

# Ah3 Invoicing and Inventory System for Repair Shops

**Joe Croft**

joe [at] croftj.net

# **Ah3 Invoicing and Inventory System for Repair Shops**

by Joe Croft

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# Chapter 1. First Steps

## 1.1. Introduction

Ah3 is an application intended for service shops. It has been designed to work for any shop which has the business model where the business has customers with one or more items to be repaired. Though it's origin is an Auto Repair Shop, it can just as easily be customized to be used for a repair shop of Televisions, Home Appliances, Clocks and more.

Ah3 has the following capabilities and features to help with the repair shop:

- Tracks customers and their vehicles (or whatever the item is)
- Allows the definition on pre-defined jobs which can include parts and labor
- Inventory and Vendor Tracking (Not fully functioning)
- Customizable Invoices and Reports

## 1.2. Prerequisites

There are only a few additional packages required to install AH3 on an operational system. they are:

- Qt-4.2 or greater
- Qt Postgres database drivers (QPSQL)
- Postgres 8.0 or greater

## 1.3. User Interface Basics

Ah3 has a reasonable consistent interface. Most dialogs are comprised of forms, tables and buttons. Information is stored as records in the database. These records are displayed and selected through the use of tables. The tables can be sorted by their contents and many of the tables can have their contents filtered.

Information in the database is manipulated through the forms. Each form will have one or more fields holding the data of the selected record.

### 1.3.1. Form Basics

Data for individual records is entered through forms. Collections of records (tables) are displayed and selected by clicking on the desired row in a table.

New records of information is created by clicking the *New* button associated with the form. The form can then be filled out with the appropriate information then saved by clicking the *Save* button.

If an error is made, pressing the key combination *Ctrl-Z* will undo the edits in the field. Moving to a new record without saving the changes will discard any changes made on the form.

A record can be deleted by clicking the *Delete* button. An appropriate confirmation dialog box will be presented to confirm that the record should really be deleted.

#### 1.3.1.1. Data Form Shortcut Keys

The following key strokes can be used for manipulating the form:

**Ctrl-N** : Create a new record

**Ctrl-S** : Save the existing record

**F10** : Clear the record for *Searching*

**F3** : Search the database for the the information in the form.

### 1.3.2. Table Basics

**Figure 1-1. Table Example**

	Ident	Name /	Address	City	State	Zip	Home #
1	1214	aaron buchma...	396 graham rd	FORT WORTH	TX	76137	(817) 555-4632
2	1316	aaron buchma...	18617 hambu...	HALTOM CITY	TX	76053	(817) 555-3149
3	1394	adam raley	201 dave elliot rd	BEDFORD	TX	76021-2152	(817) 555-5985
4	1656	adolphe ferro	1587 s old po...	ROWETT	TX	75088	(214) 555-0403
5	1581	adriane caruth...	399 captains ...	GRAPEVINE	TX	76057	(214) 555-7712
6	1041	adrienne cono...	306 w samps...	HURST	TX	76053	(817) 555-5244
7	1524	alfrena clark	707 foxborrou...	HURST	TX	76053	(214) 555-2093

Tables present multiple records of data from the database. At the top of the table are column headings. These headings can be clicked on, to sort the table on that column. Clicking on subsequent column headings will sort the table on the new column heading while keeping the ordering already set by the previous headings clicked. Clicking subsequent times on the column heading will reverse the order in which the records will be ordered for that column.

Many tables have a form associated with them. Clicking on a record of information in the table will select that row and place its data in the form to be modified.

Most of can be scrolled through using *Alt-Up Arrow* and the *Alt-Down Arrow*.

### 1.3.2.1. Filtering Table Contents

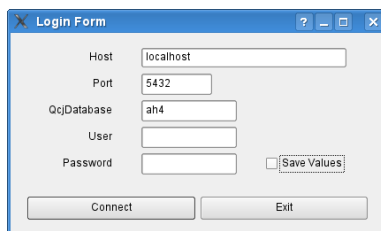
Many of the tables have the ability to filter the records shown by their content. These tables will have a form associated with them as well as *Search* and *Clear Form* buttons. The *Clear Form* button clears the entries in the form so that search information can be entered. Fields can be only partially filled out, such as entering only the last name and not the first. The filtering is also case insensitive. In other words, *jack* will match *Jack Davis* as well as *Don jackSon*.

## 1.4. Invoking

Ah3 can be simply invoked by typing in **ah3** at the command line prompt assuming it resides in a directory defined in the *PATH* environment variable. Alternatively, if you type in **ah3** at the command prompt, and get a message about *command not found*, the *PATH* is probably not set correctly. Another option is to type in **which ah3** at the command prompt, which will look in the *PATH* for the **ah3** program.

Once the program starts a *Login* dialog will be presented. Once the user has entered in the requested information, and the *Connect* button is pressed, the program will be ready to use.

**Figure 1-2. Login Dialog**



## 1.5. Tale of Two Interfaces

Ah3 has two interfaces to choose from. The original **ah3** and a small screen version **ah3xs**. The original is intended for screens with a resolution of 1024x768 or better. I recommend a minimum resolution of 1280x1024 for the original interface. The small screen version can be used on screens with a minimum resolution of 800x600. Running with 800x600 is not ideal, but hopefully I will figure out how to fit the forms on it.

**Figure 1-3. Original Interface**

The screenshot shows the 'Autohouse III' software window. It has a menu bar (File, Edit, Reports, Help) and a tabbed interface with 'Current Work Order', 'Work Order Select', 'Predefined Jobs', 'Inventory', and 'Vendors' selected. The 'Current Work Order' tab contains several sections:

- Customer:** Fields for Name (debbie johnson), Addr (33 county road 4796), City (EULESS), State (TX), Zip (76039-), Contact, Home Phone ((214) 555-3928), Work Phone, Beeper, URL, and EMail.
- Vehicle:** Fields for Cust # (1652), Ident (1839), Make (BMW), Model (328i), Year (97), Odometer (0), Tags (TX TQZ-8634), Color (BL), Engine (6), Trans (AUTO), and VIN (519852293092372).
- Work Order:** Fields for Invoice (22593), Closed (N), Customer (1652), Vehicle (1839), Date In (Jun 14, 2003), Date Out (Jun 14, 2003), Labor Rate (\$65.00), Sales Tax (\$0.00), Haz. Mat. (\$0.00), Tax Rate (0.0825), and Total (\$524.30). There is a 'Recommended' section with a large empty box.
- Parts:** A table with columns: Ident, Part #, Qty, Meas., Descr, Taxable, Supply, Cost, Total. It lists parts 7880 (ACTUATOR), 7881 (RUBBER BOOT), 7882 (PRESS. VALVE), and 7883 (GASKET). Below the table are 'Taxable Parts Total' (\$218.80) and 'Parts Total' (\$218.80).
- Labor:** A table with columns: Ident, Descr, Hours, Tech, Cost. It lists labor 37435 (DIAGNOSTIC & CHECK OUT TIME & REPLACE FRONT RIGHT DOOR ACTUATOR) and 37436 (REPLACE PRESSER VALVE & GASKET & VENT PIPE & THROTTLE BODY GASKET & RUBERSLEEVE & SERVICE IDLE VALVE & REPLACE CRANKCASE). Below the table is 'Labor Total' (\$305.50).

Buttons for 'Save Work Order' and 'Cancel Changes' are located below the Work Order section.

The original interface has the all of the information concerning the work-order on one tab. This and the inventory tab are the reason for needing the larger screen size. The parts and labor are entered in on separate dialogs which are invoked by clicking on the parts pane, or on the labor pane.



**Figure 1-4. Small Screen Interface**

The screenshot shows the 'Autohouse III' application window with a menu bar (File, Edit, Reports, Help) and three tabs: 'Workorder Select', 'Current Workorder', and 'Parts | Labor'. The 'Current Workorder' tab is active, displaying a form with the following sections:

- Customer:** Name (christina tumlinson), Addr (81 coolidge ave), City (COLLEYVILLE), State (TX), Zip (76034), Contact, Home # ((214) 555-9031), Work #, Beeper, and Tax ID.
- Vehicle:** Cust # (1639), Ident (1824), Make (Audi), Model (A4), Color (BL), Year (98), Odometer (0), Tags (TXARL-9095), Engine (6), Trans (STD), and VIN (203676592735350).
- Work Order:** Invoice (22607), Closed (N), Customer (1639), Vehicle (1824), Date In (7/8/03), Odom. In (-2,147,483,648), Date Out (7/8/03), Odom. Out (-2,147,483,648), Labor Rate (\$65.00), Haz. Mat. (\$0.00), Sales Tax (\$0.65), Tax Rate (0.0825), and Total (\$307.50). A 'Recommended' section is present but empty.

Buttons at the bottom include 'Save Work Order' and 'Cancel Changes'.

The small screen has moved the parts and labor information onto separate tabs. In addition, the parts and labor entries are modified directly on the tabs without invoking the dialogs used in the original interface.

At this time, the small screen version does not have the inventory and vendor functionality. These will be added in coming releases.

This document is written for the original version. This should not pose too big of a problem for the users of the small screen version in that the the forms presented to the user for manipulating the information will be similar (if not the same) between the two.

## 1.6. Main Window

Figure 1-5. Main Window on Startup

	WO#	Closed	Date In	Name	Make	Model	Color	Tag	Vin	Cust. Id.
1	22638	N	2007-09-09	angel powell	Mercedes	300E		TX CHI-2806	47973960752...	1424
2	22637	Y	2007-09-07	brian spencer		MERCURY		TX CVD-8518	8466029557308	1377
3	22632	N	2006-09-30	RETAIL	N/A	N/A				1
4	22631	N	2006-09-30	anthony white	Mercedes	190E 2.3	WHITE	TX OPC-0881	31617570035...	1015
5	22628	N	2006-09-30	anthony white	N/A	N/A				1015
6	22616	N	2004-06-09	sheresa shelton	Mercedes	240 D	WHITE	TX OOI-2219	60269805974...	1217
7	22609	Y	2003-07-08	felecia dallas	Volvo	740	BLUE	TX QIZ-7869	15957727708...	1454
8	22608	N	2003-07-08	michelle edwards	Volvo	740	BL	TX PMR-8754	19371001751...	1743
9	22607	N	2003-07-08	christina tumlinson	Audi	A4	BL	TX ARL-9095	20367659273...	1639
10	22606	Y	2003-07-07	dennis reed	Volvo	960	SILVER	TX TOK-8946	26970237386...	1612
11	22605	Y	2003-06-27	jennifer mannella	Mercedes	300E	ANTRACID	TX MAA-0133	54887855357...	1680
12	22604	Y	2003-06-26	denise bishop	Volvo	760 TURBO	ANTRAZIT	TX EOK-1286	45158681222...	1155
13	22602	Y	2003-06-23	charles swift	Mercedes	E420	WHITE	TX NHS-7550	35877447034...	1676
14	22601	Y	2003-06-20	amber greene	Mercedes	300SE	CHAM	TX OCX-4243	27966894908...	1521
15	22600	N	2003-06-20	lottie broussard	Mercedes	E 300 D	WHITE	TX VXX-6727	61091770461...	1695
16	22598	N	2003-06-20	brad jons	Mercedes	300 E	SILVR	TX NBM-8988	51785897804...	1672
17	22597	Y	2003-06-19	jennifer basye	Volkswagon	JETTA	BL	TX MIW-2035	47886614235...	1748
18	22596	Y	2003-06-18	jennifer basye	Volkswagon	JETTA	BL	TX MIW-2035	47886614235...	1748

On startup, the application begins in the *Work Order Select* tab. There are several other tabs, each allowing different information to be manipulated. The tabs in order on the main window are:

**Current Work Order :** This tab is for entering parts and labor for a work order, as well as editing the information about the customer and their vehicle.

**Work Order Select :** This tab is for searching, selecting and deleting work orders from the system.

**Predefined Jobs :** This tab is for creating, modifying and deleting Predefined Jobs.

**Inventory :** This tab is for managing inventory information. Parts may be created, edited and deleted as well as associated with vendors.

**Vendors :** This tab is for creating, modifying and deleting vendors.

## 1.6.1. Current Work-Order

**Figure 1-6. Current Work-order Tab**

The screenshot shows the 'Autohouse III' application window with the 'Current Work Order' tab selected. The interface is divided into several sections:

- Customer:** Fields for Name (debbie johnson), Addr (33 county road 4796), City (EULESS), State (TX), Zip (76039-), Contact, Home Phone ((214) 555-3928), Work Phone, Beeper, URL, and EMail.
- Vehicle:** Fields for Cust # (1652), Ident (1839), Make (BMW), Model (328i), Year (97), Odometer (0), Tags (TX TQZ-8634), Color (BL), Engine (6), Trans (AUTO), and VIN (519852293092372).
- Work Order:** Fields for Invoice (22593), Closed (N), Recommended, Customer (1652), Vehicle (1839), Date In (Jun 14, 2003), Odom. In (89000), Date Out (Jun 14, 2003), Odom. Out (89000), Labor Rate (\$65.00), Haz. Mat. (\$0.00), Sales Tax (\$0.00), Tax Rate (0.0825), and Total (\$524.30). Buttons for 'Save Work Order' and 'Cancel Changes' are present.
- Parts:** A table listing parts with columns: Ident, Part #, Qty, Meas., Descr, Taxable, Supply, Cost, Total.
 

Ident	Part #	Qty	Meas.	Descr	Taxable	Supply	Cost	Total
7880	1	Ea.	ACTUATOR	Y	N	62.98	62.98	
7881	1	Ea.	RUBBER BOOT	Y	N	8.91	8.91	
7882	1	Ea.	PRESS. VALVE	Y	N	79.48	79.48	
7883	1	Ea.	GASKET	Y	N	9.57	9.57	

 Summary: Taxable Parts Total \$218.80, Parts Total \$218.80.
- Labor:** A table listing labor with columns: Ident, Descr, Hours, Tech, Cost.
 

Ident	Descr	Hours	Tech	Cost
37435	DIAGNOSTIC & CHECK OUT TIME & REPLACE FRONT RIGHT DOOR ACTUATOR	1.2		78.00
37436	REPLACE PRESSER VALVE & GASKET & VENT PIPE & THROTTLE BODY GASKET & RUBERSLEEVE & SERVICE IDLE VALVE & REPLACE CRANKCASE	3.5		227.50

 Summary: Labor Total \$305.50.

This tab facilitates adding and removing parts and labor from a work order as well as modifying the customer and vehicle information. Clicking the *Save Work Order* button will save the fields modified for the work-order, customer or vehicle forms. It will not effect the Parts or Labor sections.

The parts and labor for a work-order may be modified by double clicking their respective panes. By double clicking a pane, the appropriate dialog will be presented for manipulating the parts or labor associated with a work-order.

Pressing the key combination *Ctrl-P* will preview the work-order as an invoice which can then be printed.

## 1.6.2. Work Order Select

Figure 1-7. Select Work-order Tab

Autohouse III

File Edit Reports Help

Current Work Order Work Order Select Predefined Jobs Inventory Vendors

Work Orders

Invoice: 22607 Name: christina tumlinson Closed: No  
 Make: Audi Model: A4 Tag: TX ARL-9095  
 Vin: 203676592735350 Date In: Jul 8, 2003 Date Out: Jan 1, 2000

	WO#	Closed	Date In	Name	Make	Model	Color	Tag	Vin	Cust. Id.
1	22638	N	2007-09-09	angel powell	Mercedes	300E		TX CHI-2806	47973960752...	1424
2	22637	Y	2007-09-07	brian spencer		MERCURY		TX CVD-8518	8466029557308	1377
3	22632	N	2006-09-30	RETAIL	N/A	N/A				1
4	22631	N	2006-09-30	anthony white	Mercedes	190E 2.3	WHITE	TX GPC-0881	31617570035...	1015
5	22628	N	2006-09-30	anthony white	N/A	N/A				1015
6	22616	N	2004-06-09	sheresa shelton	Mercedes	240 D	WHITE	TX OOI-2219	60269805974...	1217
7	22609	Y	2003-07-08	felecia dallas	Volvo	740	BLUE	TX GIZ-7869	15957272708...	1454
8	22608	N	2003-07-08	michelle edwards	Volvo	740	BL	TX PMR-8754	19371001751...	1743
9	22607	N	2003-07-08	christina tumlinson	Audi	A4	BL	TX ARL-9095	20367659273...	1639
10	22606	Y	2003-07-07	dennis reed	Volvo	960	SILVER	TX TOK-8946	26970237386...	1612
11	22605	Y	2003-06-27	jennifer mannella	Mercedes	300E	ANTRACID	TX MAA-0133	54887855357...	1680
12	22604	Y	2003-06-26	denise bishop	Volvo	760 TURBO	ANTRAZIT	TX EOK-1286	45158681222...	1155
13	22602	Y	2003-06-23	charles swift	Mercedes	E420	WHITE	TX NHS-7550	35877447034...	1676
14	22601	Y	2003-06-20	amber greene	Mercedes	300SE	CHAM	TX OCX-4243	27966894908...	1521
15	22600	N	2003-06-20	lottie broussard	Mercedes	E 300 D	WHITE	TX VVK-6727	61091770461...	1695
16	22598	N	2003-06-20	brad jons	Mercedes	300 E	SILVR	TX NBM-8988	51785897804...	1672
17	22597	Y	2003-06-19	jennifer basye	Volkswagon	JETTA	BL	TX MIW-2035	47886614235...	1748
18	22596	Y	2003-06-18	jennifer basye	Volkswagon	JETTA	BL	TX MIW-2035	47886614235...	1748

New Work Order  
 Preview Work Order  
 Close Work Order  
 Delete Work Order  
 Search  
 Clear Form  
☒ Show All Work Orders

This tab is for searching, creating, printing, deleting and selecting work-orders to manipulate, in the *Current Work-Order* tab.

The list of work-orders can be searched by clicking the *Clear Form* button, filling in the appropriate fields on the form such as the *name* or *tag* fields, then clicking the *Search* button. Once the *Search* button is clicked, only records satisfying the fields entered will be shown. Partial information, such as only the last name, can be entered into the fields.

Clicking the *Clear Form* button will once again, will show all of the work-orders.

By default, only opened work-orders are shown. Checking the *Show All Work-Orders* check box will show all of the work-orders, both opened and closed. Unchecking the check box will once again only show opened work-orders.

Caveat: the *Closed* selection must be set to *Yes* or *No*. In other words, only work-orders which are closed,

or work-orders which are still open, can be shown when searching.

### 1.6.3. Predefined Jobs

Figure 1-8. Predefined Jobs Tab

The screenshot shows the 'Autohouse III' application window with the 'Predefined Jobs' tab selected. The interface is divided into two main sections: 'Predefined Jobs' and 'Job Parts'.

**Predefined Jobs Section:**

- Ident: 1
- Description: 1
- Make:
- Model:
- Hours: 0.0
- Charge for Parts: No

	Ident	Description	Make	Model	Hours	Charge for Parts
1	1	1			0	
2	8	Oil Change			4	N
3	9	Brakes			2	N

**Job Parts Section:**

- Ident: 2
- Job: 8
- Part #: 1234
- Descr: Oil
- Qty: 5.0
- Meas:
- Cost: \$0.00

	Ident	Part #	Qty	Meas.	Descr	Cost
1	5		1	Qt	Brake Fluid	0.00
2	4		8	Ea	Brake Pads	0.00
3	3		1	Ea	Filter	0.00
4	2	1234	5	Qt	Oil	0.00

Predefined jobs are definitions of some specific sub-task: they involve some predetermined amount of labor, and often some specified parts. For example, a predefined job of *Tune Up, 6 cylinders* would be the labor for a *Tune Up* along with the parts (6 spark plugs). The number of hours for the labor can be defined, as well the kinds of parts and their quantities. Whether or not the parts will be charged for separately can be set.

Once a job is created, parts can be associated with the job by clicking the *Add Part*. This button behaves like the *New* button on other forms. The new part then should be modified and saved by clicking the *Save* button. The new part will be associated with the selected job.

## 1.6.4. Inventory

Figure 1-9. Inventory Tab

Autohouse III

File Edit Reports Help

Current Work Order Work Order Select Predefined Jobs **Inventory** Vendors

Part

Part # 123456 Ident 94

Make Mercedes Category Cooling Supply No

Descr. Oil Filter

Unit of Meas. Ea Low Threshold 3,000 Buy to level 10,000

New Part Save Part Delete Part Search Clear Form

Part # /	Make	Category	Descr.	Meas.	Supply	Ident
1		Misc.	Oil	Ea	N	96
2	123456	Mercedes	Cooling	Oil Filter	Ea	N 94

Vendor Part

Part # Ident

Qty in stock 0.0 Cost Retail

Vendor Ident

Contact

Phone 1

Phone 2

Fax

EMail

URL

Add Vendor Save Vendor Delete Vendor View All Parts

Vendors

The *Inventory* tab is for defining and tracking inventory. Parts can be created, modified and removed through this tab. In addition, the parts can be associated with vendors. Each vendor can be assigned their own part number for a part.

## 1.6.5. Vendors

Figure 1-10. Vendors Tab

	Name /	Active	Contact	Phone 1	Phone 2	Fax	EMail	URL	Ident
1	Vendor1	N	Fred Flintstone	(724) 555-1212					1

The *Vendors* tab is for creating, modifying and deleting vendors.

# Chapter 2. Work-Orders

Work-orders are the main purpose of this program. They have a definite flow in their life. They are first created, then modified by adding parts and labor. Once the work is completed the work order is printed as an invoice, and then closed. Once closed, work orders are considered complete and should not be modified.

## 2.1. Creating New Work-Orders

Work-orders are created on the *Work-Order Select* tab. Clicking the *New Work-Order* button begins the process, by opening a dialog for selecting the customer.

**Figure 2-1. Customer Select Dialog**

	Ident	Name /	Address	City	State	Zip	Home #	Work #	Beeper #
1	1214	aaron buc...	396 graha...	FORT WO...	TX	76137	(817) 555-...		
2	1316	aaron buc...	18617 ha...	HALTOM ...	TX	76053	(817) 555-...		
3	1394	adam raley	201 dave ...	BEDFORD	TX	76021-2152	(817) 555-...		
4	1656	adolphe ferro	1587 s old...	ROWETT	TX	75088	(214) 555-...		
5	1581	adriane ca...	399 captai...	GRAPEVINE	TX	76057	(214) 555-...		
6	1041	adrienne c...	306 w sam...	HURST	TX	76053	(817) 555-...		

An existing customer can be chosen from the list, or a new customer can be created. Once a customer is selected, a dialog for selecting the vehicle will be presented which will allow the user to select an existing vehicle associated with the customer or create a new vehicle. The RETAIL customer is special in that a vehicle will not be requested.



**Figure 2-2. Vehicle Select Dialog**

	Ident	Make	Model	Year /	Color	Odometer	Tags	VIN	Engine	T
1	1848	Mercedes	300 D	84	YELLOW	0	TX SCB-8785	550871868615228	5	A
2	1922	BMW	325	87	BL	0	TX ZAG-6135	100651290949948	6	A

When the work-order is created, the *Current Work-Order* tab will be activated.

## 2.2. Selecting Existing Work-Orders

Existing work-orders can be easily opened by double clicking on the desired work-order on the *Work-Order Select*. As in creating a work-order, the *Current Work-Order* tab will be activated.

## 2.3. Adding and Editing Work-Order Parts

Parts can be added to a work-order by double clicking on the *Parts* pane in the *Current Work Order* tab. A dialog showing the parts, if any, associated with the work-order will be displayed. New parts can be added, or existing parts entries can be modified.

Changes to the fields of a work-order are saved by clicking the *Save Work-Order* button. The changes can be discarded by clicking the *Cancel Changes* button.

Caveat: Canceling Changes to a work-order DOES NOT revert changes to parts and labor. Once those are saved on their respective dialogs, they can only be undone manually by entering in the correct information through their respective dialogs.

Figure 2-3. Parts Entry Dialog

	Ident /	Part #	Qty	Meas.	Descr	Taxable	Supply	Cost	Total
1	7937		1	Ea.	WATER PUMP	Y	N	82.00	82.00
2	7938		1	Ea.	RADIATOR	Y	N	185.00	185.00
3	7939		1	Ea.	WINDOW SWITCH	Y	N	26.00	26.00

Parts can be looked up in the inventory by clicking the *Lookup Part* button. This will present a dialog from which a list of parts to search for can be made.

Figure 2-4. Parts Select Dialog

	Ident	Descr.	Qty In stock	Cost	Retail
1	9	Oil Filter	0	0	0
2	10	Widget	0	10.00	15.00

Caveat: only those parts with a vendor will presented when looking up parts.

Once a part is chosen, the quantity and cost can be adjusted. The total will be calculated on the work-order automatically.

## 2.4. Adding and Editing Work-Order Labor

The method for adding and manipulating labor is almost identical to that for the parts. Double clicking the *Labor* pane will present a dialog for adding and editing the labor items on the work-order.

Figure 2-5. Labor Entry Dialog

	Ident	Descr
1	37452	CHECK OUT TIME & DIAGNOSTIC REMOVE ENGINE COVER & CLEAN OIL LEAK SPAT & RE
2	37953	Oil Change

Predefined Jobs of labor and parts can be added by clicking the *Lookup Labor* button. This will present a dialog showing any labor jobs already added to the work-order, and allow the user to add additional jobs.

Figure 2-6. Labor Select Dialog

	Ident	Description	Make	Model	Hours	Charge for Parts
1	1				0	
2	8	Oil Change		4	N	
3	9	Brakes		2	N	

	Ident	Hours	Description
1	37957	4	Oil Change
2	37958	2	Brakes

	Ident	Part #	Qty	Meas	Descr	Cost
1	8031		1	Qt	Brake Fluid	0.00
2	8030		8	Ea	Brake Pads	15.00

The top frame of the dialog shows the available labor items which can be added to the work-order. The bottom left frame shows the actual labor items which have been added to the work-order and the bottom right frame shows the parts associated with the selected labor item. The quantities of the individual parts as well as the number of hours can be adjusted. Parts can also be added and removed from the job as well. The parts will be associated with the labor and if the labor is removed from the work order, all of the associated parts for that labor item will be removed as well.

## 2.5. Printing an Invoice

Invoices for a work order can be printed through pressing the *Ctrl-P* combination or by clicking the *Preview Work-Order* button from the *Select Work-Order* tab. In either situation a dialog will be presented showing the work-order as an invoice.

**Figure 2-7. Work-Order Preview Dialog**

**CroftJ Internet Services**  
502 Kaylor Frogtown Rd.  
Chicora, Pa, 18025  
(724) 526-5872

Invoice 22607 Tue Jul 8 2003

Customer		Vehicle	
christina tumlinson 81 coolidge ave COLLEYVILLE, TX, 76034 Home # (214) 555-9031 Work #		98 BL Audi A4 Tags: TX ARL-9095 Vin: 203676592735350	

Parts					Labor		
PN	Description	Qty	Cost	Total	Description	Hours	Total
	OIL CAP	1 Ea.	\$5.05	\$5.05	CHECK OUT TIME & DIAGNOSTIC REMOVE ENGINE COVER &	0.5	\$30.00
	MOTOR OIL	1 Ea.	\$2.20	\$2.20	CLEAN OIL LEAK SPAT & REPLACE OIL CAP		
1234	Oil	5 Qt	\$0.00	\$0.00	Oil Change	4	\$260.00
	Filter	1 Ea	\$0.00	\$0.00			

**Recommended Services**

Totals	
Parts:	\$7.85
Labor:	\$299.00
Sales Tax:	\$0.65
Haz. Mat.:	\$0.00
<b>Total:</b>	<b>\$307.50</b>

**NOTICE PURSUANT TO SECTION 70.001 TEXAS PROPERTY CODE**

I hereby authorize the above repair work to be done with necessary materials and hereby grant you and your employees permission to operate the vehicle for the purposes of testing and inspection. As express mechanics I am hereby acknowledged on the vehicle to secure the amount of repairs thereto. I further acknowledge that you will

I am the person or agent acting on behalf of the person who is obligated to pay for the repair of the motor vehicle subject to the repair order to which this is attached. I understand that this vehicle is subject to repossession in accordance with Section 9.503, Texas Business and Commerce Code, if a written order for payment for repairs of the vehicle is stopped, dishonored because of insufficient funds.

☐ Show Source

The invoice can then be printed from this dialog by clicking the *Print* button.

## 2.6. Closing a Work-Order

Work-orders can be closed either through the file menu, or by clicking the *Close Work-Order* button on

the *Select Work-Order* tab. A confirmation dialog will be presented. If it is confirmed, the work-order will have its closed field set to yes.

Once a work-order is closed, a confirmation dialog will be presented whenever any changes are to be made to the work order.

# Chapter 3. Data Security and Disaster Recovery

With any program or computer, data loss is possible. It is mandatory that the data be backed up on a regular basis. This ensures that when there is a disaster; the computer breaks, gets stolen or worse, the data is not lost forever. Notice the use of when and not if! It is inevitable that there will be a failure in the hardware at some point. In this respect, computers are just like cars.

## 3.1. Data Backups

To help with this, there is a script called `/opt/bin/backup.sh`. This script dumps and encrypts the data stored by the program, the configuration of the program and other useful items onto a USB flash drive. The purpose of encrypting the data is to ensure the customer's information and the business information cannot be easily discovered if the USB flash drive is lost. A restoration script is also placed on the USB flash drive to aid in recovering the data when the time arises.

The script should be viewed and modified to suit the individual needs of the business. The password to recover the data is script (HUH??) as well as the name of the flash drive. The instructions for restoration, and the restoration script, can be modified as well. They are both built by the backup script. Both of these are basic with many assumptions on the machines configuration. These cannot be guessed at by the author of the program before hand.

When to run the backup program is a business decision. It can either be run through **cron** or configured to run when the computer is shut down. The restoration script will configure the system to do the backups when the machine is shut down. This is another portion of the backup script you may want to change.

It is envisioned that the user will have two USB flash drives. This will allow one of the drives to be kept off premises or in the possession of the shop owner such as on their key ring. This too is a mandatory practice to ensure worst case scenarios such as the fire or theft do not harm the business.

The size of the drives depends on the amount of data. A 128MB flash drive should work for all but the very largest national chains. A business with 1000 customers and 3000+ work-orders takes under 2 MB of space. Before you by a 2 MB drive, keep in mind that in the end, 2 copies of the data are saved on the flash drive.

## 3.2. Data Restoration

The provided backup script creates a restoration script and instructions for recovering the data from the flash drive. There are two copies of the data. One of them is from the previous back up on the drive and is in a directory named `save`, the other is in the main directory.

The name of the restoration script is **restore.sh**. This script is built by the backup script and will ask for the password used to encrypt the program data. As provided, it will delete any data in the database, restore the data in the database with that on the flash drive, and modify the system to start the postgres database and perform the backup when the computer is shut down.

The instructions can be found in the file `README.TXT`. This should have the basic information on recovering the data and reconfiguring the system. They are not finely detailed, because there is no guessing the full configuration of the system.

Caveat: the recovery of the user configuration as well as any forms and reports is left to the user. The data is on the flash, but it is the user's responsibility to put it back.

# Chapter 4. Making Ah3 Your Own

The real strength of Ah3 lies in its ability to be customized. The obvious things such as your business name and address, labor rate, sales tax, etc., can be customized through the configuration dialogs. Beyond that, the forms and tables can be customized as well. Each form can have the layout of the fields changed as well as the text for labels of the fields. Each of the tables can have the order of the fields and the text for their labels altered as well. Beyond this, some changes can be made to the database tables themselves with Fields added and removed from the tables. Even the tables themselves can be renamed.

## 4.1. Configuration Dialogs

Out of the box, Ah3 has two groups of items which can be configured, *Rates* and *Invoice Settings*. These can be accessed through the *Edit* menu on the menu bar.

On selecting either of these two items, an appropriate dialog box will be presented. The values can be changed then either saved by clicking the *Save* button or the changes can be discarded by clicking the *Cancel* button.

The *Rates* configuration group holds items which are either used as defaults on the forms for new records or they hold values for configuring the pull down lists such as *Units* or *Makes* of vehicles.

The *Invoice Settings* configuration groups holds business information which will be placed in the invoice.

Each of these dialogs provide the most current help available for what each item represents so they won't be detailed here.

## 4.2. Data Forms and Tables

The main page, and most of the elements, have one or more forms and tables of data for them. Each of these can be tailored to the end user's needs through the XML file `/opt/ah3/default_forms.xml`. Every form or table presented in the Ah3 application is defined in the `/opt/ah3/default_forms.xml` file. To learn the name of the actual element defining the form or table, click in the area of the form or table then press *Shift-F1*. This will present a short blurb about the purpose of the form or table and the name it uses in the XML file.

Caveat: disabled tables, those with no data, do not show their Blurb. As a rule, most tables have an associated form and their name can be derived by substituting `_form` with `_table`.



For details on the actual format of the file and the choices of elements, please refer the web page <http://www.linuxlots.com/~qcj/pages.html>. Ultimately, the information on that document will be incorporated into this section.

## 4.3. Invoices and Reports

*This section is not complete. It will be expanded, as time permits. At this time, the best bet is to check out the examples provided with the distribution.*

Both the invoices and reports use the same mechanism for their generation. In simple terms they are xml files residing in the directory `/opt/ah3/reports`. The invoice is just a report this has the defined name of *Invoice*. Ah3 will treat this report special in that when the user requests to preview or print the invoice this is the report which will be used. Keep in mind that the name of the report is not the file name but the name defined within the report definition. From now on through this document, only the term *report* will be used. Its use can be for either a report or the invoice.

In the following examples, to overcome formatting issues, there is a space embedded in the `]]<` sequences. If you want to copy and paste example code, you would do better going to the source `invoice.xml` than in this document.

The biggest difference between an invoice and a report, is that an invoice only can only have one input defined and it must be named *invoice*. This input will be provided by Ah3.

Other reports can have multiple inputs and they will be presented with a query dialog to get the required information from the user before the report is generated.

Each report file is comprised of different blocks. One or more of each block can be used depending on the report being generated.

### 4.3.1. Input Blocks

Input blocks are single XML elements using the *input* tags. These elements define the inputs which will need to be provided by either the program or the user. Each *input* item has a name, a label, a default value and a type attribute. The name attribute will be used to reference the item from the other sections of the report. The label is the text to present to the user when querying for a value.

Default values are provided with the attribute *default*. These can be pretty much any string, but the type will determine the appropriate values as well as any specially interpreted values.

For example, in the supplied `invoice.xml` file, only one input is defined:

**Example 4-1. Input Element**

```
<input name="invoice" label="Invoice #" type="integer" />;
```

The type defines the expected value of the item. It can be one of the following values:

**lineedit:** Simple text with no interpretation.

**password:** Like the *lineedit* type except the entered text will be masked.

**double:** A floating point number. A *min* attribute and a *max* attribute can be provided to bound the acceptable range

**integer:** Just like the *double* type except only integer values will be accepted.

**yesno:** Provides a pull-down asking for Yes or No. It will return a character of 'Y' or 'N' when referenced in the report.

**truefalse:** Like the *yesno* type, this provides a pull-down asking for Yes or No. It will return a value of 0 or 1 when referenced in the report.

**date:** Provides a specialized edit field for dates. The defaults of *today* and *tomorrow* and *yesterday* can be provided as well as any valid date.

**4.3.2. Data Sources**

Data Source blocks are defined using *data\_source* elements. Each data source must have a unique name defined using the attribute *name*. The body of the element should be a CDATA text element comprising of the sql select statement to use for selecting the data for the source.

**Example 4-2. Data Source Element**

```
<data_source name="customer">
  <![CDATA[
    select name, addr, city, state, zip,
           home_pn, work_pn
    from customers where ident =
      (select customer from workorders where ident = ::input:invoice:)
```

```

] ]>
</data_source>

```

Note that in input source *invoice* was referenced from within the SQL statement.

### 4.3.3. Report Sections

The remainder of the report is defined by one or more sections using a *section* element or a *banner* element. Each section will define what data should be presented in the report. Banner elements define graphics to be displayed on a report. Banner elements have no body as all of their information is in the attribute fields.

Each section can generate a block of text, data from the database or an image. In the former two, data can be specified from either an input argument, fields from the data-sources or a configuration parameter. Images are always hard coded at this point using the path name to the image file on the disk.

Banner elements place an image on the page with no wrapping of text around them. They are equivalent to a single column section.

#### Example 4-3. Banner Element Containing an Image.

```
<banner width="500" height="111" img="file:///path/to/image.gif">
```

In the example, the file `/path/to/image.gif` will be displayed with a height of 500 pixels and a width of 111 pixels.

Caveat: it will be rare when a report with a graphic looks exactly like what gets printed on a piece of paper. It will probably serve the user the best to set the height and width of the banner image to fit the piece of paper and then let the preview look like it will.

# Chapter 5. Building and Installation

The installation steps in this document are generic and for all versions of Ah3. When the file names `ah3-x.tar.gz` and `ah3-x.rpm` are used, it is intended that the *x* is replaced with the appropriate version and architecture.

## 5.1. Building and Installing from Source

Building Ah3 is pretty straight forward. It follows the pattern as most typical Qt applications. It does depend on having the development headers and libraries for Qt installed.

The following steps will build the original Ah3 executable **ah3**.

- i. Unpack the tar file using **tar -xzf ah3-x.tar.gz**
- ii. Change directory using **cd ah3-x**
- iii. Execute **qmake ah3.pro**
- iv. Execute **make**

Use the following steps to build the small screen executable of Ah3 **ah3xs**.

- i. Unpack the tar file using **tar -xzf ah3-x.tar.gz**
- ii. Change directory using **cd ah3-x**
- iii. Execute **qmake ah3xs.pro**
- iv. Execute **make clean**
- v. Execute **make**

It is very important the execute the **make clean** command when switching between building the two applications.

To install the application and have it work requires these additional steps executed as the root user:

- i. Execute **mkdir -p /opt/ah3/reports**
- ii. Execute **mkdir -p /opt/ah3/database**
- iii. Execute **cp ah3.xml /opt/ah3/default\_forms.xml**
- iv. Execute **cp \*sql /opt/ah3/database**
- v. Execute **ln -s /opt/ah3 /opt/ah3xs**

## 5.2. Installing and Executing the Binary Packages

As well as RPM and Debian packages, executable installations for Ah3 are now provided for both Linux and Windows. The installers look pretty much the same for either platform. Just type in the command name for the package or double click on it. Windows will probably complain about not recognizing the source of the package. Just follow the wizard. Choose an appropriate directory for installing the package into. The entire package will be placed under this directory.

A number of directories will be placed in the directory chosen for the installation. One of these is the `bin` directory. It holds the actual program files and in the case of Linux, scripts as well.

### 5.2.1. Windows

Entries for the program will be added to the Start Menu. These will include an uninstall script as well.

### 5.2.2. Linux

The executables will be placed in the `bin` directory of the directory you chose to install the package in. Be sure to run the script versions of the program, **Ah3** or **Ah3xs** (notice the capitalized first letter). These scripts will start up the application so the shared libraries needed can be found.

## 5.3. Creating the Database

### 5.3.1. By Script (Linux only)

The `create_db.sh` script has been supplied with Ah3. It will ensure postgres is started, that it will accept connections from the network, it will use trust authentication for those connections from localhost and it will create the ah3 database user. After this, it will create the ah3 database under the ownership of ah3 and install the schema and a minimal data set required to run the **ah3** program.

This script is simple to read. It does have security implications for your computer. If you are only running **ah3** on the computer and its database, it should be fine. Otherwise, you should check it and make sure it is not doing anything to your disliking.

This script is installed via the ah3 rpm file, can be found as `/opt/ah3/create_db.sh`, and should be executed as the root user.

### 5.3.2. By Hand Using the Command Line

This procedure has a couple of assumptions. First, that the postgres database is installed and the server daemon is started. Secondly, that the installer has the appropriate permissions to create postgres users and databases. On SuSE distributions, performing these operations as root will satisfy both of these assumptions.

Performing the following steps will create the database for Ah3. Select an appropriate username to use on the command lines where `<user>` is specified.

- i. Execute **`createuser --createdb --no-superuser --no-creatorole <user>`**
- ii. Execute **`createdb --owner <user> ah3`**
- iii. Execute **`psql --username <user> < /opt/ah3/database/ah3.psql`**

### 5.3.3. By Hand Using PgAdmin

Using the **pgadmin** utility is probably the easiest way to manually configure the database. The same program and procedure can be used from both Windows and Linux. Before you begin, you must have the rights to create User Roles and Databases.

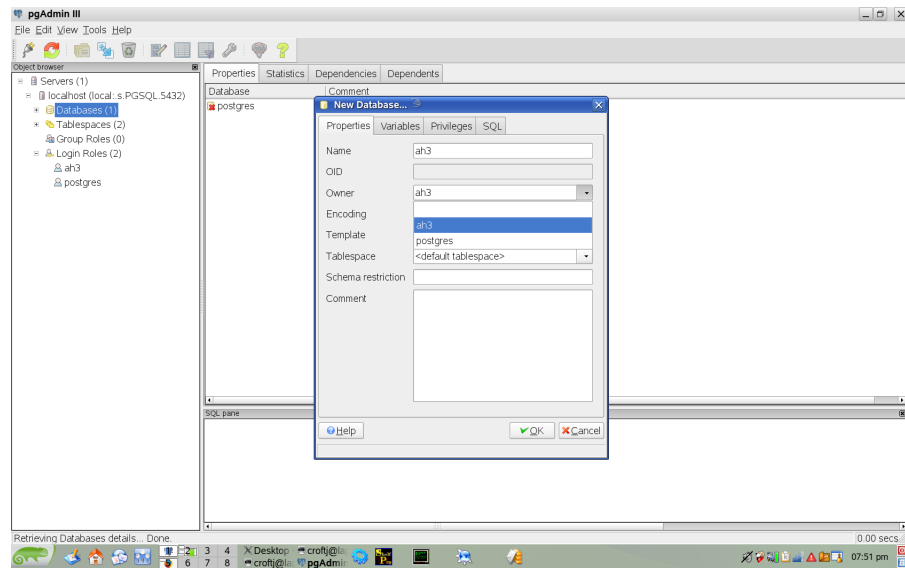
Begin by executing the **pgadmin** program. Once it starts up you will need to connect to the local database (assuming that your database will be running on the local machine). Once you have connected to the database, perform the following steps.

- i. Create the user which will be used to access the database. The user *ah3* is used in this document.



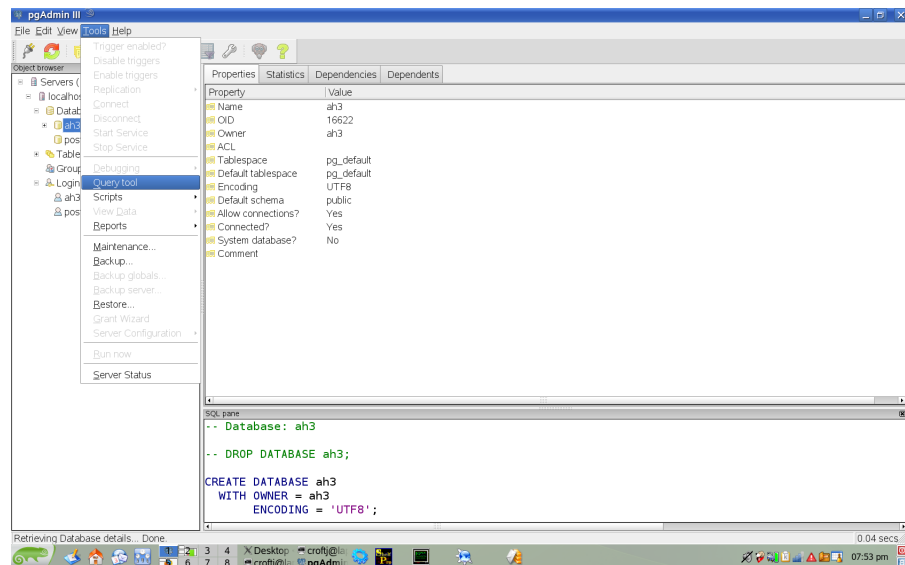
Be sure to set the owner of the database to the owner you created in step 1.

**Figure 5-3. Set Owner of the Database**



iii. Open a Query Tool dialog from the Tools menu.

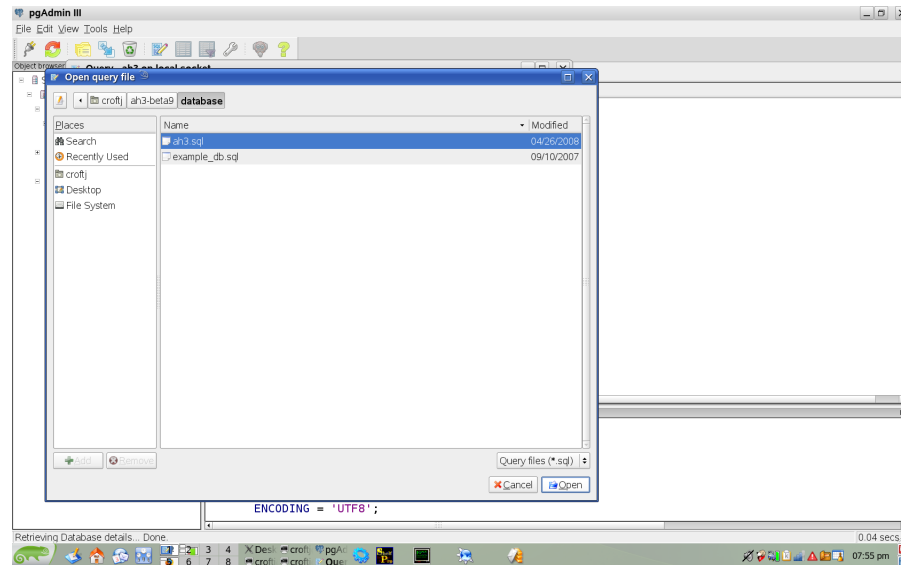
**Figure 5-4. Open Query Tool Dialog**





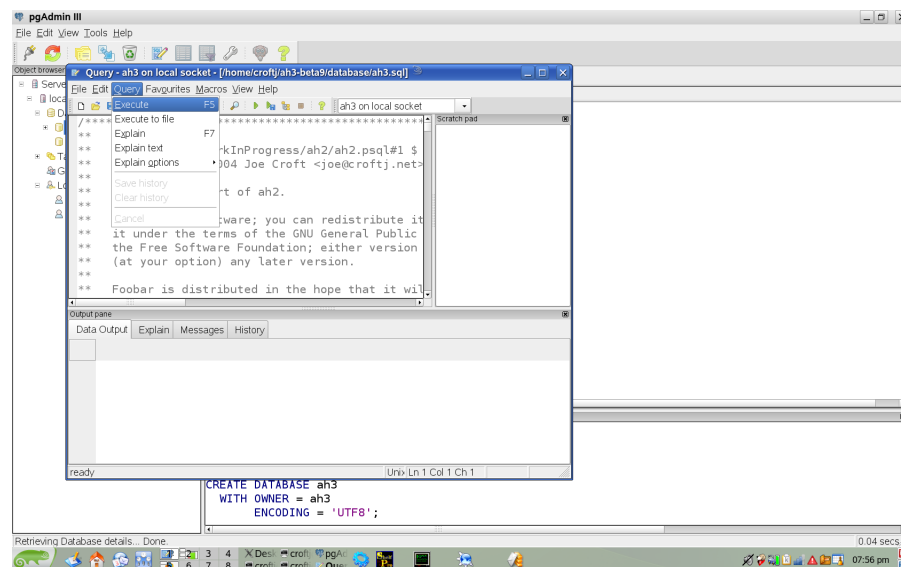
- iv. From the *File* menu, Select the *Open* item. Then browse to the `database` directory of the installed Ah3 package. Select the file `ah3.sql` file.

Figure 5-5. Open Query Tool Dialog



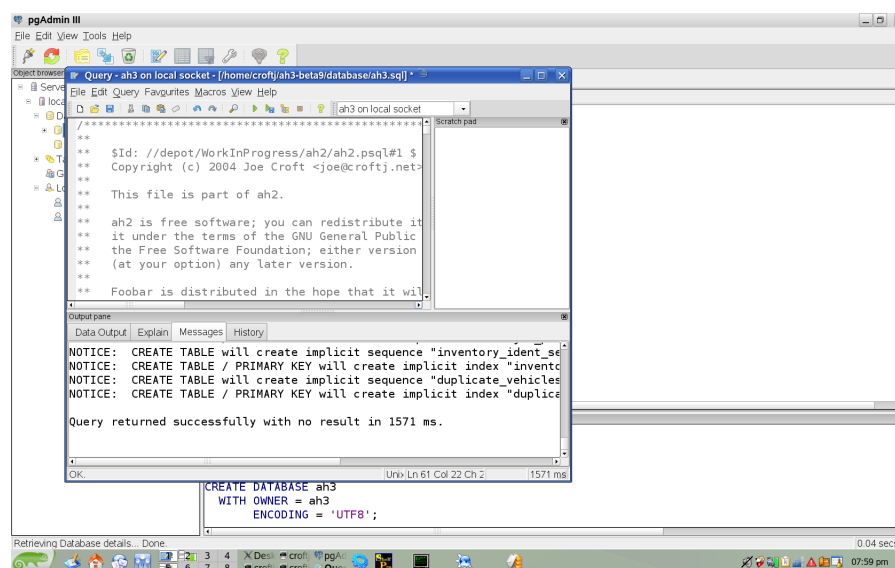
- v. Execute the file

Figure 5-6. Execute the File



vi. Confirm there were no errors.

**Figure 5-7. Confirm no errors**



At this point the database is configured and should be ready to go. You can either start by adding your own customer information or load the example database to try out ah3 and see what it's like.

### 5.3.4. Installing the Example Customer Data

An example database providing a large set of customer information including vehicles and work-orders is supplied with both the rpm and tar file distributions of Ah3. This data can be used to try out the program, then the database can be dropped and recreated to use for real. Execute the command **psql --username <user> < /opt/ah3/database/example\_db.sql**. (example\_db.sql ????) Once it completes, you should have a database with several hundred customers.

For those strange people out there who like to glean personal information from databases such as this, forget it. It just looks real. The data has been sanitized in that it has bogus names and addresses, phone numbers and vehicle information.