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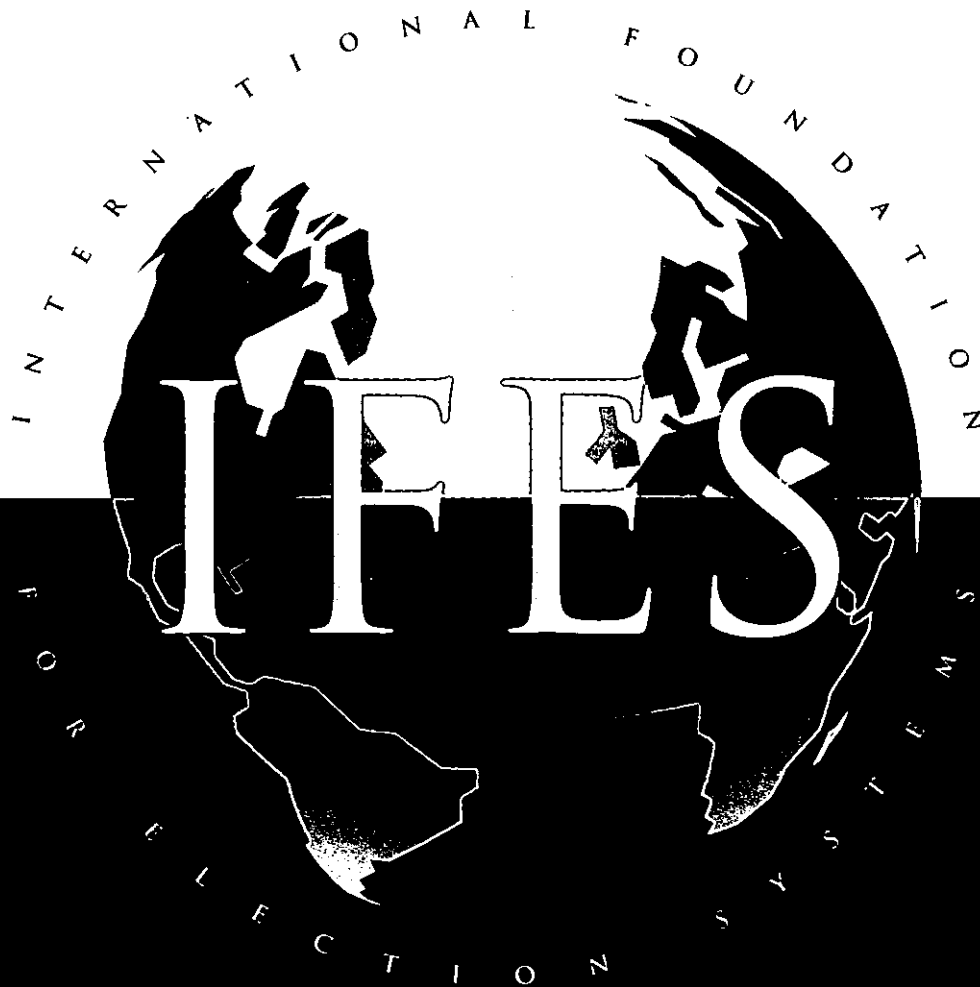
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**International Foundation for Electoral Systems**

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# Ethiopia

## Technical Assistance Project

September 1994 - July 1995

October 1995

Laurie Cooper

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## System Overview

The Election Results Tabulation System (ERT) is designed to provide the N.E.B. with a means of capturing election results on a constituency level. The application provides a means of capturing results in a safe and secure manner. A program module to verify the constituency results to make sure they are correct exists. There is also a wide variety of reporting modules that generate statistical and detailed reports for management.

For each constituency defined in the Table Control System (TCS) this system will generate three 'sheets'. Each sheet will have constituency results entered by one user. The results for one constituency must be entered into three sheets by three different people. This is to make sure all three people enter the same results.

A verification program is used to compare the entered results. The program will determine how many sheets have been entered zero, one, two and three times. For the sheets that have been entered twice or three times, it will determine if all copies are the same or different. An election is complete when all constituencies have been entered three times and all copies are the same.

As constituencies are completed (three copies are the same) a system administrator can use a program to 'freeze' the constituencies. Once the constituency is frozen, it can not be changed or deleted. This provides a way of finalizing entered results.

A wide variety of reporting programs exist to produce management reports. These reports include the following:

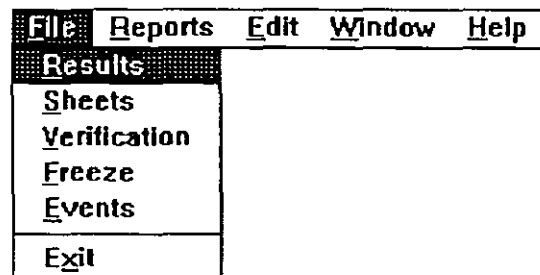
Report	Description
Verification Statistics	Report detailing the number of constituencies entered once, twice and three times, and the number of copies that are the same, and the number of copies that are different.
Verification Summary	Detailed listing showing constituencies by region, the number of copies of each constituency and whether the copies are the same or different.
Summary	Detailed listing of constituencies showing the number of candidates, projected and registered voters, etc.
Results	Detailed listing by constituency showing the candidates for each constituency and the winning candidates. Also a summary listing showing all the winning parties and the number of seats won.
Transactions	Detailed listing of all results capture transactions. This report shows who added, changed and deleted election results.

## Terms Used in this Manual

**System Bar Menu:** The system menu bar is the menu that appears at the top of the screen.

**File Reports Edit Window Help**

**Pulldown Menus:** Pulldown menus are activated by choosing options from the System Bar Menu.



**Single-click:** The process of 'pointing' to an object and pressing the left mouse button once.

The mouse pointer is as follows:



By moving the mouse, you move the mouse pointer.

**Double-click:** The process of 'pointing' to an object and pressing the left mouse button twice.

**Blocked Text:** Blocked text is text that has been marked using the shift/arrow keys or the mouse. An example is as follows:

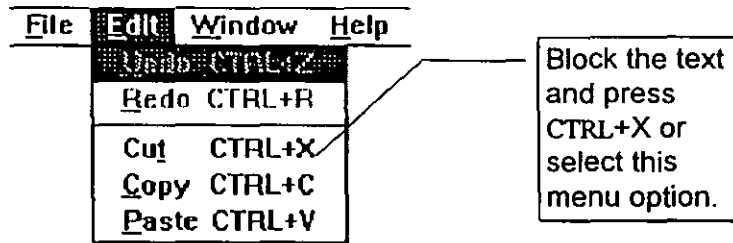
This is normal text. **This is blocked text** This is normal text.

### Clipboard:

A hidden area of the computers memory where information can be placed, or where information can be retrieved from.

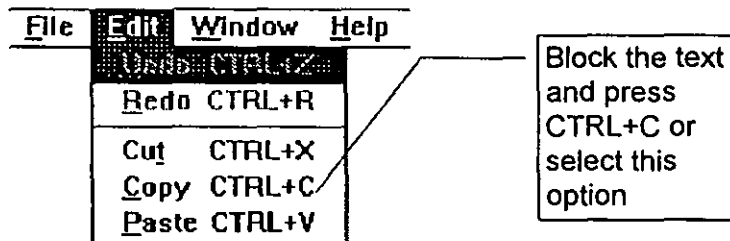
### Cutting:

The process of removing blocked text and placing it on the clipboard.



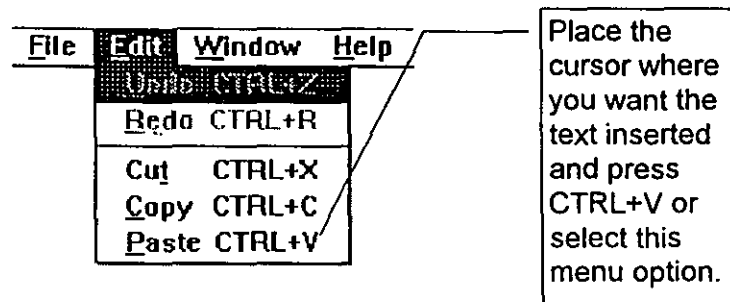
### Copying:

The process of placing a copy of blocked text on the clipboard.



### Pasting:

The process of retrieving blocked text from the clipboard and placing it where the cursor is.



### Push button:

A push button is a button that can be selected by single-clicking directly on it with the mouse or by tabbing to it and pressing the enter key. A sample of two push buttons are as follows:



## Program Startup/Main System Menu

When the program is started, the message *Opening Files...* appears in the upper right corner of the window for a short time. Once this message disappears, a screen is opened that allows you to choose the election you want to enter results for. Choose the election by single-clicking directly on the event name and then choose the 'OK' push button. If you choose the 'Cancel' push button, the program will stop and you will be returned to the menu system.

Once you have selected an election, the screen clears and the system bar menu appears at the top of the window and you are ready to begin working. The system bar menu has the following options:

Option	Purpose
File	Activates the <i>File</i> pulldown menu. Activated by pressing <Alt>F or by single-clicking on the word <i>File</i> .
Reports	Activates the <i>Reports</i> pulldown menu. Activated by pressing <Alt>R or by single-clicking on the word <i>Reports</i> .
Edit	Activates the <i>Edit</i> pulldown menu. Activated by pressing <Alt>E or by single-clicking on the word <i>Edit</i> .
Window	Activates the <i>Window</i> pulldown menu. Activated by pressing <Alt>W or by single-clicking on the word <i>Window</i> .
Help	Activates the on-line help facility. Activated by pressing <Alt>H or by single-clicking on the word <i>Help</i> . * If system help is not available, an error message is displayed when you enter this program and all help facilities are disabled.

The *File*, *Edit*, *Reports* and *Window* menu bars activate pulldown menus. Each option of a pulldown menu can be used to perform a function or access a secondary program module.

The *File* pulldown menu is used to access the main program modules of this program as well as exit this program and return to the menu program. Options in this pulldown menu are as follows:

Option	Purpose
Results	Opens the <i>Results</i> window where you can add, edit and delete election results for each constituency. Activated by pressing R or by single-clicking on the word <i>Results</i> .
Sheets	Opens the <i>Sheets</i> window generate three input sheets for each constituency. Activated by pressing S or by single-clicking on the word <i>Sheets</i> .



Verification	Opens the <i>Verification</i> window where you can verify the results that have been entered to determine how many constituencies have been entered once, twice and three times, and how many copies are the same and how many copies are different. Activated by pressing <i>V</i> or by single-clicking on the word <i>Verification</i> .
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Option	Purpose
Freeze	Opens the <i>Freeze</i> window where you can freeze constituencies that have been entered three times where all three copies are the same. Activated by pressing <i>F</i> or by single-clicking on the word <i>Freeze</i> .
Events	Opens the <i>Events</i> window where you can choose a different electoral event. Activated by pressing <i>E</i> or by single-clicking on the word <i>Events</i> .
Exit	Opens a window asking you if you want to exit this program and return to the menu program. Activated by pressing <i>X</i> , by single-clicking on the word <i>Exit</i> , or by pressing <Alt>F4.

The *Reports* pulldown menu is used to generate printed and viewed reports. The options on this pulldown menu are as follows:

Option	Purpose
Verification Statistics	Opens the <i>Verification Statistics</i> report window where you generate a report of how many constituencies have been entered once, twice and three times, and how many copies are the same and how many copies are different. Activated by pressing <i>V</i> or by single-clicking on the word <i>Verification</i> .
Verification Status	Opens the <i>Verification Status</i> report window where you generate a report of constituencies, how many copies of each constituency have been entered, and whether the copies are the same or different. Activated by pressing <i>a</i> or by single-clicking on the word <i>Verification</i> .
Summary	Opens the <i>Summary</i> report window where you can generate a report of zones, the number of constituencies, polls, projected and registered voters, party candidates, independent candidates and female candidates in each zone. Also included is the percentage of registered voters. Activated by pressing <i>S</i> or by single-clicking on the word <i>Summary</i> .
Results	Opens the <i>Results</i> window where you generate a detailed report of candidates by constituency showing the winning candidate(s), or a summary report showing a list of parties and how many seats each party has won. Activated by pressing <i>R</i> or by single-clicking on the word <i>Results</i> .
Transactions	Opens the <i>Transactions</i> window where you generate a detailed report of results transactions. The report shows who has added, changed and deleted election results and when the action was done. Also shown are the constituency results before and after the transaction. Activated by pressing <i>T</i> or by single-clicking on the word <i>Transaction</i> .

The *Edit* pulldown menu is used to speed-up editing by allowing for correction of mistakes, as well as cutting and copying to the clipboard and pasting from the clipboard. The options on this pulldown menu are as follows:

*National Electoral Board of Ethiopia*  
*Election Results Tabulation System*  
*User Manual*

Option	Purpose
Undo	Reverses the most recent edit action. For example, if you accidentally erase the information in a field you can use this option to place the original information back in the field. Activated by pressing <i>U</i> , by single-clicking on the word <i>Undo</i> or by pressing <i>&lt;CTRL&gt;Z</i> .

Option	Purpose
Redo	Repeats the action previously reversed with Undo. Activated by pressing <i>R</i> , by single-clicking on the word <i>Redo</i> or by pressing <CTRL> <i>R</i> .
Cut	Removes a text selection and places it on the clipboard. To select text, press and hold down the shift key. Then use the arrow keys to <i>mark</i> the text block. (As you press the arrow keys the text turns black.) When you have finished marking the text block, let go of the shift key. You now have a marked a text block. This text block can be removed and placed on the clipboard by using the <i>Cut</i> option selected from the <i>Edit</i> pulldown menu. Activated by pressing <i>T</i> , by single-clicking on the word <i>Cut</i> or by pressing <CTRL> <i>X</i> .
Copy	Copies a text selection to the clipboard. This option behaves in the same way as the <i>Cut</i> option, but does not remove the selected text from the field. It merely places a copy of the selected text on the clipboard. Activated by pressing <i>C</i> , by single-clicking on the word <i>Copy</i> or by pressing <CTRL> <i>C</i> .
Paste	Places the contents of the clipboard at the insertion point. Move the cursor to where you would like cut or copied text to appear and select this option. Any text placed on the clipboard will be inserted where the cursor is. Activated by pressing <i>P</i> , by single-clicking on the word <i>Paste</i> or by pressing <CTRL> <i>V</i> .

Please note, the edit pulldown menu options behave exactly the same as the editing options in Microsoft Word for Windows.

The *Window* pulldown menu is used to provide you with access to a calculator and calendar/diary, as well as provide a system administrator with technical information about the system. The options on this pulldown menu are as follows:

Option	Purpose
Calculator	Displays a calculator on the window. The calculator can be closed by pressing the <ESC> key.
Calendar/Diary	Displays a calendar/diary on the window. The calendar/diary can be closed by pressing the <ESC> key.
About	Opens a window displaying technical information about the program. This window can be closed by single-clicking on the <i>OK</i> push button or by pressing the <ESC> key.

## **Results**

This screen is the primary screen for this system. From this screen you can enter voting results for candidates in all constituencies. Each constituency is represented by three 'sheets'. The voting results must be entered into each sheet by three different people to ensure the results are entered correctly.

When you open this window, the screen will display the candidates from the first constituency in the database, as well as a set of push buttons. The push buttons let you move up and down through the list of sheets, edit the displayed, delete the displayed sheet and search for a specific sheet.

### ***Previous***

The 'previous' push button moves you to the previous sheet in the database. If you are currently looking at the first sheet in the database, selecting this button will generate the error message 'Beginning of file' which means you are on the first sheet and there are no previous sheets.

### ***Next***

The 'next' push button moves you to the next sheet in the database. If you are currently looking at the last sheet in the database, selecting this button will generate the error message 'End of file' which means you are on the last sheet and there are no more sheets.

### ***Edit***

The edit button will give you access to the candidate fields currently displayed on the screen. Select this button to enter votes for the displayed candidates. You can only enter votes into one sheet of one constituency. If you try to enter votes into a second sheet the system will display an error message.

If you are permitted to enter votes for the displayed sheet, the system will place the cursor next to the first candidate in the list. The push buttons at the bottom of the screen are disabled and the 'save' and 'Cancel' buttons are enabled. If there are more than 24 candidates, the 'more' button is also enabled.

You are now ready to enter votes for each candidate. Enter the number of votes for each candidate and press the 'tab' key to move to the next candidate. If you enter a number less than zero, the system will display an error message. After you have entered votes for the last candidate, you can select the 'save' button to save your changes in the database.

Once your changes are saved, the candidate fields, 'more', 'save' and 'Cancel' buttons are disabled and the push buttons at the bottom of the screen are enabled.

If you are entering vote counts into the sheet for the first time, your name will appear at the top of the screen. If the constituency has been 'frozen' by a system administrator, you will not be allowed to enter or change results. For more information on 'freezing' refer to the *Freeze* section.

### **Delete**

Select this button to delete the currently displayed sheet. Do not worry - you are not deleting the sheet itself - only the votes associated with the sheet. Once votes for a sheet have been deleted, they are gone and cannot be brought back.

When you select the delete button, you will be asked if it is OK to delete the displayed votes. To delete the votes, select the 'OK' button. Select the 'Cancel' button if you do not wish to delete the votes.

### **Search**

Select this button to search for a particular constituency. A window will open and allow you to choose a particular region, zone and constituency using three lists. The three lists contain only the regions, zones and constituencies for which there are sheets. Choose the desired constituency and select the 'OK' button to go to that constituency. Choose the 'Cancel' button to return to the main window without searching.

### **Browse**

When you select this button the system will open a browse window of all constituencies for the current electoral event. Use the mouse, arrow keys or page up/down keys to find the constituency you want and press the <ESC> key or <CTRL>W.

Once the browse window is closed, the screen will change to display the constituency that was selected in the browse window.

### **Help**

This button will activate the on-line help.

### **Done**

Select this button to close the results window and return to the system bar menu.

### ***More***

This button is enabled when you are editing the votes for a constituency and there are more than 24 candidates in the constituency. Selecting this button will open a secondary window that will enable you to capture the votes for the remaining candidates. Once you have entered the votes select the 'OK' button to return to the results window.

### ***Save***

After you have entered or changed results for a constituency, select this button to save your changes in the database. Once your changes are saved, you will be returned to the set of push buttons at the bottom of the screen.

### ***Cancel***

After you have entered or changed results for a constituency, select this button if you do not wish to save your changes in the database. Once your changes are discarded, you will be returned to the set of push buttons at the bottom of the screen and the results before editing will be displayed on the screen.

## **Sheets**

Select this option to generate results sheets. Results sheets must be generated for an election before results can be entered for the election. Sheets should be generated once the list of constituencies has been completed in the Table Control System (TCS). If changes are made to the constituency list, you can regenerate sheets without affecting results.

The sheets that get created correspond to the list of constituencies for the selected electoral event. For example, if there are 500 constituencies involved in an election, the system will generate 500 sheets. There will be 3 copies of each sheet. Each sheet will contain the candidates associated with one constituency.

Three copies of each sheet are created so that three different people can enter results for each constituency. This is to make sure the votes for each constituency are entered correctly.

Use the Verification option of the File pulldown menu to compare the individual copies of each sheet and determine how many sheets have been entered once, twice and three times. The verification program will also tell you how many copies of the same sheet are the same and how many are different.

**OK**                Select the 'OK' push button to begin generating sheets. It should not take much time to generate sheets for an event. If you make changes to the list of constituencies or the list of candidates, simply generate sheets again. Generating sheets more than once will not affect any election results that have already been entered.

Once the program is finished generating sheets, the Generate Sheets window will close and you will be returned to the system menu.

**Cancel**           Select the 'Cancel' button to close the Generate Sheets window and return to the system menu without generating sheets.

## Verification

This window enables you to verify the results that have been captured. This process will tell you how many copies of each sheet have been entered, how many copies are the same and how many copies are different. It also 'marks' those constituencies that have three copies entered that are the same. All 'marked' constituencies can then be frozen by a system administrator.

**OK** Select the 'OK' button to begin the verification process. This process should not take much time. When the process is complete, the system will 'beep' and display a message indicating it is finished.

**Cancel** Select the 'Cancel' button to cancel the verification process and return to the main system menu.

A sample verification screen is as follows:

Copies	Calculated	Identical	Different	Total
Triplicates	2	2	0	2
Duplicates	0	0	0	0
Single	1	1	0	1
None	372	372	0	372
Total	375	375	0	375

Sum of the 'identical' and 'different' columns.

Always equals the 'total calculated' field.

Equals the sum of the 'calculated' column.

Equals the sum of the 'identical' column.

Equals the sum of the 'different' column.



## **Freeze**

This option is available to a system administrator and is used to 'freeze' constituencies. Once the votes for a constituency have been entered three times, all three copies are the same and the verification program has been run, a constituency can be 'frozen'. Freezing a constituency makes it impossible to make changes to the constituency or delete the results for the constituency.

When you choose this option, the system will open two windows - a button bar containing four push buttons and a browse window showing a list of constituencies that are frozen or eligible to be frozen. Select a constituency with the mouse and choose the appropriate push button. The buttons are as follows:

- |                 |   |
|-----------------|---|
| <b>Freeze</b>   | Choose this button to freeze a constituency that has not yet been frozen.   |
| <b>Unfreeze</b> | Choose this button to unfreeze a constituency that has already been frozen.   |
| <b>Help</b>     | Choose this button to get on-line help.   |
| <b>Exit</b>     | Choose this button to close the 'freeze' windows and return to the main system menu. If you have made any changes to the constituency list, the program will permanently update the database when you choose this option. |

## **Events**

This window enables you to choose one particular electoral event. All the other screens in this system will use only the chosen event. For example, when you enter election results, you will enter results only for the event you choose.

The Event Selection window will open when you first enter this system. If you do not choose an event, you will be returned to the FoxPro Menu System. If you do choose an event, this program will start and let you enter results, generate reports, etc.

### **Choosing an Event**

Once you are inside this program, you can select a new event by selecting the Events option of the File pulldown menu. The Event Selection window will open and allow you to choose an event.

Any event denoted by a '\*' is an event that does not have any results entered yet. If you select a new event, you must generate sheets for the event before results for the event can be entered.

To select an event, click directly on the event using the mouse and choose the 'OK' push button. Choose the 'Cancel' push button to close the screen without selecting an event.

**OK**            Select the 'OK' push button to choose an event and continue with the program.

**Cancel**        Select the 'Cancel' push button if you do not want to choose a new event. If you choose this button when the program is starting, you will be returned to the FoxMenu System. If you choose this option after you are inside the system, the Event Selection window will close and nothing will be changed.

## Verification Statistics Report

This window enables you to generate a printed or viewed report of the verification statistics which tell you how many copies of each sheet have been entered, how many copies are the same and how many copies are different. This program produces the same results as the *Verification* process, but allows you to print the final report.

- |                |  |
|----------------|--|
| <b>Screen</b>  | Choose the screen option to send the report to the screen.                                 |
| <b>Printer</b> | Choose the printer option to print the report.   |
| <b>OK</b>      | Choose 'OK' to begin generating the report.  |
| <b>Cancel</b>  | Choose the 'Cancel' button to return to the system bar menu without generating the report. |

For more information on verification statistics, refer to the section entitled *Verification*.

## Verification Status Report

This window enables you to generate a report of constituencies, the number of copies of results that have been entered for each constituency and whether all the copies are the same or different. The report can be sent to the screen or a printer.

The report can be generated for all regions or one particular region by using the *Regions* list. You can also filter the report by specifying only those constituencies that have one, two or three copies entered. By default, all copies are included on the report. Another filter exists to filter the report to show only those constituencies that have copies that are the same or copies that are different. By default, all copies are included whether they are the same or different.

The report can be sent to the printer or the screen by clicking on the appropriate radio button.

**OK**                Once you have selected the filters you want using the two lists and *both/identical/different* radio button, select the 'OK' push button to begin generating the report.

**Cancel**           Select the 'Cancel' button to close this window and return to the system bar menu without generating the report.

## Summary Report

This window enables you to generate a detailed zone report. The report can be generated for one specific region or for all regions, and can be sent to the screen or to a printer. The columns on the report are as follows:

Column	Description
Region	Region name.
Zone	Zone name.
No. of Constituencies	Number of constituencies in the zone (minority + regular).
No. of Polls	Number of polls in the zone.
Projected Voters	Number of projected voters in the zone.
Registered Voters	Number of registered voters in the zone.
% Voters Registered	Percentage of registered voters (registered voters/projected voters).
No. of Candidates	Number of candidates in the zone.
Party Candidates	Number of candidates in the zone belonging to a political party.
Ind. Candidates	Number of independent candidates in the zone.
Female Candidates	Number of female candidates in the zone.

The number of constituencies is indicated using one or two numbers. For example it could be '5', or it could be '1+4'. If two numbers are displayed, the first represents the number of constituencies representing minorities while the second represents the number of regular constituencies. If only one number appears, it represents the number of regular constituencies.

Regional totals are also produced showing the total number of minority and regular constituencies, polls, projected voters, registered voters, candidates, party candidates, independent candidates and female candidates.

**OK** Once you have selected the region you want, select the 'OK' push button to begin generating the report.

**Cancel** Select the 'Cancel' button to close this window and return to the system bar menu without generating the report.

## Results Report

This window enables you to generate a detailed or summary results report. The report can be generated for one specific region or for all regions, and can be sent to the screen or to a printer. The detailed report is grouped by region and zone and shows the following columns:

Column	Description
List number	Internal list identifier number.
Constituency	Constituency name.
Candidate	Candidate name.
Party	Party acronym.
Votes Received	Number of votes received by each candidate.

In a federal election there can be one winner per constituency. Each winning candidate is indicated with a '\*' on the right side of the page. In a regional or local election there can be more than one winner (the number of possible winners is indicated in the constituencies screen in the Table Control System TCS). In this case the winners are ranked using numbers - the first place winner has a '1' printed on the right side of the page, the second place winner has a '2', and so on.

**OK** Once you have selected the region you want, select the 'OK' push button to begin generating the report.

**Cancel** Select the 'Cancel' button to close this window and return to the system bar menu without generating the report.

## Transactions Report

This window allows you to generate a report of results transactions. Every time a user adds, edits or deletes election results, information is saved in a database and is used to generate this report. This information includes the following:

Column	Description
Region	Region name.
Zone	Zone name.
Constituency	Constituency name.
Candidates	Number of candidates in the constituency.
User	User ID of the user who performed the transaction.
Copy	Copy number - 1, 2 or 3.
Transaction	Transaction type - add, edit or delete.
Date	Date the transaction happened.
Time	Time the transaction happened.

Also included are the votes for each candidate before and after any changes were made.

There are a variety of filters available to generate the report. There are listed below:

Filter	Description
Regions	To select all regions or one particular region.
Users	To select all users or one particular user.
Transaction Types	To select all transaction type or one type - adds, edits or deletes.
Transaction Dates	To select all transaction dates or one particular range of dates. The 'from' date must be less than or equal to the 'to' date. Either date can be left blank.

**OK** Once you have selected the filters you want, select the 'OK' push button to begin generating the report.

**Cancel** Select the 'Cancel' button to close this window and return to the system bar menu without generating the report.

## APPENDIX H



# **National Electoral Board of Ethiopia Technical Assistance Project Proposal**

## **Network Specifications**

for

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and

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May 1st, 1995

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## Introduction

This document is intended to serve as an overview of the characteristics and capabilities of the computer equipment which the International Foundation for Electoral Systems (IFES) proposes to install at the NEB headquarters in Addis Ababa for the tabulation of the May 7, 1995 local and regional election results. This installation proposal may be read in conjunction with IFES' project proposal of March 14, 1995.

To assist the NEB with the automation of the election results tabulation, IFES suggests the development of a network incorporating the existing computers at NEB headquarters and the equipment which IFES has purchased for this project. As will be demonstrated in the pages that follow, a computer network increases the efficiency of any office by saving time and money, and it provides the network users with opportunities to share their information. This in turn means an improvement in the quality of the goods which that office produces.

One of the chief concerns that every office must address is the issue of security. How does an organization protect sensitive information, yet also provide the kind of information that its clients request? This installation proposal deals with the issue of security from a network hardware and network software viewpoint.

The way a network system is maintained is just as important as the data that the system is set up to support. The section on Network Administration and Maintenance describes the ways in which users can ensure that the system is working properly at all times.

Finally, a list of the equipment which will be supplied to the NEB and a proposed physical layout of the equipment complete the presentation of the IFES computer equipment installation proposal.

We welcome your comments and questions on this document, and we reiterate our eagerness to assist the NEB to the best of our ability.

## Local Area Network

A local area network is a group of personal computers connected together in such a way that they are capable of sharing software programs, hardware components and organizational information. Local area networking has been, and continues to be one of the fastest growing areas of the information technology sector due to the substantial cost savings associated with sharing software and hardware, as well as the enormous savings associated with sharing information.

Sharing software programs reduces costs by allowing one software program to be shared by several users rather than purchasing one copy of the software for each user. Software upgrades are also cheaper because one upgrade can be purchased and used for the entire organization. It must be noted that special software licenses must be purchased to make the sharing of software legal; however, the costs of these licenses is always cheaper than purchasing multiple copies of the same software package.

Sharing hardware components reduces costs by allowing users to share disk drives, modems and printers. For example, one printer can be shared by several users reducing the initial cost of printers as well as any associated maintenance. Also worth noting is the fact that everyone in the entire organization can have access to a printer, as opposed to a user saving a document on a floppy diskette, walking to a computer that has a printer, and printing the document - a user can print documents without leaving his or her office. Sharing one or more central disk drives leads to substantial cost savings. In the event the information needs of the organization exceed the capacity of existing disk drives, one central disk drive can be upgraded, rather than upgrading each user's disk drive.

### Case Study #1

An organization requires a new software package to meet an upcoming information need at a cost of \$800.00 per copy. It is essential that all users at the organization have access to this new software package. Unfortunately, existing disk drives are too small to contain this new software package. One disk drive large enough to contain the existing information needs as well as the new software package will cost \$500.00.

### Non-Networked Environment with Five Computers:

The organization will have to purchase five copies of the software package in order for all users to have access to the package. This will cost  $5 \times \$800.00 = \$4,000.00$ . In order for the existing computers to contain the new software package, five new disk drives will need to be purchased. This will cost  $5 \times \$500.00 = \$2,500.00$ . The time required to install the new disk drives and new software will be substantial because five computers will be affected. At a cost of \$50.00 per computer, the total cost will be \$250.00.

Software:	4,000.00
Disk Drives:	2,500.00
Installation:	250.00
	-----
Total:	\$6,750.00

Networked Environment with Five Computers and One Central Disk Drive:

The organization will have to purchase one copy of the software package and one network software license in order for all users to have access to the package. This will cost \$800.00 plus an estimated \$1,500.00 for a multi-user license = \$2,300.00. In order for the central disk drive to contain the new software package, a new disk drive will need to be purchased. This will cost \$750.00. The time required to install one new disk drive and one new software package will be minimal because only one computer will be affected.

Software:	800.00
Network License:	1,500.00
Disk Drive:	750.00
Installation:	50.00
	-----
Total:	\$3,100.00

Total cost savings: \$6,750.00 - \$3,100.00 = \$3,650.00 or 54%

It must be noted that the cost of hardware and software varies. Hardware costs are dependent on capacity, speed and the manufacturer. Software packages and network license costs are dependent on the software package itself and the licensing policies of the vendor. The dollar figures used in this case study are hypothetical; however, generally speaking, a networked environment results in cost savings ranging from 30% to 60%.

## Information Sharing

The cost savings associated with sharing organizational information are intangible. The most effective approach to measuring cost savings associated with information sharing is to measure the costs of not sharing information. A second, and equally important measurement is the cost of potential human error associated with managing multiple copies of the same information spread over more than one computer. This cost can be enormous.

### Case Study #2

A charitable organization hosts a fund-raising event from which proceeds are to be donated to a local hospital. Patrons are required to pay a flat entrance fee as well as make an optional donation.

Patrons wait in one of two lines to pay the entrance fee. Two computers are to be used to process the two lineups. Each computer will contain a list of the people who attended, the amount of the entrance fee and the amount of any donations made. If a donation is made, a receipt is printed and handed to the patron immediately.

At some time after the event, organizers wish to have a printed list of all the people who attended the event. Because there exists two lists, one on each computer, producing one attendance report becomes difficult. The two lists must first be merged together onto one computer before the report can be produced. Depending on the software used to create the lists, the merge process may require one of the lists being manually entered for a second time. This approach is time consuming and error-prone. Will all the names be copied successfully? Will spelling mistakes be made? Will the dollar amounts of donations be copied correctly? What happens if one individual patron does not get copied from one list to the other and, at a later date, that patron contacts the organization and requests a new receipt because the original has been lost. The patron is informed that there is no record of his/her attendance at the event. The result could be a disgruntled patron who will never attend another fund-raising event.

In short, information sharing in a networked environment will eliminate work, eliminate the chances of human error and expedite the production of management reports. A second reason for sharing information in a networked environment is the accessibility of information. In a non-networked environment, a request must be made for someone to generate a management report. An individual must generate the report and hand deliver a paper document to the person who requested it. In a networked environment, information is accessible to everyone who is connected to the network regardless of the physical location of the central disk drive. Managers can access information without depending on other people or waiting for a paper document to arrive.

## **Network Software**

Network software is the set of software programs that controls the electronic communication between a users' computer and the central disk drive and controls which people will have access to the central disk drive, the information accessible and the level of access. Today's networking software is *invisible* in that it is invoked automatically when a computer is powered on. Users can access a central disk drive as if it were contained in the computer they are using. The central disk drive could be located ten feet away, in a different building or even in a different country.

### ***Users***

The central disk drive should be placed in a secure location accessible only by qualified personnel. An appointed system administrator will have the ability to create a list of the people who are to have access to the central disk drive, what parts of the central disk drive each user will have access to, and what level of access will be given. Each user will be assigned a unique user id and password that will be required by the network before access to the central disk drive is granted. This user list can be changed at any time with new users added and old users deleted. Individual users will have the ability to change their passwords at any time to ensure an individual does not access the central disk drive using another persons' id and password.

### ***Remote Communications***

Among the equipment to be supplied to the N.E.B. are five modems each of which is to be connected to the five existing N.E.B. computers. Modems provide a means of sending and receiving information and faxes via a telephone system. The proposed network software has inherent capabilities to operate modems. Faxes can be received as people work without interruption. They can be viewed or printed.

A more robust feature of the network software is the inherent ability to use modems to communicate with another computer or computer network. For example, a computer located in the home of a N.E.B. executive could access the N.E.B. network using a modem. It must be noted that several levels of security access must be passed before a successful connection is established.

### ***Security***

It is impossible to access the central disk drive until a system administrator provides the access by assigning a user id and password. In granting access, the system administrator can control which information users have access to and how the information is accessed. The central disk drive can be divided into any number of sections with each section

containing different information. Each user can be given different levels of access to any number of sections. Different access levels range from allowing a user to create, delete and change information to allowing a user to view information only. Network software can be configured to provide security to accommodate normal anomalies. For example, a user who has full access to sensitive information leaves his/her desk to go to lunch and forgets to disconnect from the network. The system can be configured to request a password after a small time interval, so if anyone tries to access the central disk drive in the users' absence, they will require a password before access is granted.

Accessing the central disk drive from a remote site via a modem (computer/telephone communication system) is no different than accessing the disk from a computer connected directly to the network. A user id and password are required before a connection can be established. As a means of tighter security, the network software can be configured to not accept incoming modem connections, or the central disk drive can be disconnected from the telephone system making a security breach physically impossible.

It must be noted that network security is only the first level of security. Custom software programs can be designed and developed to meet specific security needs of an organization, thus creating two levels of security. Users will be required to enter one user id and password to be granted access to the network. Users will be required to enter a second user id and password into the custom database software before access to sensitive information is granted.

### ***Electronic Mail***

The network software proposed for the N.E.B. has inherent electronic mail capabilities. Electronic mail is a document management system that allows users to create messages, notes and documents and send them electronically to other users connected to the network. For example, one memorandum can be created and sent to any number of network users by selecting the users from a list. Any memorandums received by a user can have electronic replies attached and sent back to the originator.

This functionality is very useful for sending one document to many people. It is also very useful in that one document can be received by several users only seconds after it is sent.



## **Network Administration/Maintenance**

The network software proposed for the N.E.B. is designed to be robust, simple to learn and use, as well as simple to maintain. Microsoft, the software vendor, has attempted to produce a product that, once configured, should be maintenance free. At the same time, the software is designed to be flexible in that any current configuration can be enhanced to meet the changing needs of an organization with minimal staff. The Microsoft software also has inherent troubleshooting capabilities to assist network administration staff in identifying and solving problems.

### ***Users/Passwords***

The list of network users, their user ids and passwords, as well as their access levels are easily maintained using screens supplied with the software. These screens are explicit and accompanied by extensive help facilities. The network software proposed for N.E.B. is accompanied by well-written documentation designed for people who need to learn the basic principles and operation of a network.

### ***Backups***

Backing up a network is the process of copying the contents of the central disk drive onto a small, hand-held tape, much like a cassette tape or video tape. Backups should be performed on a daily basis using a number of tapes to be rotated in such a manner as to keep information as *safe* as possible.

Included in the equipment to be supplied to the N.E.B. is a tape backup unit approximately the size of a briefcase to be connected to the central disk drive. The network software is robust in that it can be configured to backup the central disk drive automatically at a preset time. The software is intelligent enough to ensure the correct tape is being used for any given backup. The software also checks to ensure the information copied onto the tape has been copied correctly. The backup can also be performed while the network is being used by people.

### ***Uninterruptable Power Supply (UPS)***

Included in the equipment to be supplied to the N.E.B. are six UPS units to protect the central disk drive and all computers on the network from the potential damage to electronic equipment and information associated with power interruptions. UPS units are essentially large batteries that supply electricity to a computer in the event of a power failure. Rather than plugging a computer directly into a wall outlet, the computer is plugged into the UPS unit which is in turn plugged into the wall unit. In the event of a power failure, the UPS units intervene automatically keeping the computers running and

preventing loss of any information. The network software to be supplied is intelligent in that when there is a power interruption the central disk drive is notified and can act accordingly. Because the UPS units are essentially battery packs, the network can remain operational for approximately thirty minutes after the power goes out. This should be sufficient time for all users to properly disconnect from the network without endangering information integrity.

## **Equipment/Upgrade List**

The following is a list of the network related software programs and hardware components to be supplied to the N.E.B.:

### ***Central Disk Drive***

A central disk drive is a computer with a very large memory capacity (disk drive) and a very fast central processing unit. This computer is capable of processing large volumes of information at very high speeds. A high capacity, high-speed computer is required as the central disk drive as multiple users will be using this machine to run shared software programs and access shared information.

### ***Computer Upgrade Kits***

It is proposed that the five exiting N.E.B. computers be upgraded to allow for more memory capacity and faster processing. This approach is less expensive than purchasing five new computers. It is also proposed that newer circuit boards to control the screens be installed. These new circuit boards will allow the computers to display information quicker and will also enable the computers to display information in a higher resolution - more information displayed on the screen at once.

### ***Network Components***

Five network circuit boards to be installed in the five existing N.E.B. computers and one network circuit board to be installed in the central disk drive will provide a means of connecting all the computers together to form a network.

In order to connect the five existing computers to the central disk drive (file server), a concentrator will be supplied along with five individual pieces of telephone wire and one piece of special network computer cable. The five existing computers will be connected to the concentrator using the five pieces of telephone wire. The concentrator will, in turn, be connected to the central disk drive using one piece of special computer cable.

### ***Uninterruptable Power Supplies (UPS)***

Six UPS units will be connected to the five existing N.E.B. computers and the central disk drive. These will serve to ensure power interruptions do not endanger N.E.B. electronic information. These units are plugged into an electrical outlet, while the five computers and central disk drive are plugged into the UPSs.

### ***Modems***

A modem is a small component smaller than a tissue box that can be used to send information to and receive information from any other computer equipped with a similar modem via a telephone line. The modem itself is connected to the computer using a special computer cable. It is then connected to a telephone jack using standard telephone cable.

Supplied with each modem is a software program that operates the modem. The software can be used to send and receive faxes and information via the modem. At some time in the future, the modems could be used to receive voting results at N.E.B. headquarters transmitted electronically from the field.

APPENDIX I

# National Electoral Board of Ethiopia

## Vote Tally Sheet

Region:		Sheet#
Zone:		
Constituency:		Page:

**Copy #1 of 4 (Pink)**

[illegible]

## National Electoral Board of Ethiopia

### Vote Tally Sheet

Region:		Sheet#
Zone:		
Constituency:		Page:

**COPY #2 of 4 (Yellow)**

[illegible]

# National Electoral Board of Ethiopia

## Vote Tally Sheet

Region: _____	Sheet# _____
Zone: _____	
Constituency: _____	Page: _____

**COPY #3 of 4 (Green)**

[illegible]



# National Electoral Board of Ethiopia

## Vote Tally Sheet

Region:		Sheet#
Zone:		Page:
Constituency:		

**COPY #4 of 4 (White)**

**Number of Registered Voters:**

\_\_\_\_\_

\_\_\_\_\_

---

\_\_\_\_\_

[illegible]

# National Electoral Board of Ethiopia

## Vote Tally Sheet

### 1995 Federal Constituency Elections

<b>Region:</b>	Southern People's National Region	Sheet# 070906
<b>Zone:</b>	Hadiya	
<b>Constituency:</b>	Lemo 03	Page: 1 of 1

**COPY #1 of 4 (Pink)**

[illegible]

# National Electoral Board of Ethiopia

## Vote Tally Sheet

### 1995 Federal Constituency Elections

<b>Region:</b>	Southern People's National Region	<b>Sheet#</b> 070906
<b>Zone:</b>	Hadiya	
<b>Constituency:</b>	Lemo 03	<b>Page:</b> 1 of 1

**COPY #2 of 4 (Yellow)**

[illegible]

## National Electoral Board of Ethiopia

## Vote Tally Sheet

### 1995 Federal Constituency Elections

<b>Region:</b>	Southern People's National Region	Sheet# 070906
<b>Zone:</b>	Hadiya	
<b>Constituency:</b>	Lemo 03	Page: 1 of 1

**COPY #3 of 4 (Green)**

[illegible]

# National Electoral Board of Ethiopia

## Vote Tally Sheet

### 1995 Federal Constituency Elections

<b>Region:</b>	Southern People's National Region	Sheet# 070906
<b>Zone:</b>	Hadiya	
<b>Constituency:</b>	Lemo 03	Page: 1 of 1

**COPY #4 of 4 (White)**

**Number of Registered Voters:**

[REDACTED]

\_\_\_\_\_

11/11/2016

\_\_\_\_\_

[illegible]

APPENDIX J

# National Electoral Board of Ethiopia

## Computer Room Specifications

### 5 Workstations:

#### Hardware:

- 486 DX 33Mhz
- 16 MB RAM (4x4MB 30 Pin SIMMS)
- 504 MB IDE Hard Disk
- 3.5" 1.44 MB Floppy (A) Drive
- 5.25" 720 KB Floppy (B) Drive
- IDE/Video Multi-Function Card
- 1MB Video Memory
- Microsoft Bus Mouse Card
- 3Com Etherlink III Network Card (TP/Coax/AUI combination)
- 2 Serial, 1 Parallel Ports
- 14" Super VGA Color Monitor
- 1 Smart-UPS 400
- 1 Zoom Fax/Modem 14.4 BPS V.32/V.42 bis

#### Software:

- MS-DOS 6.22
- Windows 3.11 for WorkGroups
- Macafee Anti-Virus (Prevents, detects and cleans)
- Microsoft Office 4.3
  - Excel 5.0
  - Word 6.0
  - PowerPoint
  - Access 2.0

### File Server:

#### Hardware:

- Pentium 90Mhz
- 64 MB RAM (Loaded)
- 2x1GB SCSI II Hard Disks
- SCSI II CD ROM Drive
- 3.5" 1.44 MB Floppy (A) Drive
- 5.25" 720 KB Floppy (B) Drive
- 3Com Etherlink III Network Card (TP/Coax/AUI combination)
- 2 Serial, 1 Parallel Ports
- 14" Super VGA Color Monitor

1 Smart-UPS 1200 with PowerChute Software/Serial Cable  
14" Super VGA Color Monitor  
1 ExaByte 1/4" 1GB SCSI II Tape Drive with 12 1GB Tapes

1 3Com LinkBuilder FMS Twisted Pair Hub Model #3C16271  
with 12 RJ45 Jacks and 1 AUI Interface (capable of being chained 4 high)

1 Epson EPL 5200 Laser Printer (HP LaserJet II Compatible) with 5MB RAM and Parallel Interface

#### Software:

Windows NT Server 3.5  
FoxPro for Windows 2.6  
PowerChute UPS Software

#### Additional Hardware:

##### 3 Workstations

486 DX 33Mhz  
4 MB RAM (4x1MB 30 Pin SIMMS)  
103 MB IDE Hard Disk  
3.5" 1.44 MB Floppy (A) Drive  
5.25" 720 KB Floppy (B) Drive  
IDE/Video Multi-Function Card  
1MB Video Memory  
Microsoft Bus Mouse Card  
2 Serial, 1 Parallel Ports  
14" Super VGA Color Monitor

(1 workstation has 8 megabytes of RAM and a 15" VGA monitor)

#### Printers:

5 Epson LQ 870 Dot Matrix Printers with Parallel Interface (3 are broken)

#### Miscellaneous:

5 parallel printer cables.  
16 1MB 30-pin SIMM chips



APPENDIX K

# **National Electoral Board of Ethiopia**

## **Information Technology Report**

July, 1995

Prepared by:

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July, 1995

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## Introduction

Many countries in the world have fair and efficient electoral boards which are managed largely using computer systems. Developed countries including Canada have spent years determining what electoral information must be provided by computers and how computers are used to provide the information.

As computer technology becomes less expensive and more powerful, computers become efficient and cost-effective ways of supplying and managing all types of information. In order for computers to be effective at the National Election Board of Ethiopia (N.E.B.), the electoral board must first determine what information they need to effectively administer an election.

This document describes some of the electoral information management techniques being used in other countries, how computers are currently being used at the N.E.B., and how computer technology at the N.E.B. can be expanded.

## Information and Computers

Computer companies might say computers make organizations "better, faster and cheaper". Election officials in a developed country might say "it takes a lot of time to go fast, it takes a lot of energy to make things better, and it costs a lot of money to have a computer system that works when you need it to work".

This does not mean computers are a waste of time or money. Many electoral boards around the world use computers to get valuable information in seconds that would otherwise take days, or even weeks. Technology is also being used to assist electoral boards in planning, logistics and procurement activities associated with upcoming elections.

When proven technology is combined with proper training, systems management and systems support, computers become very valuable tools for smooth election administration.

Computers also provide a cost-effective and efficient means of electoral decentralization. Information collected at the national office (Addis) could be exchanged with regional offices - information collected at the regional office could be exchanged with the national office. Four examples:

- All documents and faxes can be sent between regions using computers - no fax machines. This is commonly known as *office automation*.
- Candidate registration and results tabulation could eventually be done at each regional office and sent the national office. The national office would then use the information to produce ballot papers at a central printing press in Addis Ababa.
- Vote counts could be entered directly into regional computers and electronically sent to the national office. Consolidated regional results could be used to print the official election results using a central printing press in Addis Ababa.
- Eventually, the political map of Ethiopia (elections, regions, zones, constituencies) could be managed at the regional level. Regions could electronically tabulate lists of constituencies and polling stations, the exact locations of these places, and the names, address and telephone numbers of the election officials at each constituency office or polling station.

Computers make it possible to have a slow and gradual decentralization process, or a fast transition. With good planning, computers can be made flexible and meet the exact needs of the N.E.B.

The five original N.E.B. computers have been connected to one central computer to form a local area network (*LAN*). All electoral information is stored on the central computer and is shared by the five original computers using the network.

The centralized information can be accessed by any computer connected to the network having the appropriate security clearance. A feasibility study is being done to determine the costs of installing one network cable that would link all the buildings in the N.E.B. compound to the computer center. This type of cable is called a *backbone* and would be used to connect all computers together to share N.E.B. information.

Computers can be installed in different buildings to begin collecting information for each department. When it is time for a department to begin sharing information with another department, they could be connected to the network using the *backbone* cable. Computer programs could be developed to provide departments with shared information. Three examples:

- Candidate mailing address information could be collected by one department and stored on the central computer. If the N.E.B. wanted to send every candidate a letter, the letter could be written once and one copy could be printed for many candidates.
- Civic education material could be developed and printed using computers in the civic education department. Ballot symbols could be used to create ballot papers in the ballot design department. All N.E.B. printed material could be sent electronically to a computer at the central printing press for mass-production.
- Computers could be used to administer election logistics, procure election material, track ballot production, schedule shipping, and-coordinate communications between the head office and election offices across Ethiopia. A supplies management system could be used to electronically manage central warehouse facilities and election administration. Logistics information could link to an election expenses system to track election expenses.

There are many uses for a computer system. It is necessary for any organization, including the N.E.B., to define information requirements before trying to use computer technology. It is also important to allocate sufficient time and resources to make sure people are properly trained and computer resources are properly managed.

## Electoral Information

Computers are changing election administration around the world. Electoral boards in many countries use computers for effective election administration. To move from manual administration to technology, computer systems must be scientifically designed, not crafted. Much planning must take place before computers can be used efficiently and easily. Many western countries have been using technology for many years and have developed very efficient information management policies.

Some of the information managed by election officials around the world include:

- The people that are registered to vote.
- The address where these people live.
- The electoral district or constituency where people live.
- The places where candidates go to register.
- The places where people go to vote.
- The candidates or parties people can vote for.
- Election results for each election at the local, regional and national level.
- The winning candidate and party names of each newly elected government.
- A breakdown of election costs and election financing.
- Detailed public disclosures of political party contributions and expenditures as well as the expenses associated with an individual candidate's campaign.
- The names and qualifications of each election official working for the electoral board.

To be cost-effective, electoral computer systems must be expandable. It must be easy and cost-effective to add computers to an existing computer network. Election boards around the world are usually the busiest during an election than during non-election periods. This characteristic of elections means many new people are hired for an election and computer systems must operate properly for a computer based election system to work properly.

Intensive computer training and support must be given to people who will operate computers during an election. Not only do systems need to be fast, simple and robust, they must also be "friendly" because untrained or under-trained people are likely to be using them. Spare equipment must be made available to replace failed equipment during an election. Waiting several days for a piece of equipment to be repaired can have a direct impact on a crucial deadline.

Many electoral boards have computers running twenty-four hours a day, seven days a week during an election. A lack of experienced and trained support people can become a big administrative problem. Training and support of permanent staff must be ongoing to ensure personnel are effective during elections and crucial deadlines are met.

Electoral computer systems must use high levels of security. The general public will need to know that registration lists and election results are only being changed by qualified personnel. Security must be implemented by controlling peoples' access to information. An election system must be designed to ensure the theft of one piece of equipment does not destroy the integrity of the entire electoral board.

If electoral computer systems are well planned, managed by qualified systems personnel and used by trained people, they are very useful. When properly implemented, computers can quickly provide the information election managers need to effectively administer an election.

## Information Technology at the N.E.B.

There is currently a local area network consisting of one central computer (server) and five additional computers (workstations) connected to the server. The N.E.B. has been using a variety of *off-the-shelf* programs to provide word-processing (documents) and spreadsheets (results tabulation). Four custom-made computer programs have been developed to administer the production of candidate lists and election results at the N.E.B. replacing the spreadsheets. The four programs are as follows:

- Menu system - To control information security.
- Table Control System - To define the political map of Ethiopia - elections, regions, zones, constituencies, candidates and political parties.
- Election Results Tabulation System - To tabulate election results and provide election-related statistics.
- Disaster Recovery System - To assist with computer systems administration.

The menu system is used to control access to two major systems. The first system allows personnel to create a political map of Ethiopia (elections, regions, zones and constituencies). This system also collects candidates and political parties. Candidates are classified as "independent" or belonging to a political party, and are matched with political parties and constituencies. The local area network allows personnel to simultaneously collect and store information on the central computer (server). The programs are designed to validate the information and make sure it is correct.

Once regional candidate lists are finished, simultaneous collection of election results begins. All results are stored on the central computer. The results are being electronically verified and a wide variety of reports and statistics are being produced.



## Office Automation

Microsoft Windows and the word-processing program Microsoft Word are two programs that are currently being effectively used by the N.E.B. These *off-the-shelf* products are cost-effective and easy to learn. They provide people with a way of easily creating and changing documents that can be accessed by anyone with the appropriate security clearance. Copies of a document are currently placed on a diskette and carried from one building to another. Using a local area network means a person in one building can print a document created by a person in another building.

Quality documents can be produced efficiently using a local area network and *off-the-shelf* programs like a word-processor. Some examples of office automation include:

- The spelling of English documents can be verified and corrected.
- Faxes can be sent and received using the computer, a printer, a small component called a modem and a telephone line. The computer doubles as a fax machine. Faxes are printed on fast, high-quality printers rather than one long piece of paper.
- A letter can be written once and sent to many people.
- Faxes can be sent to many places at once.

*Off-the-shelf* programs can be purchased at many computer stores. They are cost-effective, easy to learn, easy to use and do not require special training (The N.E.B. has enough in-house expertise now to train additional personnel). These types of programs can be easily used on computers that are or are not connected to the network.

## Election Results

### *Counting Ballots*

The N.E.B. election results system used by the N.E.B. tabulates election results, prints election results and generates a wide range of election statistics. This system could be modified to generate blank *forms* for collecting and tallying voting results. These forms could be mass-produced once candidate registration is finished. Constituency offices could use the forms to manually collect vote counts. The forms would then be returned to national office and entered into computers.

These forms would be created using an existing electronic political map (elections, regions, zones, constituencies) and consist of candidate names, party names and boxes to write vote counts. Blank tally sheets would be generated and sent to all N.E.B. constituency offices once candidate registration was finished.

The form is designed to make vote counting fast, accurate and non-partisan. Each form would consist of four pieces of paper separated with carbon paper. The first three copies contain the candidate names, party names (or *independent*) and a 'box' to enter the final vote count.

Three different election officials would write vote counts on the carbon-paper form. Each person would fill in one copy, sum the votes to get a total, and enter the total on the bottom of their copy. Each person can not see the numbers entered by the other two people.

Once three people have entered and removed copies 1, 2 and 3, a fourth election official would compare the three independent totals on copy 4. If all three totals match, the count is finished. If the totals are different, the completed form is destroyed and a new form is used to count the votes again. The counting process is repeated until all three totals are the same.

This counting method is fast, accurate, non-partisan and would allow N.E.B. computers to collect more information with less effort. This type of approach has quality control and fairness *built in*. It would provide consistent, accurate information at both regional and national levels.

### ***Tabulating Election Results***

Three different people are currently entering constituency results into the national computer system (similar to the way votes could be counted at the constituency level).

Once a constituency has been entered three times, the computer compares the three copies to see if they are the same. The computer produces printed reports of which constituencies have been entered, how many copies have been entered and how many copies are the same or different. This is to ensure the votes are entered into the system accurately.

When three copies of a constituency have been entered and are the same, the computer provides a way of "freezing" the constituency as a security measure. Once a constituency is "frozen" it can not be changed. Election results can not be tampered with.

A computer-generated form would allow the current N.E.B. results system to be totally non-partisan. Computer personnel can currently see candidate and party names displayed on computer screens while results are entered. The fourth copy of the form returned by the constituency office would not contain candidate names. Candidate names would be replaced by sequential numbers. Rather than display candidate and party names on

computer screens, national computers would display sequential numbers and correspond with the form.

## Election Results Decentralization

Election results could be collected in constituency offices using computers. The same computer-generated form could be generated by each constituency and used to count votes.

The same program used in the national office could be modified to collect results at the constituency level. Completed tally forms would still be sent to the national office. The *paper* election results would provide the national office with an audit trail and would not be collected using national office computers.

The *electronic* results collected at a constituency office would be electronically sent to the national computer using *modems* and telephone lines. The national office could simply print the consolidated regional results and statistics. The collection of Election results could eventually be eliminated at the national level.

## Candidate Registration

Computerized forms could be used to help administer candidate registration. A candidate registration methodology would be similar to a ballot counting methodology. A printing press would mass-produce blank forms. The blank forms would then be partially completed by national N.E.B. computers and sent to constituency offices around Ethiopia. The constituency offices would supply the missing information and send a carbon copy of the completed form back to the national office for entry into the national computers.

Computer-generated forms provide a way of efficiently collecting consistent information. Information must be consistent in order for the N.E.B. to generate statistics. Forms make the collection process fast, reliable and easy to use, and work well under the hectic pace of an election.

N.E.B. computers can be used to design all N.E.B. forms. The new N.E.B. printing press currently being installed in Addis will be capable of manufacturing these types of forms. The paper will probably have to be imported into Ethiopia. All other tasks associated with producing a multi-copy form can be performed here. It is also possible to print instructions on the back of all forms.

A summary of the steps required to use this type of form for candidate registration administration:

- Blank registration form is designed,
- Multiple copies of blank forms are printed using the new printing press,
- Computers partially complete the blank forms (region, zone and constituency names, logistics information, special instructions, etc.)
- The partially completed forms are then sent to each constituency office where information is manually collected as candidates register.
- Completed forms are then sent back to the national office for entry into N.E.B. computers.
- Once in the national database, candidate information could be used to assist with the production of ballot papers.

The following information would be printed on the form by N.E.B. computers before the form is sent to each constituency office:

- Election (event) name,
- Region name,
- Zone name,
- Constituency name, and
- A list of all valid political parties as well as the *Independent* category.
- Logistics information (the location of the constituency office).
- Instructions - how to complete the form.
- Special instructions for constituency officials.

Registration officials in constituency offices would manually supply the following information as candidates register:

- Candidate name (English and Amharic),
- Gender (male or female),
- Age,
- Years of education,
- Home mailing address,
- Business mailing address (if applicable), and
- Political affiliation.

Each form would have two copies separated by carbon paper. Once the form has been completed at the constituency level, the first copy would remain in the constituency office, while the second would be returned to the national office for entry into the national computers and eventual filing.

## Amharic Computers

Amharic is the official language of Ethiopia. Computers at the N.E.B. must be able to produce Amharic output (letters, reports, forms, spread-sheets, etc.) before the electoral board can effectively use computer technology in Ethiopia.

There are two types of software programs currently being used at the N.E.B. - *Off-the-shelf* programs and *custom developed* programs. Off-the-shelf programs include the programs that come supplied with a computer and other general-purpose programs such as word processing programs and spread-sheet programs.

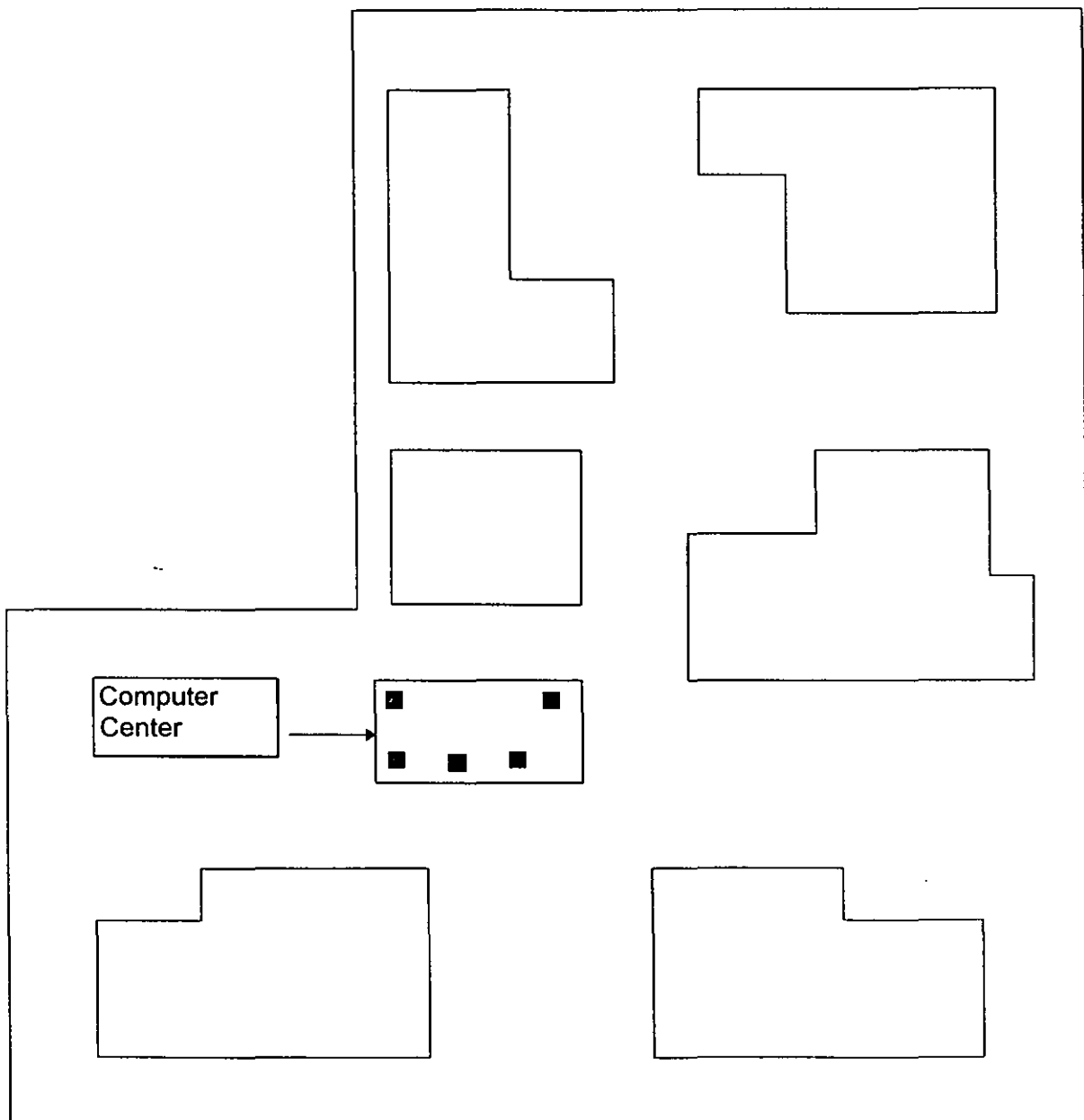
While many off-the-shelf programs come in a wide variety of languages, Amharic is not currently available. At the same time, these programs can be used with a minimal knowledge of the English language and can be used to produce Amharic output. The N.E.B. is currently using Microsoft Word for Windows and Microsoft Excel - two English programs that produce English or Amharic output.

Custom-made software programs are those programs written especially for the N.E.B. These programs are new to the N.E.B. and allow the electoral board to define the political map of Ethiopia, administer a list of candidates and tabulate election results. A computer programmer can make these programs completely bilingual - all Amharic or all English. All information displayed on a screen can be in either language. All printed reports can be Amharic, English or both. Computer users can change their language preference at any time.

I have developed several bilingual software programs for the Canadian Government using the same technology that is being used by the N.E.B. The Canadian systems provide computer users with systems that are French or English using special language *fonts*. The same technique, using different fonts, can easily be applied to all N.E.B. custom-made programs to create fully bilingual Ethiopian computer systems.

Appendix A  
N.E.B. Compound - Network Cabling  
Phase 1

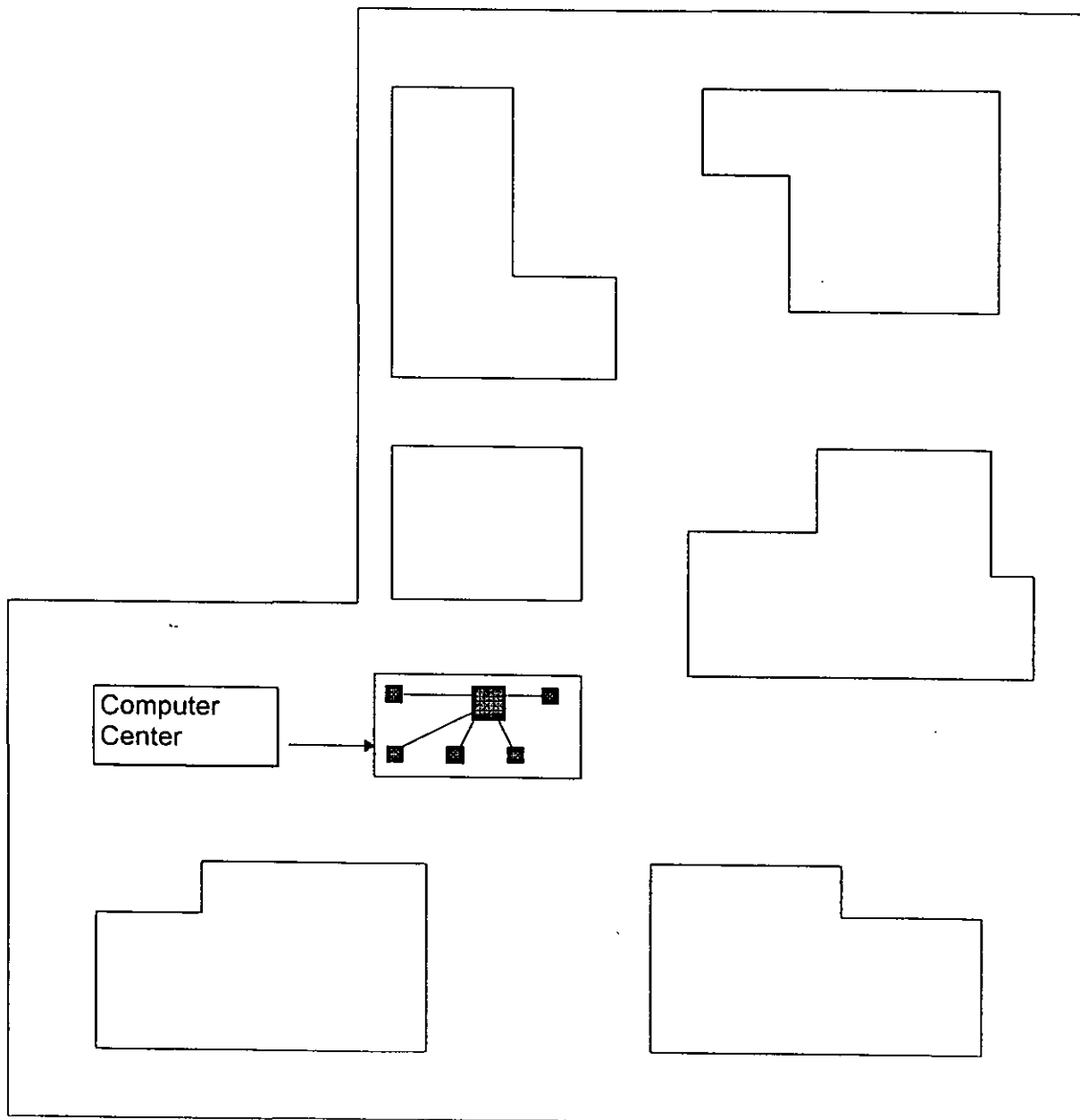
Five computers with no network. *Off-the-shelf* wordprocessing and spreadsheets - no information sharing.



Appendix A  
N.E.B. Compound - Network Cabling  
Phase 2

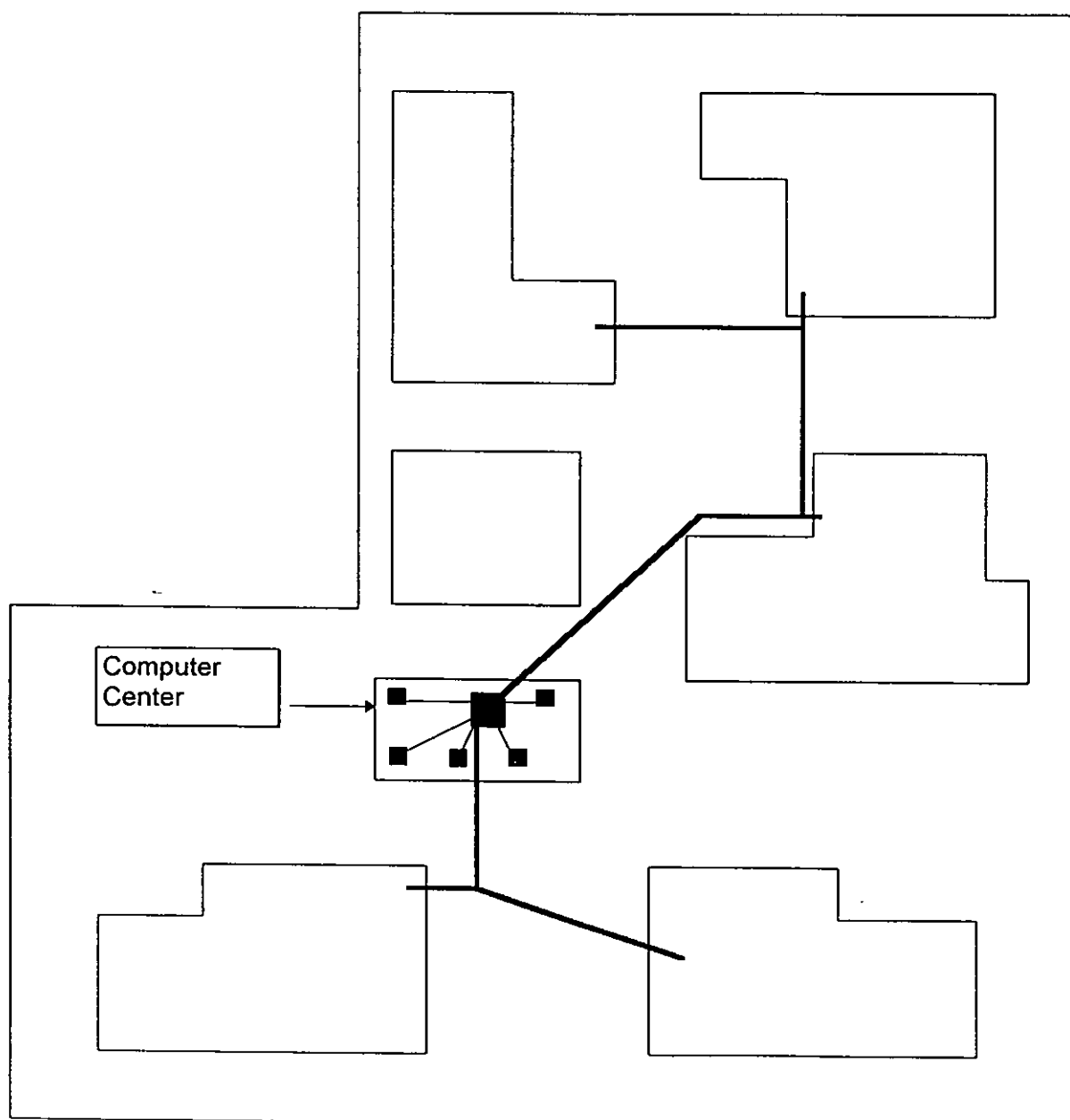
Network installed to connect 5 existing computers. Information sharing begins four custom database systems to perform the following:

- Ethiopia polical map (elections, regions, zones, constituencies),
- Candidate lists,
- Election results tabulation, and
- Computer system administration.



Appendix A  
N.E.B. Compound - Network Cabling  
Phase 3

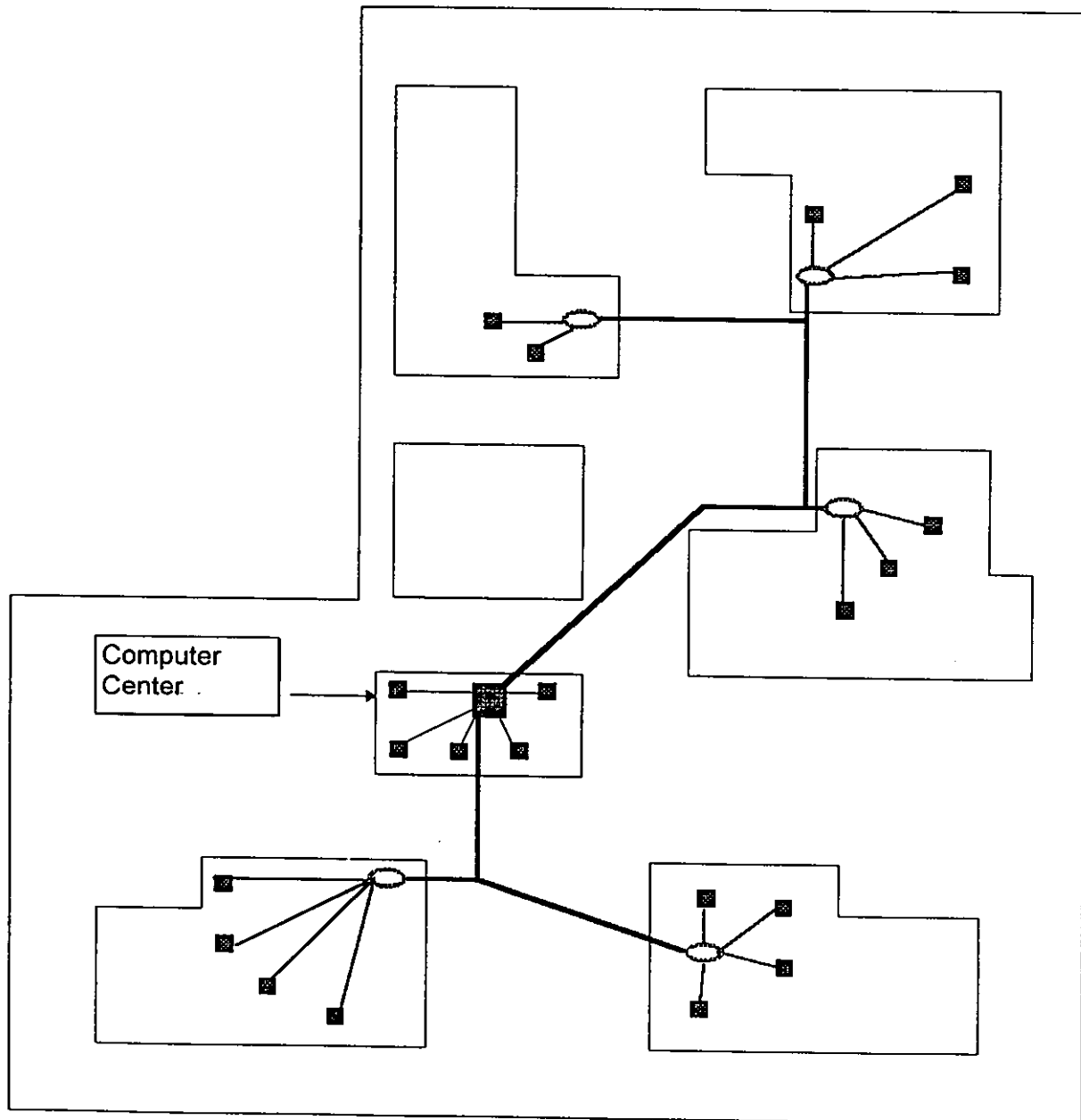
Installation of network *backbone* cable to provide for a fast, standardized expansion of computer facilities.





Appendix A  
N.E.B. Compound - Network Cabling  
Phase 4

Information sharing between departments.



## I. INTRODUCTION

This report shall serve as an activity report for USAID/Ethiopia Grant No. 623-0007-G-00-4044-00 covering the period beginning September 1994 and ending July 1995. This report incorporates and expands upon the quarterly activity reports that have been submitted by IFES to USAID Ethiopia during this period. This report also includes, in its appendices, technical documentation of the computerization assistance activity that was implemented in Addis Ababa in May through July 1995. This report is organized chronologically, with activity reported for the months between September and July 1995.

The original period of the grant was from May 1 until August 31, 1994, and provided funding for IFES' technical assistance to the National Electoral Board of Ethiopia (NEB) before and after the June 1994 Constituent Assembly elections. IFES submitted a report on these activities to USAID Ethiopia in September 1994. The grant was subsequently extended through December 31, 1994; a second time through June 30, 1995; and a third time through December 31, 1995. In addition, the original grant of \$242,941 was amended in July 1995 to \$312,078.

The original project description defined four separate activities in preparation for the June 1994 Constituent Assembly elections in Ethiopia:

- ▶ provision of up to ten mobile HF transceivers (2-way radios) for use by the National Electoral Board of Ethiopia (NEB) during the month prior to the election. This equipment became part of the permanent communication equipment inventory of the NEB;
- ▶ visit of a specialist to Ethiopia during the month prior to the June 5 election to oversee installation and use of the mobile radios, to monitor the NEB's needs and activities, and to provide advice as appropriate;
- ▶ assistance in organizing and facilitating a post-election evaluation workshop with the NEB; and
- ▶ assistance in NEB's initial goal-setting and strategic planning exercises following the evaluation workshop.

Activities in support of each of these objectives were performed from mid-May through mid-July 1994 (see IFES September 1994 report). At the conclusion of the activities, IFES was advised by USAID/Ethiopia that an immediate continuation of on-site assistance would be of questionable use, as planning for the parliamentary elections had not begun, and as the originally projected December 1994 election date was no longer feasible. Nevertheless, IFES maintained contact with NEB and remained involved in the support of the developing governance process in Addis Ababa as well as in Washington, DC. In November 1994, Keith Klein, IFES Director of Programs for Africa and the Near East, traveled to Ethiopia to meet with members of NEB and to discuss areas for continued cooperation and IFES assistance. From December 1994 through

February 1995, IFES provided information and research support to the Congressional Task Force on Ethiopia as that group prepared to host peace and reconciliation talks between the Transitional Government of Ethiopia (TGE) and a number of opposition political parties. By spring 1995, IFES and USAID/Ethiopia reached consensus on objectives which were slight modifications on the original project description. In March, IFES submitted a proposal for assistance to NEB to USAID/Ethiopia which retained the original concept of equipment procurement accompanied by on-site technical specialists to provide appropriate advice. The focus of this year's assistance was the development of an automated method of results tabulation.

The project, as amended, included the following objectives:

- provision of five HF transceivers;
- installation of a local area network to serve the computers currently in use at NEB headquarters;
- training of the NEB computer staff in network administration as well as related software applications;
- development of a database application for the tabulation of elections results: and
- training of the NEB computer staff in the use, maintenance and expansion of the database application.

On-site activity in preparation for the May 1995 legislative elections began in mid-April 1995; scheduled to conclude at the end of May, the activity was extended through the middle of July. With a \$20,000 equipment purchase, IFES installed a network linking the computers currently in use at the NEB headquarters in Addis Ababa, trained the personnel in basic software application use, and developed a database for the practical organization and publication of the election results from the 1994 Constituent Assembly Elections, the 1995 legislative elections, and future elections in Ethiopia. A second general project objective, the provision of five additional HF transceivers, was fulfilled during this period.

To a considerable extent, the objectives of this project period were achieved. Shaun McGrath, a Canadian systems analyst with election results tabulation experience, traveled to Ethiopia from mid-April through mid-July to install the network equipment, to create a database and to instruct the NEB personnel in its use. The activities in the last month of the project were sufficiently effective to enable the NEB to share its thoughts regarding a continuation of the automation upgrade in the areas of civic education, tally sheet and ballot design, as well as for internal

organizational purposes. At this writing, IFES expects to submit a proposal to perform activities in support of those objectives.

One issue of concern to IFES as this period closes, and more importantly as the next phase of activity is begun, is the degree to which all parties cooperated and communicated in the design, management and fulfillment of the objectives of the project. Undefined personnel issues, which logically could have been raised by the NEB immediately following the 1994 IFES project (or within seven months of the project's conclusion) were cited as the primary reason for the NEB Executive Staff Secretary's decision to severely and unusually restrict the on-site activities of the IFES Senior Program Officer responsible for this project on the eve of her travel to Addis. The contents of the March 1995 proposal, understood by IFES to have emanated from a request by NEB which was transmitted via USAID/Ethiopia, were not made known to the NEB executive staff until the project was two weeks into its first phase. Finally, the effort made by IFES to procure and transport the computer equipment mentioned in the proposal in advance of the May 7 elections proved to be of marginal utility, as the equipment remained in customs for more than half of the project period. It is unclear at this point whether the NEB had more problems with the manner in which the project was implemented, with IFES as the implementing organization, or with the project personnel. This lack of clarity obviously affects IFES' ability to develop effective solutions to these problems, as well as to agree on whether further assistance would be appropriate.

The fundamental organizational purpose of IFES is one of service to electoral bodies which request IFES' assistance. To ensure that IFES continues to design and implement projects which provide the maximum benefit to those electoral bodies, it is essential that the lines of communication between all parties remain open. During the April-July project period, IFES was able to deliver what it promised, even as it responded to several issues raised by NEB which potentially could have obstructed the project beyond salvage. It is IFES' expectation that the current time period will be used to clarify outstanding issues; to assure each entity involved that any future work proposed by IFES will be developed from NEB's specifications and performed to the satisfaction of all organizations; and to facilitate a smooth transition to the second phase of on-site project activity.

## II. DETAIL OF PROJECT ACTIVITY

### August - September 1994

The May - July 1994 Technical Assistance project in support of the Constituent Assembly elections in Ethiopia provided IFES with a comprehensive overview of the election process from administrative as well as political standpoints. In early July 1994, IFES assisted the NEB in the coordination of a post-election evaluation workshop, the proceedings of which formed the basis for Ethiopian election workers' recommendations for improvement of several administrative processes. In addition to the workshop proceedings, which IFES organized and prepared as a report, IFES was able to use the report and recommendations of its on-site consultant Gary Ouellet and Program Officer Laurie Cooper. These reports were made available to the NEB and to USAID/Ethiopia. The theme of all of the recommendations was how NEB might increase the level of transparency (and, by extension, the credibility) of its election process. Of particular concern to Ouellet and Cooper was the delay experienced by the NEB in release of consistent, analyzable election results from the June elections, and of results from outer regions in subsequent elections. The distance required to travel and the level of instruction and follow-up, combined with the inconsistent delivery of election results tally sheets, meant that the NEB was unable to produce much more than rudimentary tables in a spreadsheet format. The results summaries, when scrutinized closely, did not add up across columns; in addition, some information in certain regions was unavailable, making the results schedule incomplete. To alleviate this and other transparency issues, IFES recommended as a possible further activity the provision of a computer specialist to the NEB headquarters to perform an analysis of the responsibilities of the Board and to develop automated systems which would streamline the entire election process.

Following the conclusion of this project in July 1994, IFES was not immediately scheduled to perform further project activities in Ethiopia, although it was envisioned that the NEB could begin work as early as September in preparation for the regional and national legislative elections. In anticipation of eventual resumption of project activities, IFES requested and was granted a no-cost extension from August 31, 1994 through December 31, 1994. Through September and October, IFES' primary contact was with Stevens Tucker, the USAID Democracy and Governance Advisor and the Project Officer for the IFES project. Tucker in turn communicated with the Executive Secretary of the Board. At this time, IFES had not received a positive response to its suggestions regarding computer training and systems analysis. Furthermore, the Constituent Assembly, recently meeting after the August 28 elections, had to deliberate on more than one hundred constitutional issues, including certain electoral procedures. The expected conclusion of the deliberations was December 1994. As a result, little activity in reparation for the elections was being performed by the Electoral Board during this period.

## October - December 1994

Continued discussions during October and November were inconclusive regarding appropriate activities for IFES. As of the middle of October, USAID Ethiopia indicated that it had had little recent contact with NEB. It also appeared that IFES' suggestion of providing a long-term computer trainer to assist with the organization of the NEB office had not met with an enthusiastic response from NEB. Furthermore, the continued lack of opposition participation in the political process, compounded by the lack of a schedule for the beginning preparations for legislative elections, made it inadvisable for IFES to restart its work. As a result, no on-site assistance activity took place during this period.

From November 20 - 25, 1994, Keith Klein traveled to Addis Ababa to meet with USAID representatives, key NEB personnel, and opposition party representatives to discuss the preparations for elections and the prospects for further IFES activities. Klein learned that the Board at that time intended to conduct regional and national elections on the same day. Such an initiative would require the board to either redraw the local boundaries, or enter a complicated exercise by using the current constituency boundaries as regional boundaries as well. During this visit, Klein received some feedback on the earlier IFES project. Specifically, the Board was concerned that an insufficient number of election staff had been invited to the July 2-4 post-election workshop. Nevertheless, Ato Assefa viewed the overall event as an informative process, and expressed plans to follow the next elections with a similar workshop. Again, it appeared that the reaction of NEB officials to the idea of a long-term computer consultant was not overwhelmingly positive, although they were receptive to the concept of shorter term computer assistance. In addition, the possibility of an IFES civic education project was discussed. Before proposing further on-site activities, IFES was requested to wait for further developments.

In Washington, the IFES offices were the site on December 10 for a meeting of Ethiopia specialists, representatives of the Carter Center, NDI, The Brookings Institution, and the Congressional Task Force to discuss appropriate strategies for working with opposition representatives and ultimately urging them to join the political process. To support the work of the Task Force, IFES requested and was approved to charge activities performed for the Task Force to the Ethiopia grant. Throughout this process, IFES would serve as a resource to the principal advisors on the Task Force. By keeping the Task Force informed of the activities of the Electoral Board, particularly in those areas which concerned political parties the most (adjudication of election process grievances, access to media), IFES functioned as a neutral information source to each participant.

## **January - February 1995**

IFES continued its work in January 1995 with the Congressional Task Force (CTF) on Ethiopia. IFES staff participated in meetings of an advisory group held approximately every two to three weeks among Ted Dagne (representing the CTF), Terrence Lyons of the Brookings Institute, Dr. Marina Ottoway of Georgetown University, Patrick Merloe and Ben Feit of the National Democratic Institute, and Ahuma Adoadaji and Sue Palmer of the Carter Center. The purpose of the meetings was to identify the ways in which information could be provided by the institutions named above to the leaders of Ethiopia's political parties in an effort to encourage full participation in the May 7 elections. The CTF planned to host talks between the party leaders from February 6-9, 1995. During the talks, the Task Force would facilitate discussion and assist the political leaders in developing realistic positions from which to negotiate their entry into the process, with the expectation that they would return to Addis Ababa. At each meeting, Lyons and Ottoway briefed the meeting participants on the chief concerns of the party leaders, among which were the closing of the gap between the Transitional Government of Ethiopia's (TGE) responsibility and its commitment to enforce all aspects of the electoral law, specifically in the areas of campaign and registration freedom and civic education.

In addition, the members of the Congressional Task Force requested information from the advisory group on the electoral law as well as further background research which would enable them to effectively mediate the discussions during the talks. Keith Klein prepared a paper clarifying positions in the Ethiopian electoral law on various issues, including candidate and voter registration and dispute resolution. Laurie Cooper, Program Officer for Africa and the Near East, prepared a paper on the role of electoral commissions in different countries around the world. On Friday, February 3, Klein and Cooper briefed Representative Harry Johnston and Representative Alcee Hastings on the papers and presented their recommendations regarding the concerns expressed by the political party leaders. Klein and Cooper attended the talk's opening reception on February 6 at the Department of State. (A letter from Rep. Johnston acknowledging IFES' support to the Task Force is attached as Appendix A.)

## **March 1995**

Between February and early March 1995, Keith Klein and Stevens Tucker discussed the progress of the NEB in preparation for the May 7 elections to identify ways in which IFES could be of assistance. On March 1, Tucker forwarded two suggestions for IFES assistance to the NEB. The first was a procurement of HF two-way radios for use in the Board's vehicles. The second was the design of a computerized results tabulation system which would enable the Board to release unofficial election results beginning on the evening of the election, and to produce the official report of the results by the Board's May 23 deadline. On March 15, IFES submitted a proposal to USAID Ethiopia to conduct activities in response to these suggestions. Under the

proposal, IFES would procure the additional HF radios; it would also procure equipment to establish a results tabulation system. IFES would also send a results tabulation specialist to Ethiopia to develop, implement and train NEB computer personnel on the use of the system. The proposed activities would be funded by reprogramming the approximately \$107,000 remaining in the current Grant Agreement with USAID Ethiopia, signed in May 1994. At the same time, IFES requested a no-cost extension of the Grant until June 30, 1995.

Reviewing the procurement of HF radios from IFES' previous activity in 1994, IFES' procurement department solicited a bid from Motorola Communications Israel Ltd for a total of five HF radios matching the specifications of the ten radios procured in May 1994. Motorola Israel was selected as the "sole-source" vendor for the radios based on their prompt delivery of the May 1994 order, their ability to match components of the radio system already being used by the NEB, and their ability to deliver the radios by mid-April. The radios were scheduled for delivery in Addis by the second week in April.

To implement the results tabulation system, IFES proposed to supply the Board with sufficient computer equipment to link the Board's existing hardware (five workstations and assorted printers) in a network which would support the system. Through consultations with computer technicians currently working on the IFES automation project in Ghana, former IFES consultants and network administrators who engineered the South African election tabulation, and personnel involved in the results tabulation process in Canada on the provincial and national levels, IFES determined that a system based on a FoxPro database would best serve the Board. This system has the dual advantage of providing specialized data analysis as well as being relatively simple to learn and operate. Upgrading of a tabulation (or other administrative database, such as the voter register) system in the future would be more efficient from a FoxPro environment than from a spreadsheet driven system, should the Board choose to move in that direction.

While the type of system was identified, IFES obtained detailed information on the specifications of the NEB headquarters' hardware. Democracy and Governance Program Assistant Cristiana Cappetta and Systems Manager Keadu Muluken of USAID/Ethiopia performed this research by visiting NEB headquarters on a number of occasions. With this information, IFES developed specifications for a fileserver, uninterrupted power supply (ups) units, a tape backup, cables, network cards, memory chips and the software needed to build the network among the workstations. In late March, IFES requested bids for the equipment from a number of computer hardware vendors.

The consultations with various computer technicians regarding the appropriate hardware and software for the proposed activities coincided with the identification of a consultant who would develop the results tabulation system. For this series of tasks, IFES selected Shaun McGrath, a systems analyst with the Canada-based firm of Novateric Incorporated. McGrath's most recent



project was the development and conversion of constituency-level election results tabulation to a national tabulation system which would synthesize the results of Canada's 295 constituencies. McGrath would be assisted by Cooper in the development and testing of the tabulation system at NEB headquarters. He would also identify and train a counterpart within the NEB computer staff to serve as the network administrator and Management Information Systems Director.

The election results tabulation system to be developed in Ethiopia was to be based on the Elections Canada FoxPro system. IFES leased the software used at Elections Canada for modification in accordance with the Ethiopian electoral system; in exchange, IFES would provide Elections Canada with a copy of the system as it was modified for Ethiopia.

The on-site project activities were proposed to begin around the middle of April 1995. As part of the final preparations for the project, McGrath and Cooper would test the equipment in the IFES offices and make appropriate changes prior to their travel to Addis Ababa. Their travel was scheduled for April 17 through May 21, 1995.

#### April 1995

During the first two weeks of April, IFES purchased approximately \$20,000 worth of equipment for the NEB. The bulk of this equipment consisted of a fileserver, modems, network software and accessories. IFES selected International Technologies Training, Inc. as the vendor of the equipment and software. The equipment was delivered to the IFES office on April 16. At the same time, IFES made arrangements for the HF radios to be delivered to the NEB in Addis on April 16. Cooper and McGrath took inventory of the equipment and tested it prior to repackaging it for travel to Ethiopia. On April 17, Cooper and McGrath attended in-house briefings, a State Department meeting, and departed for Addis Ababa. They arrived, with the equipment, on April 18.

The start-up of project implementation was delayed for two reasons. First, Cooper was informed upon arrival that she would be not permitted to assist McGrath at the NEB headquarters offices in the installation or training activities related to the election results tabulation system. This information was apparently a direct order from the Executive Secretary of the National Electoral Board of Ethiopia. Since the project proposal (which had been approved by the Board) included a significant portion of work in the NEB headquarters office by Cooper and McGrath, the processes of developing the software, preparing documentation, and training the NEB staff had to be modified so that they could be accomplished by one person. Despite efforts by the staff at USAID/Ethiopia, this situation remained unchanged throughout Cooper's stay.

A second implementation delay was caused by the failure of the NEB to secure the release of the equipment which been purchased and transported on its behalf by IFES. In response to the request from the NEB, Cooper and McGrath had carried the equipment as excess baggage, to ensure that the equipment could be installed and working prior to (or immediately after) the May 7 elections. However, the computer equipment remained in customs until approximately May 23. No information was made available during this period about the release, delivery or use of the two-way radios, which were sent to the NEB in a separate shipment and which arrived in the airport at Addis on April 16.

During the first week of the on-site project activities, McGrath began the development of the results tabulation program. His initial meetings were with the computer staff at the NEB headquarters, as the members of the executive staff were preparing for the elections. He was able to meet fairly early in the project with Ato Samson Getahun, and he obtained a copy of the previous election results, in addition to the current election procedures. At this time, McGrath determined that the Elections Canada software with which he was supplied would not be relevant to the system requirements in Ethiopia for two main reasons: first, the Ethiopia results would be tabulated on a national level, while the Elections Canada software was used to tabulate results on a regional level. Second, the software was designed to be used in conjunction with an existing FoxPro database which defined the political zones in Canada. There was no pre-existing database in Ethiopia. McGrath therefore first created the "Table Control System", a database which represented the political "map" of Ethiopia. (Appendix B.) This backbone database would enable users to enter data for each election, using the same map. It divides Ethiopia into regions, zones, constituencies, and then assigns parties and candidates to particular constituencies. A second database, entitled "FoxPro Application Menu System" was developed for the NEB system or network administrator to manage access of the staff working on the system. (Appendix D.) Finally, the Election Results Tabulation System database enables users to collect results information for each election. (Appendix F.) The three databases are integrated to create a complete tabulation system.

At the end of April, McGrath met with Ato Samson and Ato Kassehun to discuss the project objectives. Although the prognosis on securing release of the equipment from customs was no better than it had been in mid-April, both staff members appeared interested in the concept of a computer network in their offices, and in the conversion of the results tabulation process to a database system. To illustrate the discussion, McGrath prepared a memorandum describing the function and layout of the proposed network. (Appendix H.)

Once the databases were developed, McGrath and Cooper began to prepare an on-line help system with accompanying user manuals. (Appendices C, E, and G.) McGrath continued to visit the computer room staff regularly, but without the equipment, he found it more efficient to work in his hotel room. In the meantime, Cooper procured copies of anti-virus software to

be installed on the workstations currently in operation at the NEB. In addition, she procured a licensed version of FoxPro which would eventually be installed on the network. Other procurement activities included a tape backup, cassettes and related accessories.

### **May 1995**

The delays in implementation described above would have made completion of the project activities by May 20 impossible as was envisioned in the original proposal. However, the IFES team anticipated that the computer equipment would be released early in the month of May. On May 2, Cooper prepared a request for an amendment to the grant and the time period, to enable McGrath to continue work at least until May 31. The request included a proposal to recruit a systems analyst locally who would monitor and administer the system following McGrath's departure. The analyst would also provide training for the computer staff on an on-call basis. A significant element of the proposed amendment concerned the return of McGrath to Ethiopia in three to four months to assess the utility of the results tabulation system. This assessment, in addition to providing substantive data on the viability and usage of the system, would also be used as an opportunity to discuss the prospects of expanding the network throughout the NEB offices, using the tabulation system to design ballots and tally sheets, and enhancing the development of all of the Board's programs by linking them. The timing of the return visit would be determined following McGrath's departure from Ethiopia.

The issue of timing was revisited prior to Cooper's departure from Ethiopia on May 17. With agreement from the NEB and USAID, McGrath proposed to extend his stay from May 31 until June 21. The amendment proposal was revised to reflect this change; the final version was submitted on May 24. On May 23, the computer equipment was released from customs and delivered to the NEB headquarters.

### **June 1995**

McGrath spent the first two weeks of June installing the fileserver, upgrading the workstations and operating the network. He encountered a number of problems throughout the installation process. Use of diskettes from other offices had resulted in a high number of viruses throughout the office. Some of the hard drives of the computers were affected by this and had to be completely cleaned before the network could be installed. The memory configuration had been programmed in such a way that the motherboards on several computers had to be removed for reconfiguration and preparation for the network. At the same time, McGrath made modifications to components of the election results tabulation database to permit the entry of data from constituencies where multiple seats could be won in regional and local elections.

McGrath continued to search for a candidate to serve as the system administrator or on-call computer technician. This search yielded few qualified and/or available candidates.

In mid-June, McGrath proposed that his time in Ethiopia be extended again until July 4. By this time, he had accomplished the installation of the four component systems in the development, test, and production environments, and had begun training the NEB computer staff in the use of the system. In addition, he completed the writing of the technical documentation of the equipment and the database during this time. At the end of June, the lack of a suitable candidate for the post of system administrator, combined with the flatter-than-expected learning curve, led Cooper and McGrath to extend McGrath's time in Ethiopia through July 18.

An inference of the wording of the IFES amendment proposal, outlining McGrath's continued presence and activities in Addis Ababa, caused a delay during June in the NEB concurrence with the proposal. A phrase referring to the licensing of the FoxPro software package was interpreted to mean that IFES had the ability to grant such a license. Correspondence from the NEB indicated that it might be unwilling to use the software if it was presented as an IFES product. Cooper responded to this with an offer to clarify the phrase in question, as well as with a detailed explanation of a commercial licensing agreement, which is required of all FoxPro users.

As stated earlier, McGrath concluded early in the project period that the Elections Canada software was insufficient and irrelevant to the Ethiopia results tabulation system. The agreement between IFES and Elections Canada stipulated that Elections Canada would be given credit for the use of its software. A memorandum from McGrath, endorsed by Cooper, was sent to the legal department of Elections Canada explaining IFES' decision not to use the Elections Canada software.

#### July 1995

McGrath trained the computer staff at the NEB to enter the data on the regions, zones and constituencies participating in the federal council elections. Political parties and candidate data were added to the database. McGrath simultaneously continued to work on the results tabulation software, which would be used to enter the figures provided on the tally sheets from the polling stations. The personnel were trained in this FoxPro application as well. However, a number of basic hardware and software maintenance concepts had to be re-examined, revisited and in some cases repeated altogether. McGrath experienced frustrating delays in this area, as demonstrated competence in certain sectors of computer operation were at variance with the NEB computer staff work schedule and style. By the end of the project period, McGrath concluded that a full-time systems analyst or network administrator was required in the office; further, that the current NEB computer staff had potential but insufficient experience or capability to perform the administration tasks beyond the database application. After a number

of unsuccessful interviews, McGrath agreed with Ato Assefa that the NEB would choose a candidate for this position.

During this time, McGrath noted the inconsistency of results reporting from the field, due to the different methods used to count and record ballots cast. Although the NEB issued a standard tally sheet as part of the election materials, the form was frequently filled out incorrectly. One of the recommendations made is that the database be used to generate tally sheets, which could be preprinted with information leading directly to the polling stations. This process would facilitate the transmittal of requests for further information back to the field, and the design of the sheet could be changed to make the entry of results complete. (See Appendix I.)

On July 18, Shaun McGrath departed Addis Ababa and returned to Washington, D.C. to debrief with Cooper and Klein. McGrath presented technical documentation and an inventory of the NEB computer center as part of the project requirement. (Appendix J.) Cooper and McGrath also traveled to the State Department for a debriefing meeting. McGrath departed for Ottawa on July 22 and issued a final activity report shortly thereafter. In addition, he prepared a technical proposal for hardware and software in a continuation and expansion of the results database to extend throughout the NEB offices, and encompassing tasks such as voter registration, ballot design and civic education. (Appendix K.) This proposal will be used as a framework for subsequent IFES project proposals.

### III. REVIEW OF PROJECT ACTIVITIES

The May 1994 grant for IFES assistance to the NEB originally contained four objectives; following the successful achievement of three of the objectives around the period of the Constituent Assembly elections, five more objectives were added to the project in March 1995.

**Provision of five HF transceivers.** IFES contracted with Motorola Israel to procure five HF transceivers in preparation for the May 7 elections. The radios were delivered to Addis Ababa during the weekend of April 15. IFES learned at the end of May that the radios had been removed by NEB from customs; however, IFES was unable to obtain specific information regarding its installation, use or the timing of those activities.

**Installation of a local area network to serve the computers currently in use at NEB headquarters.** IFES procured, transported and installed a fileserver and network software programs, in addition to cables, connectors and other accessories to equip the NEB headquarters with a network. The equipment was installed in June 1995.

**Training of the NEB computer staff in network administration as well as related software applications.** IFES provided basic training in network and software applications. However, the original estimates for the training requirements were too conservative; it is recommended that further project activities include more training in this area.

**Development of a database application for the tabulation of election results.** Using an off-the-shelf relational database application, Shaun McGrath built a results tabulation program that is specific to the election process in Ethiopia, which can be modified by other experienced FoxPro users, and which can be supported by the Microsoft offices. In addition, the database can be expanded to process data on voter registration, ballot design and production, as well as production of election-related forms. This objective was achieved.

**Training of the NEB computer staff in the use, maintenance and expansion of the database application.** McGrath departed from Ethiopia leaving the NEB computer staff oriented and trained in the entry of election results for the database. As stated earlier, further computer training will be required for the current staff if a higher form of technology or software is to be incorporated in the activities of the NEB.

Despite the delays in installation, training and implementation, the activities of this project represent a significant follow-up to the recommendations made by Ouellet and Cooper during the 1994 project activities. By demonstrating that a portion of the activities of the NEB could be streamlined and made more efficient in a visible manner, the NEB executive staff has become more confident of its ability to automate other process in election administration.

APPENDIX A

Harry Johnston  
Congress of the United States  
House of Representatives  
Washington, DC 20515-0919

February 15, 1995

Laurie Cooper  
IFES  
Washington, D.C. 20005

Dear Ms. Cooper:

I write to express my sincere thanks for the excellent support you gave the Congressional Task Force on Ethiopia during the three-day peace and reconciliation talks in Washington between the Transitional Government of Ethiopia and several opposition groups. Your support to the Task Force was invaluable.

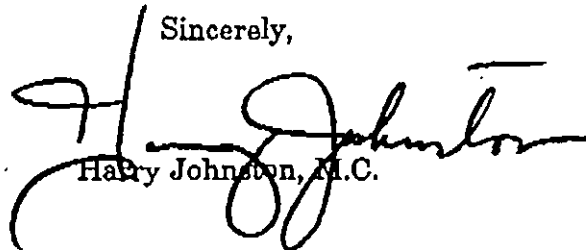
I was very pleased and encouraged that the parties represented in the talks demonstrated a serious desire to resolve their differences peacefully. It is important for the parties to continue to focus on peaceful resolution of differences if Ethiopia is to realize its great economic and political potential.

The talks in Washington reaffirmed my belief that Ethiopia and its leaders face serious challenges in the years to come. The differences that exist between the opposition groups and the government, I am convinced, will take time and patience to resolve.

Nevertheless, I consider the talks a good step in the right direction. The fact that the two sides came to talk is a major accomplishment and I believe we made progress on some issues. I am sure others will be able to build on what we have been able to accomplish in Washington. For my part, I intend to stay engaged and active in Ethiopian affairs.

Once again, I would like to express my thanks for your indispensable support.

Sincerely,



Harry Johnston, M.C.

19th District, Florida  
Democratic Whip-at-Large  
Chief of Staff:  
Suzanne Stoll  
District Administrator:  
Diane Birnbaum

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APPENDIX B

# **National Electoral Board of Ethiopia**

## **Table Control System**

### **Technical Documentation**

Prepared by:

Shaun McGrath  
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June 1st, 1995

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## **System Overview**

The table control system (TCS) is designed to provide the N.E.B. with a means of defining the geography and demographics of electoral events in Ethiopia. The system provides a means capturing and storing election information in a FoxPro for Windows relational database. The information in the TCS database is then used by the Elections Results Tabulation system (ERT) to capture election results and produce results documents and statistics.

The geographical portion of the system allows N.E.B. users to define electoral events, regions, zones and constituencies. Polling stations are located at the constituency level while election results are presently summarized at the constituency level and sent to Addis Ababa for tabulation. The demographics portion allows users to define political parties on a national level, and election candidates on a constituency level.

The FoxPro database application allows users to create, edit, delete, search for a generate reports of election information. The following modules have been implemented:

- Events - to define electoral events.
- Regions - to define electoral regions for particular events.
- Zones - to define electoral zones within regions.
- Constituencies - to define electoral constituencies within zones.
- Parties - to define political parties.
- Candidates - to define candidates within constituencies.

Once all pertinent information has been defined, the ERT application can be used to capture election results by candidate within constituency.

## **Installing and Starting the Application**

This application exists in one of three environments - development, test and production. The development area is to be used by a programmer to write and test programs. The directory structure of the development environment is as follows:

V:\TCS	- Project, help and application (.app) files.
V:\TCS\SOURCE	- TCS Source Code.
V:\COMMON	- Ethiopian flag, Foxtools.fl library.
V:\COMMONDATA	- Database file/system maps.
V:\COMMONSOURCE	- Common FoxPro library source code shared amongst FoxPro programs.
V:\ERT\DATA	- TCS database files.

The test area is to be used by someone other than the programmer to test programs before they are placed in the production environment. The structure of the test environment is as follows:

T:\	- Help and application (.app) files.
T:\DATA	- N.E.B. database files.

The test area is to be used by the N.E.B. users. This area is the 'live' area and contains the 'live' N.E.B. data. The structure of the production environment is as follows:

P:\	- Help and application (.app) files.
P:\DATA	- N.E.B. database files.

The development environment should be located on logical drive 'V'. This drive can be accessed using the Windows NT share called 'FoxPro Development Share' (DEVELOP). This share is physically located in the C:\NEB\IT\FOXPRO\DEVELOP subdirectory of the file server.

FoxPro itself should be located on logical drive 'F' and can be accessed using the Windows NT share 'FoxPro 2.6 for Windows' (FPW26). This share is physically located in the C:\FPW26 subdirectory of the file server.

The test environment should be located on logical drive 'T'. This drive can be accessed using the Windows NT share called 'FoxPro Test Share' (TEST). This share is physically located in the C:\NEB\IT\FOXPRO\TEST subdirectory of the file server.

The production environment should be located on logical drive 'P'. This drive can be accessed using the Windows NT share called 'FoxPro Production Applications' (FOXPRO). This share is physically located in the C:\NEB\OPS\FOXPRO subdirectory of the file server.

It is not necessary to create an icon for this application as it is called from the FoxPro Menu system.

## System Architecture

The application consists of one project file V:\TCS\TCS.PJX/PJT. This one project file contains the following source code modules:

### Programs

Program	Description
SYSOPNDB	Program to open all database files associated with TCS.
SYSTMBW	Program to refresh push buttons when browse window changes.
SYSKBD	Program to test for certain keystrokes.
TCS	TCS main program.

### Menus

Menu	Description
TCS	Menu for TCS application.

### Screens

Screen	Description
SYSDBERR	Screen to display error when attempting to open a locked database.
SYSABOUT	Screen to display technical information about a system.
TCNDNADR	Screen to capture the home and business addresses of a candidate.
TCNDNBRW	Screen to browse candidates.
TCNDNCAP	Screen to add/edit candidates.
TCNDNRPT	Screen to generate a candidate report.
TCNDNSCH	Screen to search for a candidate.
TCNSTBRW	Screen to browse constituencies.
TCNSTCAP	Screen to add/edit constituencies.
TCNSTRPT	Screen to generate a constituency report.
TCNSTSCH	Screen to search for a constituency.
TEVNTBRW	Screen to browse electoral events.
TEVNTCAP	Screen to add/edit events.
TEVNTRPT	Screen to generate a event report.
TEVNTSCH	Screen to search for events.
TPRTYBRW	Screen to browse political parties.
TPRTYCAP	Screen to add/edit political parties.
TPRTYRPT	Screen to generate a party report.
TPRTYSCH	Screen to search for a party.
TREGNBRW	Screen to browse regions.
TREGNCAP	Screen to add/edit regions.
TREGNRPT	Screen to generate a region report.
TREGNSCH	Screen to search for a region.
TZONEBRW	Screen to browse zones.
TZONECAP	Screen to add/edit zones.
TZONERPT	Screen to generate a zone report.
TZONESCH	Screen to search for a zone.

## Menu Structure

Menu Option	Pulldown Menu Option	Description
File	Events	Activates the events browse screen.
	Regions	Activates the regions browse screen.
	Zones	Activates the zones browse screen.
	Constituencies	Activates the constituencies browse screen.
	Parties	Activates the parties browse screen.
	Candidates	Activates the candidates browse screen.
	Exit	Exits the application.
Edit	Undo	Cancels the last edit operation.
	Redo	Repeats the last edit operation.
	Cut	Removes the currently selected text and places it on the clipboard.
	Copy	Copies the currently selected text and places it on the clipboard.
	Paste	Inserts clipboard text at the insertion point.
Window	Calculator	Activates the FoxPro calculator.
	Calendar	Activates the FoxPro calendar.
	About ...	Activates the 'About' screen.
	Cycle Ctrl-F1	Cycles through open windows.
Help		Activates the help system.

## Reports

Report	Description
TCNDNRPT	Candidate report.
TCNSTRPT	Constituency report.
TEVNTRPT	Event report.
TPRTYRPT	Party report.
TREGNRPT	Region report.
TZONERPT	Zone report.



## Program List and Description

### Programs

- SYSOPNDB** This program is used to open all the database files associated with this application. The global variable M.SYSAPPNAM is used to control which database files are opened. This variable is initialised to 'TCS'. The value of this variable is used to locate records in the file \COMMONDATA\DBFSYS.DBF. The corresponding database file records are located in \COMMONDATA\DATABASE.DBF using the value of DBFSYS.DATABASE.
- This program is used to open database files at the beginning of a program to ensure any database errors are trapped before the user enters the program. If any errors occur while opening the files, the user is informed and the program is terminated.
- SYSTMWB** This program is used in all browse modules to refresh control buttons when the record pointer changes. This program takes the form of a FoxPro function that calls the 'show gets' routine to refresh the buttons. It is called in the 'when' clause of the browse statement. For example, if the user selects a record that is not eligible for deletion, the show gets routine will disable the 'delete' button.
- SYSKBD** This routine determines if the user has pressed a control key to move from one edit field to another. Whether the user uses a control key to move from field to field determines the behaviour of error messages.
- TCS** This is the main program for the TCS application. This program initialises the FoxPro runtime environment, opens all database files associated with the application using SYSOPNDB.PRG, spawns the TCS menu and performs the foundation read.
- The menu TCS.MPR contains the code under the 'exit' option to toggle a global variable that clears the foundation read. All secondary program modules are called from the menu. This program also contains subroutines global to the TCS application.

### Menus

- TCS** This is the only menu for the TCS application. From this menu all secondary program modules are called. It is also the menu that toggles the global variable M.LEXITSYS and clears the foundation read in TCS.PRG.

### Screens

- SYSDBERR** This screen is called using an 'on error' routine while database files are being opened in SYSOPNDB.PRG. If a file locking error occurs, this screen is opened and allows a user to 'retry' or 'cancel' the file opening. If the user decides to cancel, SYSOPNDB.PRG returns false to the calling program (TCS.PRG) and the TCS application is terminated and returns to the FoxPro menu system.

**SYSABOUT** This screen displays technical information about the TCS application. It can be accessed from the 'About...' pulldown menu option of the 'Window' option of the application menu TCS.MNX. This screen provides a quick way of determining which environment the application is running in.

*National Electoral Board of Ethiopia*  
*Table Control System*  
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**TCNDNADR** This screen is called from the TCNDNCAP.SCX screen set to capture the home and business addresses of candidates. The data is captured into memory variables which are then either saved in the database or discarded via TCNDNCAP.SCX.

**TCNDNBRW** This screen is called from the 'Candidates' menu option and is used to browse the list of candidates. The screen code defines two windows - the first is used to contain the 'control' buttons, while the second is used to contain the browse window itself. As the record pointer in the browse window changes, the program SYSTMWBW.PRG is called by the 'when' clause in the browse statement which in turn calls the 'show gets' routine in the screen set. The 'show gets' routine enables and disables the push buttons in the control window depending on the data integrity rules.

The control buttons are as follows:

- Add - to create a new candidate record - calls TCNDNCAP.SCX.
- Edit - to edit the current candidate record - calls TCNDNCAP.SCX.
- Delete - to delete the current candidate record.
- Search - to search for a candidate record - calls TCNDNSCH.SCX.
- Report - to generate a report of candidates - calls TCNDNRPT.SCX.
- Help - activates context sensitive help.
- Exit - to exit this module and return to the system menu.

The rules state that candidate records cannot be deleted if there are election results associated with the candidate. A second rule is to ensure a candidate associated with a completed event is not edited or deleted. Other rules are to properly handle the empty file condition.

**TCNDNCAP** To add a new candidate record or edit an existing record. This screen allows a user to capture the following fields:

- Event/region - List created using constituencies in TCONST.DBF.
- Zone - List created using constituencies in TCONST.DBF.
- Constituency - List created using constituencies in TCONST.DBF.
- Candidate code - Two digit code unique within constituency.
- Party - List created using TPARTY.DBF.
- Name - Candidate name.
- Age - Candidate age.
- Gender - Candidate gender.
- Education - Candidate education.
- Ballot symbol - Three digit number unique within constituency.

All fields are mandatory except the candidates education which can be zero. All other fields must contain data. A candidate must be at least twenty-one years of age.

The captured data is read from and written to the TCANDN.DBF database using 'scatter', 'gather' and 'insert' commands. Full multi-user control for editing is supplied in the 'setup' code. File locking errors generated by the 'insert' command are handled by the INSERR.PRG program.

**TCNDNRPT** This screen allows users to generate a listing of candidates by event for all or one particular region. The report can be sent to the screen or a printer. The region list is repopulated whenever the user chooses a different event. The region list should only contain those regions associated with the current event.

An SQL statement in the valid clause for the M.BTNCHOICE variable selects the appropriate data into the cursor RPT. This cursor is then passed to the report form TCNDNRPT.FRX.

**TCNDNSCH** This screen allows users to search for candidates according to event, region, zone, constituency and party. These lists are populated using SQL statements contained in subroutines called in the setup code. These subroutines are called in the valid clauses for the lists themselves. Whenever the user chooses a new event/region combination, the other lists are updated to contain only the information associated with the chosen event/region. The same logic applies to the zone and constituency lists. The party list contains a list of valid political parties and is never changed.

As it is possible to choose a combination of values that result in no record being found, the valid clause for the M.BTNCHOICE variable could display an error message indicating an invalid combination. If the user specifies a valid combination of fields, the read is terminated and the parent browse window is refreshed to show the searched record as the current record.

**TCNSTBRW** This screen is called from the 'Constituencies' menu option and is used to browse the list of constituencies. The screen code defines two windows - the first is used to contain the 'control' buttons, while the second is used to contain the browse window itself. As the record pointer in the browse window changes, the program SYSTMWBW.PRG is called by the 'when' clause in the browse statement which in turn calls the 'show gets' routine in the screen set. The 'show gets' routine enables and disables the push buttons in the control window depending on the data integrity rules.

The control buttons are as follows:

Add	- to create a new constituency record - calls TCNSTCAP.SCX.
Edit	- to edit the current constituency record - calls TCNSTCAP.SCX.
Delete	- to delete the current constituency record.
Search	- to search for a constituency record - calls TCNSTSCH.SCX.
Report	- to generate a report of constituencies - calls TCNSTRPT.SCX.
Help	- activates context sensitive help.
Exit	- to exit this module and return to the system menu.

The rules state that constituency records cannot be deleted if there are candidates associated with the constituency. A second rule is to ensure a constituency associated with a completed event is not edited or deleted. Other rules are to properly handle the empty file condition.

**TCNSTCAP** To add a new constituency record or edit an existing record. This screen allows a user to capture the following fields:

Event/region/zone - List created using constituencies in TZONE.DBF.  
Constituency code - Two digit code unique within zone.  
Constituency name - Constituency name.  
Polling stations - Number of polling stations within the constituency.  
Projected voters - males - Number of projected male voters in the constituency.  
Projected voters - females - Number of projected female voters in the constituency.  
Registered voters - male - Number of registered male voters in the constituency.  
Registered voters - female - Number of registered female voters in the constituency.

Number of seats - The number of seats to be won in the constituency.  
Regular constituency - Whether the constituency is regular or was created to represent a special minority group.

All fields are mandatory with the exception of the projected and registered voters which can be zero. The number of seats to be won is set to one for a national election and can not be modified. For regional and local events, this field must contain a number greater than zero.

The captured data is read from and written to the TCONST.DBF database using 'scatter', 'gather' and 'insert' commands. Full multi-user control for editing is supplied in the 'setup' code. File locking errors generated by the 'insert' command are handled by the INSERR.PRG program.

**TCNSTRPT** This screen allows users to generate a listing of constituencies by event for all or one particular region. The report can be sent to the screen or a printer. The region list is repopulated whenever the user chooses a different event. The region list should only contain those regions associated with the current event.

An SQL statement in the valid clause for the M.BTNCHOICE variable selects the appropriate data into the cursor RPT. This cursor is then passed to the report form TCNSTRPT.FRX. The census year field comes from the TEVENT.DBF database.

**TCNSTSCH** This screen allows users to search for constituencies according to event, region, zone and constituency. The list is a representation of the constituencies database TCONST.DBF. Moving the list pointer moves the file pointer. The variable M.CKEY is used to keep track of the record that was current when the module was entered. If the user selects the 'cancel' button, the system performs a seek back to original record. If the user selects the 'OK' button, the browse window is refreshed to make the selected record current.

**TEVNTBRW** This screen is called from the 'Events' menu option and is used to browse the list of electoral events. The screen code defines two windows - the first is used to contain the 'control' buttons, while the second is used to contain the browse window itself. As the record pointer in the browse window changes, the program SYSTMWBW.PRG is called by the 'when' clause in the browse statement which in turn calls the 'show gets' routine in the screen set. The 'show gets' routine enables and disables the push buttons in the control window depending on the data integrity rules.

The control buttons are as follows:

- Add - to create a new event record - calls TEVNTCAP.SCX.
- Edit - to edit the current event record - calls TEVNTCAP.SCX.
- Delete - to delete the current event record.
- Search - to search for a event record - calls TEVNTSCH.SCX.
- Report - to generate a report of events - calls TEVNTRPT.SCX.
- Help - activates context sensitive help.
- Exit - to exit this module and return to the system menu.

The rules state that event records cannot be deleted if there are regions associated with the event. Other rules are to properly handle the empty file condition.

**TEVNTCAP** To add a new event record or edit an existing record. This screen allows a user to capture the following fields:

Event code - Unique two digit code to identify an event.  
Event name - Event name.  
Polling day date - The Julian calendar date of polling day.  
Census year - Four digit number indicating the last year a census was performed.  
Event type - Radio button to indicate national, regional or local. Stored as an integer.  
Event completed - Check box to indicate whether an event has been completed or not.

All fields are mandatory. Once an event has been completed, it will affect the editing capabilities of all other portions of the system.

The captured data is read from and written to the TEVENT.DBF database using 'scatter', 'gather' and 'insert' commands. Full multi-user control for editing is supplied in the 'setup' code. File locking errors generated by the 'insert' command are handled by the INSERR.PRG program.

**TEVNTRPT** This screen allows users to generate a listing of events. The report can be sent to the screen or a printer.

An SQL statement in the valid clause for the M.BTNCHOICE variable selects the appropriate data into the cursor RPT. This cursor is then passed to the report form TEVNTRPT.FRX.

**TEVNTSCH** This screen allows users to search for events according to event code. The list is a representation of the events database TEVENT.DBF. Moving the list pointer moves the file pointer. The variable M.CKEY is used to keep track of the record that was current when the module was entered. If the user selects the 'cancel' button, the system performs a seek back to original record. If the user selects the 'OK' button, the browse window is refreshed to make the selected record current.

**TPRTYBRW** This screen is called from the 'Parties' menu option and is used to browse the list of political parties. The screen code defines two windows - the first is used to contain the 'control' buttons, while the second is used to contain the browse window itself. As the record pointer in the browse window changes, the program SYSTMWBW.PRG is called by the 'when' clause in the browse statement which in turn calls the 'show gets' routine in the screen set. The 'show gets' routine enables and disables the push buttons in the control window depending on the data integrity rules.

The control buttons are as follows:

Add - to create a new party record - calls TPRTYCAP.SCX.  
Edit - to edit the current party record - calls TPRTYCAP.SCX.  
Delete - to delete the current party record.  
Search - to search for a party record - calls TPRTYSCH.SCX.  
Report - to generate a report of parties - calls TPRTYRPT.SCX.  
Help - activates context sensitive help.  
Exit - to exit this module and return to the system menu.

The rules state that party records cannot be deleted if there are candidates associated with the party. Other rules are to properly handle the empty file condition.

**TPRTYCAP** To add a new party record or edit an existing record. This screen allows a user to capture the following fields:

Event code - Unique two digit code to identify an event.

Party code - Unique within event.

Party name - Party name.

Party acronym - Short form of party name.

Independent party - Checked to represent independent candidates. This provides a means of ensuring data integrity between the parties and candidates files - all candidates are associated with a record in the parties table.

All fields are mandatory.

The captured data is read from and written to the TPARTY.DBF database using 'scatter', 'gather' and 'insert' commands. Full multi-user control for editing is supplied in the 'setup' code. File locking errors generated by the 'insert' command are handled by the INSERR.PRG program.

**TPRTYRPT** This screen allows users to generate a listing of political parties by event. The report can be sent to the screen or a printer. The list of events is populated using the parties table TPARTY.DBF.

An SQL statement in the valid clause for the M.BTNCHOICE variable selects the appropriate data into the cursor RPT based on the chosen event. This cursor is then passed to the report form TPRTYRPT.FRX.

**TPRTYSCH** This screen allows users to search for parties according to event code. The list is a representation of the parties database TPARTY.DBF. Moving the list pointer moves the file pointer. The variable M.CKEY is used to keep track of the record that was current when the module was entered. If the user selects the 'cancel' button, the system performs a seek back to original record. If the user selects the 'OK' button, the browse window is refreshed to make the selected record current.

**TREGNBRW** This screen is called from the 'Regions' menu option and is used to browse the list of regions. The screen code defines two windows - the first is used to contain the 'control' buttons, while the second is used to contain the browse window itself. As the record pointer in the browse window changes, the program SYSTMBW.PRG is called by the 'when' clause in the browse statement which in turn calls the 'show gets' routine in the screen set. The 'show gets' routine enables and disables the push buttons in the control window depending on the data integrity rules.

The control buttons are as follows:

Add - to create a new region record - calls TREGNCAP.SCX.  
Edit - to edit the current region record - calls TREGNCAP.SCX.  
Delete - to delete the current region record.  
Search - to search for a region record - calls TREGNSCH.SCX.  
Report - to generate a report of parties - calls TREGNRPT.SCX.  
Help - activates context sensitive help.  
Exit - to exit this module and return to the system menu.

The rules state that region records cannot be deleted if there are zones associated with the region. Other rules are to properly handle the empty file condition.

**TREGNCAP** To add a new region record or edit an existing record. This screen allows a user to capture the following fields:

Event code - List created using TEVENT.DBF.

Region code - Unique within event.

Region name - Region name.

All fields are mandatory.

The captured data is read from and written to the TREGION.DBF database using 'scatter', 'gather' and 'insert' commands. Full multi-user control for editing is supplied in the 'setup' code. File locking errors generated by the 'insert' command are handled by the INSERR.PRG program.

**TREGNRPT** This screen allows users to generate a listing of regions by event. The report can be sent to the screen or a printer. The list of events is populated using the regions table TREGION.DBF.

An SQL statement in the valid clause for the M.BTNCHOICE variable selects the appropriate data into the cursor RPT based on the chosen event. This cursor is then passed to the report form TREGNRPT.FRX.

**TREGNSCH** This screen allows users to search for regions according to event code. The list is a representation of the regions database TREGION.DBF. Moving the list pointer moves the file pointer. The variable M.CKEY is used to keep track of the record that was current when the module was entered. If the user selects the 'cancel' button, the system performs a seek back to original record. If the user selects the 'OK' button, the browse window is refreshed to make the selected record current.

**TZONEBRW** This screen is called from the 'Zones' menu option and is used to browse the list of zones. The screen code defines two windows - the first is used to contain the 'control' buttons, while the second is used to contain the browse window itself. As the record pointer in the browse window changes, the program SYSTMWBW.PRG is called by the 'when' clause in the browse statement which in turn calls the 'show gets' routine in the screen set. The 'show gets' routine enables and disables the push buttons in the control window depending on the data integrity rules.

The control buttons are as follows:

Add - to create a new zone record - calls TZONECAP.SCX.  
Edit - to edit the current zone record - calls TZONECAP.SCX.  
Delete - to delete the current zone record.  
Search - to search for a zone record - calls TZONESCH.SCX.  
Report - to generate a report of parties - calls TZONERPT.SCX.  
Help - activates context sensitive help.  
Exit - to exit this module and return to the system menu.

The rules state that zone records cannot be deleted if there are constituencies associated with the zone. Other rules are to properly handle the empty file condition.

**TZONECAP** To add a new zone record or edit an existing record. This screen allows a user to capture the following fields:



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Event/region code - List created using TREGION.DBF.  
Zone code - Unique within region.  
Zone name - Zone name.

All fields are mandatory.

The captured data is read from and written to the TZONE.DBF database using 'scatter', 'gather' and 'insert' commands. Full multi-user control for editing is supplied in the 'setup' code. File locking errors generated by the 'insert' command are handled by the INSERR.PRG program.

**TZONERPT** This screen allows users to generate a listing of zones by event for all or one particular region. The report can be sent to the screen or a printer. The region list is repopulated whenever the user chooses a different event. The region list should only contain those regions associated with the current event.

An SQL statement in the valid clause for the M.BTNCHOICE variable selects the appropriate data into the cursor RPT based on event or event/region. This cursor is then passed to the report form TZONERPT.FRX.

**TZONESCH** This screen allows users to search for zones according to event and region. The list is a representation of the zones database TZONE.DBF. Moving the list pointer moves the file pointer. The variable M.CKEY is used to keep track of the record that was current when the module was entered. If the user selects the 'cancel' button, the system performs a seek back to original record. If the user selects the 'OK' button, the browse window is refreshed to make the selected record current.

## Reports

**TCNDNRPT** This is the report form for the candidates report. The report has page breaks on the region field. Each report will consist of the information for one particular electoral event. The following columns and their associated database fields appear on the report:

Column	Description	Database Field
Zone	Zone name	TZONE.ZONNAME
Constituency	Constituency name	TCONST.CONSTNAME
Code	Candidate code	TCANDN.CANDCDE
Candidate	Candidate name	TCANDN.CANDNAME
Age	Candidate age	TCANDN.AGE
Gender	Candidate gender	TCANDN.GENDER
Education	Candidate education	TCANDN.EDUCATION
Party	Candidate party	TPARTY.PRTYACHRE
Ballot Symbol	Ballot symbol code	TCANDN.BALSYMBOL

This report form is called by the TCNDNRPT.SCX screen set.

**TCNSTRPT** This is the report form for the constituencies report. The report has page breaks on the region field. Each report will consist of the information for one particular electoral event. The following columns and their associated database fields appear on the report:

Column	Description	Database Field
Region	Region name	TREGION.REGNAME
Zone	Zone name	TZONE.ZONNAME
Code	Constituency code	TCONST.CANDCDE
Name	Constituency name	TCONST.CONSTNAME
Polls	Number of polls	TCONST.NUMPOLLS
Projected men	Projected male voters	TCONST.PRJCTDMVOT
Projected women	Projected female voters	TCONST.PRJCTDFVOT
Registered men	Registered male voters	TCONST.RGSTRDMVOT
Registered women	Registered female voters	TCONST.RGSTRDFVOT

This report form is called by the TCNDNRPT.SCX screen set.

**TEVNTRPT** This is the report form for the constituencies report. The report has page breaks on the region field. The following columns and their associated database fields appear on the report:

Column	Description	Database Field
Code	Event code	TEVENT.EVNTCDE
Name	Event name	TEVENT.EVNTNAME
Date	Julian polling day date	TEVENT.DATVOTE
Finished	Whether the event is complete or incomplete	TEVENT.FINISHED
Census	Census year	TEVENT.CENCUSYEAR
Type	Event type	TEVENT.EVNTTYP

This report form is called by the TEVNTRPT.SCX screen set.

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**TPRTYRPT** This is the report form for the parties report. Each report will consist of the information for one particular electoral event. The following columns and their associated database fields appear on the report:

Column	Description	Database Field
Code	Event code	TPARTY.EVNTCODE
Name	Party name	TPARTY.PRTYNAME
Acronym	Party acronym	TPARTY.PRTYACHRE

This report form is called by the TPRTYRPT.SCX screen set.

**TREGRPT** This is the report form for the regions report. Each report will consist of the information for one particular electoral event. The following columns and their associated database fields appear on the report:

Column	Description	Database Field
Code	Region code	TREGION.REGCODE
Name	Region name	TREGION.REGNAME

This report form is called by the TREGRPT.SCX screen set.

**TZONRPT** This is the report form for the zones report. Each report will consist of the information for one particular electoral event. The following columns and their associated database fields appear on the report:

Column	Description	Database Field
Region	Region name	TREGION.REGNAME
Code	Zone code	TZONE.ZONCODE
Name	Zone name	TZONE.ZONNAME

This report form is called by the TZONRPT.SCX screen set.

## Database Descriptions

### TCANDN.DBF - Candidate table

#### Description:

This table contains a list of candidates by event, region, zone and constituency. The events, regions, zones and constituencies tables, as well as the parties table must be populated before this table can be populated. Once populated this table is used by the Election Results Tabulation system (ERT) to capture results for individual candidates on a constituency basis.

#### Structure:

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to TEVENT.dbf.
REGCDE	C	2	Region code - links to TREGION.dbf.
ZONCDE	C	2	Zone code - links to TZONE.dbf.
CONSCDE	C	2	Constituency code - links to TCONST.dbf.
PRTYCDE	C	2	Political party code - links to TPARTY.dbf.
CANDCDE	C	2	Candidate code - uniquely identifies a candidate within a constituency.
CANDNAME	C	35	Candidate name.
GENDER	C	1	Candidate gender.
EDUCATION	N	4,1	Number of years of education.
AGE	N	2	Candidate age.
BALSYMBOL	N	3	Ballot symbol identifier - this number uniquely identifies a candidate within a constituency. This number is used by the ERT system to link back to this table.
RADDR1	C	40	Residence address - line #1.
RADDR2	C	40	Residence address - line #2.
RADDR3	C	40	Residence address - line #3.
RADDR4	C	40	Residence address - line #4.
RADDR5	C	40	Residence address - line #5.
BADDR1	C	40	Business address - line #1.
BADDR2	C	40	Business address - line #2.
BADDR3	C	40	Business address - line #3.
BADDR4	C	40	Business address - line #4.
BADDR5	C	40	Business address - line #5.
Total		458	

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Index Tags:

Tag Name	Index Key	Unique	Descending
CANDCDE	CANDCDE	N	N
CONSTCDE	CONSTCDE	N	N
EVNTCDE	EVNTCDE	N	N
EVNTRZCB	EVNTCDE+REGCDE+ZONCDE+CONSTCDE+STR(BAL SYMBOL, 3)	N	N
EVNTRZCPC	EVNTCDE+REGCDE+ZONCDE+CONSTCDE+PRTYCD E+CANDCCDE	N	N
PRTYCDE	PRTYCDE	N	N
REGCDE	REGCDE	N	N
ZONCDE	ZONCDE	N	N

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TCONST.DBF - Constituency table.

**Description:**

This table contains a list of electoral constituencies by event, region and zone. The events, regions and zones tables must be populated before this table can be populated. Once populated this table is used by the candidates module to define a list of candidates.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to TEVENT.dbf.
REGCDE	C	2	Region code - links to TREGION.dbf.
ZONCDE	C	2	Zone code - links to TZONE.dbf.
CONSTCDE	C	2	Constituency code - uniquely identifies a constituency within a zone.
CONSTNAME	C	25	Constituency name.
NUMPOLLS	N	4	Number of polls within the constituency.
PRJCTDMVOT	N	7	Number of projected male voters.
PRJCTDFVOT	N	7	Number of projected female voters.
RGSTRDMVOT	N	7	Number of registered male voters.
RGSTRDFVOT	N	7	Number of registered female voters.
NUMSEATS	N	2	Number of seats to be won - this number will be 1 for national events, and exceed 1 for regional and local events. This number affects the results report in ERT - regional and local winners are ranked according to how many seats were won.
REGULAR	L	1	Used to indicate a regular constituency or a constituency that is used to represent an official minority. This field affects the candidate report in ERT.
Total		69	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
CONSTCDE	CONSTCDE	N	N
EVNTCDE	EVNTCDE	N	N
EVNTRZC	EVNTCDE+REGCDE+ZONCDE+CONSTCDE	N	N
REGCDE	REGCDE	N	N
ZONCDE	ZONCDE	N	N

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TEVENT.DBF - Event table.

**Description:**

This table is used to define electoral events. The N.E.B. database is set up to contain more than one electoral event in the same database. This table must be populated before the regions, zones, constituencies and parties tables can be populated.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - uniquely identifies electoral events.
EVNTNAME	C	40	Event name.
DATVOTE	D	8	Date of polling day.
FINISHED	L	1	To indicate the event has been completed. Once completed, all the information associated with an event is frozen and cannot be modified.
CENCUSYEAR	C	4	The Julian calendar year the last population census was performed. This number appears on the headings of various reports.
EVNTTYP	N	1	Event type - 1=National, 2=Regional, 3=Local.
Total		69	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
EVNTCDE	EVNTCDE	N	N

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TPARTY.DBF - Party table

**Description:**

This table contains the list of political parties by electoral event. This table must be populated before the list of candidates can be created.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to TEVENT.dbf.
PRTYCDE	C	2	Party code - uniquely identifies a party within an event.
PRTYNAME	C	90	Party name.
PRTYACHRE	C	20	Party acronym.
INDEPENDEN	L	1	Indicates whether the party is a registered political party or represents an independent candidate. This field is used to link independent candidates with this table.
Total		117	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
EVNTCDE	EVNTCDE	N	N
EVNTPRTY	EVNTCDE+PRTYCDE	N	N
PRTYCDE	PRTYCDE	N	N



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TREGION.DBF - Region table

**Description:**

This table contains the list of electoral regions by electoral event. The events table must be populated before this table can be populated.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to TEVENT.dbf.
REGCDE	C	2	Region code - uniquely identifies a region within an event.
REGNAME	C	35	Region name.
Total		40	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
EVNTCDE	EVNTCDE	N	N
EVNTREG	EVNTCDE+REGCDE	N	N
REGCDE	REGCDE	N	N

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TZONE.DBF - Zone table

**Description:**

This table contains the electoral zones within an electoral region for particular electoral events. The events and region tables must be populated before zones can be defined.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to TEVENT.dbf.
REGCDE	C	2	Region code - links with TREGION.dbf.
ZONCDE	C	2	Zone code - uniquely identifies a zone within an region.
ZONNAME	C	30	Zone name.
Total		37	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
EVNTCDE	EVNTCDE	N	N
EVNTREGZ	EVNTCDE+REGCDE+ZONCDE	N	N
REGCDE	REGCDE	N	N
ZONCDE	ZONCDE	N	N

APPENDIX C

# **National Electoral Board of Ethiopia Electoral Information Systems**

## **Table Control System**

### **User Manual**

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## **Introduction**

The Table Control System is a computer program that allows you to define and manage information associated with regional, federal and local elections. This system allows you to define new events and the regions, zones, constituencies, parties and candidates associated with each event. This system should be used each time a new election is called without affecting past events.

This manual is aimed at teaching you how to use the Table Control System program. You should be seated in front of a computer and be running the program as you read this manual. This manual is structured to match the flow of the program.

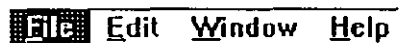
When a new election is called the following tasks must be performed using this program:

1. Define the new event.
2. Define the regions associated with the event.
3. Define the zones associated with the regions.
4. Define the constituencies associated with the zones.
5. Define the parties running in the election.
6. Define the party candidates associated with the constituencies.

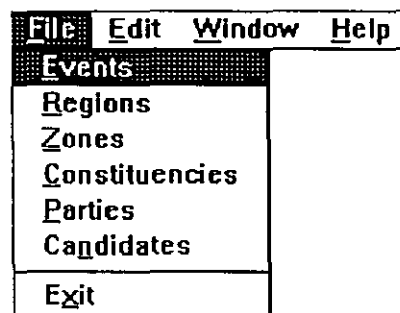
Each program module allows you to generate on-screen or printed lists of the information listed above.

## Terms Used in this Manual

**System Bar Menu:** The system menu bar is the menu that appears at the top of the screen.



**Pulldown Menus:** Pulldown menus are activated by choosing options from the System Bar Menu.



**Single-click:** The process of 'pointing' to an object and pressing the left mouse button once.

The mouse pointer is as follows:



By moving the mouse, you move the mouse pointer.

**Double-click:** The process of 'pointing' to an object and pressing the left mouse button twice.

**Blocked Text:** Blocked text is text that has been marked using the shift/arrow keys or the mouse. An example is as follows:

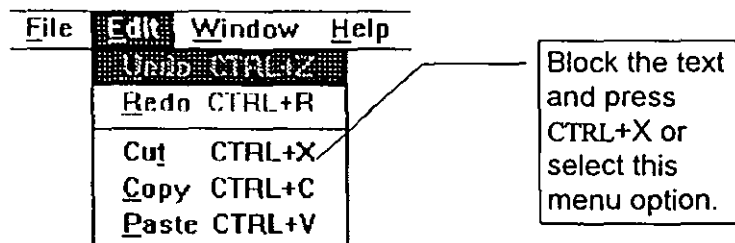
This is normal text. **This is blocked text.** This is normal text.

### Clipboard:

A hidden area of the computers memory where information can be placed, or where information can be retrieved from.

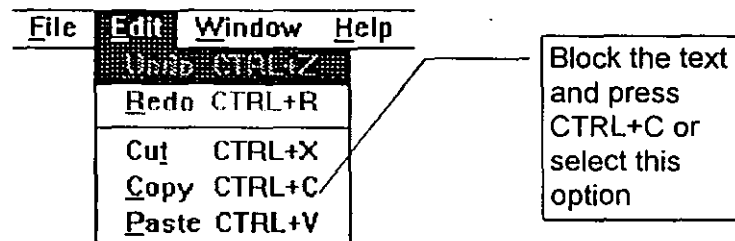
### Cutting:

The process of removing blocked text and placing it on the clipboard.



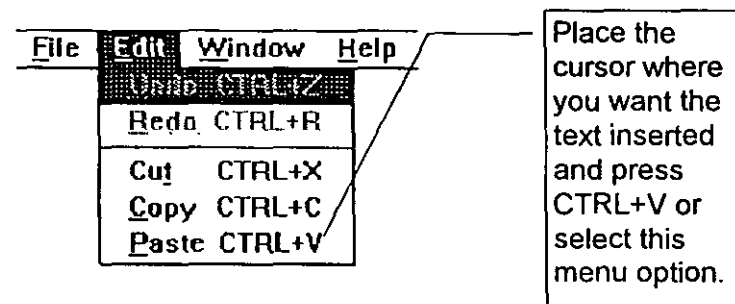
### Copying:

The process of placing a copy of blocked text on the clipboard.



### Pasting:

The process of retrieving blocked text from the clipboard and placing it where the cursor is.



### Push button:

A push button is a button that can be selected by single-clicking directly on it with the mouse or by tabbing to it and pressing the enter key. A sample of two push buttons are as follows:





**Button bar:**

A button bar is a set of push button that is used to add, edit, delete, search and report information as well as activate help and exit a screen. All data capture screens in TCS use the button bar listed below:



## Program Startup/Main System Menu

When the program is started, the message *Opening Files...* appears in the upper right corner of the window for a short time. Once this message disappears, the system bar menu appears at the top of the window and you are ready to begin working. The system bar menu has the following options:

Option	Purpose
File	Activates the <i>File</i> pulldown menu. Activated by pressing <Alt>F or by single-clicking on the word <i>File</i> .
Edit	Activates the <i>Edit</i> pulldown menu. Activated by pressing <Alt>E or by single-clicking on the word <i>Edit</i> .
Window	Activates the <i>Window</i> pulldown menu. Activated by pressing <Alt>W or by single-clicking on the word <i>Window</i> .
Help	Activates the online help facility. Activated by pressing <Alt>H or by single-clicking on the word <i>Help</i> . * If system help is not available, an error message is displayed when you enter this program and all help facilities are disabled.

The *File*, *Edit* and *Window* menu bars activate pulldown menus. Each option of a pulldown menu can be used to perform a function or access a secondary program module.

The *File* pulldown menu is used to access the main program modules of this program as well as exit this program and return to the menu program. Options in this pulldown menu are as follows:

Option	Purpose
Events	Opens the <i>Events</i> window and table where you can add, edit, delete, search and generate a report of events. Activated by pressing <i>E</i> or by single-clicking on the word <i>Events</i> .
Regions	Opens the <i>Regions</i> window and table where you can add, edit, delete, search and generate a report of regions. Activated by pressing <i>R</i> or by single-clicking on the word <i>Regions</i> .
Zones	Opens the <i>Zones</i> window and table where you can add, edit, delete, search and generate a report of zones. Activated by pressing <i>Z</i> or by single-clicking on the word <i>Zones</i> .
Constituencies	Opens the <i>Constituencies</i> window and table where you can add, edit, delete, search and generate a report of constituencies. Activated by pressing <i>C</i> or by single-clicking on the word <i>Constituencies</i> .
Parties	Opens the <i>Parties</i> window and table where you can add, edit, delete, search and generate a report of parties. Activated by pressing <i>P</i> or by single-clicking on the word <i>Parties</i> .

Candidates	Opens the <i>Candidates</i> window and table where you can add, edit, delete, search and generate a report of candidates. Activated by pressing <i>N</i> or by single-clicking on the word <i>Candidates</i> .
Exit	Opens a window asking you if you want to exit this program and return to the menu program. Activated by pressing <i>X</i> , by single-clicking on the word <i>Exit</i> , or by pressing <Alt>F4.

The *Edit* pulldown menu is used to speed-up editing by allowing for correction of mistakes, as well as cutting and copying to the clipboard and pasting from the clipboard. The options on this pulldown menu are as follows:

Option	Purpose
Undo	Reverses the most recent edit action. For example, if you accidentally erase the information in a field (ie. region name), you can use this option to place the original information back in the field. Activated by pressing <i>U</i> , by single-clicking on the word <i>Undo</i> or by pressing <CTRL>Z.
Redo	Repeats the action previously reversed with Undo. Activated by pressing <i>R</i> , by single-clicking on the word <i>Redo</i> or by pressing <CTRL>R.
Cut	Removes a text selection and places it on the clipboard. To select text, press and hold down the shift key. Then use the arrow keys to <i>mark</i> the text block. (As you press the arrow keys the text turns black.) When you have finished marking the text block, let go of the shift key. You now have a marked a text block. This text block can be removed and placed on the clipboard by using the <i>Cut</i> option selected from the <i>Edit</i> pulldown menu. Activated by pressing <i>T</i> , by single-clicking on the word <i>Cut</i> or by pressing <CTRL>X.
Copy	Copies a text selection to the clipboard. This option behaves in the same way as the <i>Cut</i> option, but does not remove the selected text from the field. It merely places a copy of the selected text on the clipboard. Activated by pressing <i>C</i> , by single-clicking on the word <i>Copy</i> or by pressing <CTRL>C.
Paste	Places the contents of the clipboard at the insertion point. Move the cursor to where you would like cut or copied text to appear and select this option. Any text placed on the clipboard will be inserted where the cursor is. Activated by pressing <i>P</i> , by single-clicking on the word <i>Paste</i> or by pressing <CTRL>V.

Please note, the edit pulldown menu options behave exactly the same as the editing options in Microsoft Word for Windows.

The *Window* pulldown menu is used to provide you with access to a calculator and calendar/diary, as well as provide a system administrator with technical information about the system. The options on this pulldown menu are as follows:

Option	Purpose
Calculator	Displays a calculator on the window. The calculator can be closed by pressing the <ESC> key.
Calendar/Diary	Displays a calendar/diary on the window. The calendar/diary can be closed by pressing the <ESC> key.
About	Opens a window displaying technical information about the program. This window can be closed by single-clicking on the <i>OK</i> push button or by pressing the <ESC> key.

## Events

This program module is accessed by selecting the *Events* option of the *File* pulldown menu. The events table is used to track electoral events in Ethiopia. The Electoral Board must first define an event before any information associated with the event (ie. regions, zones, parties, etc.) can be entered.

The information stored with an event is as follows:

Field	Description
Code	Unique, one or two digit event identifier number.
Name	Event name - to appear on the top of all printed reports.
Polling Day	Julian polling day date of the format year, month, day.
Census Year	Four digit census year to be printed on the top of all reports.
Type	Event type - national, regional or local.
Completed	Whether or not the event has been completed. Once an event is completed, the system will not permit any users to change the election results.

There are two parts to this program module - the button bar and the table. The button bar appears at the top of the window and contains the push buttons *add*, *edit*, *delete*, *search*, *report*, *help* and *Exit*. The table appears below the button bar and contains all the events currently in the database.

You can move from one event to another by pressing the *arrow* keys or the *PgUp* and *PgDn* keys. You can move from field to field by pressing the *tab* key. You can go directly to an event by single-clicking on the event itself.

You can select a push button from the button bar by single-clicking anywhere on the push button itself.

### Adding a New Event

Use this option to define a new event. Note: In order for this process to work, you must enter information in all fields. The system will not let you save the new event until all fields have been correctly entered.

#### Event Code

Enter a one or two digit Event Code. If you enter an event code that is already being used, the system will display an error message. You will be forced to enter a unique event code before the new event can be added to the event table. Press *Tab* to move to the Event Name field.

#### Event Name

Type in the event name. Press *Tab* to move to the Polling Day Date field.

<b>Polling Day Date</b>	Enter the date of the election, using two numbers each for the year (YY), month (MM), and day (DD) of the election. Press <i>Tab</i> to go to the Census Year field.
<b>Census Year</b>	Enter the year of the census used to collect population figures to be used for the election. This number must be four digits long (ie, 1993). Press <i>Tab</i> to go to Event Type.
<b>Event Type</b>	Press "R", "N" or "L" to choose either regional, national or local election category. Press <i>Tab</i> to move to the "Ok" push button.
<b>Event Completed</b>	This field is not accessible when you are adding a new event. You must be in the "Edit Existing Event" window to mark an event as completed.
<b>Ok Button</b>	After entering all mandatory fields, select the 'Ok' push button to add the new event to the events table. If there is a problem with any of the fields, the system will display an error message and prevent you from saving the new event.
<b>Cancel Button</b>	To return to the events table without saving the new event, select the cancel push button. When you select the cancel push button, no changes are made to the database.

### ***Editing an Event***

From the Events table, click on the "Edit" push button to move to the Edit Existing Event window. The window will display the event that you selected for editing.

<b>Edit Existing Event Window</b>	The Edit Existing Event window will automatically move you to the Event Name field. Once an event has been created, you cannot change the code number.
<b>Editing Text</b>	Use the <i>Tab</i> key to move from one field to another, or to skip over fields that you do not want to edit. You can type directly over the data already in the field by pressing the <i>Ins</i> key, or you can delete data by using <i>Backspace</i> and <i>Del</i> keys.
<b>Event Completed</b>	When you are in the Edit Existing Event window, you may mark the event as completed. Remember that the same rules for adding new information apply to editing information. You will receive an error message if the information is edited incorrectly.

### Saving Changes

Press *Tab* or select the "Ok" push button to save the changes that you have made to the event. Select the "Cancel" push button to discard your changes and not change the database.

### Deleting an Event

To delete an event, first select the event from the table to be deleted, and then select the delete push button.

#### Ok Button

The delete window will ask if it is "ok" to delete the event that you have selected. Select the "Ok" push button to delete the event. **Once an event is deleted, it is gone forever and can not be brought back.**

#### Cancel Button

Select the "Cancel" push button to return to the Events table without deleting any events.

### Event Search

To search for an event, click on the "Search" button. The system will open the Search for Event window.

#### Search for Event Window

Type in the event code of the event that you wish to select. The system will take you to the selected event using the code that you enter.

### Event Report

Select the Report push button to generate a report of the information stored in the database. Reports can be viewed or printed.

#### Report Button

From the Events table, click on the "Report" push button to open to the Event Report window.

#### Event Report Window

Select whether you want the report to be viewed or printed by pressing "S" or "P". Press *Tab* to move to the "Ok" push button. Select "Ok" to continue or "Cancel" to close the Event Report window.

#### Page Preview Window

This window displays the event report on the window. You can select "Zoom in/Zoom Out" to focus on certain areas of the report. Select the "Ok" button to return to the Event Report window.

#### Exiting Events Report

To close the Events Report window and return to the Events table, select the "Cancel" push button or press the *Esc* key.

## Regions

The Regions file is used to track a list of regions for an event. The Electoral Board must first define a Region before any information associated with the Region (ie. zones, constituencies, etc.) may be entered.

The Regions defined for an event must have unique Region codes which are chosen by the National Electoral Board. Activate the Regions table by clicking anywhere within the table borders.

The information stored with a region is as follows:

Field	Description
Event	Name of the event with which the region is associated.
Code	Unique, one or two digit region identifier number.
Name	Region name - to appear on the top of all printed reports.

There are two parts to this program module - the button bar and the table. The button bar appears at the top of the window and contains the push buttons *add*, *edit*, *delete*, *search*, *report*, *help* and *Exit*. The table appears below the button bar and contains all the events currently in the database.

You can move from one region to another by pressing the *arrow* keys or the *PgUp* and *PgDn* keys. You can move from field to field by pressing the *tab* key. You can go directly to a region by single-clicking on the region itself.

### Adding a New Region

Select the "Add" push button from the Region table to open the Add New Region window.

#### Add New Region Window

Locate the event you are working on from the drop-down list given in the first field. Use the arrows to move up and down the list. Press *Tab* to select the correct event and move to the Region Code field.

#### Region Code

Enter a numeric Region Code. The system will automatically enter a zero for one-digit codes. If you enter a Region code that is already being used for the associated event, the system will display an error message. You will be forced to enter a unique Region code before the new Region can be added to the Region table. Press *Tab* to move to the Region Name field.

#### Region Name

Type in the Region name. Press *Tab* to move to the "Ok" or "Cancel" push buttons.

#### Ok Button

After entering all mandatory fields, select the "Ok" push button to add the new Region to the Regions table. If there is



a problem with any of the fields, the system will display an error message and prevent you from saving the new Region.

#### Cancel Button

To return to the Regions table without saving the new Region, select the "Cancel" push button. When you select the cancel push button, no changes are made to the database.

### ***Editing a Region***

From the Regions table, click on the "Edit" push button to open the Edit Existing Region window. The window will display the Region that you selected for editing.

#### Edit Existing Region Window

When the window is opened, the cursor will be placed on the Region Name field. Once a Region has been created, you cannot change the code number or the event. You must delete the Region if the code number or event has been entered incorrectly.

#### Editing Text

Use the *Tab* key to move from one field to another, or to skip over fields that you do not want to edit. You can type directly over the data already in the field by pressing the *Ins* key, or you can delete data by using *Backspace* and *Del* keys. Remember that the same rules for adding new information apply to editing information. You will receive an error message if the information is edited incorrectly.

#### Saving Changes

Press *Tab* or click on the "Ok" push button to save the changes that you have made to the Region.

### ***Deleting a Region***

Use this option to remove a Region from the database.

#### Delete Button

To delete a Region, first select the Region to be deleted and then select the "Delete" push button.

#### Ok Button

The delete window will ask if it is "ok" to delete the Region that you have selected. Select the "Ok" push button to delete the Region.

#### Warning

Once a Region is deleted, it is gone forever and can not be brought back.

#### Cancel Button

Select the "Cancel" push button to return to the Regions table without deleting any Regions.

### ***Region Search***

Use this option to look for Regions by Event code and Region code.

**Search Button**

To search for a Region, click on the "Search" button. You will be moved to the Search for Region window.

**Search for Region Window**

Type in the Region code of the Region that you wish to select. The system will take you to the selected Region using the code that you enter.

## ***Region Report***

Use this option to generate a viewed or printed Region report.

**Report Button**

From the Regions table, click on the "Report" button to move to the Region Report window.

**Region Report Window**

Select whether you want the report to be viewed or printed by pressing "S" or "P". Press *Tab* to move to the "Ok" button. Select "Ok" to continue or "Cancel" to exit the Region Report Window. Press *Enter* to move to the Page Preview window.

**Page Preview Window**

This window displays the report on screen. Use the *Tab* key to select the fields that you wish to view, and use the arrows to move ahead or backward in the page numbers. You can also select "Zoom in/Zoom Out" to focus on certain areas of the report. Select the "Ok" push button to return to the Region Report Window.

**Exiting Regions Report**

To exit the Regions Report Window and return to the Regions table, select the "Cancel" push button or press *Esc*.

## Zones

The Zones file is used to track any electoral process to be administered by the Electoral Board by Zone. The Electoral Board must first define a Zone before any information associated with the Zone (ie. constituencies, parties, etc.) may be entered.

Each Zone must have a unique Zone code which is chosen by the National Electoral Board. Activate the Zones table by clicking anywhere within the table borders.

The information stored with a zone is as follows:

Field	Description
Event/Region	Name of the event and region with which the zone is associated.
Code	Unique, one or two digit zone identifier number.
Name	Zone name - to appear on the top of all printed reports.

There are two parts to this program module - the button bar and the table. The button bar appears at the top of the window and contains the push buttons *add*, *edit*, *delete*, *search*, *report*, *help* and *Exit*. The table appears below the button bar and contains all the events currently in the database.

You can move from one zone to another by pressing the *arrow* keys or the *PgUp* and *PgDn* keys. You can move from field to field by pressing the *tab* key. You can go directly to a zone by single-clicking on the zone itself.

### Adding a New Zone

Use this option to define a new Zone.

Note: In order for this process to work, you **MUST** enter information in each field. You cannot create a new Zone without entering all mandatory information.

#### Adding a New Zone

Select the "Add" button from the Zone table to move to the Add New Zone Window.

#### Add New Zone Window

Locate the event and region you are working on from the drop-down list given in the first field. Use the arrows to move up and down the list. Press *Tab* to select the event and move to the Zone Code field.

#### Zone Code

Enter a numeric Zone Code. The system will automatically enter a zero for one-digit codes. If you enter a Zone code that is already being used, the system will display an error message. You will be forced to enter a unique Zone code before the new Zone can be added to the Zone table. Press *Tab* to move to the Zone Name field.

**Zone Name** Type in the Zone name. Press *Tab* to move to the "Ok" or "Cancel" buttons.

**Ok Button** After entering all mandatory fields, select the "Ok" button to add the new Zone to the Zones table. If there is a problem with any of the fields, the system will display an error message and prevent you from saving the new Zone.

**Cancel Button** To return to the Zones table without saving the new Zone, select the "Cancel" button. When you select the cancel button, no changes are made to the database.

## ***Editing a Zone***

From the Zones table, click on the "Edit" button to move to the Edit Existing Zone window. The window will display the Zone that you selected for editing.

**Edit Existing Zone Window** The Edit Existing Zone window will automatically move you to the Zone Name field. Once a Zone has been created, you cannot change the code number, event or region. You must delete the zone if the code number, event or region has been entered incorrectly.

**Editing Text** Use the *Tab* key to move from one field to another, or to skip over fields that you do not want to edit. You can type directly over the data already in the field by pressing the *Ins* key, or you can delete data by using *Backspace* and *Del* keys. Remember that the same rules for adding new information apply to editing information. You will receive an error message if the information is edited incorrectly.

**Saving Changes** Press *Tab* or click on the "Ok" button to save the changes that you have made to the Zone.

## ***Deleting a Zone***

Use this option to remove a Zone from the database.

**Delete Button** To delete a Zone, first select the Zone to be deleted and then select the "Delete" button.

**Ok Button** The delete window will ask if it is "ok" to delete the Zone that you have selected. Select the "Ok" button to delete the Zone.

**Warning** Once a Zone is deleted, it is gone forever and can not be brought back.

**Cancel Button** Select the "Cancel" button to return to the Zones table without deleting any Zones.

## Zone Search

Use this option to look for Zones by Zone code.

### Search Button

To search for a Zone, click on the "Search" button. You will be moved to the Search for Zone window.

### Search for Zone Window

Type in the Zone code of the Zone that you wish to select. The system will take you to the selected Zone using the code that you enter.

## Zone Report

Use this option to generate a record of the information stored in the database by Zone. Reports can be shown on your computer window or they can be printed.

### Report Button

From the Zones table, click on the "Report" button to move to the Zone Report Window.

### Zone Report Window

Select whether you want the report to be sent to your computer window or to a printer by pressing "S" or "P" to move the radio button. Press *Tab* to move to the "Ok" button. Select "Ok" to continue or "Cancel" to exit the Zone Report Window. Press *Enter* to move to the Page Preview Window.

### Page Preview Window

This window shows a computer-sized image of the report of your Zone. Use the *Tab* key to select the fields that you wish to view, and use the arrows to move ahead or backward in the page numbers. You can also select "Zoom in/Zoom Out" to focus on certain areas of the report and to return to the "Page Preview" window. When you have selected the type of image that you want to report, select the "Ok" button to print or to return to the Zone Report Window.

### Exiting Zones Report

To exit the Zones Report window and return to the Zones table, select the "Cancel" button or press *Esc*.

## Constituencies

The Constituency file is used to track any electoral process to be administered by the Electoral Board by Constituency. The Electoral Board must first define a Constituency before any information associated with the Constituency (ie. parties, etc.) may be entered.

Each Constituency must have a unique Constituency code which is chosen by the National Electoral Board. Activate the Constituencies table by clicking anywhere within the table borders.

The information stored on a Constituency is as follows:

Field	Description
Event/Region	Name of the event and region with which the constituency is associated.
Code	Unique, one or two digit constituency identifier number.
Zone	Name of the zone where the constituency is located.
Name	Constituency name - to appear on the top of all printed reports.
Polling Stations	Number of polling stations in the constituency.
Projected Voters	Number of voters eligible to register in the constituency.
Registered Voters	Actual number of voters who have registered in the constituency.
Regular	help

There are two parts to this program module - the button bar and the table. The button bar appears at the top of the window and contains the push buttons *add*, *edit*, *delete*, *search*, *report*, *help* and *Exit*. The table appears below the button bar and contains all the events currently in the database.

You can move from one constituency to another by pressing the *arrow* keys or the *PgUp* and *PgDn* keys. You can move from field to field by pressing the *tab* key. You can go directly to a constituency by single-clicking on the constituency itself.

### Adding a New Constituency

Use this option to define a new Constituency.

**Note:** In order for this process to work, you **MUST** enter information in each field. You cannot create a new Constituency without entering all mandatory information.

#### Adding a New Constituency

Select the "Add" button from the Constituency table to move to the Add New Constituency Window.

#### Add New Constituency Window

Locate the event, region and zone you are working on from the list given in the first field. Use the arrows to move up and down the list. Press *Tab* to select the event and move to the Constituency Code field.

Constituency Code	Enter a numeric Constituency Code. The system will automatically enter a zero for one-digit codes. If you enter a Constituency code that is already being used, the system will display an error message. You will be forced to enter a unique Constituency code before the new Constituency can be added to the Constituency table. Press <i>Tab</i> to move to the Constituency Name field.
Constituency Name	Type in the Constituency name. Press <i>Tab</i> to move to the Number of Polling Stations field.
Number of Polling Stations	Enter the number of polling stations in the constituency. This number must be larger than zero. Press <i>Tab</i> to move to the Projected Voters field.
Projected Voters	Enter the number of projected male and female voters. These numbers must be larger than zero. Press <i>Tab</i> to move to the Registered Voters field.
Registered Voters	Enter the number of registered male and female voters. These numbers must be larger than zero. Press <i>Tab</i> to move to the Regular Constituency field.
Regular Constituency	Press "R" to mark the constituency check box as regular or to delete the mark. Press <i>Tab</i> to move to the "Ok" or "Cancel" buttons.
Ok Button	After entering all mandatory fields, select the "Ok" button to add the new Constituency to the Constituencies table. If there is a problem with any of the fields, the system will display an error message and prevent you from saving the new Constituency.
Cancel Button	To return to the Constituencies table without saving the new Constituency, select the "Cancel" button. When you select the cancel button, no changes are made to the database.

### ***Editing a Constituency***

From the Constituencies table, click on the "Edit" button to move to the Edit Existing Constituency Window. The window will display the Constituency that you selected for editing.

Edit Existing Constituency Window	The Edit Existing Constituency Window will automatically move you to the Constituency Name field. Once a Constituency has been created, you cannot change the code number, event, region or zone. You must delete the Constituency if the code number, event, region or zone have been entered incorrectly.
Editing Text	Use the <i>Tab</i> key to move from one field to another, or to skip over fields that you do not want to edit. You can type directly over the data already in the field by pressing the <i>Ins</i> key, or you can delete data by using <i>Backspace</i> and <i>Del</i> keys.

Remember that the same rules for adding new information apply to editing information. You will receive an error message if the information is edited incorrectly.

#### **Saving Changes**

Press *Tab* or click on the "Ok" button to save the changes that you have made to the Constituency.

### ***Deleting a Constituency***

Use this option to remove a Constituency from the database.

#### **Delete Button**

To delete a Constituency, first select the Constituency to be deleted and then select the "Delete" button.

#### **Ok Button**

The delete window will ask if it is "ok" to delete the Constituency that you have selected. Select the "Ok" button to delete the Constituency.

#### **Warning**

Once a Constituency is deleted, it is gone forever and can not be brought back.

#### **Cancel Button**

Select the "Cancel" button to return to the Constituencies table without deleting any Constituencies.

### ***Constituency Search***

Use this option to look for Constituencies by Constituency code.

#### **Search Button**

To search for a Constituency, click on the "Search" button. You will be moved to the Search for Constituency Window.

#### **Search for Constituency Window**

Type in the Constituency code of the Constituency that you wish to select. The system will take you to the selected Constituency using the code that you enter.

### ***Constituency Report***

Use this option to generate a record of the information stored in the database by Constituency. Reports can be shown on your computer window or they can be printed.

#### **Report Button**

From the Constituencies table, click on the "Report" button to move to the Constituency Report Window.

#### **Constituency Report Window**

Select whether you want the report to be sent to your computer window or to a printer by pressing "S" or "P" to move the circular indicator. Press *Tab* to move to the "Ok" button. Select "Ok" to continue or "Cancel" to exit the Constituency Report Window. Press *Enter* to move to the Page Preview Window.

#### **Page Preview Window**

This window shows a computer-sized image of the report of the Constituency. Use the *Tab* key to select the fields that you



wish to view, and use the arrows to move ahead or backward in the page numbers. You can also select "Zoom in/Zoom Out" to focus on certain areas of the report and to return to the "Page Preview" Window. When you have selected the type of image that you want to report, select the "Ok" button to print or to return to the Constituency Report Window.

#### **Exiting Constituency Report**

To exit the Constituency Report Window and return to the Constituencies table, select the "Cancel" button or press *Esc*.

## Parties

The Party file is used to track political parties within an electoral process to administered by the Electoral Board. The Electoral Board must first define a Party before any information associated with the Party (ie. candidates, etc.) may be entered.

Each Party must have a unique Party code which is chosen by the National Electoral Board. Activate the Parties table by clicking anywhere within the table borders.

The information stored with a party is as follows:

Field	Description
Event/Region	Name of the event with which the party is associated.
Code	Unique, one or two digit party identifier number.
Name	Party name - to appear on the top of all printed reports.
Achronym	Initials of the party
Independent	Indicates whether or not the party is nationally based.

There are two parts to this program module - the button bar and the table. The button bar appears at the top of the window and contains the push buttons *add*, *edit*, *delete*, *search*, *report*, *help* and *Exit*. The table appears below the button bar and contains all the events currently in the database.

You can move from one zone to another by pressing the *arrow* keys or the *PgUp* and *PgDn* keys. You can move from field to field by pressing the *tab* key. You can go directly to a region by single-clicking on the zone itself.

### Adding a New Party

Use this option to define a new Party.

Note: In order for this process to work, you MUST enter information in each field. You cannot create a new Party without entering all mandatory information.

<b>Adding a New Party</b>	Select the "Add" button from the Party table to move to the Add New Party Window.
<b>Add New Party Window</b>	Locate the event you are working on from the list given in the first field. Use the arrows to move up and down the list. Press <i>Enter</i> to select the event. Press <i>Tab</i> to move to the Party Code field.
<b>Party Code</b>	Enter a numeric Party Code. The system will automatically enter a zero for one-digit codes. If you enter a Party code that is already being used, the system will display an error message. You will be forced to enter a unique Party code

before the new Party can be added to the Party table. Press *Tab* to move to the Party Name field.

**Party Name**

Type in the Party name. Press *Tab* to move to the Party Achronym field.

**Party Achronym**

Type in the Party achronym. Press *Tab* to move to the Independent field.

**Independent**

Press "I" to mark the party as independent (a party which is not nationally based) or to delete the mark. Press *Tab* to move to the "Ok" or "Cancel" buttons.

**Ok Button**

After entering all mandatory fields, select the "Ok" button to add the new Party to the Constituencies table. If there is a problem with any of the fields, the system will display an error message and prevent you from saving the new Party.

**Cancel Button**

To return to the Parties table without saving the new Party, select the "Cancel" button. When you select the cancel button, no changes are made to the database.

## ***Editing a Party***

From the Parties table, click on the "Edit" button to move to the Edit Existing Party window. The window will display the Party that you selected for editing.

**Edit Existing Party Window**

The Edit Existing Party window will automatically move you to the Party Name field. Once a Party has been created, you cannot change the code number or event. You must delete the Party if the code number or event have been entered incorrectly.

**Editing Text**

Use the *Tab* key to move from one field to another, or to skip over fields that you do not want to edit. You can type directly over the data already in the field by pressing the *Ins* key, or you can delete data by using *Backspace* and *Del* keys. Remember that the same rules for adding new information apply to editing information. You will receive an error message if the information is edited incorrectly.

**Saving Changes**

Press *Tab* or click on the "Ok" button to save the changes that you have made to the Party.

## ***Deleting a Party***

Use this option to remove a Party from the database.

**Delete Button**

To delete a Party, first select the Party to be deleted and then select the "Delete" button.

**Ok Button**

The system will ask if it is "ok" to delete the Party that you have selected. Select the "Ok" button to delete the Party.

**Warning**

Once a Party is deleted, it is gone forever and can not be brought back.

**Cancel Button**

Select the "Cancel" button to return to the Parties table without deleting any Parties.

## **Party Search**

Use this option to look for Parties by Party code.

**Search Button**

To search for a Party, click on the "Search" button. You will be moved to the Search for Party Window.

**Search for Party Window**

Type in the Party code of the Party that you wish to select. The system will take you to the selected Party using the code that you enter.

## **Party Report**

Use this option to generate a record of the information stored in the database by Party. Reports can be shown on your computer window or they can be printed.

**Report Button**

From the Parties table, click on the "Report" button to move to the Party Report window.

**Party Report Window**

Select whether you want the report to be sent to your computer window or to a printer by pressing "S" or "P" to move the radio button. Press *Tab* to move to the "Ok" button. Select "Ok" to continue or "Cancel" to exit the Party Report Window. Press *Enter* to move to the Page Preview window.

**Page Preview Window**

This window shows a computer-sized image of the report of the Party. Use the *Tab* key to select the fields that you wish to view, and use the arrows to move ahead or backward in the page numbers. You can also select "Zoom in/Zoom Out" to focus on certain areas of the report and to return to the "Page Preview" window. When you have selected the type of image that you want to report, select the "Ok" button to print or to return to the Party Report Window.

**Exiting Party Report**

To exit the Party Report window and return to the Parties table, select the "Cancel" button or press *Esc*.

## Candidates

The Candidate file is used to track the candidates within an electoral process administered by the Electoral Board. The Electoral Board must first define a Candidate before any information associated with the Candidate may be entered.

Each Candidate must have a unique Candidate code which is chosen by the National Electoral Board. Activate the Candidates table by clicking anywhere within the table borders.

The information stored on a candidate is as follows:

Field	Description
Event/Region	Name of the event and region with which the candidate is associated.
Zone	Name of the zone in which the candidate is competing.
Constituency	Name of the constituency in the zone where the candidate is competing.
Code	A unique identifier number.
Party	Party affiliation of the candidate.
Name	Name of the candidate.
Age	Age of the candidate.
Gender	Gender of the candidate.
Education	Number of years of education the candidate has reported.
Ballot symbol code	An identifier number which indicates the ballot symbol that will be associated with the candidate.
Address	Residential address of the candidate.

There are two parts to this program module - the button bar and the table. The button bar appears at the top of the window and contains the push buttons *add*, *edit*, *delete*, *search*, *report*, *help* and *Exit*. The table appears below the button bar and contains all the events currently in the database.

You can move from one candidate to another by pressing the *arrow* keys or the *PgUp* and *PgDn* keys. You can move from field to field by pressing the *tab* key. You can go directly to a candidate by single-clicking on the candidate's name.

### Adding a New Candidate

Use this option to define a new Candidate.

Note: In order for this process to work, you MUST enter information in each field. You cannot create a new Candidate without entering all mandatory information.

#### Adding a New Candidate

Select the "Add" button from the Candidate table to move to the Add New Candidate Window.

**Add New Candidate Window**

Locate the event and region you are working on from the list given in the first field. Use the arrows to move up and down the list. Press *Tab* to select the event and region, and move to the Zone field.

**Zone**

Once you select an event and region, the Zone field will show only the zones in the region you have selected. Locate the zone you are working on from the drop-down list given in the Zone field. Use the arrows to move up and down the list. Press *Tab* to select the correct zone and move to the Constituency field.

**Constituency**

Once you select a zone, the Constituency field will show only the constituencies in the zone you have selected. Locate the constituency you are working on from the list given in the constituencies field. Press *Tab* to select the correct constituency and move to the Candidate Code field.

**Candidate Code**

Enter a numeric Candidate Code. The system will automatically enter a zero for one-digit codes. If you enter a Candidate code that is already being used, the system will display an error message. You will be forced to enter a unique Candidate code before the new Candidate can be added to the Candidate table. Press *Tab* to move to the Candidate Party field.

**Candidate Party**

Locate the candidate's party from the list given in the Party field. Press *Tab* to select the correct party and move to the Candidate Name field.

**Candidate Name**

Enter the Candidate name. Press *Tab* to move to the Candidate Age field.

**Candidate Age**

Enter the Candidate's age. This number must be larger than zero. Press *Tab* to move to the Candidate Gender field.

**Candidate Gender**

Press the "M" or "F" radio button to mark whether the candidate is male or female. Press *Tab* to move to the Education field.

**Candidate Education**

Enter the number of years of the candidate's education. Press *Tab* to move to the Ballot Symbol Code field.

**Ballot Symbol Code**

Enter the code number of the candidate's symbol on the ballot. Press *Tab* to move to the Address field.

**Candidate Address**

Enter the address of the candidate. Press *Tab* to move to the "Ok" or "Cancel" buttons.

**Ok Button**

After entering all mandatory fields, select the "Ok" button to add the new Candidate to the Candidate table. If there is a problem with any of the fields, the system will display an

error message and prevent you from saving the new Candidate.

#### Cancel Button

To return to the Candidate table without saving the new Candidate, select the "Cancel" button. When you select the cancel button, no changes are made to the database.

### Editing a Candidate

From the Candidates table, click on the "Edit" button to move to the Edit Existing Candidate window. The window will display the Candidate that you selected for editing.

#### Edit Existing Candidate Window

The Edit Existing Candidate window will automatically move you to the Candidate Party field. Once a Candidate has been created, you cannot change the event, region, zone, constituency or candidate code. You must delete the Candidate if this information has been entered incorrectly.

#### Editing Text

Use the *Tab* key to move from one field to another, or to skip over fields that you do not want to edit. You can type directly over the data already in the field by pressing the *Ins* key, or you can delete data by using *Backspace* and *Del* keys. Remember that the same rules for adding new information apply to editing information. You will receive an error message if the information is edited incorrectly.

#### Saving Changes

Press *Tab* or click on the "Ok" button to save the changes that you have made to the Candidate.

### Deleting a Candidate

Use this option to remove a Candidate from the database.

#### Delete Button

To delete a Candidate, first select the Candidate to be deleted and then select the "Delete" button.

#### Ok Button

The delete window will ask if it is "ok" to delete the Candidate that you have selected. Select the "Ok" button to delete the Candidate.

#### Warning

Once a Candidate is deleted, it is gone forever and can not be brought back.

#### Cancel Button

Select the "Cancel" button to return to the Candidates table without deleting any Candidates.

### Candidate Search

Use this option to look for Candidates by event/region, zone, constituency and party affiliation.

#### Search Button

To search for a Candidate, click on the "Search" button. You will be moved to the Search for Candidate window.

**Search for Candidate Window**

Select the event and region of the search from the list given in the first field. Use the up and down arrows to locate the correct event and region. Press *Tab* to move to the Zone field.

**Zone**

Select the zone of the search from the list given in this field. Use the up and down arrow keys to locate the correct zone. Press *Tab* to move to the Constituency field.

**Constituency**

Select the constituency of the search from the list given in this field. Use the up and down arrow keys to locate the correct constituency. Press *Tab* to move to the Party field.

**Party**

Select the party of the search from the list given in this field. Use the up and down arrow keys to locate the correct party. Press *Tab* to move to the "Ok" or "Cancel" buttons.

**"Ok" or "Cancel" buttons**

Press *Enter* to conduct the search or to cancel the search. The system will search the database for candidates matching the description you selected in the event/region, zone, constituency and party fields. Hint: If you do not know all of the information about the candidate, you can *Tab* over to the "Ok" button after entering the information that you do know. This procedure can help you narrow your search.

**Candidate Report**

Use this option to generate a record of the information stored in the database by Candidate. Reports can be shown on your computer window or they can be printed.

**Report Button**

From the Candidates table, click on the "Report" button to move to the Candidate Report window.

**Candidate Report Window**

The system has selected the event for the report. Press *Tab* to move to the Region field.

**Region**

Select the region you want to report from the list given in this field. Use the up and down arrow keys to locate the correct region. Press *Tab* to move to the report radio button. Select whether you want the report to be sent to your computer window or to a printer by pressing "S" or "P" to move the radio button. Press *Tab* to move to the "Ok" button. Select "Ok" to continue or "Cancel" to exit the Candidate Report Window. Press *Enter* to move to the Page Preview window.

**Page Preview Window**

This window shows a computer-sized image of the report of the Candidate. Use the *Tab* key to select the fields that you wish to view, and use the arrows to move ahead or backward in the page numbers. You can also select "Zoom in/Zoom Out" to focus on certain areas of the report and to return to the "Page Preview" window. When you have selected the



type of image that you want to report, select the "Ok" button to print or to return to the Candidate Report Window.

#### **Exiting Candidate Report**

To exit the Candidate Report window and return to the Candidates table, select the "Cancel" button or press *Esc*.

## **Installing and Starting the Application**

This application exists in one of three environments - development, test and production. The development area is to be used by a programmer to write and test programs. The directory structure of the development environment is as follows:

V:\ERT	- Project, help and application (.app) files.
V:\ERT\SOURCE	- ERT Source Code.
V:\COMMON	- Ethiopian flag, Foxtools.fl library.
V:\COMMON\DATA	- Database file/system maps.
V:\COMMON\SOURCE	- Common FoxPro library source code shared amongst FoxPro programs.
V:\ERT\DATA	- ERT database files.

The test area is to be used by someone other than the programmer to test programs before they are placed in the production environment. The structure of the test environment is as follows:

T:\	- Help and application (.app) files.
T:\DATA	- N.E.B. database files.

The test area is to be used by the N.E.B. users. This area is the 'live' area and contains the 'live' N.E.B. data. The structure of the production environment is as follows:

P:\	- Help and application (.app) files.
P:\DATA	- N.E.B. database files.

The development environment should be located on logical drive 'V'. This drive can be accessed using the Windows NT share called 'FoxPro Development Share' (DEVELOP). This share is physically located in the C:\NEB\IT\FOXPRO\DEVELOP subdirectory of the file server.

FoxPro itself should be located on logical drive 'F' and can be accessed using the Windows NT share 'FoxPro 2.6 for Windows' (FPW26). This share is physically located in the C:\FPW26 subdirectory of the file server.

The test environment should be located on logical drive 'T'. This drive can be accessed using the Windows NT share called 'FoxPro Test Share' (TEST). This share is physically located in the C:\NEB\IT\FOXPRO\TEST subdirectory of the file server.

The production environment should be located on logical drive 'P'. This drive can be accessed using the Windows NT share called 'FoxPro Production Applications' (FOXPRO). This share is physically located in the C:\NEB\OPS\FOXPRO subdirectory of the file server.

It is not necessary to create an icon for this application as it is called from the FoxPro Menu system.

## System Architecture

The application consists of one project file V:\ERT\ERT.PJX/PJT. This one project file contains the following source code modules:

### Programs

Program	Description
SYSOPNDB	Program to open all database files associated with ERT.
SYSTMWBW	Program to refresh push buttons when browse window changes.
SYSKBD	Program to test for certain keystrokes.
ERT	ERT main program.

### Menus

Menu	Description
ERT	Menu for ERT application.

### Screens

Screen	Description
GENSHETS	Screen to generate data capture sheets. Data capture sheets must be generated before results can be entered into the system.
RSLTSCAP	Screen to capture results on a sheet basis.
RSLTSFRZ	Screen to freeze completed constituencies - three identical copies that have been verified.
RSLTSMOR	Screen to allow the capture of additional candidates when there are more than 24 candidates for a constituency. Called from RSLTSCAP.SCX.
RSLTSRPT	Results report. Generates a detailed listing of all candidates in a constituency and the winning candidates. Also generates a summary listing of all the winning parties and the number of seats they have won.
RSLTSSCH	Search screen to search for constituencies. Called from RSLTSCAP.SCX.
RSLTSSUM	Detailed zone report showing the region, zone and statistical information such as the number of constituencies, polls, etc.
RSLTSVER	Verification screen to verify the entered results. This screen tells you how many sheets are in the database, how many sheets have one, two and three copies entered, and of the sheets that are entered more than once, how many are the same and how many are different.
SELEVENT	This screen allows a user to choose an electoral event. This screen is opened when a user logs on to the system and can also be activated from the system bar menu.
SYSABOUT	Screen to display technical information about a system.
SYSDBERR	Screen to display error when attempting to open a locked database.
TRANSRPT	This screen provides a user with a transaction report. The report details who has made adds, edits and deletes in the results capture screen. This report can be filtered using region, user id, transaction type and transaction date.
VRFACTNLS	This screen is used to generate a detailed report of constituencies and their status. Listed are individual constituencies, the number of copies that have been entered for each constituency and whether the copies are the same or different.
VRFACTNRP	This screen is used to produce a verification report. This report is the same as the information generated by the verification screen but is displayed or printed in report form.

## Menu Structure

Menu Option	Pulldown Menu Option	Description
File	Results	To open the results capture screen.
	Sheets	To open the sheets generation screen.
	Verification	To open the results verification screen.
	Freeze	To open the constituencies freeze screen.
	Events	To open the event selection screen.
	Exit	To exit this application.
Reports	Verification Statistics	To open the verification statistics report screen.
	Verification Status	To open the verification status report screen.
	Summary	To open the zone summary report screen.
	Results	To open the detailed/summary results report screen.
	Transactions	To open the transaction report screen.
Edit	Undo	Cancels the last edit operation.
	Redo	Repeats the last edit operation.
	Cut	Removes the currently selected text and places it on the clipboard.
	Copy	Copies the currently selected text and places it on the clipboard.
	Paste	Inserts clipboard text at the insertion point.
Window	Calculator	Activates the FoxPro calculator.
	Calendar	Activates the FoxPro calendar.
	About ...	Activates the 'About' screen.
Help		Activates the help system.

## Program List and Description

### Programs

- ERT** This is the main program for the ERT application. This program initialises the FoxPro runtime environment, opens all database files associated with the application using SYSOPNDB.PRG, spawns the ERT menu and performs the foundation read.
- The menu ERT.MPR contains the code under the 'exit' option to toggle a global variable that clears the foundation read. All secondary program modules are called from the menu. This program also contains subroutines global to the ERT application.
- SYSOPNDB** This program is used to open all the database files associated with this application. The global variable *M.SYSAPPNAM* is used to control which database files are opened. This variable is initialised to 'ERT'. The value of this variable is used to locate records in the file \COMMONDATA\DBFSYS.DBF. The corresponding database file records are located in \COMMONDATA\DATABASE.DBF using the value of DBFSYS.DATABASE.
- This program is used to open database files at the beginning of a program to ensure any database errors are trapped before the user enters the program. If any errors occur while opening the files, the user is informed and the program is terminated.
- SYSTMBW** This program is used in all browse modules to refresh control buttons when the record pointer changes. This program takes the form of a FoxPro function that calls the 'show gets' routine to refresh the buttons. It is called in the 'when' clause of the browse statement. For example, if the user selects a record that is not eligible for deletion, the show gets routine will disable the 'delete' button.
- SYSKBD** This routine determines if the user has pressed a control key to move from one edit field to another. Whether the user uses a control key to move from field to field determines the behaviour of error messages.

### Menus

- ERT** This is the only menu for the ERT application. From this menu all secondary program modules are called. It is also the menu that toggles the global variable *M.LEXITSYS* and clears the foundation read in ERT.PRG.

### Screens

- SYSDBERR** This screen is called using an 'on error' routine while database files are being opened in SYSOPNDB.PRG. If a file locking error occurs, this screen is opened and allows a user to 'retry' or 'cancel' the file opening. If the user decides to cancel, SYSOPNDB.PRG returns false to the calling program (ERT.PRG) and the ERT application is terminated and returns to the FoxPro menu system.

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**SYSABOUT** This screen displays technical information about the ERT application. It can be accessed from the 'About...' pulldown menu option of the 'Window' option of the application menu ERT.MNX. This screen provides a quick way of determining which environment the application is running in.

**GENSHETS** This screen is used to generate data capture sheets. There will be three sheets generated for each constituency defined in the TCS constituency table in TCONST.dbf.

For each constituency record in TCS (for the current event), one record is written to the SHEETS.dbf table. The *sheet* field is created by joining the region, zone and constituency code fields. The *identical* and *final* fields are set to 'false'. For each record that gets written to SHEETS.dbf, three records are written to COPIES.dbf. Each record in copies is the same with the exception of the *copynum* field.

Once you have generated sheets, it is ok to go back into TCS, make changes to constituencies, and then generate the sheets again. No changes will affect existing results.

An SQL statement in the push button valid clause is used to retrieve the existing constituencies from SHEETS.dbf in ERT. Then the constituencies defined in TCS are compared to the SQL cursor. Only those TCS records that are not found in the ERT SQL cursor are added to the SHEETS.dbf table. Those ERT records are then compared to the TCS constituency table TCONST.dbf. Any ERT records in SHEETS.dbf that no longer exist in the TCS constituency table TCONST.dbf are deleted. The next step in generating sheets is to delete the records in COPIES.dbf that do not have a parent record in SHEETS.dbf. The final step is to delete all those records in RESULTS.dbf that do not have a parent record in COPIES.dbf.

Data capture sheets must be generated before results can be entered into the system. Once sheets have been generated, then results can be entered into the results capture screen.

**RSLTSCAP** This screen is used to capture vote counts for each constituency. Each constituency has three 'sheets' in the database generated by the sheet generation program GENSHETS.scx. This program does a linear scan of the COPIES.dbf table displaying one record at a time. Users are then permitted to edit the displayed record.

The setup code performs several tasks. The first is to set a filter on the COPIES.dbf table according to the users security access level. If the user is a system administrator or supervisor (level 1 or 2), they are allowed to view all the sheets for the current event. If they have a lower security access level (>2) they are allowed to view sheets that have not yet been entered and sheets that they have entered themselves. All users will have access to the sheets for the current event only.

The arrays *AREGIONS* and *AREGCDES* are populated in the setup code and are used for the search screen RSLTSSCH.scx. Three other arrays are also declared in the setup code. The array *ANAMES* is used to contain the names of the candidates. A parallel array *ACANDS* is used to capture the votes, while the third array *ASNPSHT* is used to take a snapshot of the votes before changes are made. When the user edits the vote counts for a sheet, the array *ASNPSHT* is populated with the votes in the database before changes are made. When the changes are saved, *ACANDS* is compared to *ASNPSHT* to

determine if any changes were made. These two arrays are used to write transaction information to the transaction table TRNSACTN.dbf.

The procedure *Loadsheet* in the cleanup code is used to read vote counts from the RESULTS.dbf table into the arrays and is called throughout the program. This procedure used the information stored in the current COPIES.dbf record to locate the appropriate records in RESULTS.dbf. The following global variables are used throughout the program to control the arrays:

*M.NMAXCAND* - set to 24 - represents the maximum number of candidates that can be edited using this screen.

*M.NMAXCAN2* - set to 60 - represents the maximum number of candidates that can votes entered.

*M.NCANDS* - represents the number of candidates in the current constituency.

*M.SMODE* - set to 'view' or 'edit' depending on whether the user is viewing or editing the current sheet.

The variable *M.SMODE* is used by the 'show gets' routine to enable and disable certain fields and buttons. If the user is viewing information, the global arrays, 'More', 'Save' and 'Cancel' push buttons are disabled. If the user is editing the current sheet, the control buttons at the bottom of the screen are disabled.

A description of all push buttons on this screen is as follows:

**Previous** - This push button is used to display the previous record in the COPIES.dbf database. The program does a *skip -1* to move to the previous record. If there is no previous record for the current event, an error message is displayed, otherwise the procedure *Loadsheet* is called and the screen is refreshed to display the new record.

**Next** - This push button is used to display the next record in the COPIES.dbf database. The program does a *skip 1* to move to the next record. If there is no next record for the current event, an error message is displayed, otherwise the procedure *Loadsheet* is called and the screen is refreshed to display the new record.

**Edit** - This button is used to allow the user to enter votes into the current sheet. The program first checks to see if the COPIES.dbf record is locked by another user. If it is, an error message is displayed. The program then checks to see if the sheet has been entered by someone else. If this is the case, and the user is not a system administrator, the system displays an error message; otherwise, the variable *M.SMODE* is set to 'Edit' and the 'show gets' routine is called to enable/disable the screen push buttons. The program also populates the *ASNPSHT* array which is used as a snapshot of the current record.

Once in edit mode, the user is given access to the array *ACANDS* to enter votes. The function *VLDVOTES* is used to ensure no negative votes are entered. The user is also given access to the 'Save' and 'Cancel' buttons. If there are more than 24 candidates in the constituency, the 'More' button is enabled to give the user access to the *RSLTSMOR.scx* screen which is used to capture votes for an additional 36 candidates.

If the user selects the 'Save' button, the procedure *Savesheet* in the cleanup code is called to write the results to the RESULTS.dbf table. If the user selects the 'Cancel' button, the procedure *Loadsheet* is called and re-populates the arrays with the original RESULTS.dbf information.

**Delete** - This button is used to delete the votes for the current COPIES.dbf-record from the RESULTS.dbf table. The sheet itself is not deleted. Procedure *Delrec* in the cleanup code first checks to see if the COPIES.dbf record is locked. If it is, an error message is displayed. If the record is not locked, the user is prompted to confirm the deletion. If the user chooses to delete, the records in RESULTS.dbf are deleted and a transaction record is written to TRNSACTN.dbf. The program also updates the COPIES.dbf record by blanking the user id field.

**Search** - This button allows a user to search for a constituency record. This button calls the RSLTSSCH.scx screen set to perform the search. This screen set uses the global arrays *AREGIONS* and *AREGCDES* to act as a starting point for the search.

**Browse** - This button activates a browse window of constituencies. All filter conditions based on the user access level apply to the browse window. The procedure *Rsltsbrw* is used to browse COPIES.dbf. When the user exits the browse window by pressing the <ESC> key, the procedure *Loadsheet* is used to read the current COPIES.dbf record and refresh the screen. The browse facility provides the same functionality as a search.

**Help** - This button activates the on-line help facility.

**Done** - This button terminates the 'read' and closes the screen returning the user to the system bar menu. All filters are removed from COPIES.dbf before the screen is closed.

**RSLTSFRZ** This screen is used by a system administrator to 'freeze' constituencies in ERT. The verification screen RSLTSVER.scx is used to verify results. All results that have been entered three times where all three copies are the same, are eligible for freezing. Once a constituency has been frozen, it is impossible to change any of the three sheets associated with the constituency, or delete any of the sheets.

An SQL statement in the setup code is used to retrieve those records in SHEETS.dbf that have the *identical* field set to 'true' (set by the verification screen RSLTSVER.scx). If there are no eligible records, an error message is displayed and the user is returned to the main system menu. The SQL table is then presented to the user in the form of a browse window. The user can select the records to freeze/unfreeze and select the corresponding push button to update the SQL table.

Upon exit of the screen, the system finds processes the records in the SQL table by finding the original record in the SHEETS.dbf table and making the appropriate update.

**RSLTSMOR** This screen is accessed from the results capture screen RSLTSCAP.scx and is used to capture voting results when there are more than 24 candidates. This screen allows a user to capture results for an additional 36 candidates. The results themselves are stored in the array *ACANDS* while the names of the candidates are displayed using the array *ANAMES*.

When the user selects the 'OK' button, the read is terminated and the user is returned to the results capture screen RSLTSCAP.scx with the array containing votes.



**RSLTSRPT** This screen is used to generate detailed and summary results reports. The detailed report lists information by region, zone and constituency. All the candidates are listed for each constituency with the winning candidates denoted in one of two ways. For national elections, there can be at most one winning candidate. This candidate is denoted with a '\*'. For regional and local elections, the number of winning candidates is captured in the constituencies screen in TCS. These winners are denoted using numbers. The candidate with the most votes is identified with a '1', the second place winner is denoted with a '2', and so on.

An SQL statement is used to extract the report data. The resulting SQL table is then updated to include the winner fields and the rank (in the case of a regional or local event). If the user has chosen to print the detailed report, this SQL table is passed to the report form RSLTSRPTD.frx. If the user has chosen to generate the summary a second SQL statement is used to extract summary information from the first SQL table. This second SQL table is then sent to the report form RSLTSRPS.frx.

Both detailed and summary reports can be generated for all regions or one specific region. The region of choice can be selected using the region list.

**RSLTSSCH** This screen is called from the results capture screen RSLTSCAP.scx and is used to search for a constituency. There are three lists from which to choose the region, zone and constituency. There exist three more parallel lists that contain the codes for the regions, zones and constituencies. The user manipulates the names of the regions, zones and constituencies while the system uses the parallel arrays to manipulate information based on codes.

The zone list contains only those zones associated with the current region. The constituency list contains only those constituencies associated with the current zone. When the user chooses a new region, the zone and constituency lists change. When the user chooses a new zone, the constituency list changes. The procedure *Popzone* uses SQL to populate the zone list whenever the region changes. The procedure *Popconst* uses SQL to populate the constituency list whenever the region or zone changes.

The valid clause performs a seek of the SHEETS.dbf table to attempt to find the selected constituency based on the codes arrays.

**RSLTSSUM** This screen is used to generate a list of zones by region. Each zone has the number of constituencies, polls, candidates, projected and registered voters, party, independent and female candidates. Also included is the percentage of registered voters (registered/projected).

The user has the ability to generate a report of all regions or one particular region using the array *ARREGS*. The procedure *Poprregs* (cleanup code) is called from the setup code to populate this array.

When the user selects the 'OK' button, the procedure *Extrpt* is called from the push button valid clause to SQL extract the report data into the table TMPRPT. Other tables of party candidate, independent candidate and female candidate counts are created by this procedure. TMPRPT is then related to the three 'count' tables.

With TMPRPT related to the three secondary SQL tables, the report form RSLTSSUM.frx is then called to generate the report.

**RSLTSVER** This screen is used to verify captured results. This output of the program is a matrix describing the current state of the ERT database. Displayed is the number of sheets in the database, the number of sheets that have been entered once, twice and three times, and, of the sheets that have been entered twice or three times, the number of those sheets that are identical and the number of sheets that are different.

When the screen is opened, procedure *Initcop* (ERT.prg) is called to count the number of individual copies of each sheet and the total number of sheets. When the user selects the 'OK' button, the procedure *Vrfy* (ERT.prg) is called to calculate the number of identical and different copies. Procedure *Vrfy* calls the following procedures to verify results:

*Initvars* - This procedure initialises all the global counter variables associated with the matrix. The global counter variables are defined in the setup code for the screen.

*Extmdat* - This procedure uses SQL to extract a cursor called *TMPPOL*. The cursor is used to do the comparison of sheets.

*Procdat* - This procedure is used to process the SQL cursor *TMPPOL* to update the global counter variables with the number of identical and different sheets. As the variables are updated the *show gets* routine is called to refresh the screen. When the cursor has been processed, a message is displayed and the cursor is destroyed.

This set of procedures is also called from the *Verification Statistics* report screen *VRFCTNRP.scx*. Procedure *Procdat* calls procedure *Sumtot* which actually compares the votes for each copy of each sheet to determine if the copies are the same or different. Procedure *Sumtot* calls procedure *Finalize* which updates the *Identical* field of *SHEETS.dbf* with a 'true' or a 'false' depending on whether all copies of the sheet are the same or different. *SHEETS.dbf* is only updated from this screen. *VRFCTNRP.scx* does not update *SHEETS.dbf* - it only produces a report.

Once this screen has been used to verify the results and update *SHEETS.dbf*, the 'freeze' screen *RSLTSFRZ.scx* can be used by a system administrator to freeze the constituencies that have three identical sheets.

**SELEVENT** This screen is used to select an electoral event. This screen is called when the user first enters the program and is also called from the *File* pulldown menu. When the user enters ERT, this screen is used to select an initial event. If the user choose the 'Cancel' button, the application is terminated and the user is returned to the FoxPro Menu System *FOXMENU*. If the user choose an event, this entire application deals only with the chosen event. The user can choose a different event by calling this screen from the *File* pulldown menu.

SQL statements in the setup code create two arrays of events. The first, *AEVENTS*, is from the TCS events table *TEVENT.dbf*. The second, *ASHEETS*, is from the ERT table *SHEETS.dbf*. All of those events from TCS that are not present in ERT are marked with a '\*' to indicate they are not yet in ERT. *AEVENTS* is used to represent the list displayed on the screen for the user.

Three global variables are used to keep track of selected events. They are initialised to spaces in ERT.prg and are as follows:

*M.EVENT* - Event code of current event.

*M.EVENTNAME* - Name of current event.

*M.LNEW* - Whether the selected event is new to ERT.

These variables are referenced throughout ERT to control access to program modules, display the name of the current event, etc. *M.EVENT* is the most widely used as it provides a filter for all programs.

**TRANSRPT** This screen is used to generate a report of transactions that are created as results are captured. As results are added, edited and deleted, the transaction table TRNSACTN.dbf is populated. Information in this table includes the user who was using the results screen, the date and time when the transaction occurred, the region, zone and constituency that was affected, the transaction type (add, edit or delete) as well as the actual vote counts before and after the user made changes.

This screen provides a way of listing transactions using various filters. These filters include region, user id, transaction type and transaction date. The region, user and transaction type arrays are populated by calling three functions in the setup code. These functions are *POPRREG*, *POPUSERS*, and *POPTRANS* and are located in the cleanup code. *POPRREGS* populates the array *ARREGS*. *POPUSERS* populates the array *AUSERS*. *POPTRANS* populates the array *ATRANS*. All three arrays contain information that consists of a code followed by a name. All subsequent SQL statements use the code to find information.

The two global variables *DFROM* and *DTO* are used to specify a date range. The radio button variable *M.NDATES* is used to specify 'all dates' or 'specific dates'. The valid clauses for the date variables ensure the 'from' date is less than the 'to' date, and the 'to' date is greater than the 'from' date.

When the user selects the 'OK' button to generate the report, the procedure *Extrpt* (cleanup code) is called to SQL extract the report information into the table TMPRPT. The SQL statement uses macro substitution to implement the filter conditions.

Once the data is extracted, the report form TRANSRPT.frx is called to produce the report.

**VRFCTNLS** This screen is used to generate a report of constituencies and their data capture status. The report lists region, zone, constituency, the number of copies that have been entered for the constituency and whether the copies are the same or different.

The user has the ability to specify all regions or one particular region using the array *ARREGS* which is populated using procedure *POPRREGS* in the cleanup code. The user also has the ability to specify all copies, or only constituencies that have been entered once, twice or three times. This is done using the array *ACATS* which is initialised in the setup code.

If the user chooses to list only those constituencies that have been entered twice or three times, the user will also be able to choose whether they want copies that are the same, copies that are different or all copies using the radio button variable *M.NFILTER*.

When the user selects the 'OK' button the procedure *Extrpt* (cleanup code) is called from the push button valid clause to SQL extract the report data. The data is extracted into one SQL table *TMPRPT1*. This table is then updated to contain calculated copy numbers. For example, if a sheet has been entered twice, all occurrences of the sheet in the SQL table have the copy number set to '2'. If a sheet has been entered three times, all occurrences of the sheet in the SQL table have the copy number set to '3'.

Once the copy number have been adjusted, a second SQL statement is run against *TMPRPT1* to produce the table *TMPRPT*. *TMPRPT1* is then destroyed. Each sheet in *TMPRPT* is then processed to determine if all copies are the same or different. If necessary, a filter is set on *TMPRPT* to filter out only those records that are the same or different.

The report form *VRFACTNLS.frx* is then called using a 'for' condition to display only those records that have a certain number of copies entered. The 'for' condition is in the form of a macro to allow for the 'all copies' condition.

**VRFACTNRP** This screen is used to produce a verification status report. This output of the program is a matrix describing the current state of the ERT database. Displayed is the number of sheets in the database, the number of sheets that have been entered once, twice and three times, and, of the sheets that have been entered twice or three times, the number of those sheets that are identical and the number of sheets that are different.

When the screen is opened, procedure *Initcop* (ERT.prg) is called to count the number of individual copies of each sheet and the total number of sheets. When the user selects the 'OK' button, the procedure *Vrfy* (ERT.prg) is called to calculate the number of identical and different copies. Procedure *Vrfy* calls the following procedures to verify results:

*Initvars* - This procedure initialises all the global counter variables associated with the matrix. The global counter variables are defined in the setup code for the screen.

*Extndat* - This procedure uses SQL to extract a cursor called *TMPPOL*. The cursor is used to do the comparison of sheets.

*Procdat* - This procedure is used to process the SQL cursor *TMPPOL* to update the global counter variables with the number of identical and different sheets. When the cursor has been processed, it is then destroyed.

This set of procedures is also called from the *Verification* screen *RSLSVER.scx*. Procedure *Procdat* calls procedure *Sumtot* which actually compares the votes for each copy of each sheet to determine if the copies are the same or different. *SHEETS.dbf* is not updated to show which sheets are the same and which sheets are different. This updating feature is controlled by the global variable *M.LREPORT*.

Once the process is complete, and the variables have been updated, the report form *VRFACTNRP.frx* is called to generate the report.

## Reports

**RSLTSRPD** This is the report form the detailed results report. This report form is called from the RSLTSRPT.scx screen set. This report form has page breaks on the region field, group headers on the zone field and contains the following columns:

Column	Description	Database Field
List No.	Const. list number	TCONST.CONSTCDE
Constituency	Constituency name	TCONST.CONSTNAME
Candidate	Candidate name	TCANDN.CANDNAME
Party	Candidate party	TPARTY.PRTYACHRE
Votes	Vote count	RESULTS.VOTES

There are two calculated fields on the report that are printed in the right hand margin. The first will results in a '\*' being printed beside the winning candidates. The second will result in a ranking number being printed beside winners in regional and local elections (where there can be more than one winner in a constituency).

**RSLTSRPS** This is the report form for the summary results report. This report form is called from the RSLTSRPT.scx screen set. This report form contains the following columns:

Column	Description	Database Field
Party	Party name	TPARTY.PRTYNAME
Seats	Number of seats won	Calculated

**RSLTSSUM** This is the report form for the summary zone report. This report form is called from the RSLTSSUM.scx screen set. This report form contains the following columns:

Column	Description	Database Field
Region	Region name	TREGION.REGNAME
Zone	Zone name	TZONE.ZONNAME
No. of Const.	Number of constituencies in the zone.	Calculated
No. of Polls	Number of polls in the zone.	Calculated
Projected voters	Number of projected voters in the zone.	TCONST.PRJCTDMVOT + TCONST.PRJCTDFVOT
Registered voters	Number of registered voters in the zone.	TCONST.RJSTRDMVOT + TCONST.RJSTRDFVOT
% Voters Registered	Percentage of registered voters.	Registered voters / projected voters
No. of Candidates	Number of candidates in the zone.	Calculated
Party Candidates	Number of party candidates in the zone.	Calculated
Ind. Candidates	Number of independent candidates in the zone.	Calculated
Female Candidates	Number of female candidates in the zone.	Calculated

**TRANSRPT** This is the report form for the transaction report. This report form is called from the TRANSRPT.scx screen set. This report form contains the following columns:

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Column	Description	Database Field
Region	Region name	TREGION.REGNAME
Zone	Zone name	TZONE.ZONNAME
Constituency	Constituency name	TCONST.CONSTNAME
User	User id	TRNSACTN.USERID
Copy	Copy number	TRNSACTN.COPYNUM
Trans	Transaction type	TRNSACTN.ACTION
Date	Transaction date	TRNSACTN.RDATE
Time	Transaction time	TRNSACTN.RTIME
Value #1-Value #65	Vote counts before changes.	TRNSACTN.OCAND1 .. TRNSACTN.OCAND65
Value #1-Value #65	Vote counts after changes.	TRNSACTN.NCAND1 .. TRNSACTN.NCAND65

**VRFCTNLS** This is the report form for the verification status report. This report is called from the VRFCTNLS.scx screen set and contains the following columns:

Column	Description	Database Field
Region	Region name	TREGION.REGNAME
Zone	Zone name	TZONE.ZONNAME
Constituency	Constituency name	TCONST.CONSTNAME
Copies	Number of sheets.	Calculated
Identical	Whether the sheets are the same or different.	Calculated

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**VRFACTNRP** This is the report form for the verification statistics report. This report form is called by the VRFACTNRP.scx screen set and contains the following calculated columns:

Column	Description
Calculated triplicates	Number of sheets that have been entered three times.
Calculated duplicates	Number of sheets that have been entered two times.
Calculated single	Number of sheets that have been entered once.
Calculated none	Number of sheets that have not been entered.
Calculated total	Total number of sheets - sum of triplicates, duplicates, singles and none.
Identical triplicates	Number of triplicates that are the same.
Identical duplicates	Number of duplicates that are the same.
Identical single	Always set to zero.
Identical none	Always set to zero.
Identical total	Sum of identical triplicates and duplicates.
Different triplicates	Number of triplicates that are different.
Different duplicates	Number of duplicates that are different.
Different single	Always set to zero.
Different none	Always set to zero.
Different total	Sum of different triplicates and duplicates.
Total triplicates	Sum of identical and different triplicates.
Total duplicates	Sum of identical and different duplicates.
Total single	Number of single sheets.
Total none	Number of sheets that have not been entered.
Grand total	Sum of all totals.

## Database Descriptions

This system accesses all the tables defined and used in the Table Control System (TCS). They are not documented here. For more information about TCS tables, refer to the TCS technical documentation.

**COPIES.DBF** - Constituency copies table.

### Description:

This table contains one record for each copy of a constituency in the results database. Each sheet is contained in this table three times - copy #1, 2 and 3. This table is used to keep track of which user entered which sheet.

### Structure:

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to the SHEETS.dbf.
SHEET	C	6	Sheet number - links to SHEETS.dbf.
COPYNUM	C	1	Copy number - 1, 2 or 3.
USERID	C	8	Unique user id code - links to USERS.dbf in the FOXMENU system.
Total		18	

### Index Tags:

Tag Name	Index Key	Unique	Descending
COPYNUM	COPYNUM	N	N
EVNTCDE	EVNTCDE	N	N
EVNTSC	EVNTCDE+SHEET+COPYNUM	N	N
SHEET	SHEET	N	N



RESULTS.DBF - Constituency results table.

**Description:**

This table contains the number of votes for each candidate in a constituency sheet. This table is directly linked to COPIES.dbf.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to the COPIES.dbf.
SHEET	C	6	Sheet number - links to COPIES.dbf.
COPYNUM	C	1	Copy number - 1, 2 or 3 - links to COPIES.dbf.
BALSYMBOL	N	3	Ballot symbol - uniquely identifies a candidate within a constituency and links to TCS candidate table TCANDN.dbf.
VOTES	N	7	Number of votes received by this candidate.
Total		20	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
BALSYMBOL	BALSYMBOL	N	N
COPYNUM	COPYNUM	N	N
EVNTCDE	EVNTCDE	N	N
EVNTSHTBAL	EVNTCDE+SHEET+str(BALSYMBOL,3)+COPYNUM	N	N
EVNTSHTCOP	EVNTCDE+SHEET+COPYNUM+str(BALSYMBOL,3)	N	N
SHEET	SHEET	N	N

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**SHEETS.DBF** - Sheets table.

**Description:**

This table is populated using the sheets generation program and is used as a basis for entering results in three copies. This table provides a link between the TCS application and this ERT application. For each record in this table, there are many records in the COPIES.dbf table. For each record in the COPIES table, there are many records in the RESULTS.dbf table.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to the TEVENT.dbf table in TCS.
REGCDE	C	2	Region code - links with constituencies table TCONST.dbf in TCS.
ZONCDE	C	2	Zone code - links with constituencies table TCONST.dbf in TCS.
CONSTCDE	C	2	Constituency code - links with constituencies table TCONST.dbf in TCS.
SHEET	C	6	Sheet number - formed by joining the region, zone and constituency codes.
IDENTICAL	L	1	Set to 'true' by the verification program when all three copies have been entered and are the same.
FINAL	L	1	Set to 'true' when the constituency has been frozen.
Total		17	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
EVNTCDE	EVNTCDE	N	N
REGCDE	REGCDE	N	N
ZONCDE	ZONCDE	N	N
CONSTCDE	CONSTCDE	N	N
EVNTRZC	EVNTCDE+REGCDE+ZONCDE+CONSTCDE	N	N
EVNTSHEET	EVNTCDE+SHEET	N	N
FINAL	FINAL	N	N
IDENTICAL	IDENTICAL	N	N
SHEET	SHEET	N	N

TRNSACTN.DBF - Transaction table.

**Description:**

This table is used to store transactions as they happen in the results capture screen. As users add, edit and delete results, transactions are created. Each transaction has a user id, date, time, transaction type as well as other information.

**Structure:**

Field	Type	Length	Description
EVNTCDE	C	2	Event code - links to the TEVENT.dbf table in TCS.
REGCDE	C	2	Region code - links with constituencies table TCONST.dbf in TCS.
ZONCDE	C	2	Zone code - links with constituencies table TCONST.dbf in TCS.
CONSTCDE	C	2	Constituency code - links with constituencies table TCONST.dbf in TCS.
SHEET	C	6	Sheet number - formed by joining the region, zone and constituency codes.
IDENTICAL	L	1	Set to 'true' by the verification program when all three copies have been entered and are the same.
FINAL	L	1	Set to 'true' when the constituency has been frozen.
Total		17	

**Index Tags:**

Tag Name	Index Key	Unique	Descending
EVNTCDE	EVNTCDE	N	N
REGCDE	REGCDE	N	N
ZONCDE	ZONCDE	N	N
CONSTCDE	CONSTCDE	N	N
EVNTRZC	EVNTCDE+REGCDE+ZONCDE+CONSTCDE	N	N
EVNTSHEET	EVNTCDE+SHEET	N	N
FINAL	FINAL	N	N
IDENTICAL	IDENTICAL	N	N
SHEET	SHEET	N	N

APPENDIX G

# **National Electoral Board of Ethiopia Electoral Information Systems**

## **Election Results Tabulation**

### **User Manual**

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June 1st, 1995

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## Introduction

The Elections Results Tabulation System is a computer program that allows you to capture election results for regional, federal and local elections. Results are captured three times for candidates in each constituency according to the constituencies that are defined in the Table Control System (TCS). A module exists to verify the three copies of results for each constituency to ensure results are entered correctly. Various reporting modules exist to produce the final election results and other statistics.

The first step in capturing results is the generation of 'sheets'. There are three sheets for the candidates in each constituency defined in TCS. Once the sheets have been generated, the results capture screen can be used to capture vote counts three times for each constituency. The system ensures that the votes for one constituency are entered by three different users.

Another program exists that compares the individual copies of each constituency to ensure all three copies are the same. This program produces a report showing how many constituencies have been entered once, twice and three times, and how many copies are the same and how many copies are different. Once a constituency has been entered three times and all three copies are the same, a system administrator will have the ability to 'freeze' the constituency. Once a constituency is frozen, it is impossible to make changes to that constituency.

There are several programs which can be used to generate printed and viewed reports. These reports are as follows:

Report	Description
Verification Statistics	Report detailing the number of constituencies entered once, twice and three times, and the number of copies that are the same, and the number of copies that are different.
Verification Summary	Detailed listing showing constituencies by region, the number of copies of each constituency and whether all copies are the same or different.
Summary	Detailed listing of constituencies showing the number of candidates, projected and registered voters, etc.
Results	Detailed listing by constituency showing the candidates for each constituency and the winning candidates. Also a summary listing showing all the winning parties and the number of seats won.
Transactions	Detailed listing of all results capture transactions. This report shows who added, changed and deleted election results.

All reports can be viewed on the screen or printed on paper. Most reports can be generated on a regional basis.

APPENDIX D



# **National Electoral Board of Ethiopia**

## **FoxPro Menu System**

### **Technical Documentation**

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## **System Overview**

The FoxPro Menu System is designed to provide the N.E.B. with a means of defining system users, their passwords and security levels. It also provides a means of launching other FoxPro applications. Access to other applications is controlled by the security level of the user who signs on.

Any user with 'Administrator' security access has the ability to browse, add, edit and delete users. This program module is accessed via the 'Supervisor' option of the 'File' pulldown menu. The 'Edit' and 'Delete' options are only available when the user browse window has been opened. The user security levels are as follows:

- Administrator        - Full access to all application features.
- Supervisor         - Limited access to all application features.
- Data Entry         - Access to data entry facilities only.
- Clerk               - Read only access - no ability to add, edit or delete information.
- Guest                - Read only access to a limited number of program modules.

The system administrator has the ability to change any user's password using the 'Edit' menu option. All users have the ability to change their password using the 'Password' option of the 'File' pulldown menu.

Currently there are two FoxPro applications that can be launched from the 'System' pulldown menu -the Table Control System (TCS) and the Elections Results Tabulation System (ERT).

## Installing and Starting the Application

This application exists in one of three environments - development, test and production. The development area is to be used by a programmer to write and test programs. The directory structure of the development environment is as follows:

V:\FOXMENU	- Project, help and application (.app) files.
V:\FOXMENU\SOURCE	- FOXMENU Source Code.
V:\COMMON	- Ethiopian flag, Foxtools.fl library.
V:\COMMON\DATA	- Database file/system maps.
V:\COMMON\SOURCE	- Common FoxPro library source code shared amongst FoxPro programs.
V:\ERT\DATA	- FOXMENU database files.

The test area is to be used by someone other than the programmer to test programs before they are placed in the production environment. The structure of the test environment is as follows:

T:\	- Help and application (.app) files.
T:\DATA	- N.E.B. database files.

The test area is to be used by the N.E.B. users. This area is the 'live' area and contains the 'live' N.E.B. data. The structure of the production environment is as follows:

P:\	- Help and application (.app) files.
P:\DATA	- N.E.B. database files.

The development environment should be located on logical drive 'V'. This drive can be accessed using the Windows NT share called 'FoxPro Development Share' (DEVELOP). This share is physically located in the C:\NEB\IT\FOXPRO\DEVELOP subdirectory of the file server.

FoxPro itself should be located on logical drive 'F' and can be accessed using the Windows NT share 'FoxPro 2.6 for Windows' (FPW26). This share is physically located in the C:\FPW26 subdirectory of the file server.

The test environment should be located on logical drive 'T'. This drive can be accessed using the Windows NT share called 'FoxPro Test Share' (TEST). This share is physically located in the C:\NEB\IT\FOXPRO\TEST subdirectory of the file server.

The production environment should be located on logical drive 'P'. This drive can be accessed using the Windows NT share called 'FoxPro Production Applications' (FOXPRO). This share is physically located in the C:\NEB\OPS\FOXPRO subdirectory of the file server.

It is not necessary to create an icon for this application as it is called from the FoxPro Menu system.

## System Architecture

The application consists of one project file V:\FOXMENU\FOXMENU.PJX/PJT. This one project file contains the following source code modules:

### Programs

Program	Description
SYSOPNDB	Program to open all database files associated with FOXMENU.
SYSTMBW	Program to refresh push buttons when browse window changes.
SYSKBD	Program to test for certain keystrokes.
FOXMENU	FOXMENU main program.

### Menus

Menu	Description
FOXMENU	Menu for FOXMENU application.

### Screens

Screen	Description
ADDUSER	Screen to add new and edit existing users.
CPW	Screen for all users to change their passwords.
SIGNON	Screen to allow users to sign on to the FoxPro Menu System.
SYSDBERR	Screen to display error when attempting to open a locked database.
SYSABOUT	Screen to display technical information about this system.

## Menu Structure

Menu Option	Pulldown Menu Option	Secondary Option	Description
File	Supervisor	User Browse	To open the users browse window.
		Add User	To create a new user.
		Edit User	To edit an existing user.
		Delete User	To delete an existing user.
	Change Password		To change a password.
	Exit		To exit this application.
System	Election Results Tabulation		To launch the ERT system.
	Table Control System		To launch the TCS application.
Edit	Undo	Undo	Cancels the last edit operation.
	Redo	Redo	Repeats the last edit operation.
	Cut	Cut	Removes the currently selected text and places it on the clipboard.
	Copy	Copy	Copies the currently selected text and places it on the clipboard.
	Paste	Paste	Inserts clipboard text at the insertion point.
Window	Calculator	Calculator	Activates the FoxPro calculator.
	Calendar	Calendar	Activates the FoxPro calendar.
	About ...	About ...	Activates the 'About' screen.
Help			Activates the help system.

## Program List and Description

### Programs

**SYSOPNDB** This program is used to open all the database files associated with this application. The global variable M.SYSAPPNAM is used to control which database files are opened. This variable is initialised to 'FMA'. The value of this variable is used to locate records in the file \COMMON\DATA\DBFSYS.DBF. The corresponding database file records are located in \COMMON\DATA\DATABASE.DBF using the value of DBFSYS.DATABASE.

This program is used to open database files at the beginning of a program to ensure any database errors are trapped before the user enters the program. If any errors occur while opening the files, the user is informed and the program is terminated.

**SYSTMWBW** This program is used in all browse modules to refresh control buttons when the record pointer changes. This program takes the form of a FoxPro function that calls the 'show gets' routine to refresh the buttons. It is called in the 'when' clause of the browse statement. For example, if the user selects a record that is not eligible for deletion, the show gets routine will disable the 'delete' button.

**SYSKBD** This routine determines if the user has pressed a control key to move from one edit field to another. Whether the user uses a control key to move from field to field determines the behaviour of error messages.

**FOXMENU** This is the main program for the FOXMENU application. This program initialises the FoxPro runtime environment, opens all database files associated with the application using SYSOPNDB.PRG, spawns the FOXMENU menu and performs the foundation read.

The menu FOXMENU.MPR contains the code under the 'exit' option to toggle a global variable that clears the foundation read. All secondary program modules are called from the menu. This program also contains subroutines global to the FOXMENU application.

### Menus

**FOXMENU** This is the only menu for the FOXMENU application. From this menu all secondary program modules are called. It is also the menu that toggles the global variable M.LEXITSYS and clears the foundation read in FOXMENU.PRG.

### Screens

**ADDUSER** This screen is called from the 'Add User' and 'Edit User' pulldown menu options and enables a supervisor to add a new user record or edit an existing record. This screen allows a user to capture the following fields:

User ID - To uniquely identify each user.

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User name - Name of the user.  
Password - User's password - must be at least 4 characters long.  
Access - Pulldown list containing

All fields are mandatory.

The captured data is read from and written to the USERS.DBF database using 'scatter', 'gather' and 'insert' commands. Full multi-user control for editing is supplied in the 'setup' code. File locking errors generated by the 'insert' command are handled by the INSERR.PRG program. The user with the logon id of 'SUPERVISOR' can not be deleted.

**CPW** This screen enables users to change their passwords. A user must enter the new password twice before the system accepts the change. The record in USERS.DBF which is updated corresponds to the user who is currently logged onto the system.

The captured data is written to the USERS.DBF database using 'scatter' and 'gather' commands. Full multi-user control for editing is supplied in the 'setup' code.

**SIGNON** This screen is the first screen displayed by the menuing application. This screen enables users to initially log onto the system by entering their user id and password. The user id and password entered is validated against the USERS.DBF database. If the user id or password is invalid, the user is presented with an error message. If the user and password are valid, the user is permitted to enter the system and have access to system modules according to his/her security access level.

**SYSDBERR** This screen is called using an 'on error' routine while database files are being opened in SYSOPNDB.PRG. If a file locking error occurs, this screen is opened and allows a user to 'retry' or 'cancel' the file opening. If the user decides to cancel, SYSOPNDB.PRG returns false to the calling program (FOXMENU.PRG) and the FOXMENU application is terminated and returns to the FoxPro menu system.

**SYSABOUT** This screen displays technical information about the FOXMENU application. It can be accessed from the 'About...' pulldown menu option of the 'Window' option of the application menu FOXMENU.MNX. This screen provides a quick way of determining which environment the application is running in.



## Database Descriptions

### USERS.DBF - Users table

#### Description:

This table contains a list of N.E.B. FoxPro users. When users log onto the system their user ids and passwords are validated against this table.

#### Structure:

Field	Type	Length	Description
USERID	C	8	Unique user id code - links to COPIES.dbf used in the ERT system.
USERNAME	C	50	User name.
AXLEVEL	C	1	Security access level - 1 (highest) to 5 (lowest).
PASSWORD	C	8	User security password.
Total		68	

#### Index Tags:

Tag Name	Index Key	Unique	Descending
USERID	USERID	N	N

APPENDIX E

# **National Electoral Board of Ethiopia Electoral Information Systems**

## **FoxPro Application Menu System User Manual**

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## **Introduction**

The FoxPro Application Menu System is a computer program that allows you to define and manage the staff who will use the various applications on the National Electoral Board's network. This system allows you to define users and their access to the system.

This manual is aimed at teaching the System Administrator how to administer the Menu System program. You should be seated in front of a computer and be running the program as you read this manual. This manual is structured to match the flow of the program.

The Menu System is designed to provide users with the ability to use the NEB computer programs. It is also designed to restrict the users to the types of functions they can perform within each computer program. This prevents staff from altering sensitive data or entering data without the knowledge of the system administrator. Because all of the data that the Electoral Board uses and stores is sensitive, it is important that the security procedures described in this manual are followed as they are written. The System Administrator has the responsibility to protect the data as well as to make sure that it is current. More here on security?

When personnel are ready to begin using the computer programs, the following tasks must be performed using this system:

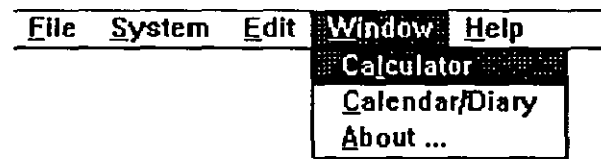
1. Define a new user.
2. Determine the type of access to the system that the user will have.
3. Make changes to the user list as needed, ie, to deal with people who move to different positions or who leave their jobs.
4. Entering the Election Results Tabulation System or the Table Control System.

## Terms Used in this Manual

**System Bar Menu:** The system menu bar is the menu that appears at the top of the screen.



**Pulldown Menus:** Pulldown menus are activated by choosing options from the System Bar Menu.



**Single-click:** The process of 'pointing' to an object and pressing the left mouse button once.

The mouse pointer is as follows:



By moving the mouse, you move the mouse pointer.

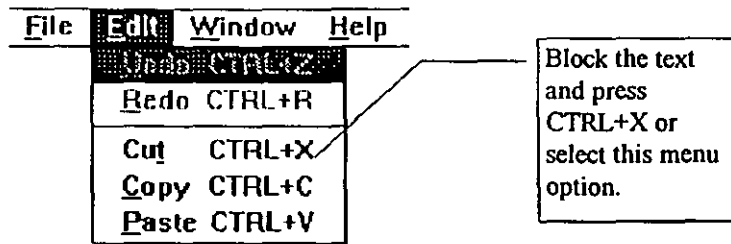
**Double-click:** The process of 'pointing' to an object and pressing the left mouse button twice.

**Blocked Text:** Blocked text is text that has been marked using the shift/arrow keys or the mouse. An example is as follows:

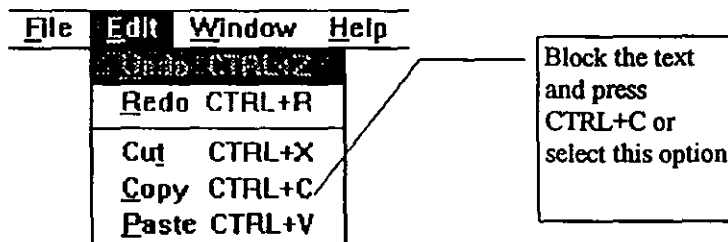
This is normal text. **This is blocked text.** This is normal text.

**Clipboard:** A hidden area of the computers memory where information can be placed, or where information can be retrieved from.

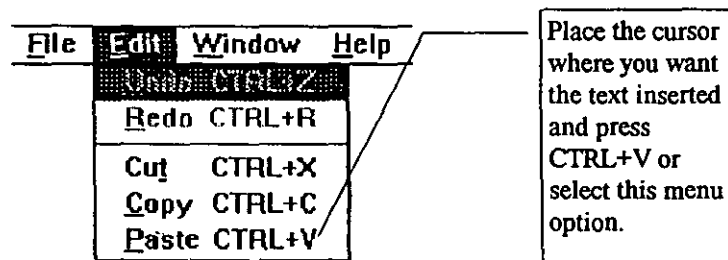
**Cutting:** The process of removing blocked text and placing it on the clipboard.



**Copying:** The process of placing a copy of blocked text on the clipboard.



**Pasting:** The process of retrieving blocked text from the clipboard and placing it where the cursor is.



**Push button:** A push button is a button that can be selected by single-clicking directly on it with the mouse or by tabbing to it and pressing the enter key. A sample of two push buttons are as follows:



## Program Startup/Main System Menu

When the program is started, the message *Opening Files...* appears in the upper right corner of the window for a short time. Once the message disappears, you will be asked to enter your System ID name and your password. When the system bar menu appears at the top of the window, you are ready to begin working. The system bar menu has the following options:

Option	Purpose
File	Activates the <i>File</i> pulldown menu. Activated by pressing <Alt>F or by single-clicking on the word <i>File</i> .
System	Activates the <i>System</i> pulldown menu. Activated by pressing <Alt>S or by single-clicking on the word <i>System</i> .
Edit	Activates the <i>Edit</i> pulldown menu. Activated by pressing <Alt>E or by single-clicking on the word <i>Edit</i> .
Window	Activates the <i>Window</i> pulldown menu. Activated by pressing <Alt>W or by single-clicking on the word <i>Window</i> .
Help	Activates the online help facility. Activated by pressing <Alt>H or by single-clicking on the word <i>Help</i> . * If system help is not available, an error message is displayed when you enter this program and all help facilities are disabled.

The *File*, *System*, *Edit* and *Window* menu bars activate pulldown menus. Each option of a pulldown menu can be used to perform a function or access a secondary program module.

The *File* pulldown menu is used to access the user functions of this program as well as exit this program and return to the menu program. Options in this pulldown menu are as follows:

Option	Purpose
Supervisor	Opens the Supervisor Functions window where you can add, edit, delete and browse the users of the system. Activated by pressing <Alt>S or by single-clicking on the word <i>Supervisor</i> .
Change Password	Allows you to change your personal password. Activated by pressing <Alt>C or by single-clicking on the word <i>Change</i> .
Exit	Opens a window asking you if you want to exit this program. Activated by pressing <Alt>X or by single-clicking on the word <i>Exit</i> .

The *System* pulldown menu is used to access the main programs of the electoral information system. Options in this pulldown menu are as follows:



Option	Purpose
Results Tabulation	Runs the Election Results Tabulation System program where you can enter or generate reports of the results of an election event. Activated by pressing <Alt>R or by single-clicking on the word <i>Results</i> .
System Tables	Runs the Table Control System program where you can define and manage information associated with elections. Activated by pressing <Alt>S or by single-clicking on the word <i>System</i> .

The *Edit* pulldown menu is used to speed-up editing by allowing for correction of mistakes, as well as cutting and copying to the clipboard and pasting from the clipboard. **Note:** While you are in the Main System Menu of this program, you cannot access the *Edit* functions. This section is included for your information. The options on this pulldown menu are as follows:

Option	Purpose
Undo	Reverses the most recent edit action. For example, if you accidentally erase the information in a field, you can use this option to place the original information back in the field. Activated by pressing <i>U</i> , by single-clicking on the word <i>Undo</i> or by pressing <CTRL>Z.
Redo	Repeats the action previously reversed with Undo. Activated by pressing <i>R</i> , by single-clicking on the word <i>Redo</i> or by pressing <CTRL>R.
Cut	Removes a text selection and places it on the clipboard. To select text, press and hold down the shift key. Then use the arrow keys to <i>mark</i> the text block. (As you press the arrow keys the text turns black.) When you have finished marking the text block, let go of the shift key. You now have a marked a text block. This text block can be removed and placed on the clipboard by using the <i>Cut</i> option selected from the <i>Edit</i> pulldown menu. Activated by pressing <i>T</i> , by single-clicking on the word <i>Cut</i> or by pressing <CTRL>X.
Copy	Copies a text selection to the clipboard. This option behaves in the same way as the <i>Cut</i> option, but does not remove the selected text from the field. It merely places a copy of the selected text on the clipboard. Activated by pressing <i>C</i> , by single-clicking on the word <i>Copy</i> or by pressing <CTRL>C.
Paste	Places the contents of the clipboard at the insertion point. Move the cursor to where you would like cut or copied text to <i>appear</i> and select this option. Any text placed on the clipboard will be inserted where the cursor is. Activated by pressing <i>P</i> , by single-clicking on the word <i>Paste</i> or by pressing <CTRL>V.

Please note, the edit pulldown menu options behave exactly the same as the editing options in Microsoft Word for Windows.

The *Window* pulldown menu is used to provide you with access to a calculator and calendar/diary, as well as provide a system administrator with technical information about the system. The options on this pulldown menu are as follows:

Option	Purpose
Calculator	Displays a calculator on the window. The calculator can be closed by pressing the <ESC> key.
Calendar/Diary	Displays a calendar/diary on the window. The calendar/diary can be closed by pressing the <ESC> key.
About	Opens a window displaying technical information about the program. This window can be closed by single-clicking on the OK push button or by pressing the <ESC> key.

## Supervisor Facilities

This program module is accessed by selecting the *Supervisor* option of the *File* pulldown menu. The Supervisor may enter the User menu to add, edit, or delete information on the system users.

The options available to the Supervisor from this menu are as follows:

Option	Purpose
User Browse	Displays the table of current users. To activate the table, click on the "User Browse" button.
Add User	Opens a window for you to define a user. To activate the window, click on the "Add User" button.

### User Browse

Use this option to view the names, passwords and security status of the current system users. You can move from one user to another by pressing the arrow keys or the PgUp and PgDn keys. You can go directly to a user by single-clicking on the user him/herself.

In order to edit or delete a user, you must first be in the "User Browse" table.

### Adding a New User

There are two ways that users may be added to the system:

- 1) Access the Supervisor Facilities pulldown menu from the File pulldown menu. Click on "Add User" to enter the Add User window.
- 2) From the "User Browse" table, click on the "File" button. Click on "Add User" to enter the Add User Window. The system will take you directly to the ID field.

#### ID

Enter the identification name of the user. This name must be at least four characters long. The user will enter this name to access the menu system. Press *Tab* to go to the Name field.

<b>Name</b>	Enter the full name of the user. Press <i>Tab</i> to go to the Password field.
<b>Password</b>	Enter the password that the user will enter to access the menu system. The password must be at least four characters long. Press <i>Tab</i> to go to the Access field.
<b>Access</b>	Use the arrow keys to go up and down the list of access codes for users. Select the correct access code for the user by pressing <i>Tab</i> . Press <i>Tab</i> again to move to the "Ok" button.
<b>Ok Button</b>	After entering all mandatory fields, select the 'Ok' push button to add the new user to the User table. If there is a problem with any of the fields, the system will display an error message and prevent you from saving the new user.
<b>Cancel Button</b>	To return to the user table without saving the new user, select the "Cancel" push button. When you select the "Cancel" push button, no changes are made to the database.

### ***Editing an Existing User***

From the User Browse table, click on the "File" push button to access the Supervisor Facilities pulldown menu. Click on the Supervisor menu to access the Supervisor options, and click on the "Edit" push button to move to the Edit Existing User window. The window will display the User that you selected for editing.

<b>Edit Existing User Window</b>	The Edit Existing User window will automatically move you to the User Name field. Once a User has been created, you cannot change the identification name.
<b>Editing Text</b>	Use the <i>Tab</i> key to move from one field to another, or to skip over fields that you do not want to edit. You can type directly over the data already in the field by pressing the <i>Ins</i> key, or you can delete data by using <i>Backspace</i> and <i>Del</i> keys. Remember that the same rules for adding new information apply to editing information. You will receive an error message if the information is edited incorrectly.
<b>Saving Changes</b>	Press <i>Tab</i> or select the "Ok" push button to save the changes that you have made to the User. Select the "Cancel" push button to discard your changes and not change the database.

### ***Deleting a User***

To delete a User, first select the User from the User Browse table to be deleted. Click on the "File" push button to access the Supervisor pulldown menu. Click on the "Delete" push button.

**Ok Button**

The delete window will ask if it is "ok" to delete the User that you have selected. Select the "Ok" push button to delete the User. Warning : Once a User is deleted, it is gone forever and can not be brought back.

**Cancel Button**

Select the "Cancel" push button to return to the Users table without deleting any Users.

## ***Changing Passwords***

Any user may change his/her personal password by selecting "Change Password" from the File pulldown menu. Otherwise, only the Administrator and Supervisor may change user passwords.

From the User Browse table, click on the "File" button to access the Supervisor pulldown menu, then click on the "Edit" menu item to access the Edit User window. Press *Tab* to move to the Password field, then change the password.

## ***Starting Other Programs***

To access the other FoxPro Applications in this system, exit the User menu by pressing *Esc*. Click on the System button to activate the system pulldown menu. From this pulldown menu, you can run either the Results Tabulation System or the Table Control System.

**Results Tabulation System**

The Results Tabulation System is a computer program that allows you to manage and conduct the tabulation of regional, federal and local election events.

**Table Control System**

The Table Control System is a computer program that allows you to define and manage information associated with regional, federal and local elections.

APPENDIX F

# **National Electoral Board of Ethiopia**

## **Election Results Tabulation System**

### **Technical Documentation**

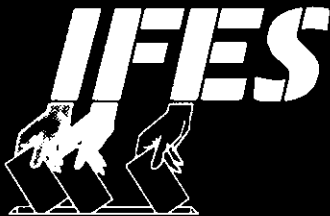
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