methods available.

In order to be able to retrieve information on any donor in the system as quickly as possible, it was necessary to select some item that could be used in a data base key read. A combination of the first three letters of a last name, the first letter of the first name and the birth date of the donor form the key for each donor (DONOR KEY). Because of the possibility of duplicate donor keys existing for different donors, it was determined to add two more digits at the end of this key and, in so doing, one hundred different donors could be uniquely identified with this method. Another key selected was the blood unit number (UNIT KEY) of each donation. This provides for the near instantaneous retrieval of specified units and also facilitates the interface with the laboratory, hospital services and accounting systems. By specifying various dates (DATE KEY) as a key search item, statistics and batches of mailers are expedited. The last key used in the donation records is that of the donor plan (CLUB KEY). Mailers to donor club members and listings of such membership is rapidly achieved with chained reads using this key.

The on-line registration of donors assists in more accurate record keeping procedures. As receipts are generated at the time of donation, donors are able to review their current information and alert the Nueces County Medical Society Community Blood Bank of any change in address or phone number immediately. If donors question the accuracy of such records, the IMAGE Data Base Management System includes a QUERY processor that can be utilized by the Electronic Data Processing department to conduct further searches into past records. IMAGE also assists in filing the records so that access to individual records can be quickly established using the items selected as key items.

The Donor Management System provides the means to generate numerous mailings and call lists to assist in the recruitment of donors. It also cuts the costs of such mailings through the consolidation of donor records and the purging of donors from the active files who have not donated in the past two years. When an extreme emergency does exist, archival tapes can be loaded to the system in order to appeal to a larger base of individuals.

Deferred donors are detected immediately at the time of registration whether in interactive or batch mode. Temporary deferrals are automatically re-instated when eligible to donate again.

Statistics which took several hours to compile are possible within minutes on a hard copy.
The hardware being used is the Hewlett-Packard 3000 Series 42. Main memory is currently 1.5 megabytes, of which .5 megabytes are devoted to disk caching. There are 600 megabytes of disk storage, a system line printer (2608A) with a speed of 400 lines per minute and one 200 character per second dot matrix printer (2932A) used for the in-house registration of donors. All terminals in use are block mode terminals (2622A, 2624B, 2628A).

The Hewlett-Packard IMAGE data base management system is the main file management tool on the donor system. However, several indexed (KSAM) files are utilized. The data base schema for data base DONORA is listed in Appendix C. Also listed are the file structures for CALLIST and DEFERRED.

Menus and screens are designed with the Hewlett-Packard VPLUS/3000 screen design system. This allows data verification at the terminal level prior to the transmission to the central processing unit. As well as lessening the burden on the CPU, VPLUS eliminates hours of programmer coding. For example, when a programmer specifies that a certain field be in numeric or date format, it is not necessary for him to write an edit checking routine in the source code. Ranges for fields, patterns of characters and IF THEN ELSE constructs are possible with VPLUS. VPLUS generates its own microcode to verify such fields and alter values based on the instructions given at the time of form design. Thus edit checking is noticeably absent from the source code of the Donor Management System.

All source code is written in COBOL/3000 with interfaces to IMAGE, VPLUS/3000 and KSAM.

The end product is the property of the Nueces County Medical Society Community Blood Bank, and is used in conjunction with laboratory, hospital services and accounting systems (Appendix D). However, the Donor Management System is designed as a stand-alone system.
This project consists of six major programs:

(1) Donor Registration and Maintenance,  
(2) Donor Plans,  
(3) Mailings and Call Lists,  
(4) Donor Purge,  
(5) Deferral, and  
(6) Statistics.

Each of these is further sub-divided after reaching one of the six menus. The system manager can establish and control the security to each of the menus easily.

The major divisions are based on the specific requirements of the Nueces County Medical Society Community Blood Bank in Corpus Christi, Texas, and thus may not meet the exact requirements of other blood centers. Appendix B further lists the basic interrelationship of each of the programs.

Program One provides for the registration and maintenance of the donor base by the donor room staff.

Program Two consists of donor club listings and donor club mailers. Program Three includes the remainder of the mailings as well as the initialization and generation of telephone call lists.

Program Four allows for the purge of blood units and donors from the active (on-line) files after a lapse of two years.

Program Five maintains the deferral file and furnishes lists for mobile units that will not be linked to the on-line system until a future date.

Program Six provides reports for analysis by Nueces County Medical Society Community Blood Bank management personnel.