
CHAPTER 9 *House Keeping*

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The “House Keeping” menu provides administrative functions for the ERP2020 system. The functions are used to customize an initial installation and also for on-going system maintenance. Many of the system settings are stored in a single record/form referred to a the “House Keeping Record”. Other settings and lists are accessed through their own menu-items in the House Keeping Menu.

Concepts and Definitions

Archiving

Database management (conducted by the administrator using the House Keeping menu) involves the management and removal of database records from the active tables at periodical intervals to ensure the security of non-active and the trimming of active tables to reduce them in size. When a job has been completed (all lots in the job have been shipped and it has been invoiced) it is considered closed. At any time, and, for reasons that will become apparent, at month-end, these closed records (from the "Receiver" table) are moved into the Archive-Table. Simultaneously, records are created in the Receivables and Sales-Summary tables.

Archiving is therefore the process of not only closing and removing completed jobs from the data file but creating the necessary month-end data for accounting. There are two-levels to the archiving process.

Archiving Level I:

In the first-level, closed records are tagged as being "closed" and further-more some closed records are moved within the database. Example of records being moved within the database are records in the Receiver table, which are moved to the Archives table. Once these records are moved into the Archives table they are deleted from the Receiver table. Examples of records which are tagged but retained in their respective tables include records in the LOTINFO and LOTSTEPS MATERIALSUSED tables. The records in these tables are tagged with the month and year of the (level-1) archive. Level-1 archiving also updates the Receivables and Sales-Summary tables. Note that Level-1 archiving does **not** remove any information from the active data-base. The user may readily access the data, although, any job-related information must be recalled via the Archives-table. The information pertaining to the traveler and lot-steps is available in the normal fashion. Once the frequency of access to this information has diminished the administrator should move out this information to an external data-base via the level-2 archiving process.

Archiving Level II:

In the second level, these records are physically removed from the data-file and transferred into a separate "archives" database. This is done so that the user may maintain a manageable size of the active database, thereby retaining the advantages of having a smaller database to backup and, of course, maximizing the speed of searching and sorting operations and at the same time permanently secure non-active data. This second ("archives") database is a different data-file but is operated upon by the same Structure File. The second level of archiving may be performed after the level1 archiving

and **after the level1 information has been transferred to any replicated databases**. See “Replication behavior during the Archiving Process” on page 2- 21.12. The user may typically want to retain the records in the active data-base for a quarter, six-months, or a year. Since level-2 archiving physically deletes data from the active data-base the administrator must integrate the exported data into the external data-base prior to deleting the information from the active data-base.

Users and Groups

The ERP2020 structure file uses named “Users” and “Groups” to control access to various modules and menus of the system. For example, floor operators should only have access to floor operations and certainly not to accounting functions. A given user may belong to one or several groups to give limited cross function access such as for a planner. Conversely a given group may contain single or multiple users (the groups membership). Users and Groups may be created both by the Designer and Administrator.

The users and groups created by the administrator are shaded when displayed in the Users and Groups Dialog Form. In addition their ID numbers are always negative. The users and groups created by the designer have a positive ID number and are not shaded. The designer cannot access users and groups created by the administrator. The administrator cannot directly modify users and groups created by the designer but can re-arrange the group memberships. It also follows that the administrator cannot modify the passwords of designer-created users. The designer-created users' passwords may be changed by specifically logging in as the user (whose password is to be changed) and then individually changing them via the HOUSEKEEPING menu-bar, menu EDIT ACCESS, and menu CHANGE USER PASSWORD.

Administrator and Designer

The Designer is the person who first installs the system, and may be an employee of the software reseller. Users created by the Designer are the pre-configured users. The Administrator is the person responsible for ongoing administration and additions and changes, and is typically an employee of the company that owns the installation.

Step Template Numbers

The purpose of a template-number is to customize a traveler step to match the uniqueness of the operation being performed in a step. For example, a step that performs electrical testing requires the ability to enter multiple bin-data. Additionally, the tools and/or operator skills required in an electrical-test are different from the tools required in burn-in. Different operations are therefore characterized with different template-numbers. The template number controls the following:

- Format of data-entry form.

- Format of printed traveler.
- Definition of the tools list required to implement the step.
- Definition of operator skill-sets required to implement the step.
- Bin Titles of the 32 Bins available in the traveler-step.
- Availability of various buttons such as the Label-Creation Button
- Availability of various facilities such as the Count Transformation Facility.
- Upper and Lower limit of percentage yields for each Bin (To allow CPK calculations).

Containers and Container Checking

A container is a magazine (of assembled units) or other container holding part of a lot during processing. ERP2020 provides the facility to group together the containers used for one lot to ensure that the lot is kept intact during processing. Container tracking also guards against the physical mixing of two lots.

Structure File

The structure file defines the menus and features of ERP2020. A new structure file is loaded when the current version of ERP2020 is upgraded

Data File

The datafile is the database data file. It is not normally updated by the administrator, although, it may require maintenance when a structure file is changed.

Menus:

•Menu: **File**

Menu-Item: *Dashboard*

-Tool for most commonly used utilities.



Menu-Item: *Update Data file On Server*

Sometimes a structure update may include extra fields in the database and often these fields may need to be properly populated for existing data. In such cases the new structure also contains the necessary procedure(s) to perform the update on the data-file. This menu allows the user to invoke the procedure(s) that will upgrade the data. Once the data has been upgraded there is no need to run these procedures again. The update procedure is executed on the server for efficient execution. This procedure updates the ERP2020 log file (called "ERP2020log.html, saved in the root level of the database structure) with any changes made to the data base.

Menu-Item: *Change User*

Changes the user that is currently logged on.

•Menu: **File**

Menu-Item: *Re-index*

This menu is used to recreate index tables and will only run on a COMPILED ERP2020 structure with the **control-key pressed**. Once the menu is invoked further authentication via a pass-phrase is required. The recreation of index tables becomes necessary when an existing structure gets upgraded from 6.5 to 6.7. This is to take advantage of the new indexing scheme introduced in 6.7. Per this new scheme the keys (translated to records if no sub-table keys are being created) per table limit has been

doubled from 8 million to 16 million. Index tables must also be re-created if index corruption has been noticed or suspected in the data-file.

For indices to be recreated they must first be dropped and then re-created. The procedure invoked by this command loops on every field in every table to see if it is indexed. If it is indexed, the field-index is dropped and then recreated. Note that this procedure actually modifies the structure which in turn modifies the data (drops the index table and then recreates it). It is therefore important that the procedure be executed in full without errors, otherwise an indexed field in the structure file may end up not being indexed if the index creation command after the index-drop command does not get executed. If the procedure has not been successfully completed then the user must rerun the procedure by using a backup copy of the structure-file.

Note: The user may also drop the indices on a data-file by using the third party tool called "Data-check". This tool drops all the index tables in a data file. The indices are then automatically recreated when the structure file is reopened with 4D server.

•Menu: **File**

Menu-Item: *Change customer name*

Customer records are stored in two different and totally independent tables. The first table is the "Contacts" table which contains a contact-list. This list is used to send quotations or other mailing material.

The customer names (for customers that conduct business with the company, as opposed to "potential" customers in the "Contacts" table) are stored in the "Customer-log" table. Customer records are entered in the accounting menu-bar, via the "customers & POs" menu. This customer-name MUST be entered correctly as it is then proliferated through multiple tables. As an example, when a job is received, the customer name gets tagged to the applicable entries in the "LOTINFO" table and then to the entries in the "LOTSTEPS" table. It also proliferates to the "customer's PO", Aging, QCAR, Archives tables (and many others). The customer-name is therefore, generally "un-modifiable" because any modification must be database wide. Changing the name is not only time-consuming but involves changing numerous records in numerous tables and therefore error prone. Nevertheless this name may be changed via this menu-item. The user must exist in the "SU" group to make this change. Since this change involves an enterprise-wide change in the database it is highly discouraged.

Menu-Item: *Modify HK Record*

This function allows for the modification of the “House Keeping” variables. These variables define information pertaining to the company using the database and other database configuration parameters. This is a one-time modification (made during the initial installation) unless some company constants (like the telephone number, address etc.) necessitate a change. This menu invokes the multi-tab form shown in figure 9.1 on page 9.8.

The screenshot displays a multi-tabbed application window titled 'Constants'. The active tab is 'Constants', and the user is logged in as '{RW}'. The form contains the following fields and values:

Field	Value
Datafile	PLAY
Version	
Config	
Fiscal year	1998
Beginning date	01/01/98
Company name	Silicon Turnkey Solutions Inc.
Federal ID	94-33677157
Web-page-folder	WebpageERP
Text Server	ISE2.SYS
Specs folder	STS_SPECS
Forms folder	STS_SPECS\FORMS
Specs and Forms server	HTTP://209.237.27.9/
Web Site	
Outgoing SMTP Server	ERP2020.COM
Source of data message	STS WIP
Default currency abbreviation for Buy Orders	US\$
Default currency abbreviation for invoicing	US\$
Default currency (full) name in check-text	Dollars
Default currency (full) name for hundredths	Cent
Barcode font MAC	HR36c39highlaser
Barcode39 font PC	AdvC39b
Barcode128B font PC	AdvC128c
Encoding Type for email-attachment	0
Balance Sheet start-date	01/01/04
Invoice Terms (days)	30
Last-Export Time Stamp (MYSQL)	141921000
Last-Export Time Stamp (4D)	198311400
Sales tax fraction	0.0825
Lot-Split character	
WEB_Print_Client Name	An ISO 9002 registered facility.

On the right side, there is a 'Sequence# offsets ...' table:

Field	Value
Receiver #	126391
Quote #	9683
Contacts-List ID#	660
QCAR#	1000
sub packing slip#	8080
Buy order#	19810
repair-log report#	1000
Asset list offset#	1249
CM offset#	1000
DS offset#	984
PO many offset#	1
Lotsteps offset#	1
Buyitems offset#	1

At the bottom right, there is a 'Choose splash screen ...' button and a small empty window. Navigation arrows and a green checkmark are visible at the bottom right of the form.

FIGURE 9.1

Housekeeping Record Fields in TAB1:

Datafile:	Name of the data-file in use. The name may be "MAIN" for active database, "Archives" (where "yy" stands for the year) for Archives database or "PLAY" for a play (or practice) database. When a "Play" data-file is selected on the server then the client will display a play-icon and a "Play" text identifier on the splash-screen to alert the user that the data-file does not contain real data. The administrator must make sure that the Structure Files used to open the real and play data-files always have different names. This will ensure that on the client-side each structure has its own set of resources and therefore different splash-screens. Note: The Splash-screen is the screen shown by the ERP2020 when the user first logs on and when the user exits any data-entry form or dialog. See also "Splash_Active" on page 1.9.74, "Splash_Play" on page 1.9.74 and "Splash_Archives" on page 1.9.74
Read Only	This boolean flag must be set when the data-file is an "Archives" data-file. If this flag is not set the user will not be able to import archived data into the database. See "Restore from FILE" on page 1-9.44. This flag must not be set for an active , WIP data-base.
Version:	Version of ERP2020 structure-file.
Fiscal year:	Year for which the start-date below has been defined.
Beginning Date:	Start date of fiscal year. Together this field and the Fiscal Year field define the fiscal year parameters for the organization.
Federal ID:	The Federal Tax ID of the company. This ID is printed on the 1099 forms generated for sub-contractors.
Web page folder:	The absolute path of the web-folder.

Path-definitions

Text Server:	If the secondary server is Mac then the name of the server as it is mounted on the Local Station.
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Specs folder:	Name of the folder containing the user's specifications. See "Doc Control" on page 1- 8.51. This field is to be used only if the user is storing all specifications in a single (common) folder e.g. "Doc-Ctrl\Specs". The complete path to the specifications folder is defined by adding the URL of the Specs and Forms Server. (See below)
Form folder:	Name of the folder containing forms. e.g. "DocCtrl\Forms". The complete path to the forms folder is defined by adding the URL of the Specs and Forms Server. (See below)
Specs and Forms Server:	URL of the Web-Server on which the company's controlled documents (specifications, procedures, forms etc) are stored. See "Doc Control" on page 1- 8.51.
SMTP Server:	Used by ERP2020 to route outgoing email. Should be a valid IP address or Domain-name. e.g. "exchange.erp2020.com"
Source of data message:	This string appears in the footer of reports indicating source of data.
Default currency abbreviation for Buy Orders:	Default currency abbreviated name for "Buy Orders" (e.g US\$).
Default currency abbreviation for invoicing:	Default currency name for invoices.
Default currency (full) name in check text:	The full name of the currency (plural) e.g. Dollars, for check writing purposes.
Default currency (full) name for hundredths:	Currency Fractional unit (singular) e.g. Cent, for check writing purposes.
Barcode39 Font:	The barcode {Code39}-font name which will be used by the client-workstations for barcode-printing. Barcode fonts are dependent on the kind of printer being used. Advc39b and Advc39a from IDAutomation (at IDAutomation.com) have been tested to work well on the HP laser-jet series. Note that the substitution character for "space" is the ASCII-Code 61

- Barcode128 Font The barcode {Code128} font name which will be used by the client-workstations for barcode-printing. Barcode fonts are dependent on the kind of printer being used. Advc128B and Advc128C work well on the HP laser-jet series and have also been tested on the ZEBRA Z4000. Note that the substitution character for “space” is the ASCII-Code 194
- Invoice Terms (days): Number of days before invoice is due.
- Last-Export Time stampMYSQL: Date time stamp of the last 4D replication. Enter a valid date time stamp to force a replication starting from this value. For example, enter “0” (zero) to force the next replication to send all the data (since time zero) in the database. See also “Resetting The Beginning Date-time Stamp” on page 2.21.11
- Last-Export Time stamp4D: Date time stamp of the last MYSQL replication. Enter a valid date time stamp to force a replication starting from this value. For example, enter “0” (zero) to force the next replication to send all the data (since time zero) in the database. See also “Resetting The Beginning Date-time Stamp” on page 2.21.11
- Last-Export Time stampORACLE: Date time stamp of the last ORACLE replication. Enter a valid date time stamp to force a replication starting from this value. For example, enter “0” (zero) to force the next replication to send all the data (since time zero) in the database. See also “Resetting The Beginning Date-time Stamp” on page 2.21.11
- Sales tax fraction: Default sales tax rate.
- Lot split Character: This character is appended to the parent-lot (or parent inventory-stock-item) to create a unique Lot-Number (or Stock-number) for child-lot (or child-inventory-stock-item). By default this character is a “\$”.

- WEB_Print_Client Name: Name of Client Station that will be used to produce PDF documents requested by the Web Server.
- Sequence# Offsets These fields contain offsets for sequence-numbers of records in various tables in the ERP2020 that require a unique sequence# field. The sequence numbers need to be changed only if a new data-file has been created from records exported from another ERP2020 database. The Receiver number, Quote number etc. will start from the number specified in the respective fields. Sequence number offsets may also be used to differentiate records between multiple master servers. This would be necessary if data from multiple masters has to be assimilated in a single ERP2020 server.
- Choose Splash screen: The drop down menu lets the user change the screen on a single-user application. In Client/Server mode the server automatically selects the splash-screen and transfers it over to the Client upon the Client's first logon. (This is flagged to the user by the message "duplicating resources").

BOM Pull module	If this box is checked then pulling of raw-material from inventory is automatically done by the ERP2020 when BOMs associated with traveler steps are exercised (“resolved”)
Other check boxes:	
Debug Log On:	Debug-log is activated. This is a Designer Function.
New Stored Procedure Scheme:	If the check box is checked then the user can select the pre- and post-processing method during an FTP export via a stored procedure.
Station Code	This is a binary-encode field modifiable only by the designer. The first 4 bits (LSB) denote the Slave-Server-Number. If this value is non-zero then the database is configured in the Slave-Mode, with the value encoded in these bits, being the Slave-Server ID-number. If the value of this field is zero then the Server is deemed to be a Master Server.
Inventory bins:	If checked then ERP2020 is configured to maintain a “Finished-Goods” inventory-bin by customer.
No lots by default:	When the check box is checked then LOT record(s) will not be created when a job is received.
32 Bins in traveler	When the check box is checked then 32 Traveler bins are enabled instead of the default 10.
Perform Steps Sequentially:	When the check box is checked then the traveler punch-in and punch-out must be performed sequentially. See “Start STEP {Punch-in}” on page 1- 6.10. and “Done with Step.” on page 1.6.26
Daily Report Cutoff Time:	Cut off time for daily production report.
Master/SlaveURL	During a Master-Slave WEB-Services (SOAP) interface this is the URL to the complementary (remote) Master if the current-server is a Slave. If the current-server is a Master then this URL to the complementary (remote) Slave-Server. Note that the URL must include the port-number on which the ERP2020 server is being published. E.G. “ 192.168.0.1:8080 ”.

Remote User Name	Name of the user as specified in the Users and Groups of the complementary (remote) Master or Slave Server, if the current server is a Slave or Master respectively.
Remote User Password	Password of the user as specified on the remote server.
Encoding Type For email	This field defines the encoding-type (BinHex, Base64 etc.) used for email attachments. Default encoding is BinHex.

Lot-Flow and Split Merge Controls

Binary-encoded controls for split-merge operations and properties of the AltLotnumber field.

Bit#	Functionality
1	If this bit is set during a lot-split operation the child lot's AltLotnumber field is set to the mother-lot's AltLotnumber. In the default-condition, when this bit is not set, the AltLotnumber field is set to the mother-lot's Lotnumber field. Note that when a lot is first received for processing, the AltLotnumber is set the same as the Lotnumber. Also note that changing this bit in the Housekeeping record does NOT change historical data.
2 Lot-number vs. Alternate-Lot-Number	The MergeLotList field of the LOTSTEPS record, which contains the lot genealogy will use the AltLotnumber of the parent-lot for its population. Note that a change made to this control-bit will not affect legacy lots (lots that have already been split or merged). Note: After RevH1K this bit is not being used as the field contains not the lot-number and the Alt-Lot-number. Additionally when shipping labels are printed then the constituent -lots list (list of lots that were merged into the current lot) will contain the merging lot's AltLotnumber instead of the LotNum.
3	The ERP2020 will allow merging of lots across jobs. If this bit is NOT set (default) then merging operations may be performed across lots with the same job-number.
4	If the external-job merge function is enabled (via bit 3 above) then merging can be performed with lots in an external job as long as all jobs have the same SetupSheetCode (field in the Receiver table)
5	If the external-job merge function is enabled (via bit 3 above) then merging can be performed with lots in an external job as long as all jobs have the same Alternate_ID (field in the Receiver table). If this bit is not set (default condition) then merging is performed across lots with a common Flow (field in the LOTINFO table) value.
6	During a split-operation the child lot will automatically inherit the un-implemented steps of the mother lot, without providing the user with a choice dialog.
7 Cumulative Date-Code	If set then during a merge operation the date-code of the merging lot, if different will be appended to the date-code of the acquiring lot.
8	

TABLE 1.

Bit#	Functionality
9	
10 Automatic assignment of new Device-Number	Assign Link-To-Device-Table & Device-Number to child-lots created via automatic segregation of good bins. See “Automatic Splitting of a Lot with multiple good-bins” on page 1- 6.65.
11 Child-Lot Suffix	Append Bin# to the lot# of child lots created via automatic segregation of good bins. See “Automatic Splitting of a Lot with multiple good-bins” on page 1- 6.65.

TABLE 1.

Data-base configuration done by Administrator

The "Admin Controls page and its fields are discussed in figure 9.3 on page 9.18.

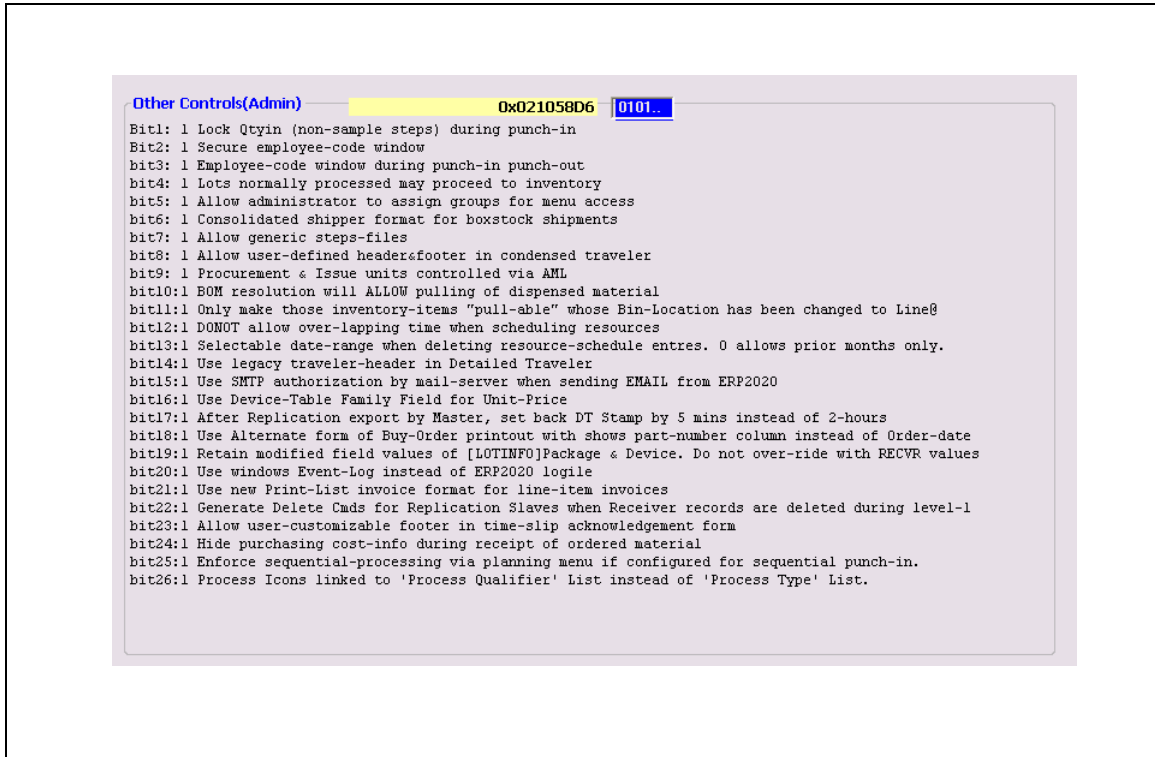


FIGURE 9.3

Other controls (Admin): Binary encoded for various configuration options that are controlled by the administrator during the initial configuration:

Bit	Function
1	If this bit is set then the quantity into a step during punch-in is set to the good quantity out of the previous step.
2 Employee Password Security	If this bit is set then the employee-code window must also require a password.
3 Punch-control	Present employee-code window during punch-in and punch-out operations.
4 Shipment to Inventory	Lots normally processed may proceed to inventory. Note shipment to inventory is different from shipment to Box-Stock. A lot shipped to inventory will typically become raw-material for another lot and will therefore be pulled from inventory as such.
5	If this bit is set then the administrator may by-pass the default menu-access control and define up to three groups that may have menu access to certain critical menu-bars, menus and menu-items.
6 Enhanced Box-Stock pull and shipment-mode	If set then the “consolidated shipper” format will be used to ship products out of box-stock. Note that this bit is overridden by the Multiple Alternate Addresses in the Standard Shipper Bit in the Designer-Control field. If the latter bit is set then the “Consolidated Shipper” format will be used for a Box-Stock-Pull shipment, irrespective of the setting of this bit in the Admin-Control field.
7	If this bit is set then the data-base will allow creation of Generic Steps Files. These files are not customer-specific. Generic steps-files may be used when the Device-Table option is installed.
8 User Graphics in Condensed Traveler	User defined headers and footers may be added to condensed traveler
9 Raw materials units	If this bit is set then procurement units and inventory-issue units are defined in the AML. Also affects the inventory unit-transformation mode.
10 BOM resolution mode	If this bit is set then raw-material which is defined as “dispensed by tool {line}” in the BOM record is pulled (fractionally) from inventory during BOM resolution. If this bit is not set then such raw-material must be pulled via “inventory adjustment”

TABLE 2.

Bit	Function
11 Eligibility for inventory pull	If this bit is set then eligible lists of inventory items that may be pulled by BOM resolution is restricted to only those qualifying items that have been physically moved to the line (from the ware-house). (“Eligibility criteria for inventory-items to be “pullable”” on page 1.6.21)
12 Disallow time-over-lap in Resource Calender	If this bit is set then the ERP2020 will be configured to disallow multiple reservations for the same time-slot on a given resource. See “Time-Slot check” on page 1- 6.91.
13 Resource Calender deletion-control.	If this bit is set then the user may choose a specific time-period when deleting time-slip entries in the Resource Calendar table. If this bit is not set the user can delete only those time-slips that belong to prior month(s).
14 Legacy-Traveler Header	If this bit is set then user may retain the “old” format of the traveler-header.
15 Use SMTP authorization	If this bit is set then the ERP2020 will use SMTP authorization from the mail-server before sending any ERP2020 SMTP-based email. This setting may be desirable if the SMTP-server blocks email relaying. If this bit is set then the user must also define complete email-account information (including the password) in the Client-Work-Station settings. See “Client-Work-Stations Settings:” on page 1- 3.12.
16 Use Device-Family as basis of Unit-Pricing	If this bit is set then the unit-cost applied to an invoice is based on the device-family as opposed to device-number. The DeviceTable must be installed for this option to work,
17 Date-Time stamp set-back on ERP2020 master	If this bit is set then after a successful replication export by the master, the date-time stamp threshold for the next export will be set back by only 5 minutes, instead of the default set-back time of 2-hours.
18 Alternate Buy-Order Printout	If this bit is set then an alternate format is chosen for the Buy-Order printout. This printout contains a column for Internal Part-number and suppresses the Order-Date column.
19 Retain modified Lot-Info Fields	When multiple lots exist in Job and the Device and Package Fields for a lot a modified in the Lot-record, the Receiver record will not override the values of the se fields when the Job record to which the lots belong is modified.

TABLE 2.

Bit	Function
20 Use Windows Event Log	The Windows event-log will be used to save ERP2020 messages instead of the erp2020.txt file in the root directory of the ERP2020 application. Note that if the event log is being used, the administrator must make sure that the “4dmsg.dll” file exists in the System32 folder.
21 Use new Invoice-Format for line-item Jobs	New Invoice-format for line-item jobs will be used for both Archived and UnArchived invoices.
22 Job deletion from Slave during level-1 Archiving	Without this bit set, no deletion commands are created for replication slaves when jobs are deleted from the Receiver table during level-1 archiving. When this bit is set deletion commands will be generated to delete Jobs From Receiver Table when they are moved to the Archive-Table during Level-1 archiving.
23 User-customizable Footer in Time-Slip Acknowledgement form	When this bit is set, the footer-section of the Customer-Acknowledgement slip for time used on a resource, is customizable by the administrator. Customized text and/or graphics are stored in a Picture record. This picture is saved by the name “TimeSlipGraphic”. For details on saving or modifying a picture see “Add picture to database” on page 1.9.73 and “Modify Picture” on page 1.9.75 respectively.
24 Suppress cost-information during order-receipt process	If this bit is set then the cost-information in the order-acknowledgement form and the Material-Receipt printout is suppressed
25 Enforce sequential update of traveler steps when updating a traveler via the lot-record.	If this bit is set (and the “Perform Steps Sequentially” check-box is set) then the sequential-processing rule will be enforced when updating a traveler via the lot-record (such as via the Planning Menu). This enforcement will be in addition to the enforcement of sequential processing via the step-punch-in and punch-out menus. See “HouseKeeping-record fields and check boxes :” on page 1.9.13
26 Controlling List for Process-Icon in running traveler-header	A user-defined icon can be attached to each Process or Process-Qualifier defined in the Process-Type or Process-Qualifier lists respectively. If this bit is set then the Icon is associated to items in the Process-Qualifier list as opposed to the Process Type list.

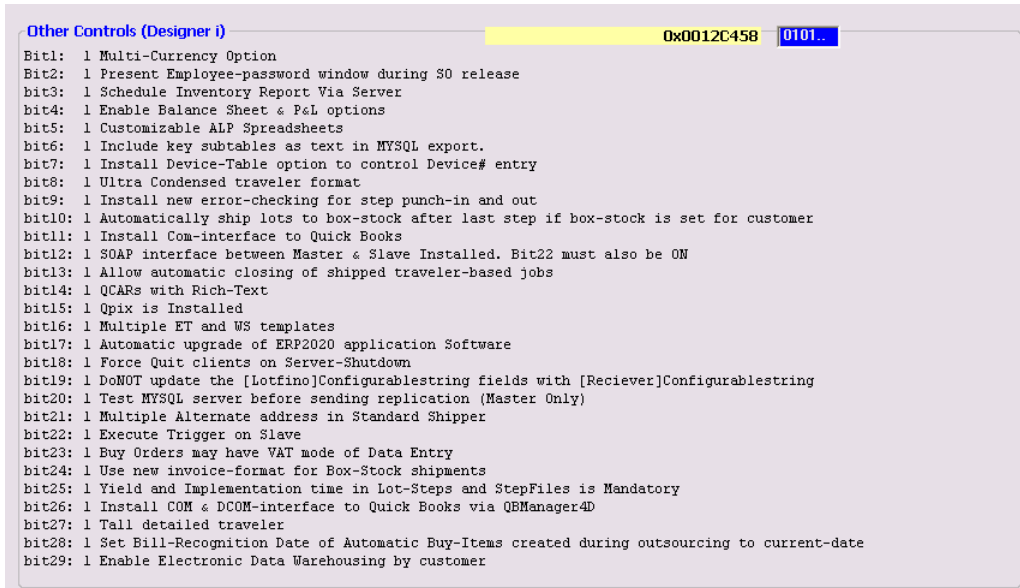
TABLE 2.

Bit	Function
27 Turn on Modification Log	This bit enables a limited log of modification history to the ERP2020 data-base. This log is maintained on the Server and is updated whenever a record is modified. Modification does not include Text, Subtable, Picture or Blob fields. Turning on this log may cause significant performance issues and is recommended for debugging purposes only. The ERP2020 backup-log-file should be used as the primary vehicle for audit trail purposes. The log file is called "DataModificationLog.txt" and is stored at the root-level of the data-base. A new log-file is created each time this file (upon logon) has exceeded 100Meg in size.

TABLE 2.

Data-base configuration done by Designer

The "Designer Controls 1" tab and its fields are shown and discussed below:



Other controls (designer-1): Binary encoded for various configuration options that are controlled by the designer during the initial configuration:

Bit	Function
1 Multi-currency	Multi-currency option is installed in the data-base
2 Employee-password	Present Employee-password window during Sales-Order release. Applicable only when the ERP2020 is being used in the Fabless-Mode
3 Schedule Parts-Data update	Schedule Inventory Report Via Server. (Stored procedure)

TABLE 3.

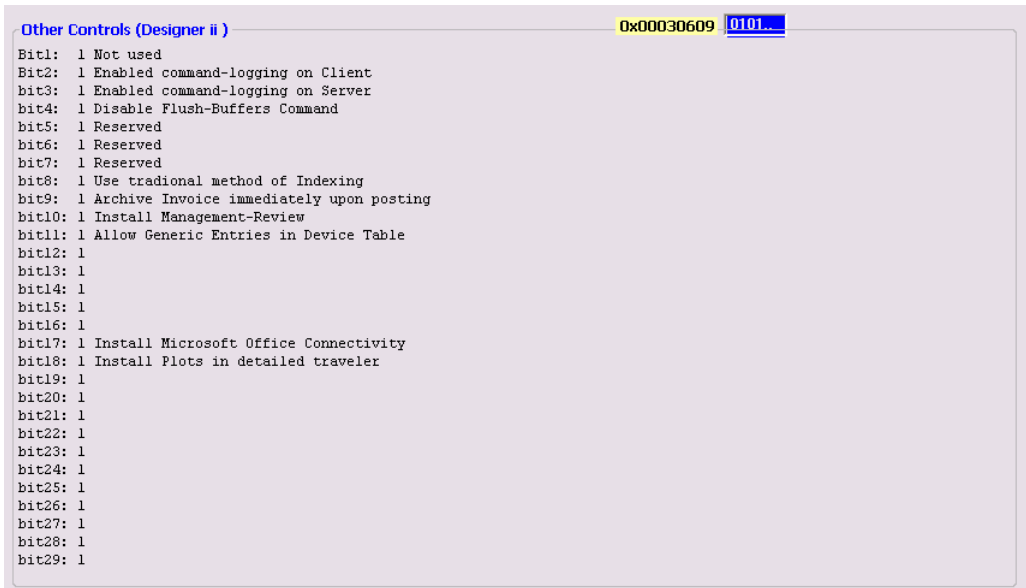
Bit	Function
4 Balance Sheet	Enable Balance Sheet & P&L options
5	Show units in Buy-Order printout
6	Include key subtables as text in MYSQL export.
7 Device-Table	Install Device-Table option to control Device# entry. (See "Device Table" on page 1- 8.79.)
8 Ultra condensed traveler	Print Ultra condensed traveler instead of condensed traveler
9	Install new traveler-counts error-checking routine
10 Ship to Box-stock	Enable direct shipping to Box-Stock at last completed step of traveler (See "Move to Box-Stock:" on page 1- 6.33.)
11 Install Com-interface to Quick-Books	If this bit is set then the ERP2020 Com-Interface to Quick-Books is operation. The ERP2020 uses this interface to transfer accounting information to Quick-Books in an fully automatic mode, in which Quick-Books is totally passive.
12 Automatic WEB-Services call by Slave to Master	If this bit is set then an ERP2020 Slave-Server will make an automatic WEB-Services call to the Master Server to push updated data from the Slave to the Master.
13 Automatic Closing of Traveler based jobs	If this bit is set then all traveler based jobs that have been completed and shipped (and do not have any invoice amount entered) can be automatically closed and posted (0 invoice amount) by clicking a single button. See "Special-Functions Buttons" on page 1- 11.78.
14 Rich Text QCARs	QCARs can be created abd printed in Rich-Text mode
15	Qpix plug-in is installed in the data-base
16 Multiple ET and WS templates	If this bit is set then template-properties may be configured to allow for Multiple ET and WS templates. See "Wafer-Sort Template" on page 1.9.86 & "Electrical-Test template" on page 1.9.86 & "Rescreen Template" on page 1.9.86

TABLE 3.

Bit	Function
17 Automatic upgrade of 4D client	Automatic upgrade of 4D client software is enabled. A MISCDATA record must also exist defining the new revision and FTP path of the 4d Client to which the user must upgrade.
18 Force-Quit clients on Server-shutdown	When a Server-Shut-Down is started via the server-console, with this bit set, the Server will issue a “force-quit” to any clients that are in the middle of a form-based open-transaction. A message and the “force-quit” command are issued after the server-shut-down time-out has expired.
19 Precedence of [Lotinfo]ConfigurableStringFields	If this bit is not set then the [Lotinfo]ConfigurableStringFields are updated by any change in the corresponding [Reciever]ConfigurableStringFields. The [Lotinfo]ConfigurableStringFields will retain their value (if modified) if this bit is set. In the latter case the [Reciever]ConfigurableStringFields only function is to assign a value to lots in the job when these fields in the lot-record hold not value (such as during the initial creation of the lot-record).
20 Interface to MYSQL Server	Option for direct connection from ERP2020 4D Server to ERP2020 MYSQL Server
21 Multiple Alternate Addresses in the Standard Shipper	Multiple Alternate Addresses are allowed in the Standard Processed-Lot Shipper and the Box-Stock-Pull shipper. The Box-Stock-Pull shipper format will be the new Consolidated-Shipper-Format.
22 Slave Trigger Control	When set an ERP2020 Slave Server will execute Table Triggers. Table triggers are used when a Slave Station is allowed to update data in the Master Server.
23 VAT mode of data-entry in Buy-Orders	When entering unit price for an item being purchased, the user has the flexibility to enter the unit-cost inclusive of tax or VAT
24 Alternate Invoice Format for Box-Stock shipments	When this bit is set the invoice format for a Box-Stock shipment uses an alternate format. See “Printed-Invoice Formats:” on page 1- 11.31.

TABLE 3.

Designer-Control 2 Options



Other controls (designer-ii): Binary encoded for various configuration options that are controlled by the designer during the initial configuration:

Bit	Function
1	Reserved
10	Invoice will be archived immediately upon posting
11	Device-Table is allowed to have non-customer-specific records
13	Scheduled-Reports if installed will be generated by the ERP2020 Server. A Client-Station is not required and will be ignored if present.

TABLE 4.

Bit	Function
16 Multiple Web-Servers for publishing of controlled documents	Multiple Web-Servers are used for hosting the company's controlled documents (specifications and procedures). See "Doc Control" on page 1- 8.51.
17 Microsoft Office Con- nectivity	
18 Install Plots in Detailed Traveler	Install Reject-Pareto Plots in Traveler
19 Default Admin Configura- tion	Automatically load a new structure file with a default Administrator password when the new structure is first launched
20 Server Menus	Enables a menu-set in the About ERP2020 dialog
21 Un-Archive PO	Allow un-archiving of archived POs. Only essential information is archived.
22 User-Mode Access	If this bit is set, the Administrator may launch the User-Mode. Administrator must clear the "Startup Method" in the Administrator's user-record in Users and Groups data-base.

TABLE 4.

Replication Reference Time: This is the base-time for the replication (export). The time of the replication will be this time + The Replication-Duty-Cycle

Replication Duty Cycle The replication will repeat itself at the interval specified here. First replication will occur at Replication Reference Time + Replication-Duty-Cycle.

Site-specific data in the House-Keeping record:

The last tab in the menu is “Division” tab which is used to add a new division or modify existing division data. First a list of divisions is displayed. See figure 9.4 on page 9.28

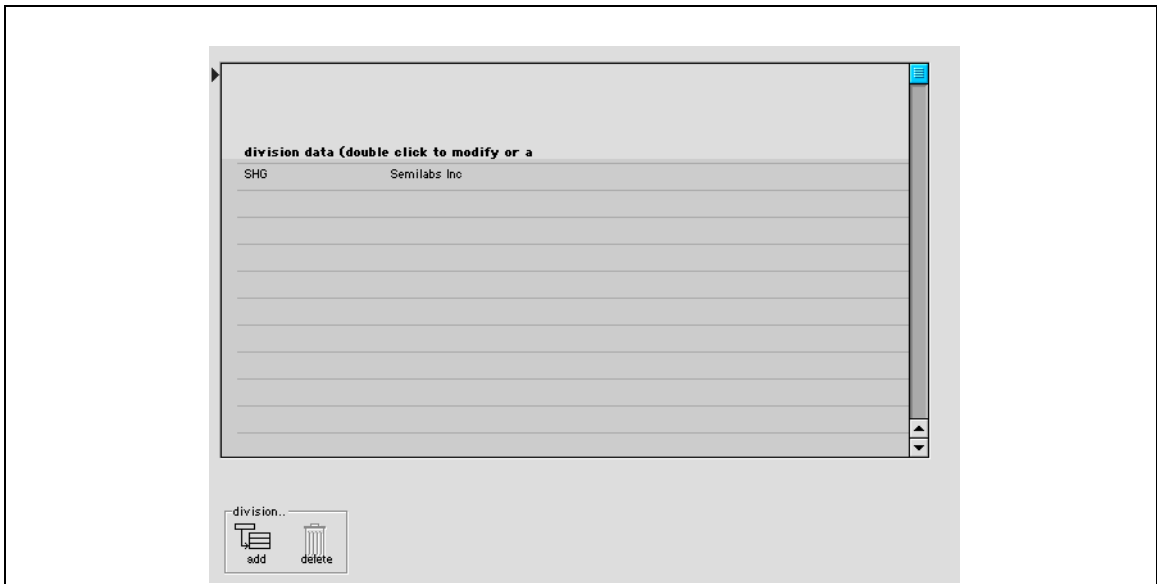


FIGURE 9.4

Double clicking on an entry will invoke the details form (see figure 9.5 on page 9.29) to allow the user to add, delete or modify existing division data.

Division-Specific data

division SHG parent company (default)

full name Semilabs Inc.

site add1 No. 438, Zhaoxian Road, Jia Ding Industrial Development Park

site add2 Jia Ding, Shanghai 201821,China.

Bill add1 No. 438, Zhaoxian Road, Jia Ding industrial Development Park

Bill add2 Jia Ding, Shanghai 201821,China. A/C Dept.

Invoice Footer GEM (Shanghai) Electronics Co., Ltd.

telmesg tel: (510)-623-9171 fax: (510)-623-9194

remit add1 43170 Osgood Road

remit add2 Fremont, CA 95148, USA

site SHG

slogan Internet Enablers

division logo

FIGURE 9.5

Division	Abbreviated name of division. This name will segregate all division-specific records in the data-base.
Full name	Full name of division as it appears on the letter head.
Site add1 & Site add2	Physical address of the site where the division is updated. This address will appear on the letter-head.
Bill add1 & Bill add2	Billing address of the division. It will appear on the buy-order sent to a vendor.
Invoice Footer	This text will be displayed in the footer section of an invoice.
Remit add1 & Remit add2	This address will be displayed on the printed invoice.

Site	Physical site where the division is located or co-located. It should be an abbreviation.
Slogan	This slogan is printed in the header of various print-outs.
Division logo	This logo, if specified, overrides the default logo for the enterprise specified in the pictures table.

•Menu: **File**

Menu-Item: ***Modify Policy Records***

The ERP2020 allows the user to maintain various customized policy documents. The documents (records) include:

Quotation Terms.

These are the default terms and conditions that are appended to each quotation created in the ERP2020. These terms and conditions have enterprise-wide scope, i.e. all divisions have the same default terms. These terms & conditions can then be edited for the individual quote and the edited terms are retained with the quote. The quote terms& conditions are also printed at the end of the quote printout. (See “Terms & Conditions:” on page 1- 4.14.)

General Servicing or Product warranty Policy.

This “Policy” is a detailed statement defining service (or product) guidelines, conditions, pricing formulas etc. The Policy statement is **not** automatically attached to a Quotation.

Company Mission Statement.

This statement is disseminated to every user via the Main-Menu. See “Quality Alert” on page 1- 3.37.

Buy-Order Terms and Conditions.

These are the default terms and conditions that are appended to each Buy-Order created in the ERP2020. The Buy Order terms as defined here have enterprise-wide scope, i.e. all divisions have the same default terms. When a Buy-order is first created the default terms are added to the buy-order. These terms can then be edited for the individual buy-order and the edited terms are retained with the buy-order. The buy-order terms are also printed at the end of the buy-order printout. (See “Buy Order Terms” on page 1- 13.19.)

Previous versions of the ERP2020 stored these documents in the HouseKeeping record. Starting from revision “H8” of the ERP2020 these documents are stored as independent records in the FORMATS table. Legacy databases will be automatically updated (i.e. information will be transposed from the HK records to new records in the FORMATS table) by the ERP2020

All the preceding documents may be added (during the initial database configuration and site-customization) or modified via this menu. The menu invokes the dialog shown in Figure 9.6 on page 9.31. The user may click on any of the button in the dialog to add or modify the appropriate document. The document-edit form is shown in Figure 9.7 on page 9.32.

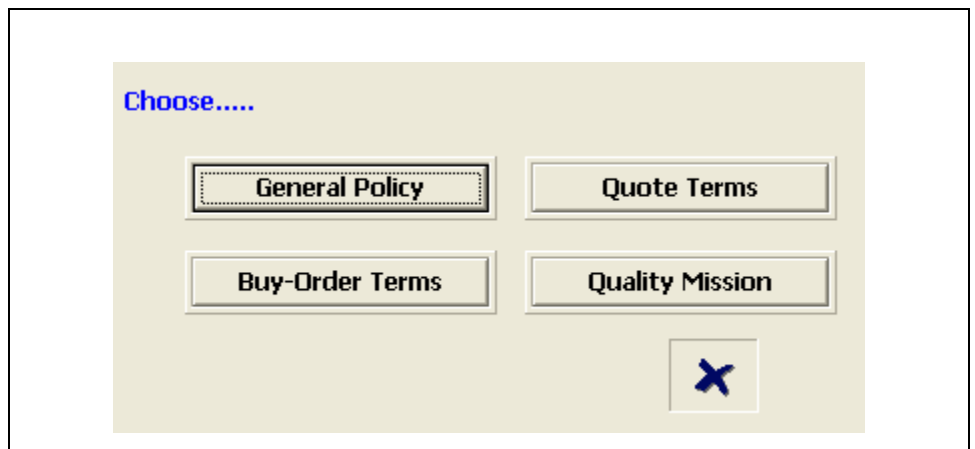


FIGURE 9.6

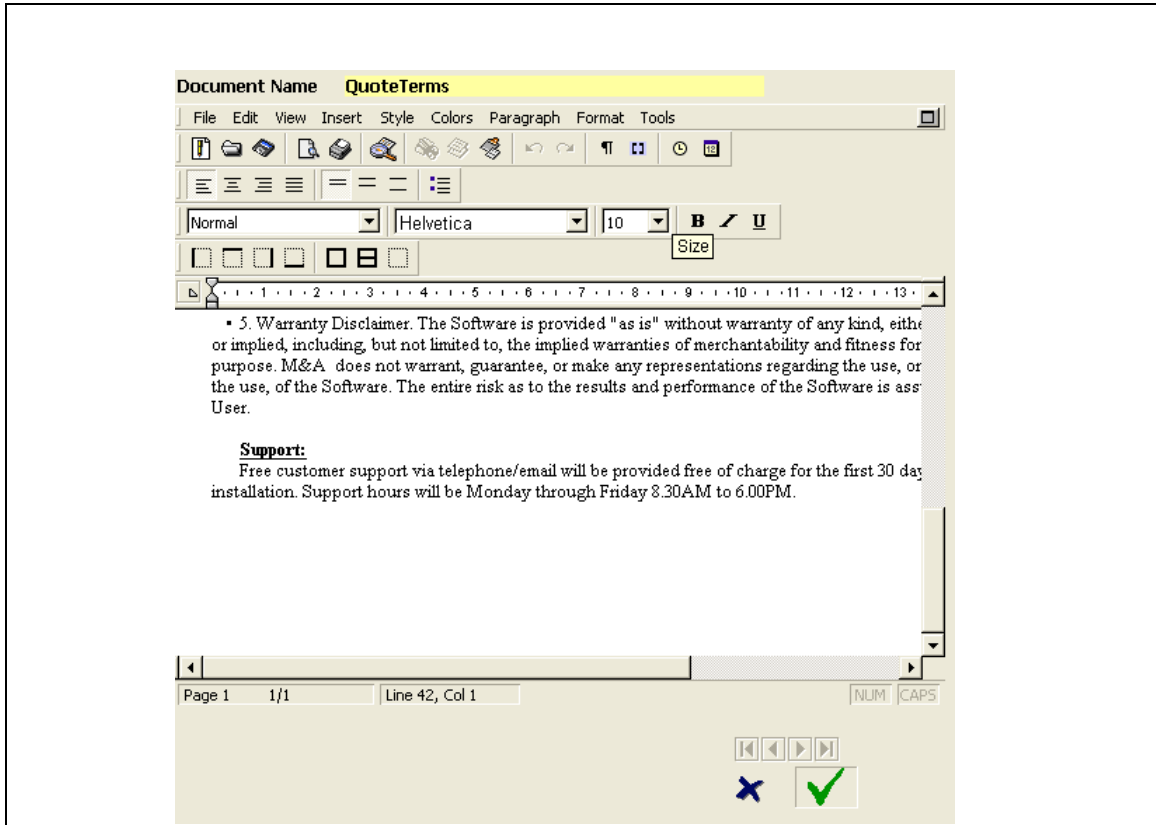


FIGURE 9.7

Menu-Item: *Get Structure:*

This menu, provides the user with the ability to browse the database structure (Tables and Fields) and the data contained therein. In the form shown in figure 9.8 on page 9.33, the left scroll box lists all the tables in the database alongside the read and write status of the table. Clicking on any table-name in the list populates the scroll-box on the right-hand side with the name of the fields in the table, the type and property of each field. Other information including the number of data-records in the selected table is also provided below the scroll-box.

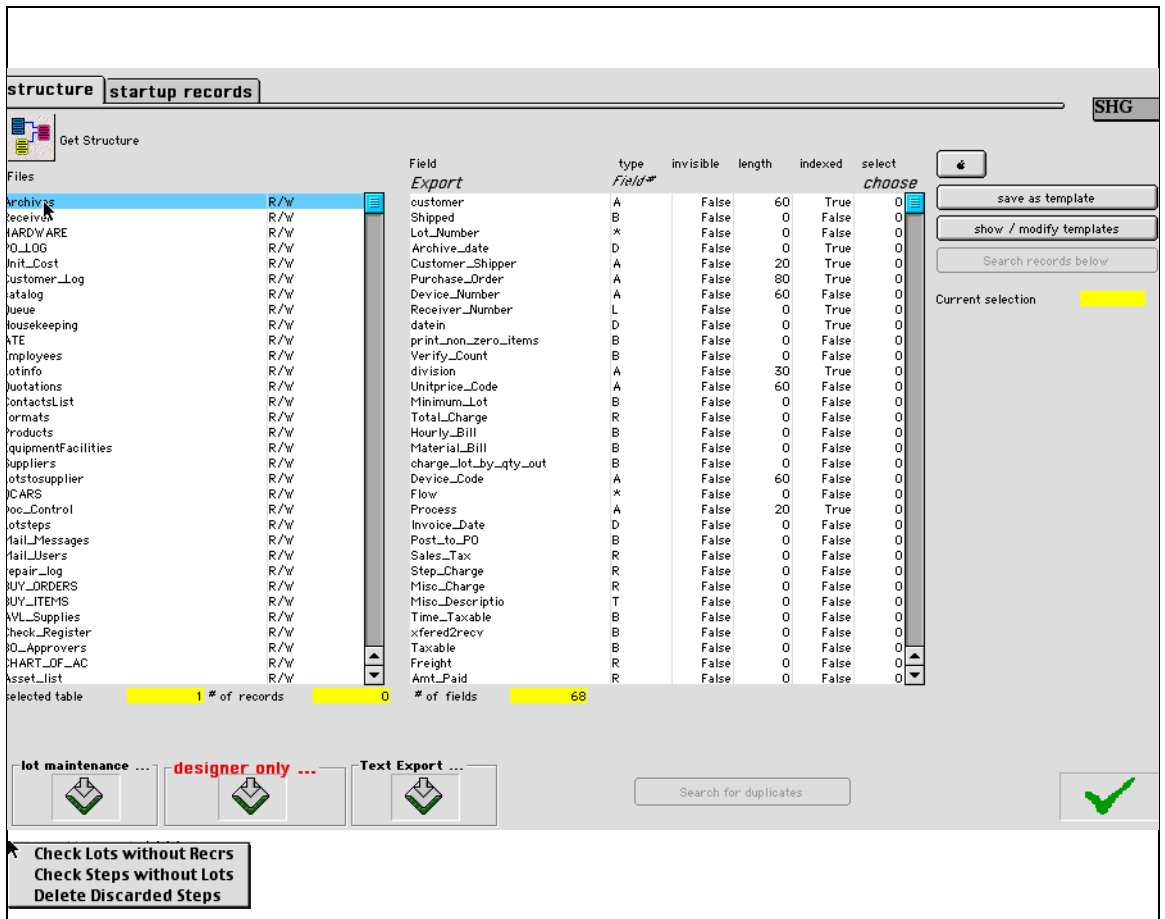


FIGURE 9.8

.Lot maintenance Button Provides a pop-up menu with three options. All options allow the user to search for broken relationships between the RECEIVER, LOTINFO and LOTSTEPS tables, each of these tables having a many-to-one relationship with the preceding table respectively. The user can search for LOTINFO records that do not have any corresponding record in the RECEIVER table and similarly search for any records in the LOTSTEPS table that do not have any corresponding record in the LOTINFO table. The third option allows the user to permanently delete any “discarded” records in the LOTSTEPS table.



NOTE: When a user deletes a step in the traveler (which is a record in the LOTSTEPS table), the step (record) is not deleted from the database but instead a boolean field is set (marking the record as “OK to delete”). This is done so that the user may recover the step if the step was mistakenly deleted. The record is only permanently removed via the lot maintenance button.

The second tab of this form provides a facility to export and import records. The import function is used to populate a new data-file, but cannot be used to import updated data records such as in the ERP_HELP, WEB_MENU, and PICTS tables. These latter tables do not contain user-generated data.

To create a fresh data-file the user must first launch the server with the old data-file and export data via the 4D Client. The user must then restart the server and while selecting the structure via the 4D Server hold the ALT-key (Option-key on the Macintosh) down. This last action will prompt the user to choose a data-file or create a “new” one. To create a new data-file choose “new” and modify or accept the proposed name of the data-file. Connecting with the same 4D Client (that performed the export) the user may now import the table-data into the newly created data-file.

The dialog to facilitate the export and import of data-base records is shown below in figure 9.9 on

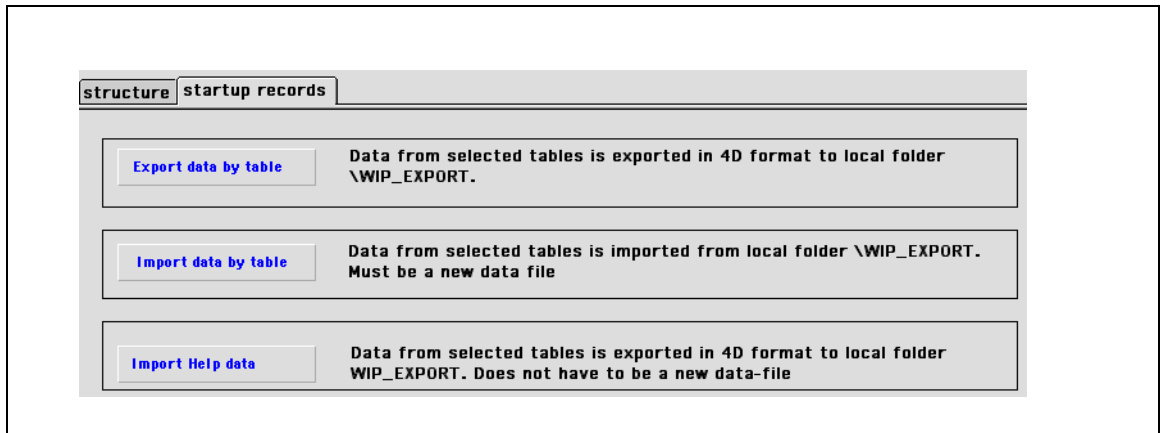


FIGURE 9.9

page 9.35

Export data by table button

This button creates a pull-down menu with self-explanatory options. Depending upon the menu chosen, the user may export all the data from a few selective tables or from all the tables in the database. The selective tables are tables whose data will usually carry forward from an existing file into a new datafile. This is only a recommended list of tables.

The user also has the option to export the data for all the tables. The pull-down menu allows the user to limit or not-limit the export to division-specific records. Note that to make the process inter-active the user must keep the **Caps-Lock on**. In this case a dialog will be issued to confirm the export of each file.

The data in each table is exported into a local folder called WIP_EXPORT in the first level of the volume where the database or the 4DClient is stored. The name of each file is composed with the table name and the date of the export i.e. TABLENAMEmm_dd_yyyy

Import data by table button

This button is used to import data into a new datafile. ERP2020 first checks the datafile to make sure that it has no records in the RECEIVER and CUSTOMERLOG tables. An import will proceed only

if this condition is met. This is to prevent unintended update of an existing data file. The import process is selective via a confirmation dialog which allows the user to import or not import a given table. The file to be imported in a particular table must be named TABLENAMEmm_dd_yyyy and must reside in the local WIP_EXPORT folder (in the first level of the volume where the database or 4DClient is stored). **All existing records in a given table are first deleted before the new data is imported.**

When making a choice of which tables not to import the user must be aware of the many-to-one-relationships that exist between various tables see "additional Information" for a list of relationships.

Import help data button This button imports the ERP2020 data into the ERP_HELP, PICTS, AND WEB MENUS tables into an **existing** database. **All existing records in a given table are first deleted before the new data is imported.**

Menu-Item: *Clear Semaphores:*

Semaphores (locks) are variables used to communicate between clients. They are used in this database to lock users out when certain tasks are being performed. For example, during a check-run at one station other users are not allowed to modify purchase orders or print checks. If an abnormal halt (such as a system crash) occurs during this process the semaphore may remain set and the unlocked users would continue to be denied access. This function clears such anomalies.

Menu-Item: *delete icons on 4D Server WIN4D*

Menu-Item: *All files in READ & WRITE mode*

Sets the state of all tables to read-write (for the local client station only).

•Menu: **ARCHIVE**

Menu-Item: *Automatic Archiving*

This menu is a database option, installed by Semilabs and is to be used in lieu of the legacy level2-archiving processes defined under figure Menu-Item: on page 9.39. This option must be installed in **both** the WIP (Active) and Archives Databases. The option is installed and controlled via the MISC-DATA records. See “Maintain MiscData Records” on page 1.9.71. The menu itself is executed from the **Archives** data base only. When this menu is invoked, the Client logged in the Archives-Database acts as a Web-Services Client to the Active ERP2020 server (which acts as A Web-Services server). The Web-Services Client automatically invokes level-2 archiving on the WIP Server (Web-Services server). The Level-2 Archiving process on the WIP Server exports the requested data, compresses the data and then sends a single compressed file to an intermediary FTP server (as defined in the MISC-DATA record of the Active database). The Web-Services Client then retrieves this compressed file from the intermediary server (as defined in the MISCDATA record of the Archives database), uncompresses it and integrates it into the Archives Data-base.

Configuration Requirements for enabling Archive-Web-Services:

- 1) Configure MISCDATA record to specify intermediate FTP Server
- 2) Define URL of the Active Database Server in the HouseKeeping Record of the Archive Database
- 3) ZIP.exe must be installed in the system folder of both the Archives and WIP data-bases
- 4) The User-name and Password defined in the Housekeeping record of the Archive-Server must match with a valid user name and password account defined in the users and **password table** of the WIP Server
- 5) There must be network connectivity between the Archive and WIP Servers.

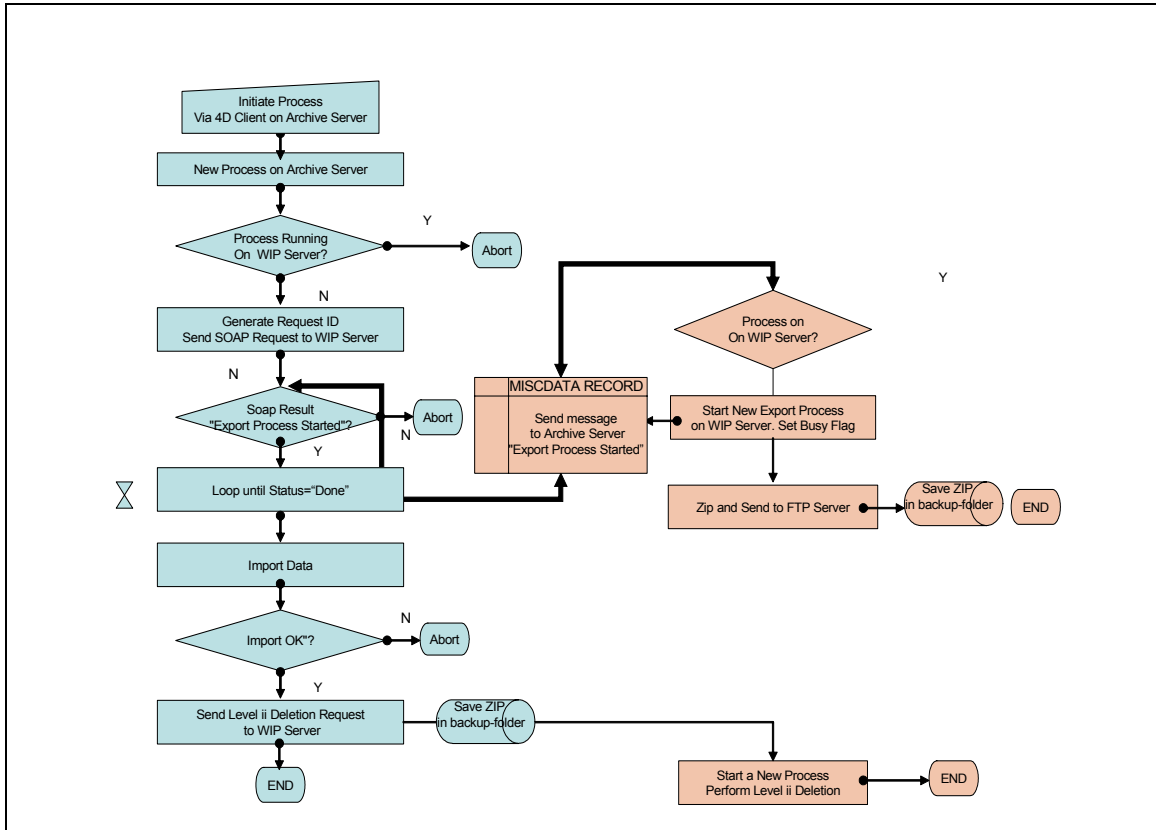


FIGURE 9.10

•Menu: **ARCHIVE**

Menu-Item: *All closed jobs*

Archiving is the process by which the administrator maintains the data-file by securing and removing old data. This menu allows the administrator to archive closed jobs. In the first instance (level1 archiving) records are secured from any further modification and in the second instance (level2 archiving) they are physically removed from the data-base (and presumably imported into a archives-repository data-base). **Archiving must be done on a consistent schedule and at least at the end of every month.** The consistency is required not just to update period-end accounting data but to keep the data-file compact and well-managed.

Archiving is a critical process, because it rearranges and deletes information inside the data-base. The user must therefore fully comprehend its impact. To this end a brief description of the life of an ERP2020 job is recapped here and precedes the discussion of the menu item

Archiving In A Typical Job Life-Cycle

1. Receive job.
2. Create travelers.
3. Implement travelers.
4. Ship lot(s).
5. Invoice for job when all lots have been shipped.
6. Post job. (Extract the money from the Customer's Purchase-Order and “close” job)
7. Archive (Level-1) Jobs: (Move all jobs into a new table (within the same data-file) called “Archives”. This step is performed at month-end. Only jobs that have an invoice date that falls within the selectable monthly period are archived. Jobs earlier or later than the requested period are NOT moved.
8. Delete Job: All closed jobs are deleted after they are transferred to the “Archives” table.
9. Tag Lots related Lot-steps and related MaterialsUsed with month and year of archive: All associated lots steps and materials-used become “removable” (upon Archive-Level II) but until then remain in the same data-file. This is done automatically during the Archiving (level-I) process.
10. Update A/R: Information from the “Archives” table is transferred into the “Receivables” file to maintain Receivables-Aging. This is done automatically during the Archiving (level-I) process.
11. Update Sales Summary tables: This is done automatically during the Archiving (level-I) process.
12. Export Sales information to external accounting package.

13. All boxstock lots and related lot-steps that have been depleted via boxstock shipment are also tagged with the month and year of archive. These will also be removable via Archive Level II
14. Archive (Level II) to separate database: Depending upon how long the database administrator wants to maintain these records in the same data-file, these records are then ready to be transferred to a separate file.

NOTE: Records in other files can archived. Of note are the records for customer Purchase orders, Buy-orders, Check-register, and Quotations Tables. The purchase-orders are removable once the purchase-order is marked as “removable” and it has no active jobs that refer to the purchase-order. Removable purchase-order records are moved to a different table within the same database.

When this menu is selected the user is presented with this dialog shown in figure 9.11 on page 9.40

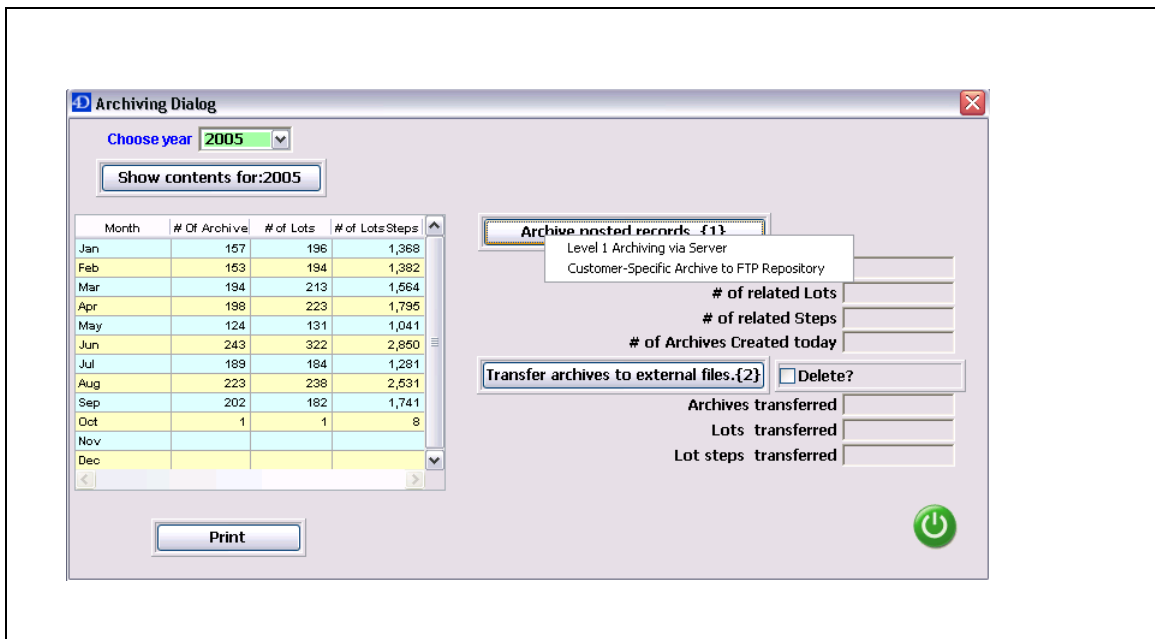


FIGURE 9.11

Archive Dialog Buttons

Show Contents for Year

This button lists the number of records that have been archived before (via Level1) and still reside inside the current data-base. A list of months with record-counts from various tables is shown in a columnar format. The listing is on a year by year basis. The applicable year is selected from the drop-down year list above the record-count table.

Note that when level-ii archiving is performed, with deletion, the record-counts for the selected month will be reduced to zero. The Print button below the list allows the user to print the list. **This print-out should be printed and filed away before level-ii archiving. Similarly this list should be printed and filed after the archived records are imported into Archive-data-base. This way the user will have a physical evidence of the accuracy of the record-transfer from the WIP to the Archive-data-base**

Archive Posted Record

This button perform level1 archiving on a month by month basis. The data-base must be an active data-base, i.e. the "Read Only" property of the data-base in the HouseKeeping record must be **false**. **Pressing** this button opens a dialog to select the applicable archiving period, i.e. month and year. (Note that archived data is organized internally and externally by month and year). After choosing the correct month and year, a confirmation windows re-confirms the choice, acceptance of which launches the level-1 archiving process. During level-1 archiving when records are being **deleted** from the RECEIVER table or are being **updated** in the LOTINFO, LOTSTEPS, MATERIALSUSED tables, they must not be locked by another user. The ERP2020 will alert the administrator if this happens. The administrator must then abort the user to proceed. Level-1 archiving process may be repeated if any error conditions could not be rectified. Note **that if the replication option is on then force a replication just prior to performing level1 archiving. This will update the records in the Receiver-Table of the Slave-DB, specially if the Slave-DB is setup to retain the Receiver records.**

Delete

This check-box determines whether or not, after the transfer of records to external files (in Level ii archiving), the records are permanently deleted from the data-base.

Transfer archives to external files This button performs level (2) archiving on a month by month basis. The data-base must be an active data-base, i.e. the “Read Only” property of the data-base in the House Keeping record must be false. The files will be exported to a local folder “Xfer” in the local volume. Names of the files will be “Archives $MonYear$.txt”, “LotFile $MonYear$.txt”, “StepsFile $MonYear$.txt” and “MaterialsUsedFile $MonYear$.txt”. **Note that if the replication option is on then do not delete the archived data until after the archived records have been exported to the slave replicators otherwise the slave stations will not automatically receive the archived records.**

Also See “Archiving Level I:” on page 1- 9.3. & See “Archiving Level II:” on page 1- 9.3.



The user must make cautionary backups before any archiving process.

Depositing Archived Travelers on Customer's FTP site

Often there are requirements by the customer to deposit travelers to a customer-specific electronic-data-warehouse. This facility, once it is installed as a data-base configuration-option (via the designer-control bits of the House Keeping record) is available through the Archives Level 1 button. When this facility is invoked the ERP2020 creates PDF documents for travelers (for a specific customer) of all lots that were **shipped** during the archiving period. The PDF traveler-documents and an index file are then deposited on a remote FTP site defined in the Customer's record. The Index file is a tab-delineated text document that provides one line of data for every traveler being archived. The data contained in this file is show below in Table 5 on page 1.9.43. The name of the index file is also appended with the month and year for which the travelers are being archived (e.g. "IndexJan05.txt")

This remote archiving of travelers is customer-specific. The customer-record must have this facility enabled and the FTP accounts details must be specified in the customer-record. See "Archiving of travelers to electronic-data-warehouse" on page 1- 11.49. The PDF documents and the associated index file may be deposited as a single compressed RAR file or as individual files depending upon the configuration control settings in the customer's record. This process is undertaken by the client. On the local client the PDF documents are index file are first created on the desktop in a folder named for the customer and then transferred by FTP. The user may delete these folders from the desktop or maintain a local file.

Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8
File Name	Name of division where processing was performed.	Process as defined in the ERP2020 process-field.	Device Number	Lot-Number	Country of Origin. I.E. country where lot was processed. Defined in division-specific sub-record in HK record	Date lot was shipped	ERP2020 Job-Number

TABLE 5. Index File column definition

Menu-Item: *1 posted invoice only:*

This function archives one job as opposed to all posted jobs above. The steps are, however, similar.

Menu-Item: *Restore from FILE*

This menu allows an ARCHIVE database to import external files created by the active database. See "Archive Dialog Buttons" on page 1- 9.41. The Archives database must have the "Read Only" property of the data-base set to **true**. (See "Housekeeping Record Fields in TAB1:" on page 1- 9.9.) This data-base is a physically separate data-file. The ERP2020 system is capable of serving this data-file much the same as the active ERP2020 file except the mode is a read-only mode. When a file is imported into a table the import is done on a record by record basis. If the record does not already exist in the data-base it is saved otherwise it is discarded.



Note: Uploading the external files into the Archives Database implies that the user has previously created by files by downloading the then information into them from the WIP (active) ERP2020 database as depicted in the figure below:

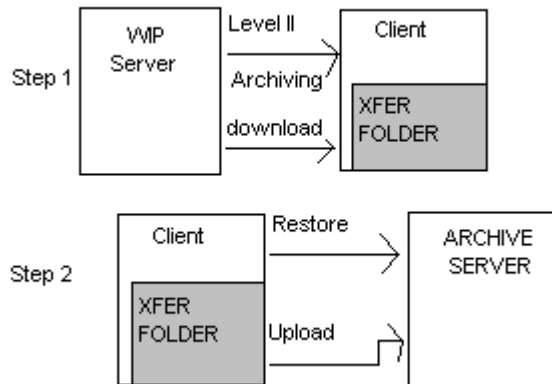


Table	Archiving Criteria
Archives	Selected month
Receiver	n/a
LotInfo	Selected month
LotSteps	Selected month
MaterialsUsed	Selected month
Inventory	All stock with current quantity available =0 & last modified 90 days prior to archiving request
Inven_Usage	Selection based on selection of Inventory records above

TABLE 6.

Menu-Item: *UnArchive One*

Allows the user to remove an archived invoice from the Archive table back to the Receiver (active-job) table. This action will be required if the user has accidentally archived an invoice with erroneous data. If the invoice has already been mailed to the customer (of which the ERP2020 maintains no record) and the invoice is not recallable then the user must use a credit or debit memo to reverse the errors. Before the user is allowed to un-archive an invoice the ERP2020 will make the minimum test of determining that no payment has been received against the invoice. If a payment has been received (or the receivable has been adjusted via a credit or debit memo, i.e. the amount receivable against the invoice does not equal the total-charge on the invoice), the system will **disallow** the un-archiving process.

If an invoice is “un-archivable” and has been successfully un-archived, then for traceability purposes the system will make an entry in the system log on the server and will also send email notifications to employees who belong to the relevant notification team. See “Notify when invoice is un-archived” on page 1.14.5

Menu-Item: *Show Archived Invoice*

-Allows the user to see/print an archived invoice. This is a legacy menu-item. Current versions of the ERP2020 allow the user to view or print an archived invoice directly from the “Invoicing Spreadsheet”.

•Menu: **Export**

Menu-Item: **Dialog**

This menu allows the user to export accounting-data to an ASCII I file. The “EXPORT” icon provides a drop-down list of the various exports available. The time-period used for the exports is chosen via the calendar. See figure 9.12 on page 9.47

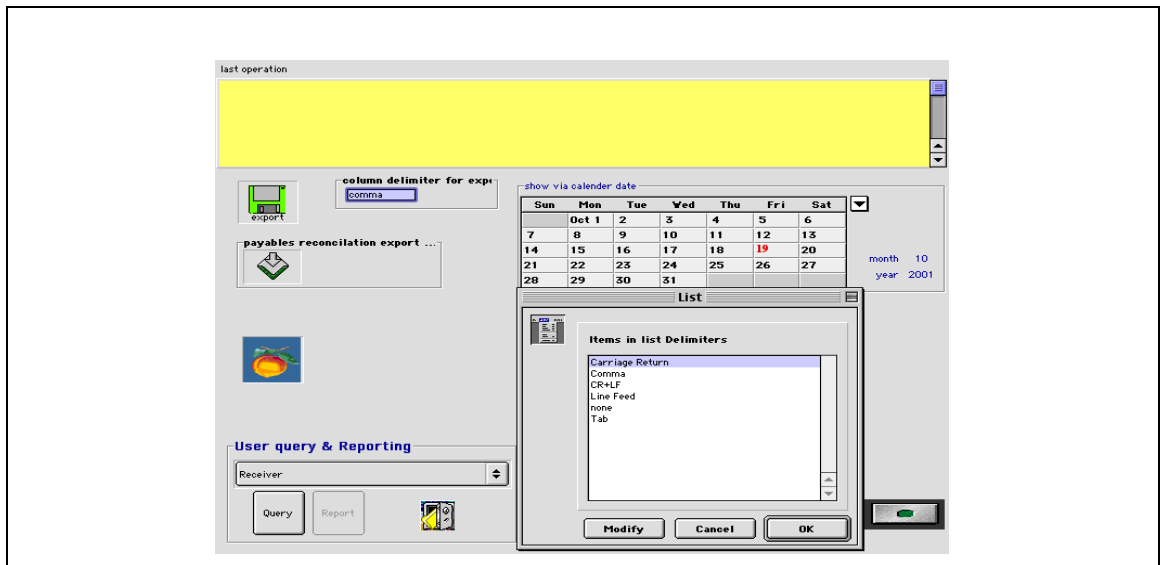


FIGURE 9.12

As well as the accounting-exports, the user may also perform a user-defined query on any table and print (or export) the selection via a user-defined report (export template).

Export Sales:

Using the pull-down menu options provided by the Export button the user may export sales data for a user-selected month. Each invoice stored in the Archives Table is exported, detailing the Customer, Invoice-Number, Customer's Purchase Order, Invoice Amount, Sales Tax, and the currency in which the invoice was made.

Export of Payables based on a cut-off date:

The user may request for an export of payables based on a certain cut-off date. If the cut-off date selected via the calendar is **before** the current date the system must re-construct the payables by off-setting any payments that may have been applied after the cut-off date. The following rules apply for the determination of payables:

Buy-item Order date	Must be before or equal to the cut-off date
-Vendor-Invoice-Number	A vendor-invoice must have been applied to the payable
The Vendor Invoice-Number	Must be before or equal to the cut-off date
Payment Date	The vendor invoice must be un-paid or should have been paid after the cut-off date.

TABLE 7.

Menu-Item: *Show user-export template*

This menu is used to display the existing user-templates (for export) in the ERP2020 system. The user may also test the export-process via this menu. The user cannot modify the templates via this menu.

Menu-Item: *Add user-export template*

This menu is used to create User-templates for export of selected data from the ERP2020 to a remote FTP host. These templates define the parameters for a recurring FTP export. These exports are typically used to transfer lot-status data from the ERP2020 system to an external system. The export-templates define the fields to be exported, their formats, the name of the export-file and the duty-cycle

(time) of the export. The export-template consists of a single-record which includes a sub-table of items. The main record defines the query-selection criteria and the FTP parameters. The items in this sub-table define the contents of the export. See figure 9.13 on page 9.49

show Record Add Fields Help

Export Template

template name NEC

ble#	fld#	seq#	Table Name	field name	var name	string size	padding Character	leading or trailing	Format
-999	0	1.0	CONSTANT	6Q1-TFHGA07-					
12	12	1.0	Lotinfo	Device	Device_1	30			
-999	0	2.0	YEAR						
-1	-1	2.0	CONSTANT			6			
-999	0	3.0	MONTH						
12	73	3.0	Lotinfo	AltLotNumber	AltLotNumber_1	20			
-999	0	4.0	DAY						
12	1	4.0	Lotinfo	Lotnum	Lotnum_2	20			
-999	0	5.0	TIMEHHMM						
12	89	5.0	Lotinfo	CurrentOrNextArea	CurrentOrNextArea_1	1			Substitute1

Query Method

Field Delimiter: none Record Delimiter: CR+LF

Customer: NEC Corporation

FTP host: ERP2020.COM

Directory:

User Name: mysql

Password: [masked]

Triggers: mins 0

Last FTP date: 07/15/02

Last FTP time: 12:58:47

Sub-table

FIGURE 9.13

Sub-Table fields:

Each item in the sub-table constitutes either a data-item (to be exported) or a control-item. A specific use of a control-item is to construct the name of the ASCII file which will contain the exported data. This last functionality is useful when the remote system receiving the data expects the file-name to be

in a specific format. The field in the first column of the sub-table ("Table#") defines the item-type. If the value of this field for an item in the sub-table is -999 then the item is used to construct the name of the file (**on the remote FTP host**) containing the exported data otherwise the item represents data to be exported. In the latter-case if the table# is -998 then the items define a line of header which will be added at the beginning of the export. If the table# is -1 or a valid ERP2020 table-number then it defines the content of each-line of export. The total lines being equal to the number of records selected (as defined by the query) for the export. The data exported may be constant, a variable or derived from a field (and in the case of the latter, the value of the field may also be substituted based on a look-up table). If data to be exported is a constant (or a variable) then the value of the Table# field is -1. If data is derived from a field in the ERP2020 then the value of the Table# is equal to the number of the table (in the ERP2020) in which the field resides. Table items may be directly edited (to add fields, See "Selecting fields to be exported" on page 1- 9.57.). Double-clicking a table-item opens the detail form.

Table#	Field#	Significance
-999	n/a	Table-item will be used to construct file-name. Note that this name-construction is relevant to the name of the file on the remote FTP host ONLY and NOT on the local client disk. The name on the local client-disk is simply the name of the export-template + current date (server-clock) + "_" + current time (server-clock).
>0	n/a	Table-number in ERP2020 from which fields will be exported. The data export will contain as many lines as the total number of records selected by the Query. This item will define the column (data-element) in each line
-1	n/a	Constant value as defined in the field name will be exported
-998	n/a	Table item will be used to construct the header (first-line) of the data being exported.

TABLE 8.

Table# & fld# (for file name)

If the Table# is -999 then the entries are used to construct the export-file name. The sequence-number then signifies the order in which the control-lines (items in the table) are used for the name-construction. The name of the file is constructed based on the information in the Table Name field. The user may specify constants or variables in this column. The following variables are provided:

Value in Table-Name field	Format	Exported file-name component
CONSTANT	n/a	value stated in the column Field-name
Date_ (kept for compatibility)	Blank	xx_yy_zzzz
Date (kept for compatibility)	Blank	xyyzzzz
Date	MMDDYYYY	MMDDYYYY
Date	DDMMYYYY	DDMMYYYY
Date	YYYYMMDD	YYYYMMDD
Date	YYYYDDMM	YYYYDDMM
Date	MMDDYYYY-	MM-DD-YYYY
Date	DDMMYYYY- or DDMMYYYY/	DD-MM-YYYY or DD/MM/ YYYY
Date	YYYYMMDD- or YYYYMMDD/	YYYY-MM-DD or YYYY/MM/ DD
Date	YYYYDDMM- or YYYYDDMM/	YYYY-DD-MM or YYYY/DD/ MM
Date	XXXXXXXXHHMM (XXXXXXXX is any format above). This is to make the 4D date format compatible to the Oracle for- mat with the time-component set to 0s	XXXXXXXX0000
Date	XXXXXXXXHHMMSS (XXXXXXXX is any format above) This is to make the 4D date format compatible to the Oracle format with the time-component set to 0s	XXXXXXXX000000
Time	HHMMSS, HHMM,	HH:MM:SS, HH:MM
TimeNumber	HHMMSS, HHMM,	HHMMSS, HHMM,
TimeHHMM (kept for compatibil- ity)	n/a	HHMM

TABLE 9.

Value in Table-Name field	Format	Exported file-name component
Month	n/a	Current Month e.g. 03 for march
Year	n/a	Current Year e.g. 2002
Day	n/a	Current day. e.g. 03,30,31 etc.
Hr, Hour, Hours	n/a	Hours component of current time on Server
Min, Mins, Minutes	n/a	Minutes Component of current time on Server
Secs, Seconds	n/a	Seconds Component of current time on Server
DayName	n/a	Monday, Tuesday etc.

TABLE 9.

Table# & fld# (exporting Constants) To include constant/variables in export file# should be -1.

Table# & fld# (exporting Fields) If the Table# is greater than 0 (zero) then it represents the table-number in the ERP2020 from which a field will be chosen for export. In this case the Fld# column represents the field-number of the field in the table defined in the Table# Column. The user can simply choose the fields via the Add Fields tab. (See discussion below on choosing fields)

String Size

If this field is not defined then the exported data is not padded or truncated to fix its size. If a value is provided then the exported data will be truncated or padded with a padding character (see below) to conform to the fixed size. When a string is being exported then by default trailing padding is used. When a numeric value is being exported then by default leading spaces are used. The user may override the default by specifying the value in the "leading or trailing" field of the sub-table. (see below)

Padding Character

This field defines the character that is used to pad the exported data-item if the string-size of the data being exported is less than the specified size (see above). The user must define a single character. For

example a space-character for strings and a “0” for numeric fields. The default-character is the space character.

Leading or Trailing

By default string fields are padded with trailing padding characters and numeric fields are padded with leading padding characters. The user may override the default here and specify “leading” or “trailing”.

Format

This field is a multipurpose field used to format or to replace the value of an exported field. In the latter case the user may also execute a 4D statement such as a value assignment, allowing the user to temporarily (during the duration of the export) modify the data in a current record (to be exported).

When used as a format-control it formats a numeric export value. For example if this field is set to “\$###,###,###.00” then the numeric value being exported is sent with a “\$” prefix and with two decimal places. The format values must follow the 4D guidelines for formatting. Note when a Long integer field is being exported and the field is a date-time-stamp field the user may format it by using the formatting code DTSTAMPYYYYMMDDHHMM, DTSTAMPYYYYMMDDH-HMMSS, DTSTAMPMMDDYYYYHHMM code. If the date component of the date-time stamp is zero then all formats will output a null string.

A boolean field may be formatted as “A;B;C” where A is true and C is false. Default case (with the format being specified) is 0;1 for true:false respectively.

(Data Substitution)

When this field is set to “SubstituteNN” then during the export the value of the field is substituted via a look-up table. The look up-table contains four arrays, the elements of which contain the substitution-code, the original value (to be replaced) and the new value (to be replaced with) and a valid 4D Command to be executed (which may assign a new value for the current record of the selection being exported). When an item with format value “SubstituteNN” is exported the ERP2020 looks up the array to get the first matching element whose substitution-code is equal to “SubstituteNN” and the original value is equal to the value of the field being exported. During the export the value is then replaced with the new value specified in the look-up table. Also if a command is specified in the “Execute Statement” column that command is executed **after** the substitution is made and **before** the data is exported for that particular item. If the user wants to change the value of the current field being exported

then an assignment can be made to the variable "BULKTEXT" in the Execute statement. For example if the Execution statement is defined as "BULKTEXT:=String(2*6) then the current field's exported value will be "12". Any value assignments made to a record in the current selection are temporary and are **not** saved because each record is loaded in the read-only state. Note that if a user needs to force the execution of a statement irrespective of the data the user may put a "%" for values of both the original and the new value and specify the command to be executed in the "Execute Statement" column.

Note that the look-up table is common to all items in the table, the scramble-code determining the array elements to be used for a specific export-item. The look-up table may be edited by double-clicking on any item in the table. The detail form shown in figure 9.14 on page 9.55 is invoked when a double-click is performed on an item in the table.

item-details & common look-up table

Table Number:

Field Number:

Sequence#:

Table Name:

Field Name:

String Size:

Field Format:

Look-up table item

Substitution Code <small>Double-click to edit</small>	Old Value <small>Double-click to edit</small>	New Value <small>Double-click to edit</small>	Execute Statement
Substitute1	INCOMING STORE		
*Substitute1	QCGATE1	2	
*Substitute1	FGStore	2	
*Substitute1	DIEBANK	2	alert ("die bank")
*Substitute1	100 %sortvoidbyx-ray		
*Substitute1	100 %VGbefore Trim_Form	1	
*Substitute1	100 %VGafter P.M.C.		
*Substitute1	WAFERS AW	2	
*Substitute1	IGBT Reflow		
*Substitute1	TRIM FORM MARK	1	
*Substitute1	Reflow		
*Substitute1	TEST&TAPE	1	message ("Lot is at Test&Tape")
*Substitute1	DEJUNK	1	
*Substitute1	SOLDERPLATING	1	
*Substitute1	100 %Visual Inspection-EOL		
*Substitute1	Different Dual Die		
*Substitute1	Epoxy Cure	1	
*Substitute1	Debanksplit		!lotinfojdate Out:=100/00/00!
*Substitute2	QCGATE1	200	
*Substitute2	Die Bond	300	

FIGURE 9.14

Other fields:

template name.

Unique name for the template

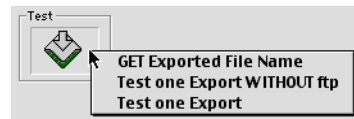
Query method	A customized procedure that will execute with the export. At a minimum this procedure will create a selection of records from which to extract the data. These procedures have been created by the designer and are chosen from a pre-published list. (see discussion on Query Methods Below)
Field and Record delimiters	Chosen from a list, define the character(s) that will delimit a field and a record (line of data).
Customer name	Name of the customer to whom the data will be exported.
FTP Host,	FTP host address.
Directory	A sub-directory name if the file is not to be deposited to the default home directory of the FTP account. The directory must be in Unix notation, e.g. "abc/def" User must make sure that the FTP user has read-write access to the directory being specified.
User ID and Password	Login account and password information on the FTP host.
Auto Send	If set then the user-template may be used to start an automatic stored-procedure on the client (see menu-item "Start Stored Procedure" below). Once the process has been started it will repeat itself either at the time defined in the "Trigger Time" field or at intervals defined by the "Trigger Mins" field.
Trigger Time	Once the stored procedure has been launched and the "Export at fixed Time" box is checked the stored procedure will be executing at this specified time. The time is matched with the server-clock.
Export at fixed time only	If this box is checked then when the stored procedure is started it is paused until the Trigger-time is reached on the server-clock. Upon reaching the trigger-time the process begins execution and upon completion pauses itself till the same time on the following day. If this box is NOT checked then the stored-procedure is not paused until completion of the first export. Subsequent exports are delayed by the value defined in the "Trigger Mins" field.
Trigger Mins	The number of minutes between each export. Exports will take place at this interval for as long as the client connection is alive, provided that the "Export at fixed Time" box is unchecked.

Disable DT Query

Query is not limited by the DateTime stamp of the last export.

Test Button

This pop-up menu buttons provides the user with several options to test the exported-data, its file-name (as it will be deposited on the host) and the FTP process.



Selecting fields to be exported

The user must first click on the Table column to choose the table from which the fields are to be exported. Typically the user will choose either the LOTINFO or the LOTSTEPS table. (Note: If an export is required from more than one table then a special procedure (created by the designer) may be required to establish the appropriate cross-table relationships). To select a field click on the right-most column. A number appears that represents the order of the field in the export. Choosing a field that has already been selected before, removes the field from the export list. Once all the fields have been selected then clicking on the "Save in export-parameters table" button will add the fields to the export table. If this process is repeated additional fields may be added to the table. The system suppresses duplicate entries of the same field. Once the fields have been added to the table, the user must carefully review the fields and if necessary modify the sequence-numbers. See figure 9.15 on page 9.58

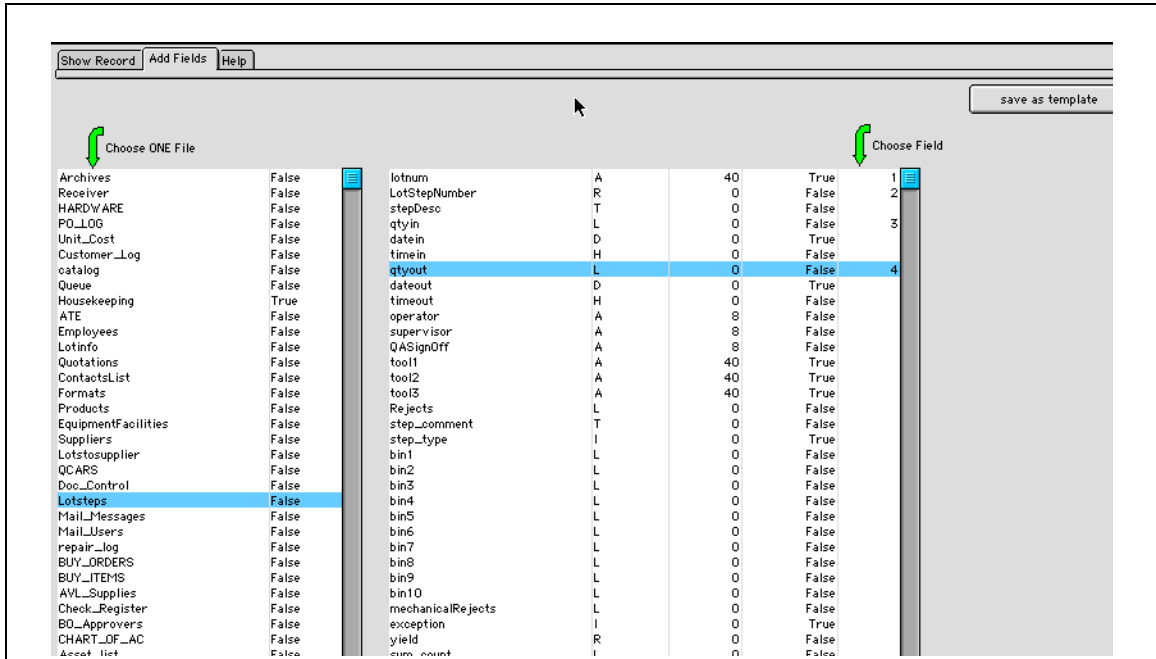


FIGURE 9.15

FTP-export processing methods: The fields to be exported are extracted from a filtered selection of all the records. Presently three canned selection criteria/methods have been written and are provided in the system:

1) SPQLotsWIPAnd7dayShip

This canned method builds a query to select all lots that are currently in process AND lots that have been shipped in the last seven days.

2) SPQStepsDataChange

This method builds a query based on changes of a traveler's data **since the last export**.

3) SPQCustomerQueryinChosenTable

This method simply filters all the records for the customer chosen.

Listings of the programs used for the three methods are given in Additional Information at the end of this chapter

Menu-Item: *Modify user-export template*

This menu is used to modify user-templates (for export) in the ERP2020 system. The user may also test the export-process via this menu.

Menu-Item: *Start Stored Procedure*

If there is currently no stored-procedure running then this menu-item invokes the dialog shown hereunder. This dialog provides a list of all user-template (for export) records whose "Auto-Send" field is set to true. The user may choose a particular template and launch it. This template will then execute the FTP- export via a stored-procedure. The stored procedure is launched and executed via a client station and it keeps it's execution status alive only for as long as the client is connected to the ERP2020 server. A client can have only ONE stored procedure running at a time. On the server-side the stored procedure is documented as a process with the name "FTPExportXXX" where "XXX" is the name of the user-template that launched the procedure. See figure 9.16 on page 9.60

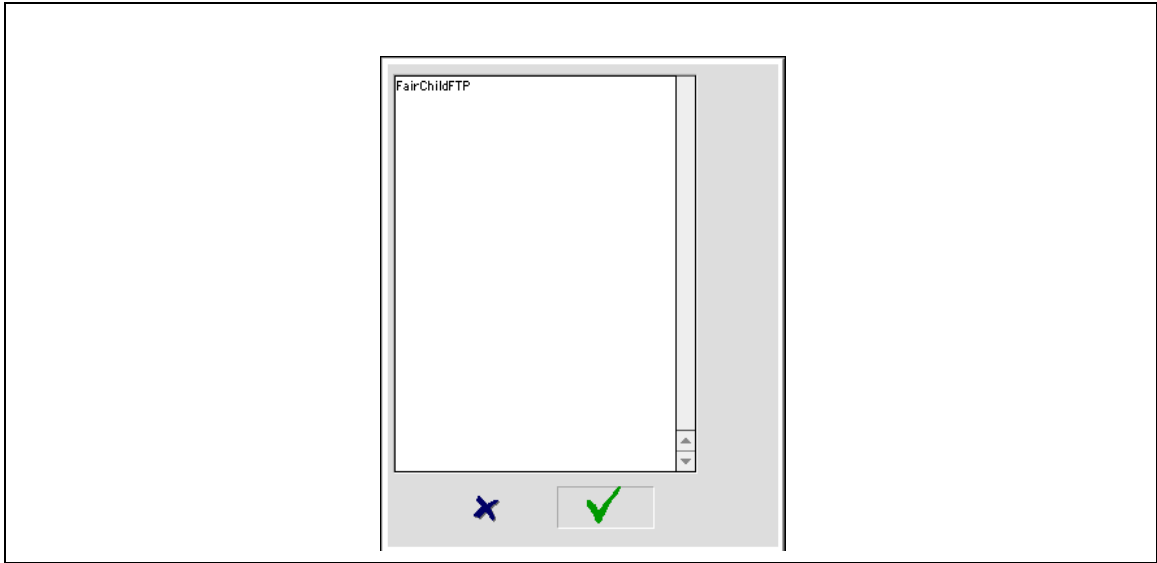


FIGURE 9.16

If the client currently has a stored procedure running then the user will be issued a flag and given the option to terminate the procedure. If the user elects to terminate the procedure then the current FTP (if it is in session) will be completed and the stored-procedure aborted. If the stored procedure has been paused to conform to the time-triggers defined in the template then the process will be immediately aborted without any FTP.

•Menu: [Lists](#).

Menu-Item: [List Management](#)

The ERP2020 system uses lists throughout the database in entries where the user has a limited number of choices. A choice list does not just make data-entry easier but it also maintains the integrity of the data by forcing user-conformance to choices limited by the list. These lists are stored within the

ERP2020 system structure file. A new installation requires customizing of these lists to fit the requirements of the specific application. Additionally, when an upgrade to the ERP2020 system is made available, the user must transfer his own customized lists to the new structure file.

This function allows the user to browse and modify the lists and save a copy of the current lists (in the structure file) to the user's data-file. In the event of an upgrade to a new version of the ERP2020 software, the user will then restore his customized lists from the data-file.

All user-modifiable lists available in the database are listed in the column labelled "LISTS". Clicking on any item in this column initiates the modification process of the selected list. The modification process is different between hierarchical and non-hierarchical lists. A non-hierarchical list contains data-items in a single level while hierarchical list will have multiple levels of data-items via sub-lists.

Modifying non-hierarchical lists:

When the user clicks on a **non**-hierarchical list in the Lists (top) spread-sheet the List-items (bottom) spread-sheet is loaded with all the items of the selected list. Clicking on these items allows the user to modify the contents of an item. The group of buttons in the “Action on list” group box facilitate other actions in the modification process. Items can be added or deleted via the “ADD item” or “Delete item” buttons respectively. After the user has made his modifications to a particular list the “Save List in Structure” button permanently saves the changes made to the list in the current ERP2020 structure file. When saving a list, the administrator may further choose to lock or un-lock the list for the user. It is recommended that the lists be saved as “user non-modifiable”, so that their integrity is maintained by the administrator. To permanently save an image of all the lists in the data-file the user must use the “Save all Lists” button in the “Operate on Data-file” group-box. Saving in the data-file allows the user to update the lists in a new (upgrade) ERP2020 structure file. See figure 9.17 on page 9.62

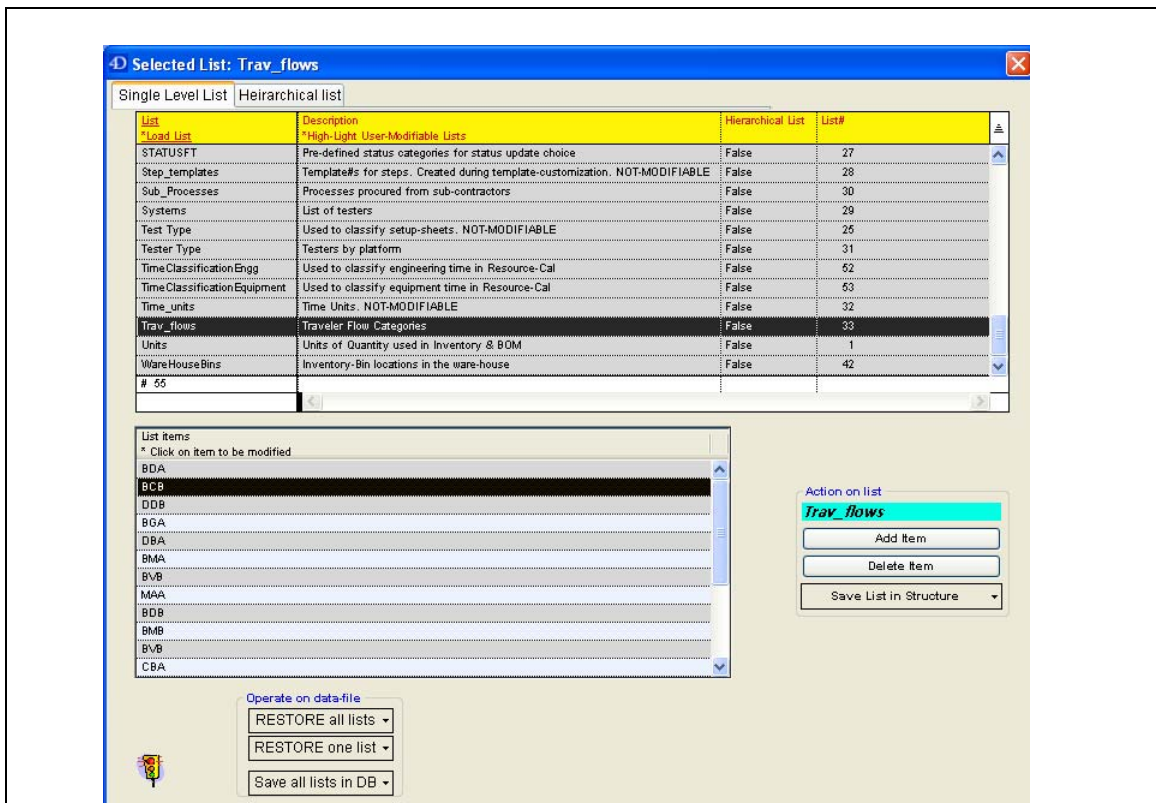


FIGURE 9.17

Buttons in the “Operate on data-file” group-box:

- | | |
|----------------------|---|
| Save all lists in DB | The “Save all lists” button backs up all lists within the structure onto the data-file. |
| Restore all lists | The “Restore all Lists” performs the reverse function (as compared to the (Save all lists” button), whereby all lists in the structure file are refreshed from the data-file. This action is necessary when the administrator installs a new upgrade of the ERP2020 structure file. |
| Restore one list | This button refreshes the currently selected list (in the Lists spreadsheet). The list is loaded from the data-file into the Structure file. |

Modifying hierarchical lists:

When the user clicks on a **hierarchical** list in the Lists (top) spread-sheet the hierarchical list is presented for modification as shown in figure 9.18 on page 9.64.

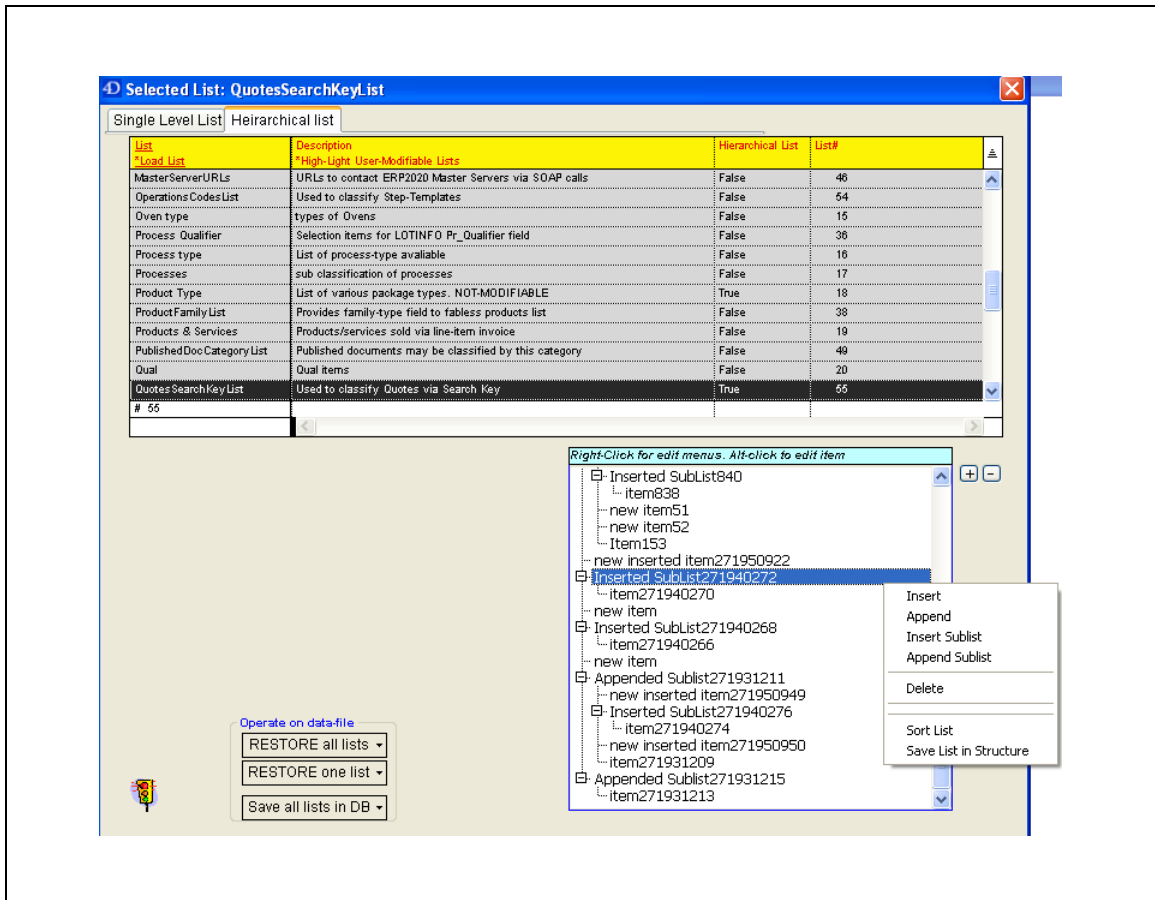


FIGURE 9.18

All modifications to the hierarchical list are made by right-clicking on an item in the hierarchical list. To modify an existing item in the list the user must "alt-click" on the item and enter the new information. The user may append items to the list or add a sub-list to an existing list via the pull-down commands

enabled upon right-clicking on the list. After the desired modifications have been made the user must execute the "Save list in Structure" menu-command to save the list. When saving a list, the administrator may further choose to lock or un-lock the list for the user. It is recommended that the lists be saved as "user non-modifiable", so that their integrity is maintained by the administrator. After the list has been saved in the structure it must be saved in the data-file so that a structure upgrade can be updated with the user's data from the data-file.

Menu-Item: *View Saved Lists*

Displays a list of all Lists saved in the data-file

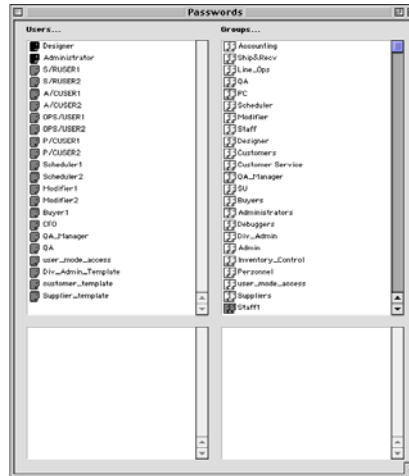
Menu-Item: *Refreshing Automatic Lists*

The ERP2020 uses both static and dynamic lists. Static lists are those which are directly edited during the initial configuration process and are relatively constant. An example of a static list is the "Equipment Type" list. This list is directly edited and contains the types of equipment that will be put to use in an enterprise. Dynamic lists on the other hand are created from the data resident in various tables of the data-base. These lists are not directly edited by the administrator since the ERP2020 automatically updates them based on new data. An example of a dynamic list is the list of actual tools that are made available for traveler implementation. Dynamic Lists are automatically updated on the server when the server is started. They are also updated from the client-side when a user adds a new resource (such as a particular piece of equipment) via the QA menu. In addition to these automatic updates the administrator may force an update of lists using this menu. This menu also updates lists that are used by the WEB-Server for various drop-downs in the WEB-interface.

•**Menu:** *Edit Access*

Menu-Item: *Manage Users & Groups*

Invokes the password window which allows the administrator to manage Users and their Group-memberships. ((See 4D User's Reference manual for more details on managing Users and Groups))



Menu-Item: *Create Division Admin*

Menu-Item: *Change user-password*

Allows a user's password to be changed by the administrator

Menu-Item: *Add to user attribute*

The user-attribute record is created automatically when a supplier or a customer are provided access-rights to the ERP2020 system. This menu-item is therefore not normally used.

Menu-Item: *Modify user attribute*

The user-attribute record is created automatically when a supplier or a customer are provided access-rights to the ERP2020 system. This record is **automatically** maintained and **must** exist for each customer or supplier that has been given access to the ERP2020 system. It therefore follows that access control for customers and suppliers is at two levels. First at the structure-level which contains the users and group information and then at the data-file level which must contain a valid user-attribute record. This menu-item is also used to configure the WEB options for the user. These control-bits are defined by the administrator via this menu.

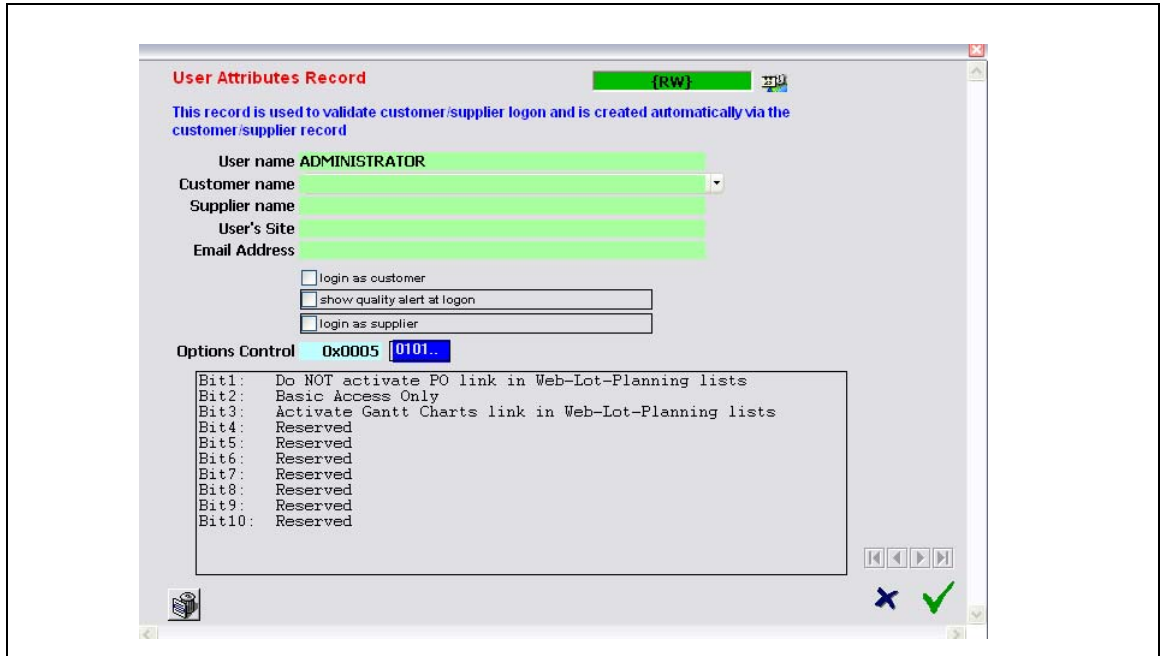


FIGURE 9.19

Menu-Item: *Save users group in datafile*

Users and Groups information is saved in the structure File. This menu allows the administrator to save this information **in the data-file**. This information will be required later when a new Structure file (upgrade) is being installed. When the Structure file is being updated the administrator will load the Users and Groups from the data-file into the **new** Structure file. The menu will update the data-file only if Groups exist in the Structure file, thereby preventing an accidental update of the data-file when a new Structure has been installed.

See “Additional Information,” “Importing and Exporting Users and Groups” at the end of this chapter for more information on how this menu-item is used.

Menu-Item: *Load users group from datafile*

This menu-item allows the administrator to load the Users & Groups information **from** a data-file **into** a (new) **Structure** file.

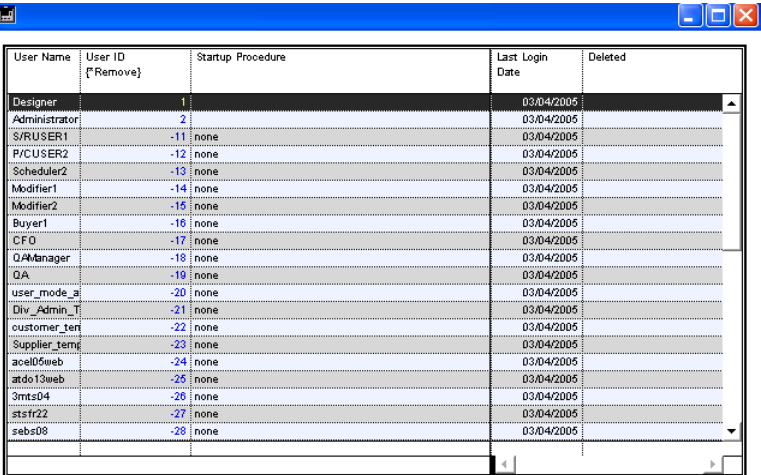
See “Additional Information,” “Importing and Exporting Users and Groups” at the end of this chapter for more information on how this menu-item is used.

Menu-Item: *Print Group Membership*

Allows a list of group membership to be printed

Menu-Item: *Users Spreadsheet*

This menu allows the administrator to manage the Users and Groups via a spread-sheet interface (shown below in Figure 9.20 on page 9.69). The administrator may also remove users from the Users and Groups (“UG”). Note that 4D does not completely delete (erase) a user record from the UG database. The record is simply voided so that its unique-id number is not reused again.



User Name	User ID [*Remove]	Startup Procedure	Last Login Date	Deleted
Designer	1		03/04/2005	
Administrator	2		03/04/2005	
S/RUSER1	-11	none	03/04/2005	
P/CUSER2	-12	none	03/04/2005	
Scheduler2	-13	none	03/04/2005	
Modifier1	-14	none	03/04/2005	
Modifier2	-15	none	03/04/2005	
Buyer1	-16	none	03/04/2005	
CFO	-17	none	03/04/2005	
QAManager	-18	none	03/04/2005	
QA	-19	none	03/04/2005	
user_mode_a	-20	none	03/04/2005	
Div_Admin_T	-21	none	03/04/2005	
customer_ten	-22	none	03/04/2005	
Supplier_temp	-23	none	03/04/2005	
ace05web	-24	none	03/04/2005	
atdo13web	-25	none	03/04/2005	
3mts04	-26	none	03/04/2005	
ststr22	-27	none	03/04/2005	
sebs08	-28	none	03/04/2005	

FIGURE 9.20 Users Spreadsheet



Only those users that have been created by the administrator can be deleted. To delete a user control-click on the User-ID. To view all users in the database (including deleted users) press the control-key before invoking the spreadsheet.

•Menu: **Miscellaneous**

Menu-Item: *Add Super Reports*

Used to add “Super Reports” based report options in the ERP2020. Super Reports allow graphics and complex reporting functions. Using a feature-rich drag and drop interface the user may drag fields, variables, and graphics, format them, choose the selection of records, and then print reports. “Super Reports” is a third party plug-in from ASG at <http://www.asgsoft.com>. For more information see the Super Report Developer reference manual. An alternative to Super reports is to use the replication module and use a standard ODBC database query tool.

A Super-Report record is added via the form shown in figure 9.21 on page 9.70.

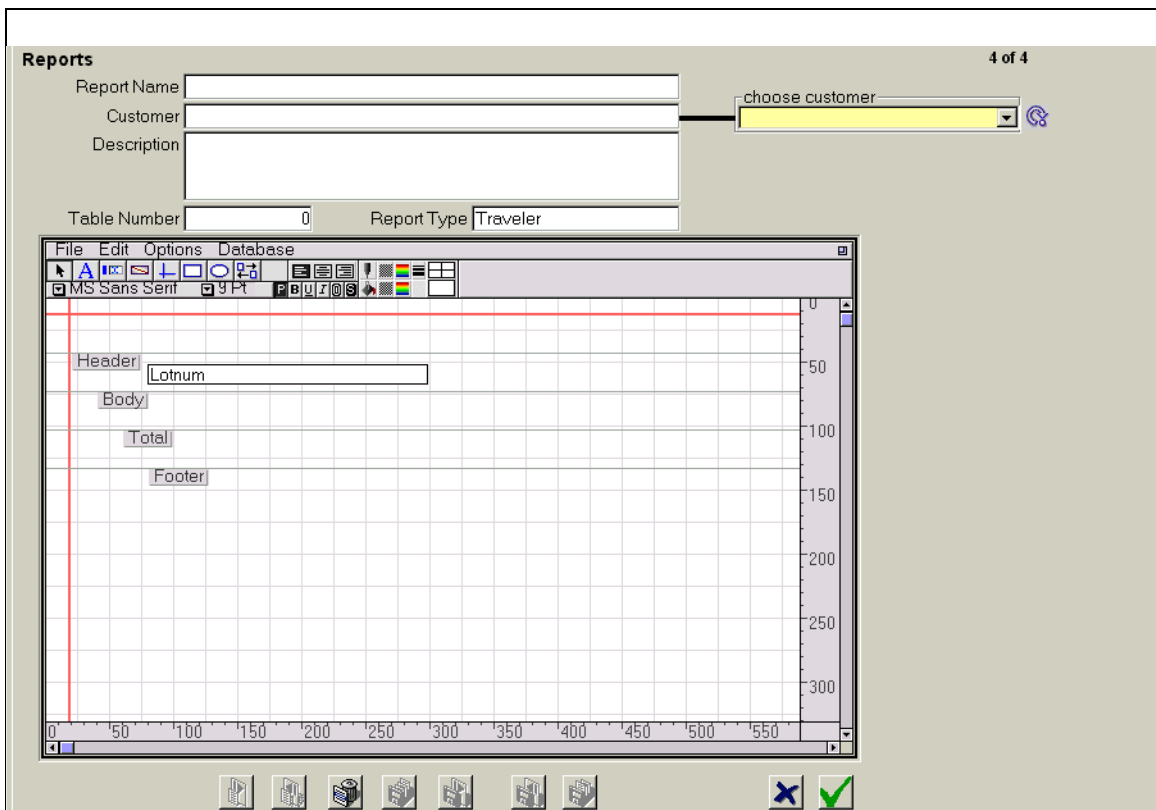


FIGURE 9.21

Report Type: This field is entered via a list and defines the type of report (form) to be created. If the report-type is “labels” then only the LABELS table is available to select the fields from. If the report-type is “Traveler” then the user will be able to select fields from the LOTINFO and LOT- STEPS table. The ERP2020 allows the user to optionally call these reports when printing labels or printing a traveler, the user does not need to create a selection of records for these two reports.

Customer: Name of the customer if the report is customer-specific. E.G. travelers are not customer-specific but labels are customer-specific.

Description A brief description of the report.

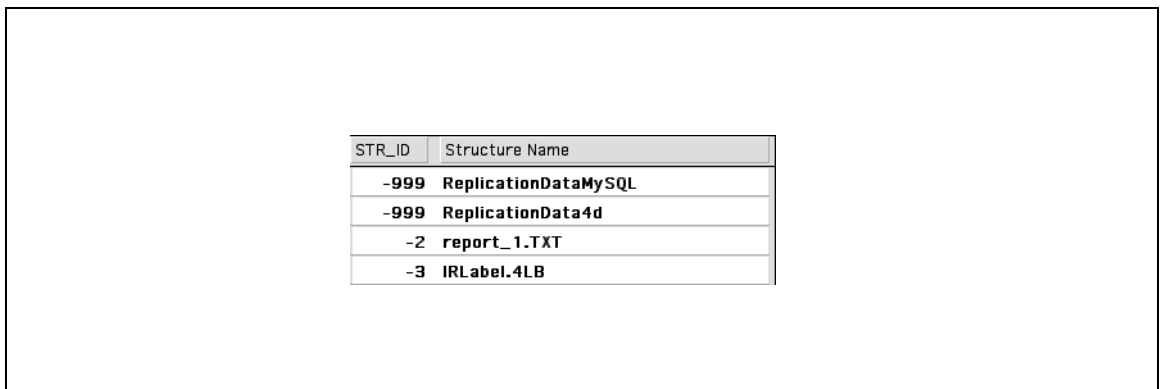
Menu-Item: *Modify super reports*

Used to modify any Super Reports that have been created.

Menu-Item: *Maintain MiscData Records*

Records in the MiscData table are used to store miscellaneous data and configuration parameters. The type of data stored in a MiscData record depends upon the STR_ID (structure ID) of the record.

This menu displays all the MISCDATA records in the database. The user can edit a record by double-clicking on an entry. See figure 9.22 on page 9.71



STR_ID	Structure Name
-999	ReplicationDataMySQL
-999	ReplicationData4d
-2	report_1.TXT
-3	IRLabel.4LB

FIGURE 9.22

The format of detail-form launched by the double-click will depend upon the STR_ID of the record being opened (modified). The format for an STR_ID -999 record is shown in figure 9.23 on page 9.72:

The screenshot shows a 'Misc Data Record' form with the following fields and annotations:

- ID:** -999
- Creation/Mod date:** 00/00/00
- Name:** ReplicationDataMySQL
- Customer:** (empty)
- WorkField1:** C:\MYSQL (Annotation: local-folder on Server where replication data will be temporarily stored.)
- WorkField2:** C:\freezip (Annotation: absolute-path to freezip.exe folder)
- FTP host where rep-data will be deposited:** 192.168.1.251
- User name:** replicate
- Password:** 2020
- Void:** (Annotation: Set to true if Replication is to be suppressed)

FIGURE 9.23

MiscData records with STR_ID of -999 are records that have been created by the designer. These records contain data pertaining to the configuration of the database. These records are further qualified by the structure name. E.G. A record with STR_ID -999 and Structure name of ReplicationData-MySQL enables Replication Services for MYSQL.

A list of standard ERP2020 records is shown below:

STR_ID	Name	Function
-999	ReplicationDataMySQL	Enables and configures MYSQL replication services
-999	ReplicationData4D	Enables and configures 4D replication services
-999	ReplicationDataORACLE	Enables and configures ORACLE replication services
-2	Quick Report Template	Stores a quick report template created by the administrator
-3	Label template	Stores a shipping label template created by the administrator
-999	AutomaticUpdates	Enables a stored procedure on the Server for automatic background update of various data.
-999	AutomaticArchiving	Sets up a web-services communication-link between the Archives and Active databases.

TABLE 10.

•Menu: Pictures

Menu-Item: *Add picture to database*

Allows the administrator to add pictures to the database. Some of these pictures with special reserved names have specific usage. An example is the picture called LOGO, which contains the enterprise logo. The table below lists the special reserved pictures and their functionality. The administrator may add, modify, or delete these pictures.

Picture Name	Function
Logo	This picture is used as the default logo for the enterprise. It must be scaled to the 100x70 pixels. The logo is drawn as a fixed-size picture on top of most forms.
Splash_Active	This is a picture installed by the designer and is installed as the main splash-screen for a “MAIN” ERP2020 database. This picture must exist in the data-file. This picture provides the background only. The ERP2020-Server will automatically add the name of the company (as defined in the HouseKeeping record) to this picture.
Splash_Play	This is a picture installed by the designer and is installed as the main splash-screen for a “PLAY” ERP2020 database. This picture must exist in the data-file. This picture provides the background only. The ERP2020-Server will automatically add the name of the company (as defined in the HouseKeeping record) to this picture.
Splash_Archives	This is a picture installed by the designer and is installed as the main splash-screen for a “Archives” ERP2020 database. This picture must exist in the data-file. This picture provides the background only. The ERP2020-Server will automatically add the name of the company (as defined in the HouseKeeping record) to this picture.

TABLE 11.

Picture Name	Function
TravelerHeader	This is a graphic which is printed in the top-half of the condensed (or ultra-condensed traveler). This graphic is printed as a variable size graphic. It will not be scaled during the printout. Since the traveler is printed on portrait page-setup (8x11) the graphic x-size should be equal to 542 pixels.
TravelerFooter	This is a graphic which is printed at the end of the condensed (or ultra-condensed traveler). This graphic is printed as a variable size graphic. It will not be scaled during the printout. Since the traveler is printed on portrait page-setup (8x11) the graphic x-size should be equal to 542 pixels.

TABLE 11.

Menu-Item: *Modify Picture*

Allows the administrator to modify pictures stored in the database. One of these pictures is called LOGO, which contains the enterprise-logo.

Menu-Item: *Get logo from picture*

ERP2020 saves a custom-logo in the PICTS table. This menu copies the LOGO from the data-file to the structure resource so that the logo is available to various forms in the ERP2020. The administrator must execute this menu-item, each time the 4D Structure File is updated.

•Menu: *Container***Menu-Item:** *Create Lot Containers*

During the manufacturing process a lot may temporarily reside in a 'Container', an example in the assembly process is loading die or strips in magazines. If the lot-containers are entered into the system then the ERP2020 provides traceability (during processing) via container-IDs.

To use the facility, the administrator must enter all containers into the system. Each container is assigned a unique ID number using the screen in figure 9.24 on page 9.76. Additionally, ERP2020

attaches a “/” prefix to this ID to distinguish it from the lot number. The lot number is not normally entered at this time as it is temporary and perishable data. This data is retained until the lot is unloaded or a new lot is loaded into the container

Containers can be loaded or unloaded only if BIT2 and BIT3 are set, respectively. However, the containers can always be checked if BIT1 is set.

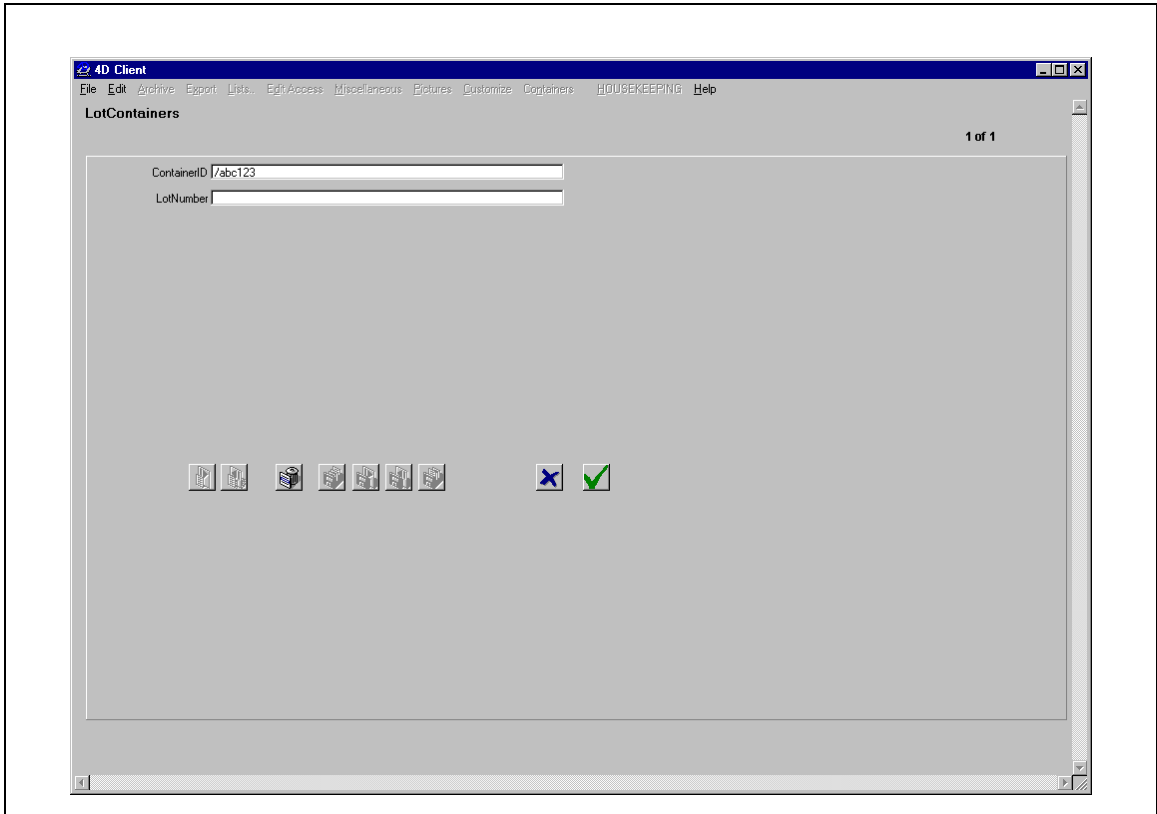
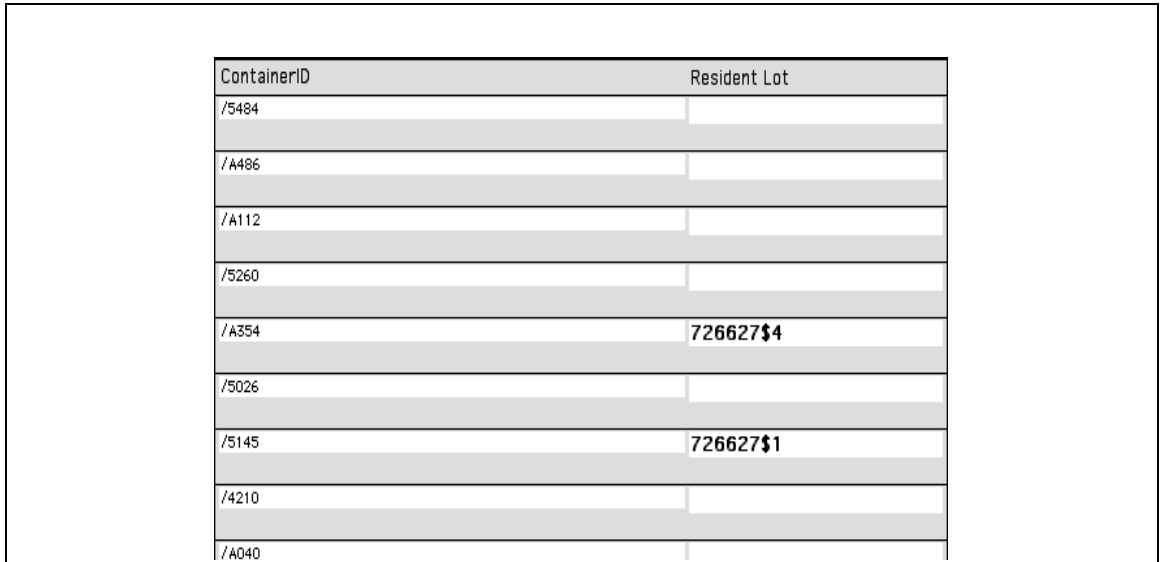


FIGURE 9.24

Menu-Item: *Modify Lot Containers*

Used to modify a container's unique ID. Double click on the field to modify. See figure 9.25 on



ContainerID	Resident Lot
/5484	
/A486	
/A112	
/5260	
/A354	726627\$4
/5026	
/5145	726627\$1
/4210	
/A040	

FIGURE 9.25

page 9.77

Menu-Item: *Print Containers List*

The administrator can use this menu to print a Container-list. In this list the ContainerID is printed in Code39 Barcode Format to allow barcode labels to be placed on the containers.

•Menu: **Customize**

Menu-Item: *Step-Template Properties & Bins.*



A traveler for a lot consists of one or more steps. Each step describes the operation to be performed. The step is also characterized by a field called “Step-Type” (also known as Step Template-Number). The Step-Type determines the implementation properties of the step, such as the tools and the operator skill-set required to implement the step, the binning definition of the step, the format of the printed-traveler, the mandatory property of various fields during data-entry, etc. For each Step-Type there must exist a unique Step-Type Record (called Template Definition Record). This menu-item allows the administrator to customize each Step-Template Properties Record and thereby define the implementation properties of each step-type. This operation is to be performed during the initial setup only. Since LotStep data is categorized via the template-number (step-type), changing template-definitions mid-stream will create data inconsistencies. When Template Definition Records are modified it is recommended that the data-base be restarted to make the changes available to all Clients and Web-based processes. Update of data on the local client (only) may be accomplished via the “Update resource Information” menu. (See “Update Resource Info” on page 1.6.8).

Note that Template Definition Records are added to the data-base when a new data-file is created. They may be added to an existing data-base by the designer. Modification of a template, does not cause loss of data to old travelers but will cause re-formatting of the printed traveler to conform to the new properties. The modification process is facilitated via spreadsheet interface as shown below in Figure 9.26 on page 9.79. The user may modify or review a record by selecting (single-clicking) the record in column one or column two respectively. The spread-sheet interface also allows the user to query records with certain property types, such as templates that provide the label-creation facility, templates that provide transformation-control etc.

All templates					
# * Modify	Template-Name * See	Operation	Tool1 if required	Tool2 if required	Tool3 if required
1	Etest	Test			
600	Park	Test			
800	Incoming Inspection	Test			
0	CSI	Test			
11	Moisture Endurance	Test			
2	BURNIN	Test			
131	BAKE	Test			
3	Res_Solvents	Test			
4	Solderability	Test			
5	PDA	Test			
6	WS	Test			
7	GrossLeak	Test			
8	FineLeak	Test			
9	NA	Test			
10	Reminder	Test			
120	lead_scan	Test			
121	val_in	Test			
122	val_out	Test			
1,001	RETEST	Test	Tester	Handler	Tester
999	Bin_Wise_Out	Test			
998	Bin_Wise_Out_98	Test			
148	Post Op Visual	assembly			
147	Wafer Saw	assembly	Saw		
#75					

FIGURE 9.26

The Template Properties and Binning Definition form is a multi-tab form shown in figure 9.27 on

The screenshot shows a software interface for defining a template. At the top, there are tabs: Main, Advanced (i), Advanced (ii), Binning Control Parameters, and Data Table. The current tab is 'Main'. Below the tabs, there are several input fields and a table.

Fields include:

- Name: Incoming Inspection
- Operation: QA
- Template_num: 800
- Large layout Name: PlainUniversalWith4DWr
- Small Layout Name: PlainUniversalWith4DWr
- Certification List: ESD HCC Doc, Incoming (IQA, 2/Op), ITAR
- Skill Code: 0x0103
- Tool1, Tool2, Tool3: (Empty)
- IsBinningRequired: Yes

A table below the fields lists bins from bin1 to bin32 in a 4x8 grid:

1 bin1	2 bin2	3 bin3	4 bin4
5 bin5	6 bin6	7 bin7	8 bin8
9 bin9	10 bin10	11 bin11	12 bin12
13 bin13	14 bin14	15 bin15	16 bin16
17 bin17	18 bin18	19 bin19	20 bin20
21 bin21	22 bin22	23 bin23	24 bin24
26 bin25	26 bin26	27 bin27	28 bin28
29 bin29	30 bin30	31 bin31	32 bin32

At the bottom of the form, there are several icons and a status bar with a blue 'X' and a green checkmark.

FIGURE 9.27

page 9.80

Configuration fields of Template-Definition record (Main Tab):

Name	Name of the Step-Template
Operation	An operation to which the template is typically associated. This field is used for categorization purposes. It is also used to create the “List of Operations’ for the Certificate of Compliance that may be created for a lot subsequent to the completion of its processing
Template-Number	Unique number that identifies the template. The template is invoked in a traveler-step via this number. The pre-defined templates and their corresponding template-numbers are shown in “Additional Information” at the end of this chapter. These templates should not be

changed. Any extra templates defined by the user must have template-numbers between 200 and 299. Template numbers are also useful during creation of reports, to categorize rejects for example, so some thought should be given to template numbering.

L-Layout

The name of the Layout (form) that will be used to format the step in a printed traveler. The Layout is pre-defined by the designer. "L" signifies that the layout is "large" (in pixels). The printed traveler will choose between the Large or Small layout, depending on the size of the text in the Step-Description field of the traveler-step. The Large Layout can also be forced by ending the Step_description with a "#" character.

Note that starting with Rev K of the ERP2020, the layouts are self-expanding (to accommodate larger text in the step-description field). There is therefore no need to specify separate "large" and "small" layouts.

S_Layout

The name of the Layout (form) that will be used to format the step in a printed traveler. The Layout is pre-defined by the designer. "S" signifies that the layout is "small" (in pixels). The printed traveler will choose between the Large or Small layout, depending on the size of the text in the Step-Description field of the traveler-step.

Note that starting with Rev K of the ERP2020, the layouts are self-expanding (to accommodate larger text in the step-description field). There is therefore no need to specify separate "large" and "small" layouts.

Suppress

This field will "retire" a template and make it unavailable during the creation process of a new Steps File (see "Create Steps File" on page 1.5.110) or a new Step-Template (see "Add traveler Step-Template" on page 1.8.62). Legacy travelers and Steps Files will still be functional.

Universal Layouts

Starting with version 2004 of the ERP2020, two universal layouts called “PlainUniversal” and “PlainUniversalwithBinsAndMark” may be used in lieu of dedicated layouts. These layouts are self-resizing to accommodate the amount of text included in the step-description field (limited to a maximum of one page). The properties in these fields are user configurable and therefore may be used in any step-type with the appropriate configuration control. When selecting either of these layouts, the “small” and “large” layout-names become irrelevant and must therefore refer to the same layout name. As evident from the name the first of these layouts does not include binning and marking data while the second does.

Operator skill-set required to implement step:

Skill Code This field defines the certification-types that an operator must have to be qualified to implement the specific step-type. Each employee is certifiable in one or more of seventeen distinct skills. For information on certified-skills on each employee see “certification matrix” on page 8.11

Tools required to implement step:

Tool1 Each step-type in a traveler can use up to three different types of equipment (Tools). All equipment in ERP2020 is categorized from a list of valid “Types” (controlled by the administrator via the “Equipment Type” List). The type of equipment entered here will define the equipment list shown (as the primary tool) during equipment selection when executing a traveler-step with this template-number.

Tool2 The type of equipment entered in Tool2 will define the equipment list available (as Tool 2) during a traveler-step with this template-number.

Tool3 The type of equipment entered in Tool3 will define the equipment list available (as Tool 3) during a traveler-step with this template-number.

Alternate Tools Allowed When this field is set the tool-sets required for the traveler-step (as determined by the equipment-types associated with Tool1, Tool2 and

Tool3) the user may select other equipment type during the step processing.

Configuration fields of Template-Definition record (Advanced (1) Tab). See figure 9.28

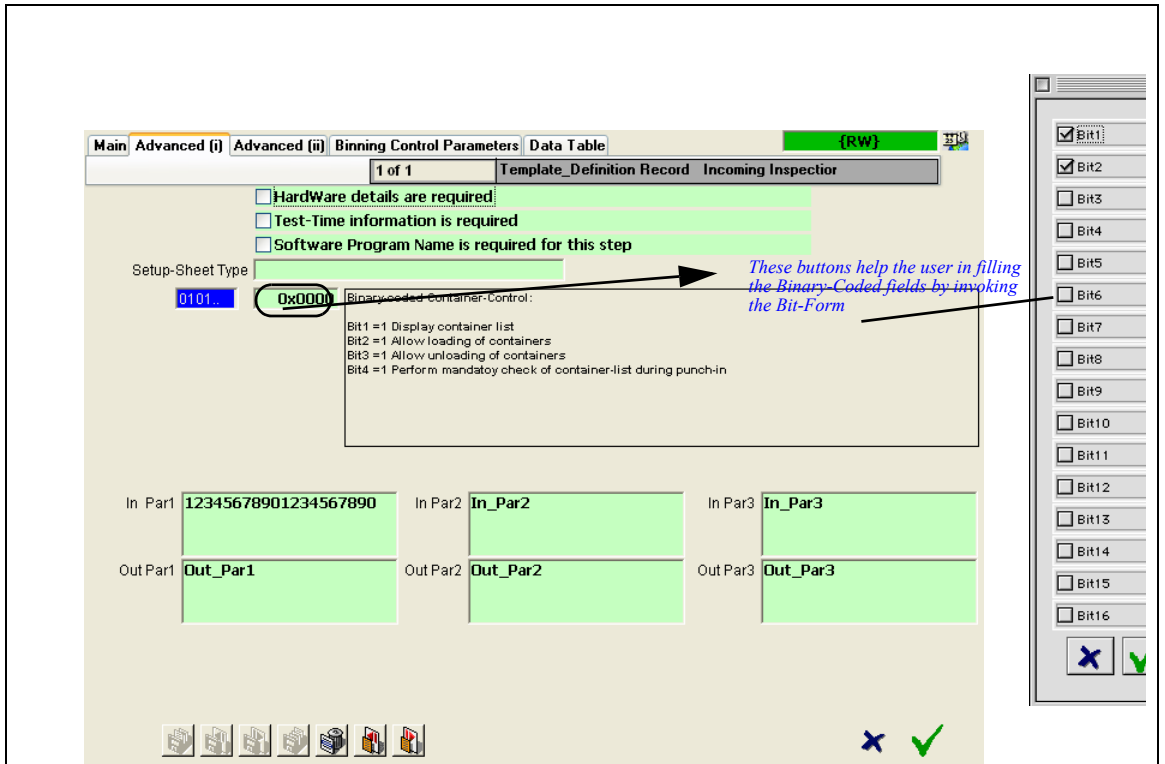


FIGURE 9.28

on page 9.83

Setup Sheet Type

This field is entered via the choice list called “Test Type”. If the Device-Table option is installed then the user may browse step-sheets via the lot-step punch-in and punch-out forms. If this field is set then only the setup-sheet code for the chosen “Test Type” is chosen. For example, if this field is set to “FT” then when a step with this spe-

cific template-number is being punched in or punched out, the user will be able to “browse” the setup-sheet for “Final test” (FT) for the Device-name specified in the “Device” field of the Lot-record.

Advanced (2) Tab

Other controls:


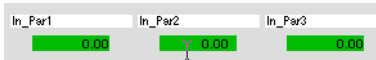
Bit#	Function
1 Transformation Control	Show Transformation Control (1). This bit controls whether or not the Transformation Control option will be available in a particular Traveler Step template. The Transformation Control option in a traveler-step allows the user to transform the count (by using a multiplication and division factor) to a new count (based on new units). A typical example would be using 2-die in a Die-Bond step to create a unit. If this bit is set then the Transform Control Box will show in the Punch-Out form as shown in the figure below:
2 Labels Button	Show Labels Button  will appear on the Punch-Out form. This button allows printing of fixed format or user-defined shipping labels. When traveler-step with this template-number is punched-out the label-icon is available in the punch-out window. This icon provides the pull-down menu list shown below. The “custom” option allows the user to recall a customer-specific label-format saved by the user (in the MISCDATA) records.
3	1 Make [LOTSTEPS] field In_Par1 available (decimal 4). See note below on “Parametric measurement fields in lot-steps”
4	Make [LOTSTEPS] field In_Par2 available (decimal 8).See note below on “Parametric measurement fields in lot-steps”
5	Make [LOTSTEPS] field In_Par3 available (decimal 16).See note below on “Parametric measurement fields in lot-steps”
	 <p>If Bit3, Bit4 and Bit5 are set then the fields shown above will appear on the Punch-Out Form</p>
6	Make [LOTSTEPS] field Out_Par1 available (decimal 32).See note below on “Parametric measurement fields in lot-steps”
7	Make [LOTSTEPS] field Out_Par2 available (64).See note
8 Parametric Measurements	1 Make [LOTSTEPS] field Out_Par3 available. See note below on “Parametric measurement fields in lot-steps”

TABLE 12.

Bit#	Function
9 Auxiliary Count	Make [LOTSTEPS] field auxiliary-count-in fields (2) available in punch-in and auxiliary-count-out fields (2) in punch-out windows. (see See “Punch-in form information.” on page 1-6.12.)These fields are always brought out in the ultra-condensed version of the traveler.
10 Marking Picture	A picture field defined in the Device-Table(“Device Table” on page 1.8.79) will be printable in the detailed traveler via the “L_ExpandedBins” layout. This field will also be viewable via the punch-in and punch-out forms.
11 Wafer-Sort Template	When this bit is set the template is for a wafer-sort operation. A traveler-step with a wafer-sort template has special properties, including enabling of a sub-table per step that contain the yield and binning by wafer, calculation of required tester time etc. Prior to revision I6E a special template number (6) was reserved for wafer-sort. While still reserving template-number 6 for wafer-sort, (for compatibility) the user may now configure additional templates for the wafer-sort operation, allowing differentiation by template-number. Note this bit can be set only when the control-bit in the HK record (enabled by the designer) is set. See “Multiple ET and WS templates” on page 1.9.24
12 Electrical-Test template	When this bit is set the template is for a electrical-test (also referred to as ‘Final-test’) operation. A traveler-step with an electrical-test template has special properties, including calculation of required tester time, association of a Binning-Control record, etc. Prior to revision I6E a special template number (1) was reserved for electrical-test. While still reserving template-number 1 for electrical-test, (for compatibility) the user may now configure additional templates for the electrical-test operation, allowing differentiation by template-number. Template number 1 is now considered as the primary electrical-test step. See “Consolidate Yield” on page 1- 6.114. Note this bit can be set only when the control-bit in the HK record (enabled by the designer) is set. See “Multiple ET and WS templates” on page 1.9.24
13 Rescreen Template	When this bit is set the template is for a re-screen operation (typically associated with the re-screen of electrical rejects). Prior to revision I6E a special template number (1001) was reserved for re-screen. While still reserving template-number 1001 for re-screen, (for compatibility) the user may now configure additional templates for the re-screen operation, allowing differentiation by template-number. Template number 1001 is now considered as the primary electrical-test rescreen step. See “Consolidate Yield” on page 1- 6.114. Note this bit can be set only when the control-bit in the HK record (enabled by the designer) is set. See “Multiple ET and WS templates” on page 1.9.24

TABLE 12.

Bit#	Function
20 Test-Window Control	Test-Window Control is available for this template. As for example set this bit true for Burn-in and Moisture Endurance Templates.
21 Test-Window Control ii	An Electrical Test Step succeeding a Step referencing this Step-Template must start <i>after</i> the expiration of the time specified in the Test-Window. Note that Bit 20 must be also be set to enable the Test-Window Control. As for example set this bit true for Moisture Endurance Template.

TABLE 12.

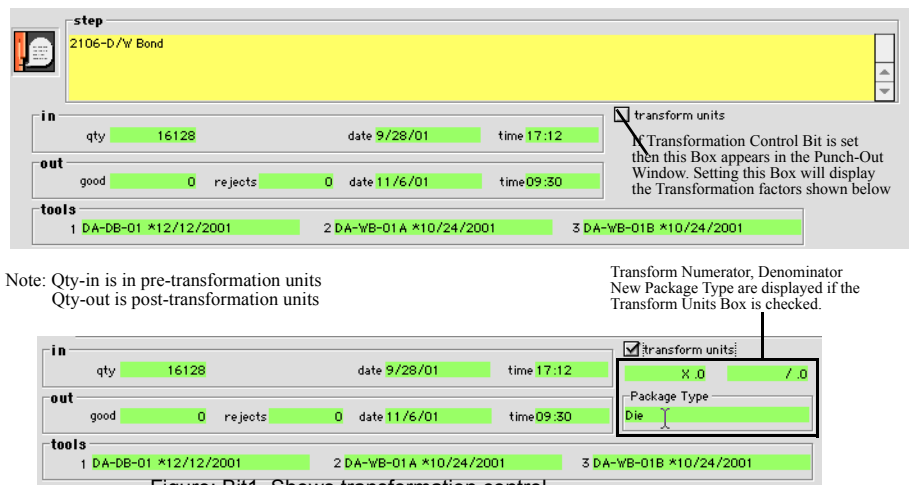


Figure: Bit1. Shows transformation control

Container Code Field:

(Binary-Encoded)

If BIT1 (decimal value 1) is set then the container-table will be displayed in the Punch-In and Punch-Out forms.

If BIT2 (decimal value 2) is set then the container can be LOADED in the step

If BIT3 (decimal value 4) is set then the container can be UNLOADED in the step.

If BIT4 (decimal value 8) is set the container-check is mandatory at punch-in. Container-check uses the LOTSTEPS EXCEPTION field.

Before a step that requires mandatory container-check is punched in, the EXCEPTION bit (6, 0x0020) is set. When the container-check is done this bit is cleared and bit 4 (0x0008) is set if the wrong container is punched-in and bit5 (0x0010) is set if ALL the containers were not checked. If either of these two bits is set (0x0018) the punch-in is blocked. The image in figure 9.29 on page 9.88 shows (dependent on the settings discussed above) the container-list and pull-down menus that become available in the step punch-in and punch-out operations.

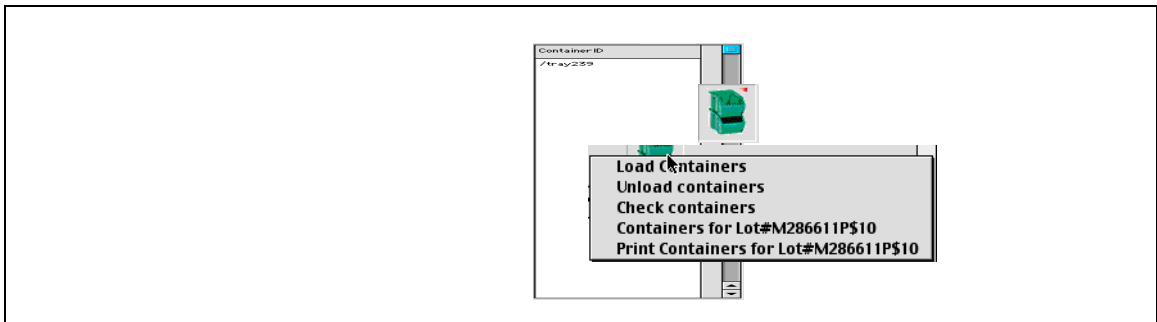


FIGURE 9.29

The LOTSTEPS EXCEPTION field is encoded as follows:

Bit	Action (if 0)	Action if set (1)
1		Tool was out of calibration
2		Tester summary-count exception
3		Bin-Control
4		Wrong container
5		Wrong container count
6		Container count not done

TABLE 13.

Parametric measurement fields in lot-steps.

When a traveler-step is punched-out the typical information entered for each step includes the total quantity into the step, the net quantity out of the step, and the categorization of the good and bad quantities (i.e. binning information). Often the user may require to store other information such as parametric measurements. Typical examples of parametric measurements would be coplanarity data before and after electrical-test or assembly data such as "Wire Pull Avg", "Wire Shear Avg", Loop Height Avg" etc. The "In_par1" through "In_par3" and "Out_par1" through "Out_par3" are six measurement parameters that may be stored with each lot-step. Since each step-type has its own definition of what these parameters mean the user may store as many parameters as required in a traveler by adjusting the number of step-types being used by a traveler.

The user may configure each of these parameters via this menu. When configuring the parameter the first line describes the name of the parameter (what the measurement means), the second line defines the lower-limit (to be used for CPK calculation), and the third line defines the upper-limit of the measurement (to be used for CPK calculation). {For information about CPK calculation on parametric data See "Binning Distribution" on page 1- 12.21.)

:Fields for "Binning Control Parameters" Tab:

The user may define an upper and lower limit for the yield range of each-bin. This is done by clicking the “Binning Control Parameters” tab to launch the form in figure 9.30 on page 9.90.

The screenshot shows a software interface with a tabbed menu at the top containing 'Main', 'Advanced', and 'Binning Control Parameters'. Below the tabs is a header bar with 'Page 1', '1 of 72', and 'template_definition record default'. The main area contains a table with the following columns: Bin-Names, Absolute Hold Qty, Hold %, SPC UL, and SPC LL. The SPC UL and SPC LL columns have a note '-1 to disable' below them. The table lists bins from 'good' to 'Bin27' with values for each parameter.

Bin-Names	Absolute Hold Qty	Hold %	SPC UL -1 to disable	SPC LL -1 to disable
good	0	0.0%	0.00	20.00
Bin2	0	0.0%	0.00	0.00
Bin3	0	0.0%	0.00	0.00
Bin4	0	0.0%	0.00	0.00
reject	0	0.0%	0.00	0.00
Bin6	0	0.0%	0.00	0.00
Bin7	0	0.0%	0.00	0.00
Bin8	0	0.0%	0.00	0.00
Bin9	0	0.0%	0.00	0.00
Bin10	0	0.0%	0.00	0.00
Bin11	0	0.0%	0.00	0.00
Bin12	0	0.0%	0.00	0.00
Bin13	0	0.0%	0.00	0.00
Bin14	0	0.0%	0.00	0.00
Bin15	0	0.0%	0.00	0.00
Bin16	0	0.0%	0.00	0.00
Bin17	0	0.0%	0.00	0.00
Bin18	0	0.0%	0.00	0.00
Bin19	0	0.0%	0.00	0.00
Bin20	0	0.0%	0.00	0.00
Bin21	0	0.0%	0.00	0.00
Bin22	0	0.0%	0.00	0.00
Bin23	0	0.0%	0.00	0.00
Bin24	0	0.0%	0.00	0.00
Bin25	0	0.0%	0.00	0.00
Bin26	0	0.0%	0.00	0.00
Bin27	0	0.0%	0.00	0.00

FIGURE 9.30

A value of -1 disables the limit. The upper and lower limit values are used to calculate the CPK values of the binning yields. (This facility is available via the Binning Plots in the Operations Review Menu). Note that the Bin names cannot be changed here because they are defined in the first tab. Also the Hold parameters are disabled as this feature is only available for Electrical-Test templates (template number 1) via the “Binning Control Record” See “Binning Control” on page 1- 7.9. for more details.

Data Table

This page allows to configure the traveler-step to also have a data-table. The Data-Table is available

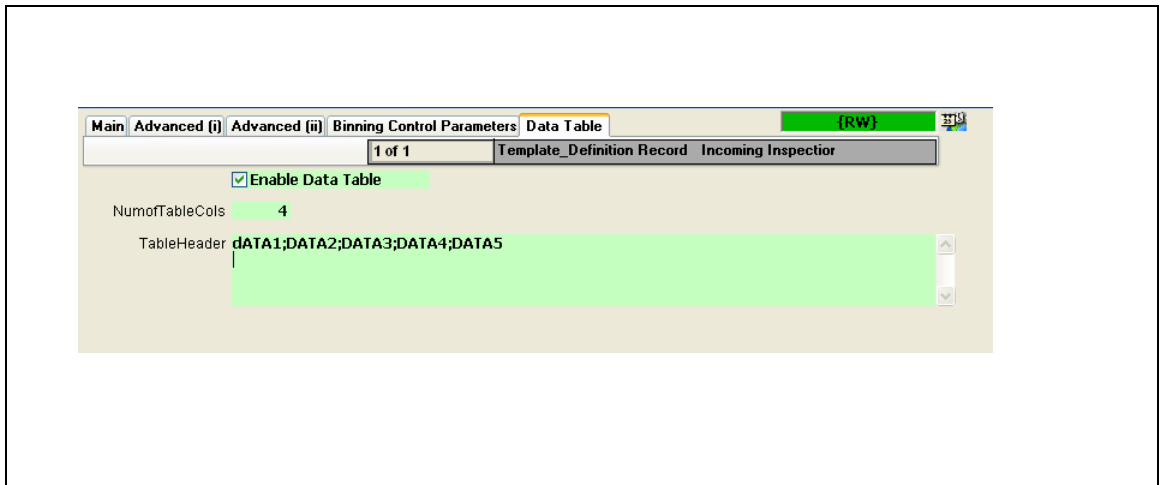


FIGURE 9.31

during data-entry and is included in printout. The layout-form for printout must be set to "PlainUniversalWith4Dwr".

Customize

Menu-Item: *Update Traveler Layout Pixels*

The TemplateDefinition record attaches a large and small layout to a given template. These layouts determine the format of the template when a detailed traveler is printed. The detailed traveler printout therefore consists of one or more layouts. When a detailed traveler is printed then as each step of the traveler is loaded, the ERP2020 determines the print-layout to be used for that step depending upon the step-type (template-number) of the step. The layout is selected via the settings in the Template-Definition record. Each template has two layouts associated with it: a large layout and a small layout. The large layout accommodates more text in the step-description and is invoked if the step-description length is greater than 300 characters or if the step description is terminated with a “#” character. Note that in the latter case then “#” character and NOT a line-feed should be the **last** character. Transparent to the user the ERP2020 calculates the number of pixels being used for the traveler-printout so form-feeds and headers and footers may be correctly placed, page-numbers are tracked, assure that no layout is broken over two pages and that each page has a footer plus an last-page stamp for the last

page. The ERP2020 must therefore know the precise pixel -size of each layout. This menu allows the administrator to automatically re-assign (register) the pixel-sizes of all layouts for all TemplateDefinition records. For each template definition record, the Large and Small layouts defined in the record are temporarily displayed. During this display the ERP2020 measures the pixel-size of the layout and automatically updates the template definition record. Note this procedure is required to be run only if a new structure upgrade has modified the size of a layout or a new data-file is being created.

•Menu: **Customize**

Menu-Item: *Print Sample Traveler printout*

This menu allows the user to print a sample of the detailed-traveler. For each template definition record the Large and Small layouts defined in the record are printed. This printout serves as documentation for the various layouts being called by the administrator in the template definition records.

•Menu: **Customize**

Menu-Item: *Employee Certification*

This menu allows the administrator to assign a description to each of the 17 certification disciplines (skills) in which an employee can be certified. Assigning a description to each category will simply attach this description in all employee forms and print-outs (e.g. The employee Badge). This menu is invoked during the initial ERP2020 system configuration. The form in figure 9.32 on page 9.93 is invoked by this menu.

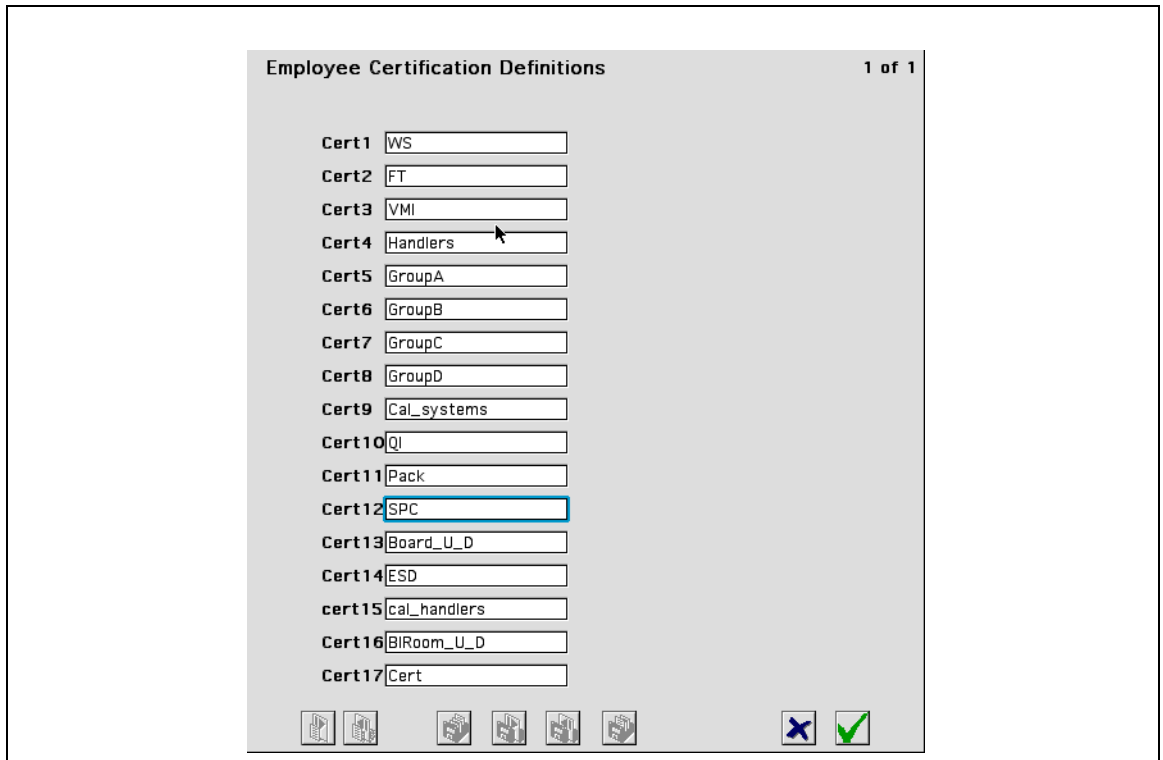


FIGURE 9.32

•Menu: [Customize](#)

Menu-Item: [Create Codes](#)

Often it is necessary to create codes that can be used to categorize a type of data. For example, when an equipment is logged down, in addition to describing the problem, the user may want to assign a code to the incident (problem). This code then allows the user to perform pareto analysis (categorizing the incidents or defects into a histogram form). This menu allows the administrator to create "codes". The scope of the code is defined by the "scope" field. For example, codes with the scope "DownEquipmentCode" will be used to categorize equipment down-incidents. In this case the codes are available to the user when recording the failure-status of the equipment (when it is "logged-down") via the Floor

Menu in the ERP2020 system. The code and description are user-defined, whereas the scope (which defines where in the ERP2020 these codes will be used) is selected from a drop-down list. See figure 9.33 on page 9.94

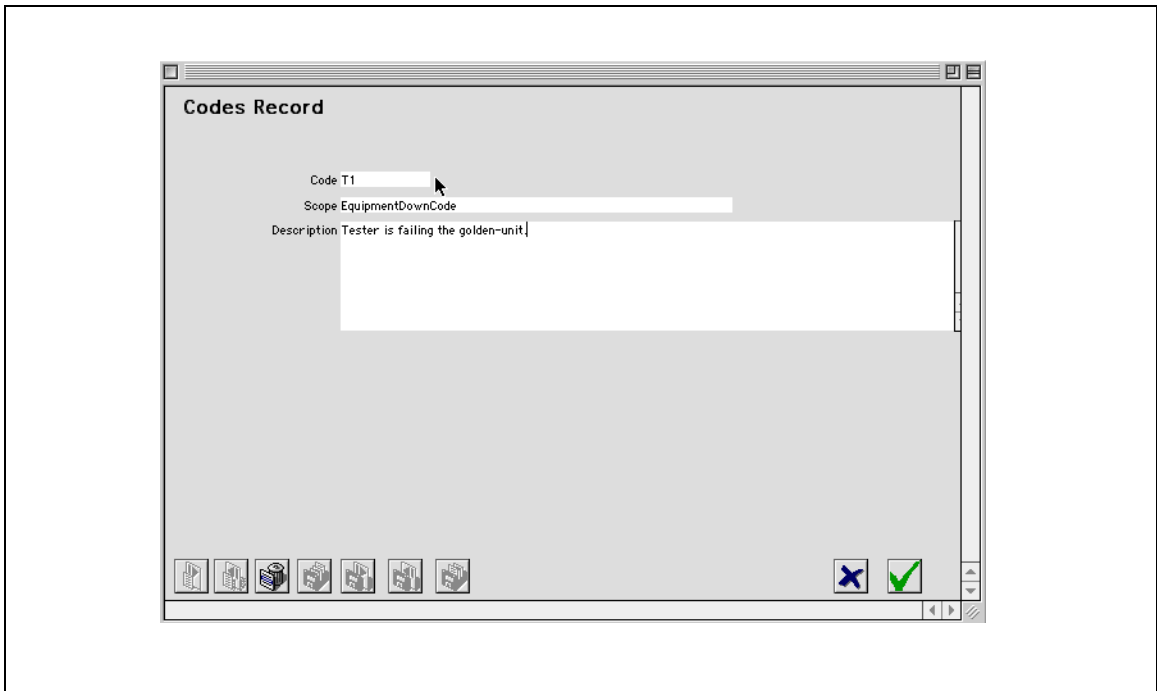


FIGURE 9.33

•Menu: [Customize](#)

Menu-Item: [Add Area](#)

ERP2020 maintains a list of WIP areas. When a Steps-File is created each step is associated with an area in which the step will be performed. When this Steps-File is pasted to a lot to create a traveler (records in the lotsteps table) each lot step contains the area information. As traveler implementation proceeds and when a given step is completed, the Lot-record (in the LOTINFO table) updates itself with the next area of processing. This is also the area in which the lot is considered to reside. Using the area filter the user can get a snap-shot of the lots within a given area (via the Lot -Planning Spreadsheet menu). The user can also recall all steps that have been or will be implemented in a given area (via the LotSteps Spreadsheet menu). This menu allows the administrator to define these areas. The

user must contain a unique record for each area (in the AREADEFINITION table). Each area has a name ("Areaname") and a sequence-number associated with it. The sequence-number is used to sort Area-Inventory reports in sequence-number order. Hence the lowest sequence-number should belong to an area front-most in the Manufacturing-Line and the highest sequence-number should be associated with an area at the end of the Manufacturing Line. The WIP inventory-report will then list WIP in all areas, starting from the beginning to the end of the line. Please note that area-names must NOT contain any spaces, slashes ("/", "\") or other control characters.

The add area menu-item opens the window shown in figure 9.34 on page 9.95.

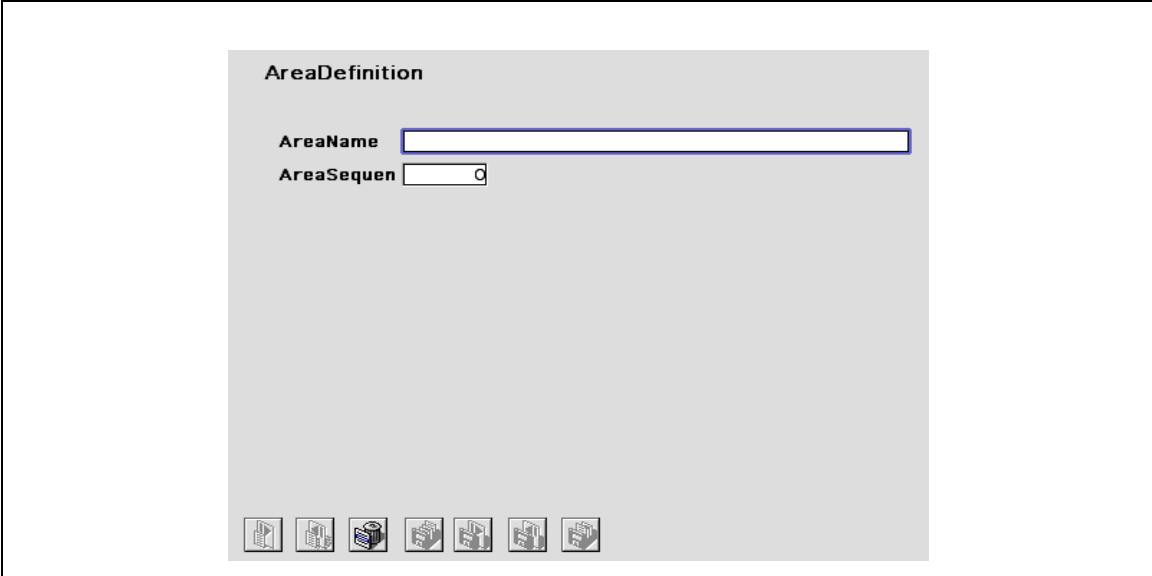
The image shows a screenshot of a software window titled "AreaDefinition". Inside the window, there are two input fields: "AreaName" and "AreaSequen". The "AreaName" field is a long text box, and the "AreaSequen" field is a shorter text box with a small circular icon to its right. At the bottom of the window, there is a row of seven small icons representing different manufacturing or inventory functions.

FIGURE 9.34

•Menu: [Customize](#)

Menu-Item: [Modify Area](#)

Areas are defined during the initial configuration of the ERP2020 system. Modifying area-names after Steps-Files have been created and lot travelers have been generated will introduce querying problems with legacy data. The administrator must therefore manage the process of updating legacy lots and lot-steps with the new area names. This menu is used to both modify an area name, its sequence in the operations, and manage modification of legacy data. The sequence-numbers are used to sort the production-report (this report shows the quantities processed and remaining inventory in each-area). The first sequence-number would indicate an area in the front of the line and the last sequence-number

would similarly indicate an area at the end of the line. The user may modify an area by clicking on the entry in the first line. The sequence numbers are rearranged by dragging the line in the second column and then saving the rearrangement in the data-base. After the user dismisses the spreadsheet the user may then update the database list with the new area definitions. This would provide all clients with a revised area list without the need to restart the server. See figure 9.35 on page 9.96

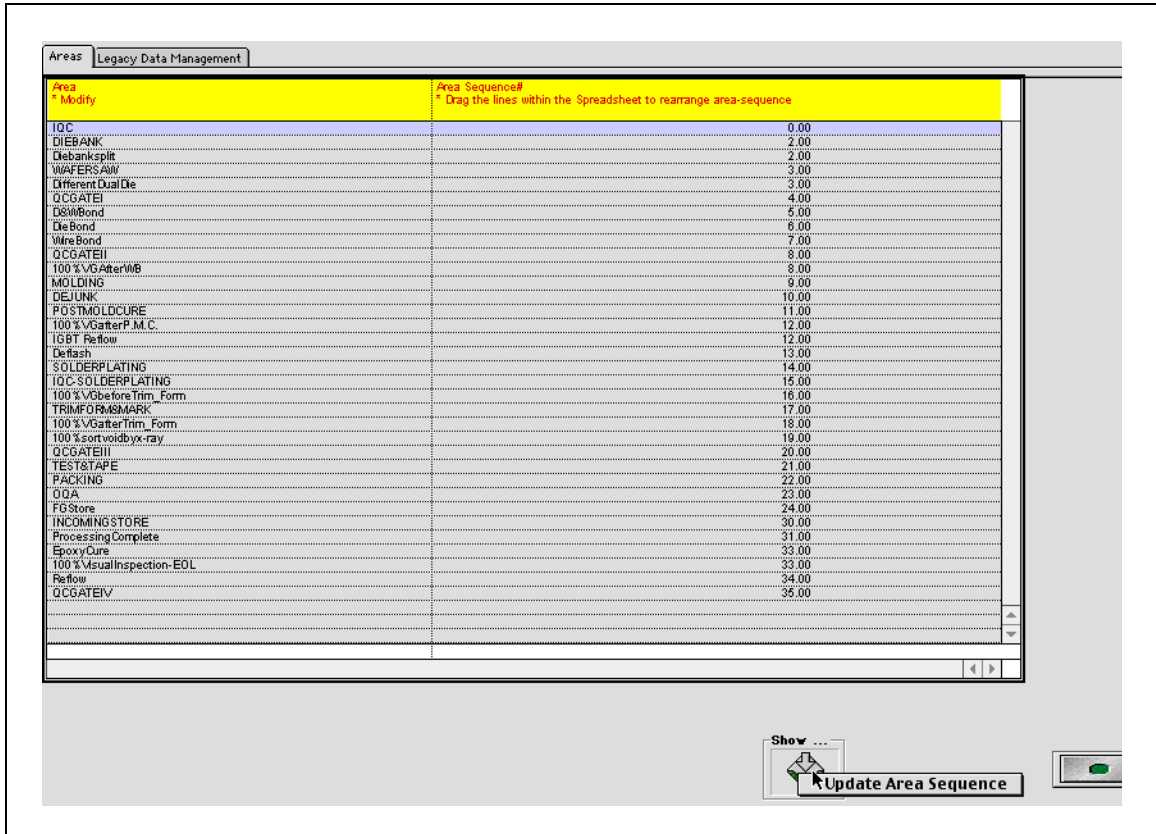


FIGURE 9.35

The second tab of this menu allows the user to update all historical Lotsteps and Lots which contain areas that currently do NOT have a record in the AREADEFINITION table. The user must follow the following procedure to accomplish this:

1) Using the pull down menu query the data-base for all lotsteps that contain area names NOT in the AREADEFINITION table. The form in figure 9.36 on page 9.98 has three scroll boxes. The first scroll-box lists the areas presently defined in the database. The second scroll box lists the areas uncovered in the database that do not have a corresponding record in the AREADEFINITION table. The third scroll-box is a copy of the second box with user modifications. To modify legacy data the user must first map the legacy area to the new area. To do so simply drag an area from the first scroll-box to the second scroll box. (The user may map one or several areas at a time).

2) Once an old area is mapped the user may choose the "Update data" from the pull-down menu and update any LOTINFO and LOSTEPS records with the old area name with the new area name. Note the LOTINFO and LOSTEPS records with a blank area will NOT be updated by this procedure. Also not that this procedure does NOT modify data in the steps-files.

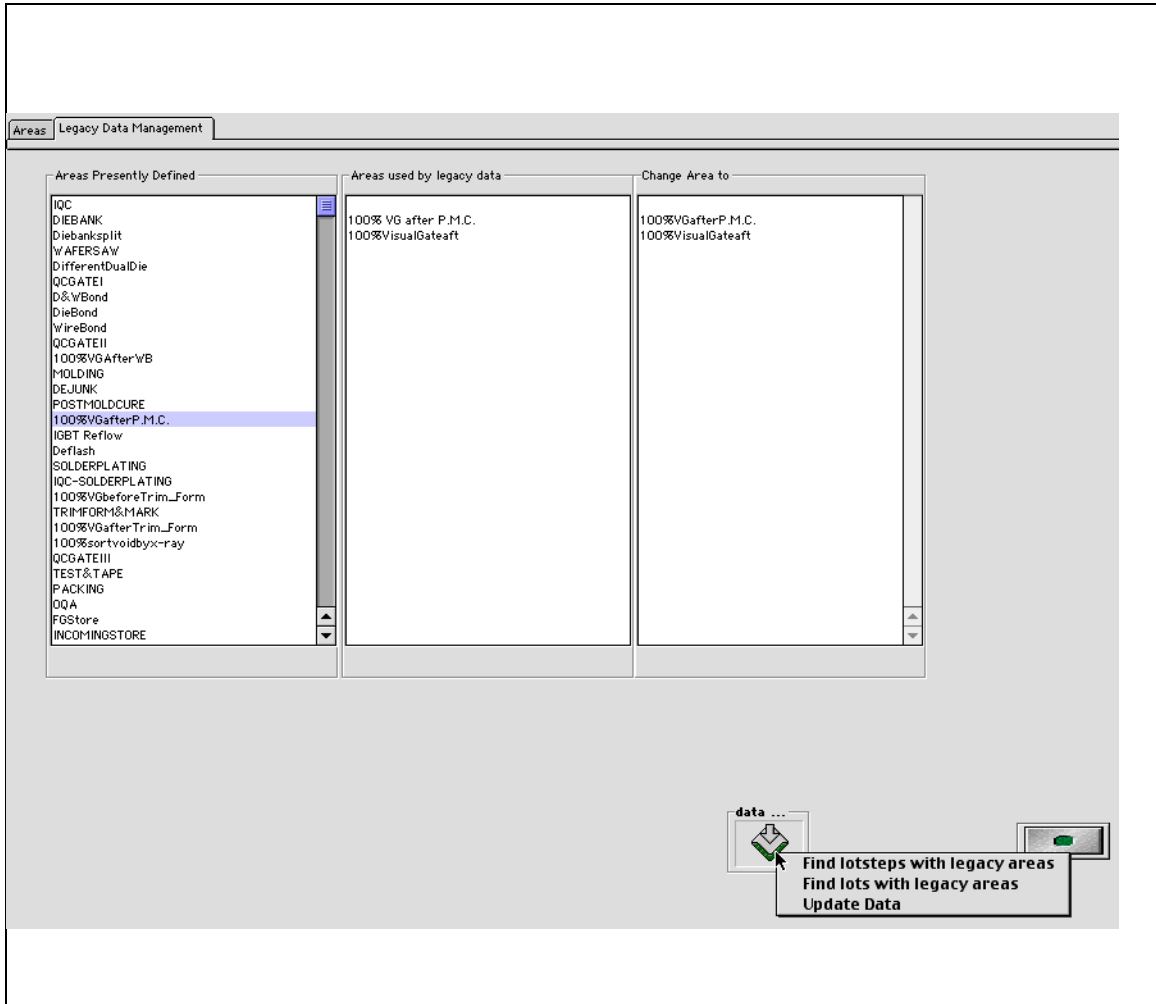


FIGURE 9.36

•Menu: **Customize****Menu-Item:** *Add Process Icon*

Each ERP2020 Job and its constituent lots have a Process and Process-Qualifier field. These fields are populated by the user-defined Process-Type and Process-Qualifier lists (see “List Management” on page 1.9.60). The user may store and associate icons with each process-category defined in the Process-Type list or alternatively (based on the setting in the Housekeeping record, see “Controlling List for Process-Icon in running traveler-header” on page 1.9.21) the icons may be associated with the Process-Qualifier list -items. These icons are then conditionally printed in the running header of the detailed traveler. By default the icons in the running-header are 50x50 pixels. Icons may be added at any-time by the administrator as and when the relevant list is updated. To create an icon, select the Icon-Name (via the Process Type or Process Qualifier list), select the Icon-Type via the Item-Type list, click the icon area to select it and paste the appropriate icon

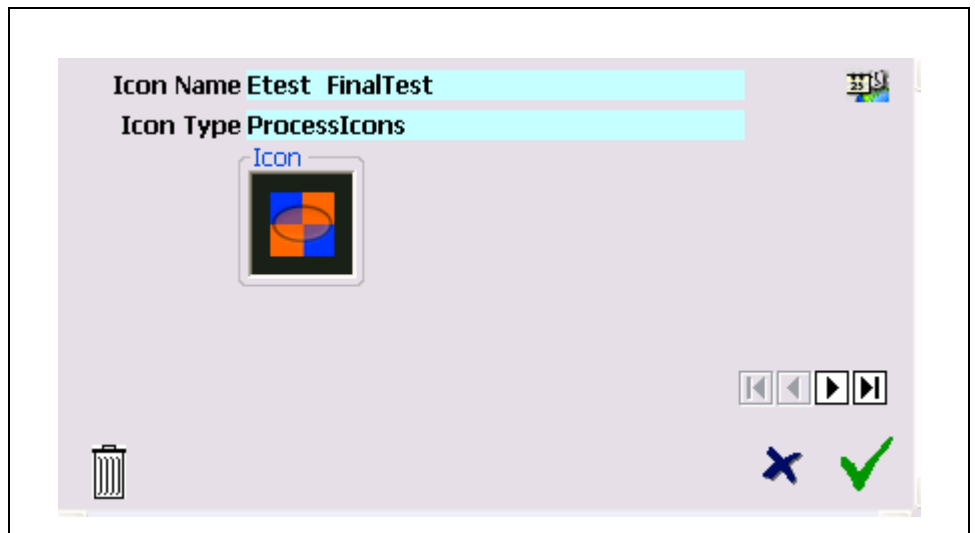


FIGURE 9.37

•Menu: **Customize**

Menu-Item: *Modify Process Icons*

This menu-item allows the administrator to modify any existing icons.

•Menu: **Customize**

Menu-Item: *Add Currency Definition Record*

•Menu: **Customize**

Menu-Item: *Add Sales Tax Record*

Starting with version 2004 of ERP2020 the Sales-Tax Rates, their named identification and the associated Taxing Agency are saved in records in the data-file as opposed to being saved in a list (in previous versions). The ERP2020 system automatically creates records for legacy rates that were previously saved in the list. This menu is used to add a new rate to the data-base via the details-form shown below in figure 9.38 on page 9.100:

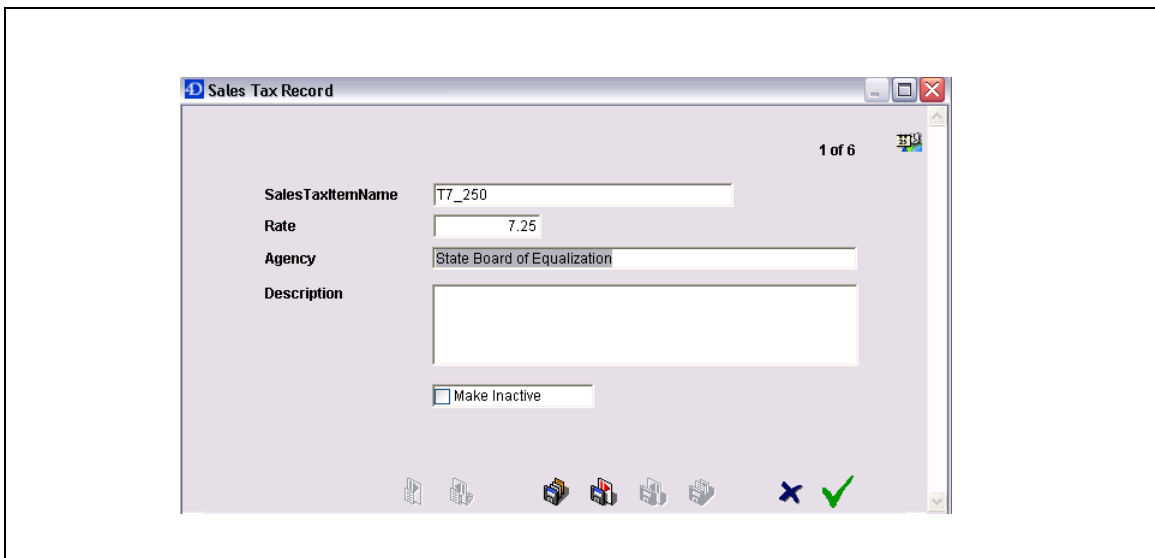


FIGURE 9.38

When a new record is added, the user-sales-tax-list (list of tax rates available during the invoicing process) is not updated until the server is restarted or the list is refreshed in the invoice-generation form.

•Menu: **Customize**

Menu-Item: *Modify Sales Tax Record*

This menu-item allows the user to modify existing Sales-Tax records in the data-base. A sales-tax-rate that is no-longer applicable may be made in-active. If a record is modified then the user must update the user-sales-tax-list (list that is made available to client-stations during the invoice-generation process) via the dialog prompt issued after the modification session is completed. Modification of the sales-tax rate does not affect job that have already selected a sales-tax rate.

•Menu: **Customize**

Menu-Item: *Edit Forms*

This menu allows the administrator to customize those forms that have been configured to be user-customizable. The customization is typically of limited nature and does not allow modification of form scripts or methods. The customized forms are saved in the "ERP2020nn.DA" file next to the structure file. When a new ERP2020 upgrade is installed, the administrator must rename the ".DA" file to conform to the name of the new structure file. Note that if a form has been revised (at the design level) in a new revision of ERP2020, the user modifications must be made again. When this menu item is invoked, the administrator is presented with a list of forms that are user configurable. To edit a form, select the form in the list to invoke the form-editor.

•Menu: **Customize**

Menu-Item: *Set Client Time-out*

Each 4D Client maintains an active session with the server and even when no menu commands are being executed on the client station, the 4D Server continues to poll the clients to make sure that the connection is still active. If an un-expected abort occurs on the client-station, such as a power interruption or the client-machine loses its network connection, or if the client-station (or the server in some instances such as saving cache-memory to disk) is simply too busy to communicate, the server aborts the connection with the client if no communication has been established for a time-out period. The default time-out of the 4D-Client application, when it is shipped by 4D Inc., is set to 2 minutes. This

time-out is programmable within the ERP2020. These settings affect the current session and are also retained for future client sessions. When the client is first launched if the client time-out is less than 7 minutes it is set to 7 minutes. When a transaction is launched by a Client the time-out is set to 4 minutes, for the duration of the transaction and then set back to the value before the transaction. For high-load setups the client-time-out may need to be increased. If the time-out parameter is set too low then there may be frequent dropped connections on the client (error type 10002). If the time-out is set too high then the server may continue to maintain a process for the client for the period of the time-out after the client has unexpectedly quit.

The recommended ERP2020 setting is 7 minutes. This menu allows the user to change the time-out parameter. If the current user is a designer then other data-base parameters may also be changed. This menu invokes the forms in figure 9.39 on page 9.102 and figure 9.40 on page 9.103 for the administrator and designer respectively.

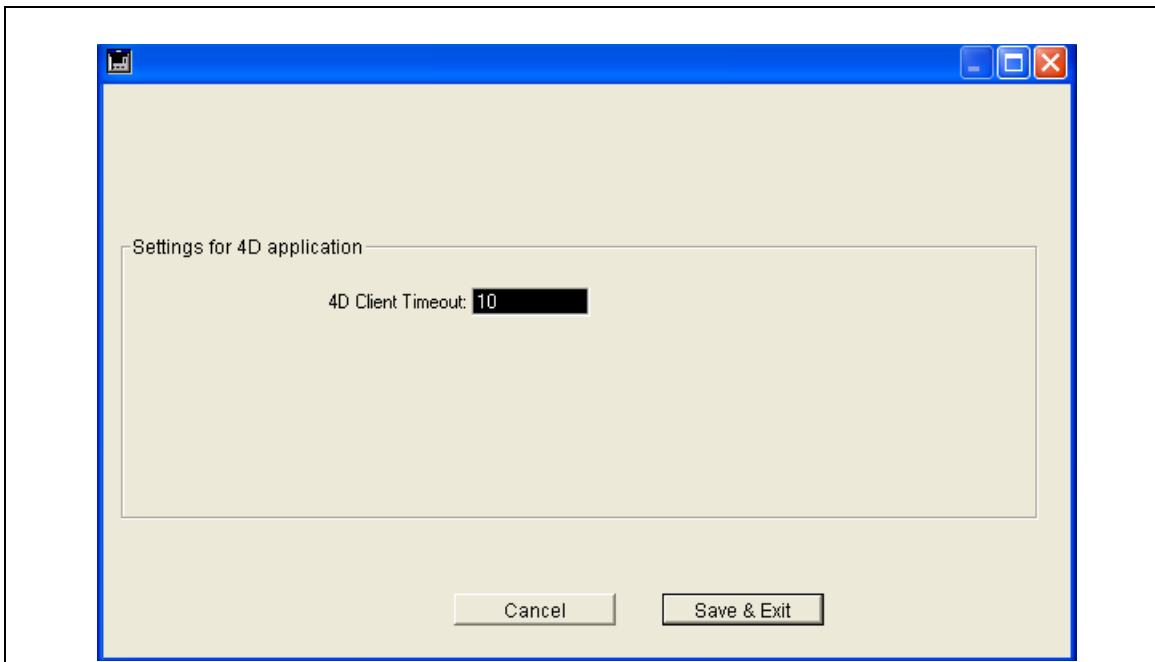


FIGURE 9.39

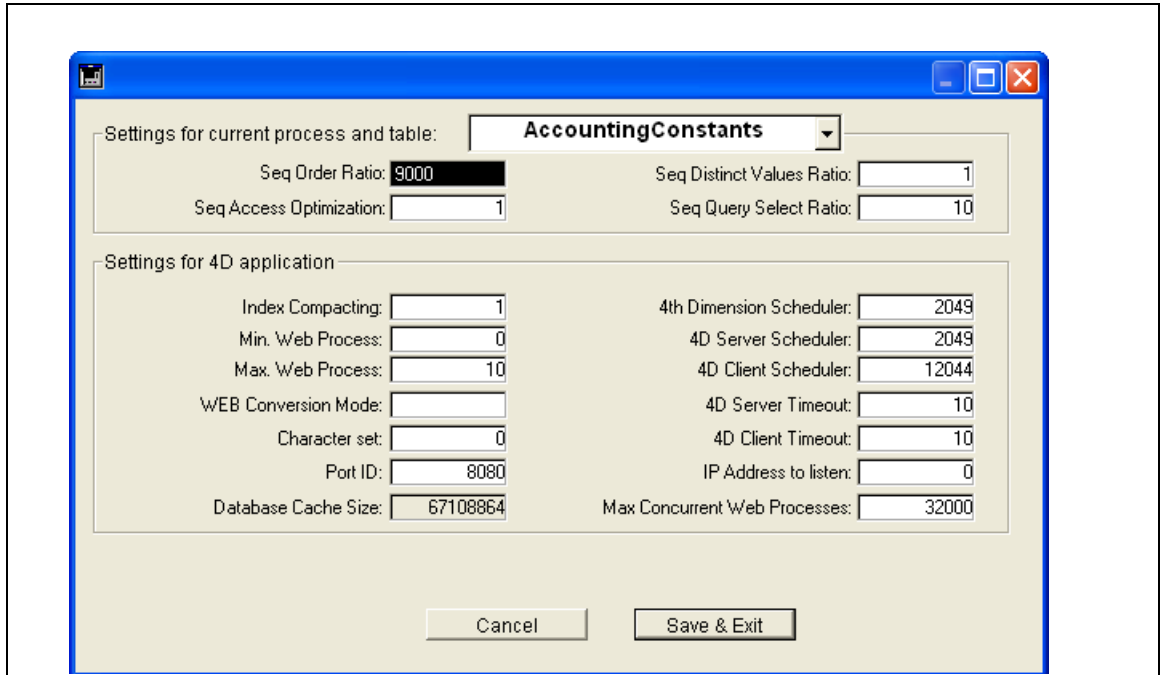


FIGURE 9.40

•Menu: **Customize**

Menu-Item: *Show Menu-Control records*

This menu allows the administrator to review the menu-control records installed in the data-base

The screenshot shows a window titled "MenuControl" with a toolbar at the top containing "Order by", "Print", and "Done" buttons. Below the toolbar is a table with the following data:

MenuBar #:	MenuItem :	MenuText :	AllowedGroup1 :	AllowedGroup2 :	AllowedGroup3 :
1	Buying	BuyingTEST	EnablePurchasing		
1	Change User	General			
1	Housekeeping	New Menu	Staff		
1	Sales via Division	OPs Review	Administrators	Designer	
6	Change User	File			
6	Refresh automatic lists	Lists..			
12					
12	Accounts & Posting Spread	GL Accounts	C_AllAccountingRestrict		
12	Add account	GL Accounts	C_AllAccountingRestrict		
12	Add Adjusting Entry	GL Accounts	C_AllAccountingRestrict		
12	Create account	Bank	C_AllAccountingRestrict		
12	Create Invoice	Invoicing..	Accounting	Modifier	Administrators
12	Credit-Memos-Spreadsheet	Receivables..	CAccountsReceivable	Administrators	Designer

FIGURE 9.41

•Menu: [Replication](#)**Menu-Item:** [Force Master](#)

ERP2020 replication is performed via a server-side stored procedure. This procedure replicates the data on a predefined duty-cycle. Between each replication, the Replication process is delayed until the trigger-time of the next scheduled replication is reached. (For details see chapter on Replication). This menu allows the administrator to force the immediate execution of a delayed Master replication procedure. This menu operates on a Master Server only. Replication is forced via a multi-dialog process. The first dialog provides information on the current setting of the replication parameters in the House-Keeping record.

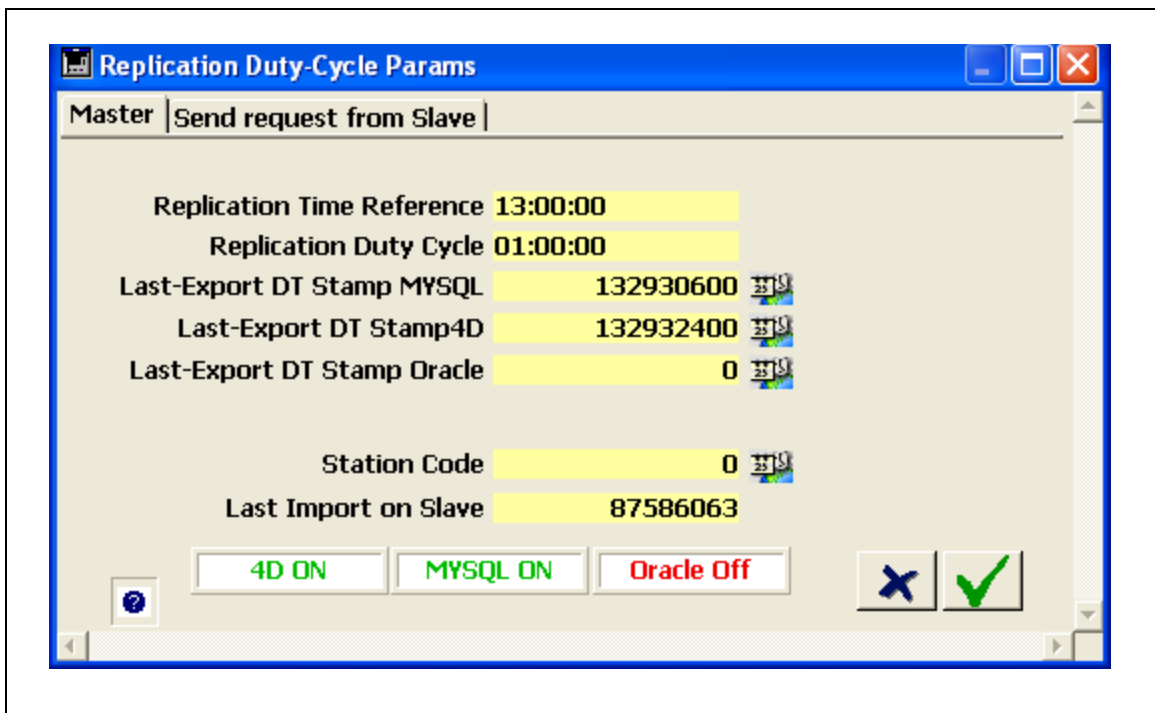


FIGURE 9.43

If the user **accepts** this dialog then a second dialog (see Figure 9.44 on page 9.107) provides information on the next scheduled replication (**assuming that it is not currently running**). This second dialog solicits the user's final confirmation to force an immediate replication. Note that this menu does **not** force an **extra** replication but merely pulls in the next scheduled replication. So if for example the current time is 10:30 AM and the replications are scheduled for 12 noon, 2:00PM and 4:00 PM (duty-cycle of two hours) and a replication is forced then the next replication (after the current one that was forced has been completed) will occur at 2.00PM.

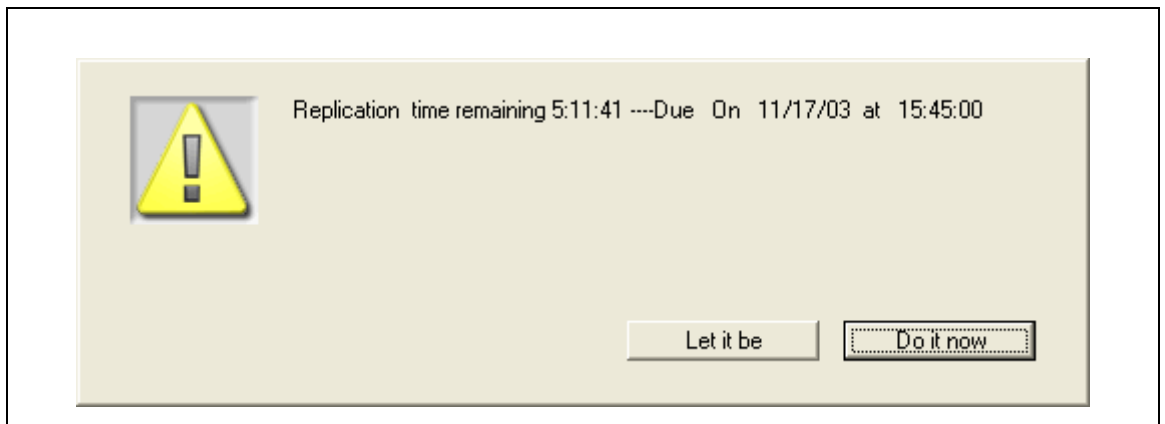


FIGURE 9.44\

Note that if the replication **is** currently running, the user is issued an appropriate alert and the user must let the current replication run its course.

•Menu: *Replication*

Menu-Item: *Force Slave*

ERP2020 replication is performed via a server-side stored procedure. On the Slave server this procedure integrates the data (exported by the Master server) on a predefined duty-cycle. Between each replication, the Replication Process is delayed until the trigger-time of the next scheduled replication is reached. (For details see chapter on Replication). This menu allows the administrator to force the

immediate execution of a delayed Slave replication procedure. This menu operates on a Slave Server only.

Replication Parameters	
Replication Time Reference	11:45:00
Replication Duty Cycle	04:00:00
Last-Export DT Stamp MYSQL	104219100
Last-Export DT Stamp4D	103873500
Last-Export DT Stamp Oracle	0
Station Code	1
Last Import on Slave	120469500

FIGURE 9.45

The second tab of this form also allows the user to issue a message to the master-server (via the intermediary FTP server) requesting a modified export from the master server. The request may be for a modified date-time-stamp threshold and or an export of a single table. The second tab of the form is shown below

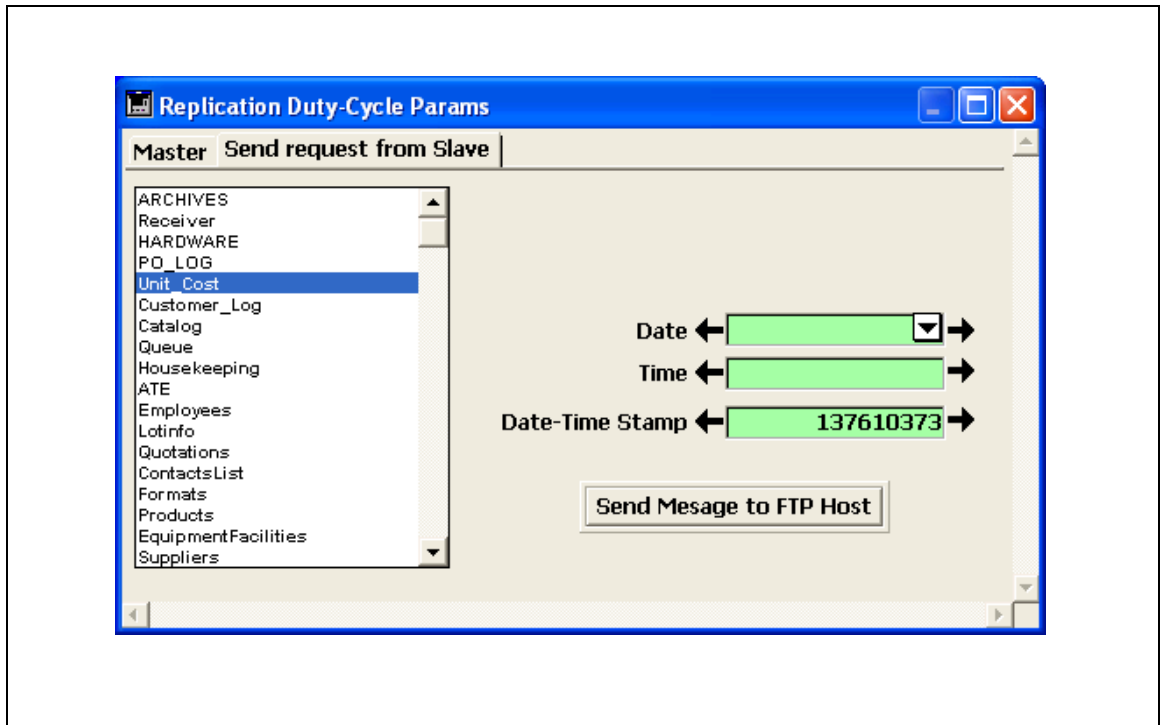


FIGURE 9.46

To issue a message to the master server, the user must click the “Send Message to FTP Host” button. The message is constructed automatically by the slave-server and sent via FTP to the intermediary FTP server. (For details on the message format see “Replication-Control From Slave-Side” on page 2.21.18). Before sending the message the user must select the table in the table list (if a single-table’s data is desired) and also adjust the date-time stamp for the time-threshold of the export from the master. The date-time stamp is adjusted by adjusting the date and time separately. Note that a date of Jan1st 2000 and a time of “00:00:00” corresponds to date-time-stamp zero.

If the user selects a date-time-stamp zero export for a single table then the user may also elect to delete all records (in the slave-data-base) from the selected table. This is useful when a table on the Slave-Side has lost sync with the table on the Master-Side.

•Menu: **Replication**

Menu-Item: *Turn-On Replication Process*

This menu-item allows the administrator to turn on the Replication Stored procedure on the Server if the process is **not** already running.

•Menu: **DB test**

Menu-Item: *List Date or Time errors*

This menu tests the data-base for error in date and time fields. All records in all tables are tested to assure that the date value is less than or equal to !01/01/2999! and is greater than or equal to !01/01/1900! and the time value is less than or equal to 24:00:00. All discrepancies are logged in file "DataTestLognnnnn.html" (located in the Structure folder on the Server) where "nnnnn" is the Date-Time-Stamp referencing the time when the procedure was executed. This procedure is executed on the server. The log file list the discrepant record with the primary-key value

Exporting and Importing Users and Groups (New Structure File)

Operations with the old structure

1. Start the Server (or the single-user version) with the old structure and a data-file (called DATA.4DD for reference here).
2. Save the users and groups to a local (external) file outside the database (called MYFILE.ug for reference). The users and groups can be saved in a local file, via the House Keeping menu bar, menu “Edit Access” menu, and “Manage Users and Groups” menu-item. A new menu bar with three new menus, Edit, Passwords, and Help is displayed. The administrator may then save the users and groups via the Passwords menu, “Save Groups” menu-item. Using this method, the administrator saves all users and groups created by the administrator, which are typically all the users apart from the administrator himself/herself. To return to the House Keeping menu, close the “passwords” window by pressing the X in the top right hand corner (PC).
3. Save the users and groups into the ERP2020 data-file (DATA.4DD). This is done via the House Keeping menu bar, “Edit Access” menu, “Save Usergroups In Datafile” menu-item. This step saves all the users and groups in the data-file irrespective of the creator (Administrator or Designer). This step does not save the passwords.

Operations with the new structure (using the same data-file)

1. Start the server (or the single-user version) with the NEW structure and the data-file (DATA.4DD).
2. Login as Administrator and load the external users and groups file (MYFILE.ug) that contains the users and groups created by the Administrator. This is done via the House Keeping menu bar, menu “Edit Access” menu, “Manage Users and Groups” menu-item. Using the new menu bar that is shown, the administrator may load the users and groups via the “Passwords” menu, “Load Groups” menu-item. This operation restores all the users and groups created by the administrator along with the passwords. To return to the House Keeping menu, close the “passwords” window by pressing the X in the top right hand corner (PC) of the smaller passwords window.
3. Load the users and groups information stored in the data file (DATA.4DD). This is done via the House Keeping menu bar, “Edit Access” menu, “Load Users fm Datafile” menu-item. This process recreates all users and groups created by the designer (although this is typically only the Administrator user). This does NOT recreate the old passwords. During this process a dialog allows the administrator to selectively add the users.

4. Print the new users and groups via the House Keeping menu bar, “Edit Access” menu, “Print Group-Membership” menu-item. All shaded users are administrator created while the non-shaded ones were created by the designer.
5. Enter a new password for the Administrator, which is typically the only designer-created user.

Table relationships

Table relations follows

[Receiver]customer(2,1)	related to: [Customer_Log]Customer(6,1)
[Receiver]Purchase_Order(2,6)	related to: [PO_LOG]PO_Number(4,4)
[Receiver]UnitPrice_Code(2,13)	related to: [Unit_Cost]Device(5,1)
[Receiver]SetupSheetCode(2,19)	related to: [HARDWARE]SetupSheetCode(3,15)
[PO_LOG]CUSTOMER(4,1)	related to: [Customer_Log]Customer(6,1)
[Queue]sys_num(8,4)	related to: [ATE]ATENumber(10,1)
[Lotinfo]Job(12,2)	related to: [Receiver]Receiver_Number(2,8)
[Lotinfo]Customer(12,11)	related to: [Customer_Log]Customer(6,1)
[Lotinfo]ConsolidatedShipperID(12,166)	related to: [ConsolidatedShipper]UniqueID(77,2)
[Quotations]ContactCode(13,4)	related to: [ContactsList]Contactcode(14,1)
[Lotstosupplier]Lotnum(19,1)	related to: [Lotinfo]Lotnum(12,1)
[Lotstosupplier]Supplier(19,8)	related to: [Suppliers]Supplier(18,1)
[QCARS]Customer(20,2)	related to: [Customer_Log]Customer(6,1)
[QCARS]supplier_name(20,23)	related to: [Suppliers]Supplier(18,1)
[Lotsteps]lotnum(22,1)	related to: [Lotinfo]Lotnum(12,1)
[Lotsteps]step_type(22,18)	related to: [template_definitions]template_num(49,2)
[Mail_Messages]Sender(23,1)	related to: [Mail_Users]user_name(24,1)
[Mail_Messages]Recipient(23,2)	related to: [Mail_Users]user_name(24,1)
[repair_log]sys_ID(25,1)	related to: [ATE]ATENumber(10,1)
[repair_log]DownCode(25,22)	related to: [CodesTable]Code(75,1)
[BUY_ORDERS]Approver1(26,10)	related to: [BO_Approvers]Approved_by(30,1)
[BUY_ORDERS]Approver2(26,44)	related to: [BO_Approvers2]Approved_by(68,1)
[BUY_ITEMS]PO_NUM(27,1)	related to: [BUY_ORDERS]SEQ_NUM(26,1)
[BUY_ITEMS]check_num(27,18)	related to: [Check_Register]Check_num(29,1)
[BUY_ITEMS]int_jobnum(27,32)	related to: [Receiver]Receiver_Number(2,8)
[BUY_ITEMS]Vendor_partnum(27,50)	related to: [AVL_Supplies]vendor_partnum(28,2)
[AVL_Supplies]OUR_partnum(28,1)	related to: [PartData]InternalPatnum(69,1)
[AVL_Supplies]Supplier(28,3)	related to: [Suppliers]Supplier(18,1)
[inv_usage_many]jobnum(55,6)	related to: [Receiver]Receiver_Number(2,8)
[resource_calendar]PO_num(56,5)	related to: [PO_LOG]PO_Number(4,4)
[deposit_items]slipnum(58,1)	related to: [Deposits]slipnum(35,1)
[cm_items]cmnum(59,1)	related to: [credit_memo]cmnum(41,1)
[bom_items]bom_part_num(61,1)	related to: [BOM]bom_part_num(60,1)
[LotContainers]LotNumber(65,2)	related to: [Lotinfo]Lotnum(12,1)
[MaterialsUsed]ID(66,1)	related to: [Lotsteps]Seq_Number(22,108)
[PO_Items]PO_number(67,1)	related to: [PO_LOG]PO_Number(4,4)

Standard Template Names and Numbers

Template name	Num	L_layout	L-pixels	S_layout	S_pixels
default	0	plain_in_out	55	L_plain	250
Park	600	plain_in_out	55	L_plain	250
Incoming Inspection	800	plain_in_out	55	L_plain	250
CSI	900	plain_in_out	55	L_plain	250
Moisture Endurance	11	plain_in_out	55	L_plain	250
BURNIN	2	burn_in	70	burnin_L	200
BAKE	131	bake	70	bake	70
Res_Solvents	3	res2solvents	70	res2solvents	70
Solderability	4	Solderability	100	Solderability	100
PDA	5	PDA	35	PDA	35
WS	6	WS	80	L_WS	250
GrossLeak	7	grossleak	60	grossleak	60
FineLeak	8	fineleak	60	fineleak	60
NA	9	N/A	50	N/A	50
Reminder	10	data_prep	50	data_prep	50
lead_scan	120	lead_scan	70	lead_scan	70
val_in	121	lead_scan	70	lead_scan	70
val_out	122	lead_scan	70	lead_scan	70
ETEST	1	Elec_test	110	L_Elec_test	250
RETEST	1001	Elec_test	110	L_Elec_test	250
Bin_Wise_Out	999	bin_wise_out	80	bin_wise_out	80
Bin_Wise_Out_98	998	bin_wise_out	80	bin_wise_out	80
Merge -Step Acquiring-Lot	501	SplitMergeOut	80	SplitMergeOut	80
Merge -Step Dying-Lot	502	SplitMergeOut	80	SplitMergeOut	80
Merge-Step Consolidation Acq-Lot	503	SplitMergeOut	80	SplitMergeOut	80
Split-Step Mother	511	SplitMergeOut	80	SplitMergeOut	80
Split-Step Child	512	SplitMergeOut	80	SplitMergeOut	80
UnMerge-Step Mother	521	SplitMergeOut	80	SplitMergeOut	80
UnMerge-Step Child	522	SplitMergeOut	80	SplitMergeOut	80
IQC	101	expandedBins	190	expandedBins	190
IQA	102	expandedBins	190	expandedBins	190
Die Prep	103	bin_wise_out	80	bin_wise_out	80
Second Optical	104	expandedBins	190	expandedBins	190
Die Attach	105	bin_wise_out	80	bin_wise_out	80
Wire Bond	106	bin_wise_out	80	bin_wise_out	80
Third Optical	107	expandedBins	190	expandedBins	190
Overcoat	108	bin_wise_out	80	bin_wise_out	80
Seal	109	bin_wise_out	80	bin_wise_out	80
Epoxy Attach	110	bin_wise_out	80	bin_wise_out	80
Heat Sink Attach	111	bin_wise_out	80	bin_wise_out	80
Mark	112	bin_wise_out	80	bin_wise_out	80

Final Visual	113	bin_wise_out	80	bin_wise_out	80
X-Ray	114	bin_wise_out	80	bin_wise_out	80
OBO	115	bin_wise_out	80	bin_wise_out	80
Plasma Clean	116	bin_wise_out	80	bin_wise_out	80
Package Load	117	bin_wise_out	80	bin_wise_out	80
Temperature Cycle	118	bin_wise_out	80	bin_wise_out	80
Stud Pull	119	bin_wise_out	80	bin_wise_out	80
Mold	123	bin_wise_out	80	bin_wise_out	80
Dejunk_Debar	124	bin_wise_out	80	bin_wise_out	80
Stabilization Bake	125	bin_wise_out	80	bin_wise_out	80
Backgrind	126	bin_wise_out	80	bin_wise_out	80
Post Mold Cure	127	bin_wise_out	80	bin_wise_out	80
Lead Finish	128	bin_wise_out	80	bin_wise_out	80
Coplanarity	129	bin_wise_out	80	bin_wise_out	80
Encapsulation	130	bin_wise_out	80	bin_wise_out	80
Singulation	132	bin_wise_out	80	bin_wise_out	80
Final Cleaning	133	bin_wise_out	80	bin_wise_out	80
M-Pyrol	134	bin_wise_out	80	bin_wise_out	80
Trim and Form	135	bin_wise_out	80	bin_wise_out	80
Mould / Heat Spreader	136	bin_wise_out	80	bin_wise_out	80
Fourth Optical	137	expandedBins	190	expandedBins	190
Vent Cap	138	bin_wise_out	80	bin_wise_out	80
CSI 1-3/O	139	bin_wise_out	80	bin_wise_out	80
CSI 2-FV	140	bin_wise_out	80	bin_wise_out	80
Wire Pull	141	bin_wise_out	80	bin_wise_out	80
Pre-Seal Bake	142	bin_wise_out	80	bin_wise_out	80
Centrifuge	143	bin_wise_out	80	bin_wise_out	80
Solder Ball Attach	144	bin_wise_out	80	bin_wise_out	80
Final Visual	145	expandedBins	190	expandedBins	190
Solder Plating	146	bin_wise_out	80	bin_wise_out	80
Wafer Saw	147	bin_wise_out	80	bin_wise_out	80
Post Op Visual	148	bin_wise_out	80	bin_wise_out	80

Documentation Steps

Documentation steps have special template-numbers. These numbers are automatically assigned by ERP2020 when these steps are created. The user must not use these template-numbers.

Template#	Reserved Function
501	Merge -Step Acquiring-Lot
502	Merge -Step Dying-Lot
503	Merge-Step Consolidation Acquiring-Lot
511	Split-Step Mother-Lot
512	Split-Step Child-Lot
521	UnMerge-Step Mother-Lot
522	UnMerge-Step Child-Lot
540	Box-stock Pull and Ship-out step
541	Box-stock consolidation step. Acquiring Lot, when lots with like alternate-lot-numbers are merged.
542	Box-stock consolidation step. Merging Lot,, when lots with like alternate-lot-numbers are merged.
561	Inventory pull-step

TABLE 14.

WIP Areas and Database Fields

Each traveler step (which is a record in the LOTSTEP table) contains two fields for the current-step and the next-step areas (called STEP_AREA and NEXTSTEPAREA respectively). Every step must have the STEP_AREA field defined. This is done during the traveler-creation process. (The NEXT-STEPAREA is automatically updated by the system). These fields can provide a quick snap-shot of the manufacturing activity in a given area, in a given time-period.

The LOTINFO record also maintains an area field (called CURRENTORNEXTAREA). This field is updated each time the lot is moved (via a punch-out of a traveler-step). When a traveler is first created the LOTINFO Area-field is set to the first step of the traveler. Thereafter whenever a step is completed, this field is set to the NEXT step that requires implementation. (The only exception being when the step that has been completed is a PARK step (template# 600). In this case the LOTINFO Area-field retains the area specified in the PARK step. This mechanism allows the user to retain a lot in a given area.) The purpose of the LOTINFO Area-field is to provide the user with a quick snapshot of the inventory in various areas. This information is available in the planning menu.