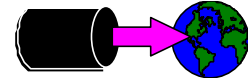


Migrating Data to the World



A Robelle Tutorial

Mike Shumko, August

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The ability to migrate data from IMAGE databases and MPE files to other platforms is becoming more of a necessity all the time. Past methods of exporting data from MPE relied on fixed formats which did not always permit the data to be imported easily into other applications, and which required considerable work from programmers. A new tool, however, can make this process easier. STExport is the newest module of the popular and powerful Suprtool database utility. In *Migrating Data to the World*, you will learn how to use STExport to export data from your HP 3000 or HP 9000 to just about any other platform—all without your having to write a custom program.

Migrating Data to the World is presented by Robelle's Mike Shumko. Mike has just celebrated his tenth anniversary at Robelle. During his decade with the company, he has spent much time as a technical support person and trainer, helping users of Qedit and Suprtool to get the most from this software.

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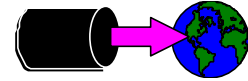
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For Techies

References

See the other papers and tutorials being presented by Robelle at this conference.

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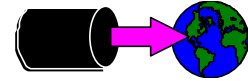
For brevity's sake, this tutorial shows examples only from MS Access. STExport can, of course, export data to many other platforms and applications. STExport allows control over the format into which you convert date-type, numeric-type, and floating-type fields. You can, therefore, format your data in a way acceptable to your target database.

For Techies

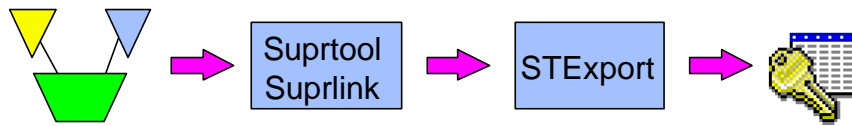
References

STExport is fully documented in the *Suprtool User Manual* and the *Suprtool Quick Reference Guide*.

Import *IMAGE/SQL* Data into *MS Access*



- Extract the IMAGE data using Suprtool and Suprlink
- Create the export file using STExport
- Transfer the file to the PC
- Import the file into MS Access



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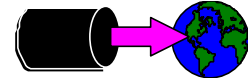
Importing to a PC application is similar in concept to almost any job where Suprtool is used to feed IMAGE data to a program. The only extra wrinkles here are using STExport to reformat the output, and transferring the file to the PC.

For Techies

These examples show STExport/iX version 3.8, and MS Access for Windows version 2.0.

References

The IMAGE Data Looks Like This



```
>get employees; list; xeq

ADDRESS          = 307-2222 Edinburgh
BANK-ACCT        = 001-2547-66983
BANK-NAME        = Toronto Dominion
BIRTH-DATE       = 19700214      CITY           = Richmond
COUNTRY          = Canada
DATE-HIRED       = 19920304      DEPARTMENT-NO = 10
EMPLOY-STATUS    = 1            EMPLOYEE-NO    = 5557
HOME-PHONE       = (604) 574-2627
MARITAL-STATUS   = 2            NAME           = Grinham, Robert
POSTAL-CODE      = V9H 2R6      PROVINCE-CODE  = BC
REVIEWED-DATE    = 19960501     SALARY         = 4000.00
SEX              = M            SIN            = 689521478
SPOUSE-NAME      =
TITLE            = Administrative Clerk
VACATION-DAYS    = 15           WORK-PHONE     = (604) 244-4000 x2587
```

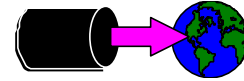
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| EMPLOYEES | Master | Set# 1 | Offset | |
|----------------|--------|--------|--------|------------------|
| ADDRESS | | X20 | 1 | |
| BANK-ACCT | | X20 | 21 | |
| BANK-NAME | | X20 | 41 | |
| BIRTH-DATE | | I2 | 61 | <<YYYYMMDD>> |
| CITY | | X20 | 65 | |
| COUNTRY | | X20 | 85 | |
| DATE-HIRED | | I2 | 105 | <<YYYYMMDD>> |
| DEPARTMENT-NO | | I1 | 109 | |
| EMPLOY-STATUS | | I1 | 111 | |
| EMPLOYEE-NO | | I2 | 113 | <<Search Field>> |
| HOME-PHONE | | X20 | 117 | |
| MARITAL-STATUS | | I1 | 137 | |
| NAME | | X20 | 139 | |
| POSTAL-CODE | | X10 | 159 | |
| PROVINCE-CODE | | X2 | 169 | |
| REVIEWED-DATE | | I2 | 171 | <<YYYYMMDD>> |
| SALARY | | I2 | 175 | << .2 >> |
| SEX | | X2 | 179 | |
| SIN | | I2 | 181 | |
| SPOUSE-NAME | | X20 | 185 | |
| TITLE | | X20 | 205 | |
| VACATION-DAYS | | I1 | 225 | |
| WORK-PHONE | | X20 | 227 | |

For Techies

References

The MS Access Data Looks Like This



- The table already exists in an MS Access database
- We will be appending records to the table

| Employee Name | Employee Num | Status | Address | City | Province/State | Country |
|------------------|--------------|--------|-------------------|-----------|----------------|---------|
| Brinham, Robert | 5557 | 1 | 307-2222 Edinburg | Richmond | BC | Canada |
| Fernandes, Karen | 24386 | 1 | 1786 E 30th | Vancouver | BC | Canada |

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The table is defined like this:

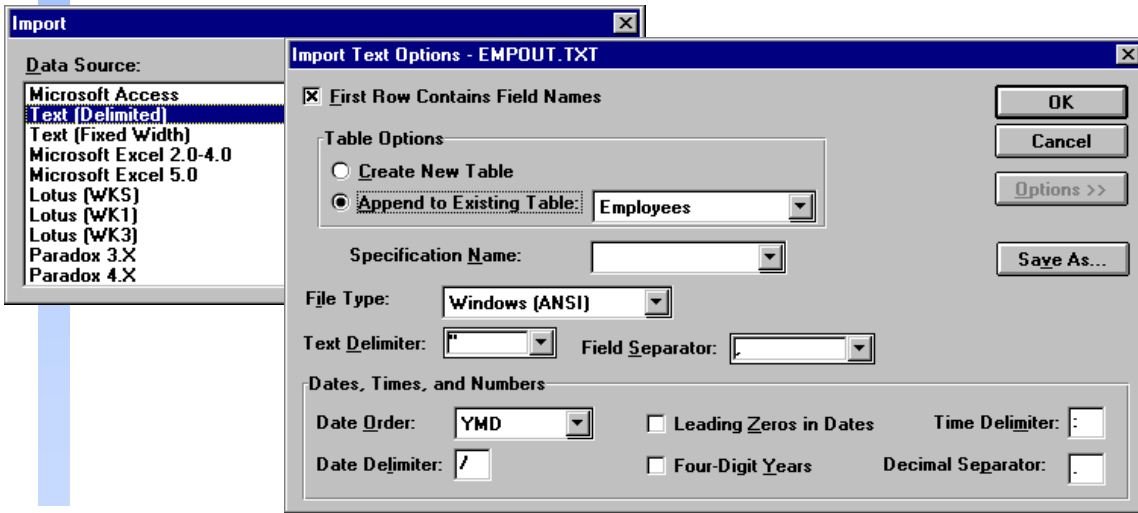
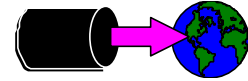
| Name | Type | Size |
|-------------------------|------------------|------|
| Employee Name | Text | 50 |
| Employee Number | Number (Long) | 4 |
| Status | Number (Long) | 4 |
| Address | Text | 50 |
| City | Text | 50 |
| Province/State | Text | 50 |
| Country | Text | 50 |
| Postal/Zip Code | Text | 50 |
| Home Phone Number | Text | 50 |
| Sex | Text | 50 |
| Social Insurance Number | Number (Long) | 4 |
| Hire Date | Date/Time | 8 |
| Marital Status | Number (Integer) | 2 |
| Spouse Name | Text | 50 |
| Monthly Salary | Currency | 8 |
| Bank Name | Text | 50 |
| Bank Account ID | Text | 50 |
| Birth Date | Date/Time | 8 |
| Title | Text | 50 |
| Department Name | Text | 50 |
| Work Phone Number | Text | 50 |
| Last Review Date | Date/Time | 8 |
| Vacation Days | Number (Integer) | 2 |

For Techies

Employee Number is the index item to the table. It's configured as non-duplicating.

References

The MS Access Import Choices



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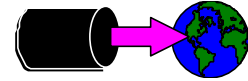
MS Access can import data from a variety of source applications. Not surprisingly, Suprtool and IMAGE/SQL are not listed, so we'll use the generic delimited text format. We'll just use the MS Access defaults for delimiters and separators because they are also the defaults in STExport.

For Techies

References

The MS Access manual explains the various import options.

The Import File Text (Delimited)



■ Without Column Headings

```
"Fernandes, Karen",24386,1,"1786 E 30th","Vancouver","BC","Canada",...  
"Grinham, Robert",5557,1,"307-2222 Edinburgh","Richmond","BC","Cana...
```

■ With Column Headings

```
"Employee Name","Employee Number","Status","Address","City","Provin...  
"Fernandes, Karen",24386,1,"1786 E 30th","Vancouver","BC","Canada",...  
"Grinham, Robert",5557,1,"307-2222 Edinburgh","Richmond","BC","Cana...
```

■ Fields in Different Sequence, With Column Headings

```
"Address","Bank Account ID","Bank Name","Birth Date","City","Countr...  
"1786 E 30th","006-2407-11896","First National",1958/04/01,"Vancouv...  
"307-2222 Edinburgh","001-2547-66983","Toronto Dominion",1970/02/14...
```

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It is important that MS Access know where to find the fields in the import record. The separator character (in this case a comma) separates the fields, and the text delimiter character (here, double-quotes) marks the start and end of text fields.

If we are creating a new table then there is no need to synchronize the import file with anything. All we need to do is to put the fields in the desired order. If the first row of the file contains the field names, then those names will be used. If not, the columns will be named 1, 2, 3, etc.

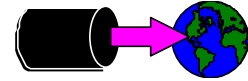
If we are appending the data to an existing table, then either the fields in the import file must be in the same sequence as those in the table, or the first row of the file must contain field names. The names must match the names in the MS Access database, though the sequence need not be the same.

Note: For our example we will create a file that has all the fields required, but we'll use whatever field sequence is produced by Suprtool and Suprlink. We'll put field names in the first record so that MS Access will know how to load the data.

For Techies

References

Select the Data Using Suprtool



```
get      employees
sort     department-no
output   emp,link
xeq
```

```
get      departments
sort     department-no
output   dept,link
xeq
```

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The Employees dataset has department number, while the target MS Access table has department name. We have another IMAGE/SQL dataset that associates department numbers to names, so we extract that data and use Suprlink to add the department names to the file we'll feed to MS Access.

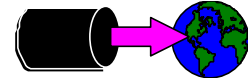
The Departments dataset looks like this:

```
DEPARTMENTS      Master      Set# 2
  Entry:                Offset
  DEPARTMENT-NAME      X20      1
  DEPARTMENT-NO        I1       21 <<Search Field>>
Capacity: 20 (20)  Entries: 2  Bytes: 22
```

For Techies

References

Link the Files Using Suprlink



```
link      {invoke suprlink from suprtool}  
input    emp  
link     dept  
output   empdept  
xeq  
exit     {from suprlink}
```

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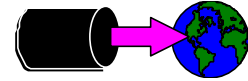
Suprlink uses the common sort key, department-no, to link the files, creating composite output records composed of the link record appended to the input record.

For Techies

The common key, department-no, appears in both the input and link files, but will not be duplicated by Suprlink in the output file.

References

Create File Using STExport



```
export      {invoke stexport from suprtool}
input      empdept
date       yyyyymmdd "/"
heading    '"Address",'
heading    add '"Bank Account ID",'
...
heading    add '"Work Phone Number",'
heading    add '"Department Name"'
output     empout
xeq
exit       {from stexport}
```

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Date Format

The Date command specifies how date fields are written to the file. Here we have specified that dates are in yyyy/mm/dd format, with slashes.

No Headings

The default is not to have a heading record.

Fieldnames

The Heading Fieldnames command creates a heading record with the names of the fields as recorded in the self-describing input file. These usually are the names of the IMAGE/SQL fields.

User Specified Headings

Add your own headings to match the names in the MS Access file. All Heading commands except the first have the Add keyword. Put in your own delimiter quotes and separator commas if they are expected by MS Access.

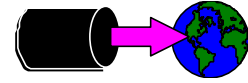
Defaults

We're taking the defaults of quoted text fields with trailing blanks suppressed, comma separators, and variable length columns.

For Techies

References

The Resulting File on the Host



```
"Address", "Bank Account ID", "Bank Name", "Birth Date", "City"..  
"307-2222 Edinburgh", "001-2547-66983", "Toronto Dominion", 19..  
"1786 E 30th", "006-2407-11896", "First National", 1958/04/01, ..
```

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The output from STExport has all the data we need to supply to MS Access:

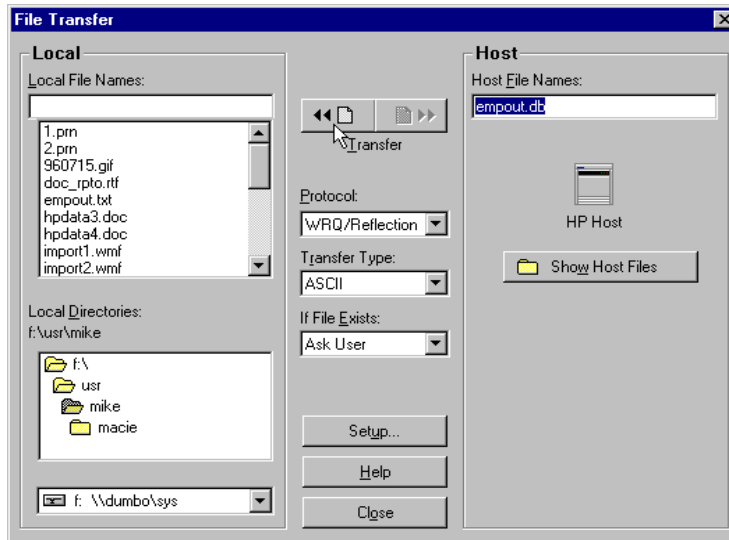
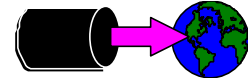
- First record has the names of the fields
- Data values separated by commas
- Non-numeric values surrounded by quotes
- Date fields in yyyy/mm/dd format

Notice that the field sequence in this file is not the same as the sequence shown on page 7 of the workbook. Because the first record contains the list of field names, MS Access will be able to import the data correctly, mapping the file's fields into the correct database fields.

For Techies

References

Transfer the File to the PC



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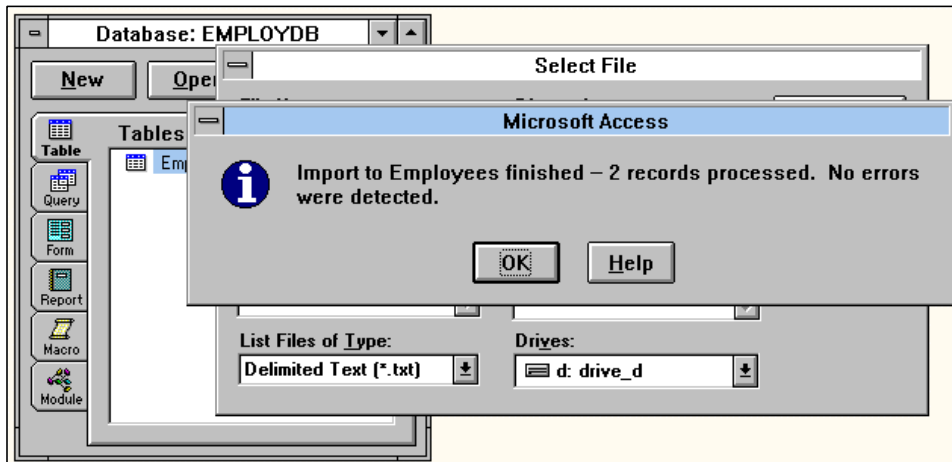
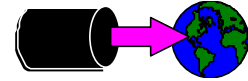
Suprtool has no built-in file transfer capability. You have a range of options to get the file from the host server to the PC, including WRQ's Reflection file transfer, and FTP.

For Techies

FTP client capability is included in MPE/iX 5.0

References

Import the Data into MS Access



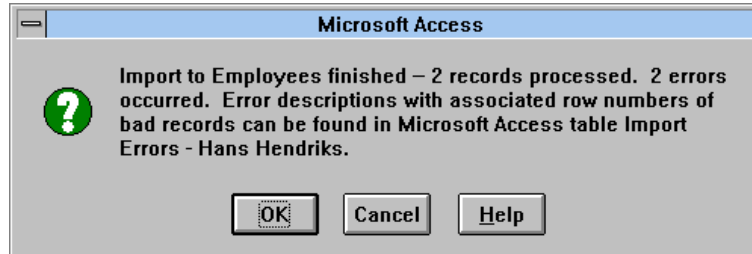
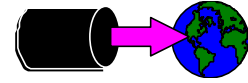
13

MS Access lets you know the outcome of the import operation.

For Techies

References

Errors While Importing



| Table: Import Errors - Hans Hendriks | | |
|--------------------------------------|-------|-----|
| Error | Field | Row |
| Key Violation | | 2 |
| Key Violation | | 3 |
| * | | |

Record: 1 of 2

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It's pretty easy to get errors during the import step. Usually errors happen because the import file doesn't match the layout that MS Access is expecting. More on this later.

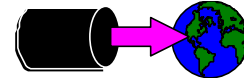
A common error is the *Key Violation*, which results when you have a field in your table which is a non-duplicating index. The same concept is at work in IMAGE/SQL master datasets, which cannot have two records with the same key value. To generate the error shown above, I simply repeated the import that was successful on the previous page.

When records cannot be imported, MS Access creates a new table called the Import Errors table, which describes the error that occurred, and the field and row/record number that the error applies to. You can delete the Import Errors table after you have analyzed the errors.

For Techies

References

Names or Fields Don't Match



| Table: Import Errors - Hans Hendriks | | | |
|--------------------------------------|-------------------------|-----------------|-----|
| | Error | Field | Row |
| ▶ | Type Conversion Failure | Employee Number | 1 |
| | Type Conversion Failure | Employee Number | 2 |
| | Type Conversion Failure | Employee Number | 3 |
| * | | | |

Record: 1 of 3

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Import Errors are the result of MS Access seeing data in the import file that it cannot load into the table. Some typical errors are

Field Truncation

- Type Conversion Failure
- Key Violation
- Validation Rule Failure
- Null in Required Field
- Unparsable Record

What caused this error?

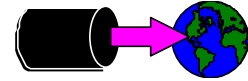
All I did to create the error shown above was forget to check the First Row Contains Field Names box on the Import Text Options menu. Because this box was not marked, MS Access assumed that the fields in the import file were in the same sequence as those in the table. MS Access also tried to read the first record as data when it really contained field names. The first field in the table, Employee Name, was loaded without incident from the import file—even though the first field in the file really contained an address. All MS Access cared about was that it got quoted text not exceeding the length defined for Employee Name. The second field, Employee Number, was a problem, however, because in the second field of the import file there was another quoted string, Bank Account Id, instead of a number.

For Techies

If importing a text file takes an unexpectedly long time, many errors are happening. To cancel importing, press CTRL+BREAK.

References

Why Use STExport?



STExport lets you....

- Strip trailing spaces from text fields
- Control the format of dates and numbers
- Add field names to the first record
- Specify the delimiter and separator characters

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Thank you, Michael Shumko, for your recent subscription to our fine magazine, Scientific American. You will soon receive your first issue, along with your free gift, the Binford 9000 Particle Accelerator. Blah blah blah ...

Obviously for some applications it's critical that text fields have their trailing spaces removed. STExport gives you control over the format of the data going into the import file, whereas the PRN option of Suprtool's Output command does not have any flexibility.

STExport Formatting Commands

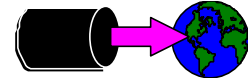
- Columns
- Date
- Delimiter
- Floating
- Heading
- Quote
- Sign
- Spaces
- Zero

For Techies

Confusing terminology: STExport calls the character that appears between fields a *delimiter*; MS Access calls this a *field separator*. STExport calls the character used around byte-type fields a *quote*; MS Access calls this a *text delimiter*.

References

Exporting from ALLBASE/SQL



```
open  allbase employee.db humres
select * from humres.employees
sort  department_no
output emp,link
xeq

select * from humres.departments
sort  department_no
output dept,link
xeq
```

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Let us assume that the original data is in an ALLBASE/SQL environment instead of an IMAGE/SQL database. You can still use Suprtool to extract the data into self-describing files.

There are two differences:

- use the Open command instead of a Base command, and
- use an SQL Select command instead of a Get command.

The rest of the job is the same, feeding the two files into Suprlink, then processing the resulting file with STExport.

Using the flexibility of the Select command, you could even extract all the fields you need in a single pass. The command would be something like this:

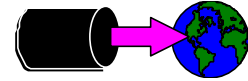
```
Select address, bank_account, ... department_name
from humres.departments Dept, humres.employees Emp
where Dept.department_no = Emp.department_no
```

If you use "*" as a column list, the department number will be extracted twice because it is in both tables. You could then create the Empdept file immediately, bypassing the Suprlink step and going straight to STExport.

For Techies

References

Importing into Oracle/UX



- Load the file into the Oracle table
- The load specs are in their own control file

```
sqlload userid=username/userpass control=loaddate.ctl log=load.log
```

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You can import the data into an Oracle/UX database with the SQL*Loader utility. To execute SQL*Loader, you can do:

```
sqlload userid=username/userpass control=loaddata.ctl log=load.log
```

where `sqlload` is the filename of the SQL*Loader program

`userid` is the username and password to use to connect to the database

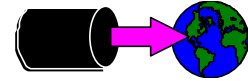
`control` is used to point the file containing the load specifications (shown on the slide)

`log` is requesting SQL*Loader to write the various messages generated during the load operation, including error messages

For Techies

References

Importing into Oracle/UX The Control File



```
load data
  infile '/users/mike/oracle/data/empdept'
  append into table employees
  fields terminated by ","
  optionally enclosed by '"'
(employee_name, employee_number, status, address,
 city, province_state, country, postal_zip_code,
 home_phone_number, sex, social_insurance_number,
 hire_date, marital_status, spouse_name,
 monthly_salary, bank_name, bank_account_id,
 birth_date, title, department_name,
 work_phone_number, last_review_date, vacation_days)
```

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| | |
|-------------------------------|---|
| load data | load command |
| infile | name of the data file |
| append into table | destination table <i>insert</i> assumes the table is empty <i>append</i> creates new rows <i>replace</i> deletes existing rows before loading <i>truncate</i> is the same as <i>replace</i> |
| fields terminated by | character used between column values |
| optionally enclosed by | character used around text strings |
| (employee_name,...) | column names, in the same sequence as the data file |

For Techies

References